REPORT

JOINT COMMITTEE ON PESTICIDE RESIDUES IN AND SAFETY STANDARDS FOR SOFT DRINKS, FRUIT JUICE AND OTHER BEVERAGES

(THIRTEENTH LOK SABHA)

Presented to Lok Sabha on 4 *February,* 2004
Laid on the Table of Rajya Sabha on 4 *February,* 2004

LOK SABHA SECRETARIAT
NEW DELHI
January 2004/*Magha* 1925 *(Saka)*

CONTENTS

*Not printed. Copy placed in Parliament Library.

COMPOSITION OF THE JOINT COMMITTEE ON PESTICIDE RESIDUES IN AND SAFETY STANDARDS FOR SOFT DRINKS, FRUIT JUICE AND OTHER BEVERAGES

Shri Sharad Pawar — *Chairman*

MEMBERS

Lok Sabha

2. Shri Ananth Kumar
3. Shri Anil Basu
4. Shri Avtar Singh Bhadana
5. Shri Ramesh Chennithala
6. Dr. Ranjit Kumar Panja
7. Shri E. Ahamed
8. Shri Akhilesh Yadav
9. Dr. (Smt.) Sudha Yadav
10. Shri K. Yerrannaidu

Rajya Sabha

11. Shri S.S. Ahluwalia
12. Shri Prithviraj Chavan
13. Shri Prasanta Chatterjee
14. Shri Prem Chand Gupta
15. Shri Sanjay Nirupam

SECRETARIAT

1. Dr. (Smt.) P.K. Sandhu — *Joint Secretary*
2. Shri S.D. Gupta — *Principal Chief Parliamentary Reporter*
3. Shri N.C. Gupta — *Under Secretary*

INTRODUCTION

I, the Chairman of the Joint Committee on pesticide residues in and safety standards for soft drinks, fruit juice and other beverages, having been authorized by the Committee to submit the Report on their behalf, present the Report of the Committee.

2. The Committee constituted on 22 August 2003 were asked to present a Report to Parliament by the beginning of winter session. As the Committee could not complete their work by the scheduled date, they sought an extension by the beginning of the Budget session 2004.

3. The Committee held 17 sittings in all. The Committee took evidence of the representatives of 8 Ministries, and also of the representatives of the Council for Scientific and Industrial Research (CSIR), Central Food Technological Research Institute (CFTRI), Mysore, the Central Food Laboratory, Kolkata, the Indian Council of Medical Research (ICMR), the National Accreditation Board for Testing & Calibration Laboratories (NABL) and the Agricultural and Processed Food Products Export Development Authority (APEDA). The Committee also took evidence of the representatives of the Centre for Science and Environment, PepsiCo India Holdings Private Limited and Coca Cola India. In addition, the Committee heard the views of the Associated Chambers of Commerce and Industry of India (ASSOCHAM), the Federation of Chambers of Commerce and Industries (FICCI), the Association of Indian Bottled Water Manufacturers, the All India Food Processors' Association, New Delhi, and Shri M.P. Veerendrakumar (Former Union Labour Minister) and Chairman and Managing Director of Mathrubhoomi, Shri R.C. Periwal, Director, J.K. Dairy Foods Ltd. and Dr. Aparajito Basu, Vice President, Paschimbanga Vigyan Mancha, Kolkata. The list of Ministries, whose representatives gave evidence before the Committee, is given in Annexure. A verbatim record of the oral evidence before the Committee was kept.

4. Committee considered the final draft of the Report at their sitting held on 27 January 2004 and adopted the same unanimously.

5. For facility of reference and convenience, the observations, conclusions and recommendations of the Committee are also given separately at the end of the Report.

6. As Chairman of the JPC, I would like to place on record my heartfelt gratitude to the members for their active participation in the Committee's deliberations and their valuable contribution in preparation of this report.

7. The Committee wish to express their thanks to the representatives of various Ministries/ Departments, Organisations, individuals for placing before them the material and information asked by them in connection with the examination of the terms of reference of the Committee and for giving evidence before them. The Committee also wish to express their thanks to its consultants Dr. G. Thyagarajan, Dr. N. P. Agnihotri and Dr. S. K. Khanna for providing valuable inputs and suggestions.

8. The Committee place on record their deep appreciation for the commendable work done by Dr. (Smt.) P. K. Sandhu, Joint Secretary, Shri N. C. Gupta, Under Secretary and Shri C. Kalyanasundaram, Committee Officer.

NEW DELHI;
January 27, 2004
Magha 7, 1925 *(Saka)*

SHARAD PAWAR,
Chairman,
Joint Committee on Pesticide Residues in and Safety Standards for Soft Drinks, Fruit Juice and other Beverages.

ANNEXURE

[Para 3 of Introduction]

LIST OF MINISTRIES, WHICH APPEARED BEFORE THE JOINT COMMITTEE ON PESTICIDE RESIDUES IN AND SAFETY STANDARDS FOR SOFT DRINKS, FRUIT JUICE AND OTHER BEVERAGES

1. Ministry of Health & Family Welfare.
2. Ministry of Food Processing Industries.
3. Ministry of Consumer Affairs and Food & Public Distribution (Department of Consumer Affairs).
4. Ministry of Water Resources.
5. Ministry of Environment & Forests.
6. Ministry of Urban Development & Poverty Alleviation.
7. Ministry of Rural Development (Department of Drinking Water Supply).
8. Ministry of Agriculture (Department of Agriculture and Cooperation).

INTRODUCTORY

THE CONSTITUTION OF THE JOINT PARLIAMENTARY COMMITTEE

A report of analysis of pesticide residues in soft drinks conducted by Centre for Science and Environment(CSE), an NGO based in Delhi was made public on 5th August, 2003. This Report was covered very prominently by both electronic and print media. In the Report it was stated that CSE found pesticide residues, in the samples of 12 soft drinks brands procured by it from open market in Delhi. The issue was also discussed in Lok Sabha on 6th August, 2003. The members expressed serious concern over the finding of pesticide residues in soft drinks and requested the Government to come with an explanation after finding out all the facts. The Minister of Health and Family Welfare assured the House that she will lay the facts on the matter after collecting the same. Subsequently the Minister made a statement on the matter in Lok Sabha and laid the same on the Table of Rajya Sabha on 21.8.2003. After the Minister laid her statement in the House, the members demanded a JPC probe in the matter. The Minister of Health and Family Welfare also agreed for the formation of JPC. At the end of the discussion, Hon'ble Speaker ruled that a JPC will be formed and requested the Minister of Health and Family Welfare to bring in a Motion in that regard. Accordingly, the Minister of Health and Family Welfare moved a Motion in Lok Sabha on 22.8.2003 for the constitution of a Joint Committee on Pesticide Residues in and Safety Standards for Soft Drinks, Fruit Juice and other beverages and the motion was adopted in Lok Sabha the same day *i.e.* 22.8.2003. The motion included the following members of Lok Sabha:—

1. Shri Sharad Pawar
2. Shri Ananth Kumar
3. Dr. (Smt.) Sudha Yadav
4. Shri Ramesh Chennithala
5. Shri Avtar Singh Bhadana
6. Shri K. Yerrannaidu
7. Shri E. Ahamed
8. Dr. Ranjit Kumar Panja
9. Shri Akhilesh Yadav
10. Shri Anil Basu

The motion regarding appointment of the Committee concurred in by the Rajya Sabha on the same day (22.8.2003) and included the following members of Rajya Sabha:

1. Shri S. S. Ahluwalia
2. Shri Prithviraj Chavan
3. Shri Sanjay Nirupam
4. Shri Prem Chand Gupta
5. Shri Prasanta Chatterjee

The Joint Committee was constituted on 22.8.2003, with Speaker, Lok Sabha appointing Shri Sharad Pawar from amongst the members as Chairman of the Joint Committee.

Thus, a Committee of 15 members of Parliament was constituted as Joint Committee on Pesticide Residues in and safety standards for Soft Drink, Fruit Juice and other Beverages.

The terms of reference of the Committee were as follows:

(i) whether the recent findings of Centre for Science and Environment(CSE) regarding pesticide residues in soft drinks are correct or not; and

(ii) to suggest criteria for evolving suitable safety standards for soft drinks, fruit juice and other beverages where water is the main constituent.

The Committee at their first sitting held on 16th September, 2003, deliberated upon the broad procedure to be adopted by the Committee for their working. The Chairman and members of the Committee expressed their unhappiness over the notification No. G.S.R. 685(E) dated 26th August, 2003 issued by the Ministry of Health and Family Welfare regarding draft rules to further amend Prevention of Food Adulteration Rules, 1955, pertaining to pesticide residues and heavy metals in carbonated water, fruits and vegetable juices, etc. particularly when the matter had already been entrusted to JPC for examination. Taking into account the fact that only 30 days time had been stipulated under this draft notification for inviting suggestions/objections from the public, the Committee decided to ask the Minister of Health and Family Welfare to extend the date till JPC presents its Report to Parliament. At the request of the Committee, the Ministry of Health and Family Welfare issued another notification No. G.S.R. 769(E) dated 29.9.2003 extending the date for inviting objections/suggestions from public/interested parties till 31.12.2003. In this regard the Minister of Health and Family Welfare was further requested by the Committee to keep in abeyance the issuance of final notification till such time that the JPC submits its Report to Parliament.

As per the procedure adopted in earlier JPCs, the Chairman of the Committee briefed the media from time to time on the deliberations that took place during the sittings of the Committee.

The Committee also invited suggestions/views from the public on the terms of reference of the Committee in the form of memoranda. Subsequently, the Committee received hundreds of letters/memoranda from the public. Many of them were in the form of individual grievances. Memoranda which were of analytical nature were circulated to the Members of the Committee for their consideration.

The Committee were mandated to submit their report to Parliament by the beginning of winter session. Since the subject matter is of scientific and technical nature, the Committee required some more time to formulate their views on the subject matter under their examination and hence they sought an extension of time for presentation of the Report upto the beginning of the budget session.

At their inaugural sitting the Committee also decided to request the Hon'ble Speaker to appoint Dr. S. K. Khanna, Dr. N. P. Agnihotri and Dr. G. Thyagarajan, experts in the fields of toxicology, agriculture and pesticide to work as consultants to the Committee. Subsequently as per their availability, Dr. G. Thyagarajan was appointed as full time consultant Dr. S. K. Khanna and Dr. N. P. Agnihotri were appointed as part time consultants to the Committee.

PREAMBLE

Pesticides refer to any substance that is used for preventing, destroying, repelling, controlling pests, rodents and insects. These are necessary evils—necessary because they help protect the crops, increase yields and ensure food security, but evil because they are poisons if consumed continuously for a long period of time or in large quantities. Some pesticides naturally degrade quickly whereas there are others like DDT, BHC etc., which persist in the soil for a long time. It is for this reason that a balance has to be struck in its judicious and responsible use. Developed countries have started moving from long persistent pesticides to less harmful, low persistence and easily degradable pesticides.

Before any new pesticide is allowed for use, it has to be registered with the appropriate Government Authority as mentioned under the Insecticides Act, 1968 which is the Registration Committee. The Ministry of Agriculture which administers this Act, recommends the type and the dosage of a pesticide for use on a particular crop. The Ministry of Health & Family Welfare prescribes standards for different pesticides which can be allowed to remain in the case of a particular agricultural commodity and be allowed to be ingested by humans, based on the nature of pesticide, potential for harm and the food habits of the population.

The permissible level *i.e.* Maximum Residue Limit, (MRL) of the pesticide residue is thus required to be legally defined in the Prevention of Food Adulteration Act, 1954 and rules made thereunder, for each of the agricultural commodities in the case of each pesticide which is recommended. An important point arises as to whether if MRL, for an agricultural commodity for a particular pesticide, is not determined/set and in case that pesticide is found in the food made from that commodity, is it illegal, and therefore unsafe?

When the Centre for Science and Environment—a NGO based in New Delhi came out with a report stating presence of pesticides in some brands of soft drinks that they tested, it attracted the attention of the public, media as well as Parliament, where members expressed concerns. In order to allay such apprehension, the Minister for Health & Family Welfare ordered independent testing of samples of soft drinks by two of the most reputed Government laboratories, which also found presence of pesticides in the samples tested by them, though the quantity was much less. These samples however, pertained to the same bottling plants as collected by the NGO but the date of manufacturing and batch numbers were different.

The Minister, while disclosing the results of the laboratories informed the House that the pesticide residues tested in some of the samples were found well below the EU standards and in some others these were found a few times higher than the EU limit. However, according to the standards prescribed under PFA Rules, all were found within the safety limits as per the existing standards of packaged drinking water. The members were not satisfied with the statement made by the Minister and demanded the constitution of JPC. The House therefore appointed a Joint Parliamentary Committee, with twin terms of reference—(i) whether the recent findings of Centre of Science and Environment (CSE) regarding pesticide residues in soft drinks are correct or not; and (ii) to suggest criteria for evolving suitable safety standards for soft drinks, fruit juice and other beverages where water is the main constituent.

CHAPTER I

I. FIRST TERM OF REFERENCE OF THE COMMITTEE

1.1 As per the first term of reference, the Committee have been mandated to find out whether the recent findings of the Centre for Science and Environment regarding pesticide residues in soft drinks are correct or not.

II. REPORT OF CENTRE FOR SCIENCE AND ENVIRONMENT

Pollution Monitoring Laboratory

1.2 Centre for Science and Environment has set up a Pollution Monitoring Laboratory(PML) in New Delhi to monitor environmental pollution. In its report CSE has stated that PML is equipped with state-of-art equipments for monitoring and analysis of air, water and food contamination including High Performance Liquid Chromatograph (HPLC), Gas Chromatograph (GC) with ECD, NPD, FID and other detectors, UV-VIS Spectrophotometer, Mercury Analyzer, Respirable Dust Sampler, etc.

Materials and Methods

Sampling Methodology

1.3 It has been stated by CSE in its report that soft drink bottles of different brands and flavours were purchased from various markets in Delhi during the month of May, 2003. Extraction and pesticide residue analysis was carried out at the PML during the same month. Three samples of each of the 12 different brands (thirty six samples) were analyzed for 16 organochlorines, 12 organophosphorous pesticides and 4 synthetic pyrethroids. Details of the samples purchased from India are at Annexure I and the details of soft drinks samples procured from USA and tested in PML are also at Annexure I.

Equipments

1.4 Gas Chromatographs used for pesticide residue analysis were Thermoquest—Trace GC with the 63Ni Selective Electron—Capture Detectors with advanced software(Chromcard-32 bit Ver 1.06 October 98) and Nucon-GC-5765 series equipped with Nitrogen phosphorous detector. GC column employed were capillary column, DB-17, J & W make and DB-5, J & W make (for cross verification). Rotatory evaporator (Buchi type) and a 10—μ l syringe from Hamilton Co. were employed.

Solvents

1.5 All the solvents acetone, methylene chloride, hexane (HPLC) grade used for the analysis were purchased from E-Merck.

Chemicals

1.6 In CSE's report it has been stated that pesticide reference standards were obtained from Sigma Chemicals USA.

Sample extraction and Clean Up

1.7 The samples were analysed by CSE by using EPA method 8081A for organochlorines by Gas chromatography and EPA Method 8141A for organo phosphorus compounds by gas chromatography: Capillary column technique.

Sample Analysis

Organochlorines and Synthetic Pyrethroids

1.8 Organochlorine (OC) and synthetic pyrethroids were analysed by Gas Chromatograph(Thermoquest-Trace GC) with Ni^{63} selective electron-capture detector. The capillary column used was DB-17-coated with 50% methyl polysiloxane(length 30m, 1D 0.25 mm and film 0.25µm). The carrier gas and the makeup gas was nitrogen with a 0.4 ml/min-flow rate respectively employing the split less mode.

Organophosphorus Compounds

1.9 Organophosphorus(OP) pesticides were analysed by Gas Chromatograph(Nucon- 5765 series equipped with Nitrogen phosphorus detector). The capillary column used was another GLC capillary column—DB-17-coated with 50% phenyl, 50% methyl polysiloxane (length 30m, 1D 0.25 mm and film 0.25µm). The carrier gas and the makeup gas was nitrogen with 1.3 ml/min and 25-ml/min-flow rate respectively, Hydrogen at 8ml/min and Air at 80 ml/min respectively, employing the split less mode. The samples were calibrated (retention time, area count) against standard mixture of known concentration of 12 organophosphorus pesticides. Each peak was characterized by comparing relative retention time with those of standards.

Calculations

1.10 All calculations were done as described in US Environmental Protection Agency (USEPA) method and the amount of residues in samples were obtained.

Recovery

1.11 Recovery experiment was done as mentioned in extraction methodology, a known amount of standard pesticides was injected in the sample before extraction, to check how much were recovered after complete exercise. Generally with the ten set of extraction one recovery experiment was performed. Recovery was 90% for OCs, 85% for OPs and 88% for synthetic pyrethroids. The reproducibility of results for all the pesticides was 95% and above for all the samples. However, the mean average reading of a individual sample analyzed in triplicate, has been reported in the results.

Confirmation and quantification

Spiking

1.12 Identifications were confirmed by spiking the sample with known standard only to confirm the unknown. Thin layer chromatography of the pooled extract was also performed. Solvent systems used were hexane:benzene(4:1, v/v). The spots corresponding to the position of standards were scraped, extracted and analysed by GLC.

Dual Column

1.13 The identifications were crosschecked with another column- DB-5 coated with 5% diphenyl and 95% dimethylpolysiloxane of different polarity. Elution pattern was different from the elution pattern in DB-17.

Results

Organochlorines

1.14 The details of organochlorine pesticides detected by CSE are in Annexure II.

Y- Hexachlorcyclohexane(HCH)(Lindane)

1.15 Lindane was detected in 100% of the 36 samples analysed by CSE. Minimum concentration was detected in Diet Pepsi—0.0008 mg/L (8 times the EU limit for drinking water) and maximum concentration was detected in Miranda lemon- 0.0042 which is 42mg/L times higher than EU limit for drinking water *i.e.* 0.0001 mg/L. Average concentration of lindane detected in all the samples was 0.0021 mg/L, which is 21 times higher than the EU limit for drinking water.

DDT alongwith its metabolites (DDD+DDE)

1.16 DDT alongwith its metabolites was detected by CSE in 81% of the samples *i.e.* 29 out of 36. Minimum concentration was detected in Blue Pepsi—0.0001 mg/L. Maximum concentration was detected in Mirinda lemon—0.0042 mg/L which is 42 times higher than the maximum EU limit for drinking water. Average concentration of total DDT in all the samples was 0.0015 mg/L, which is 15 times higher than the EU limit for drinking water.

1.17 Heptachlor, aldrin, dieldrin, endosulfan, methoxychlor and chlordane were not detected by CSE in any of the samples of soft drinks tested by it.

Organophosphorus

1.18 The details of organophosphorus pesticide residues detected by CSE are in Annexure III.

Chlorpyriphos

1.19 Chlorpyriphos was detected by CSE in 100% of the 36 samples of soft drinks analysed by it. Minimum concentration of 0.0015 mg/L was detected in Sprite, a Coke product and maximum was detected in Mirinda Lemon flavour, a Pepsico product, which is 72 times higher than the EU limit for drinking water. Average concentration of 0.0042 mg/L of chlorpyriphos was detected in all the samples (that is 42 times higher than the EU limit for drinking water).

Malathion

1.20 CSE has reported that Malathion was present in 97% of the 36 samples analysed by it. Minimum concentration of 0.0013 mg/L was detected in Sprite and maximum concentration was in Mirinda Lemon—0.0196 mg/L which is 196 times higher than the EU limit for drinking water. Malathion was present in all samples except one sample of Sprite (BN 787).

Synthetic Pyrethroids

1.21 None of four synthetic pyrethroids—Permethrin, Deltamethrin, Cypermethrin and Fenvalerate—was detected by CSE in any of the soft drink samples tested by it.

Total pesticide residues

1.22 The range of concentration of total pesticides (Organochlorines and Organophosphorus) , in the 12 brands of soft drinks tested by CSE, varied from 0.0055—0.0352 mg/L. Minimum value of 0.0055 mg/L was detected in Sprite which is 11 times higher than the EU limit for drinking

water and maximum value was detected in Mirinda Lemon—0.0352 mg/L which is 75 times higher than the total EU limit for drinking water of 0.0005 mg/L. Average concentration of total pesticides detected by CSE was 0.0168, which is 34 times higher than the total EU limit for drinking water.

Samples procured from USA

1.23 CSE in its report stated that it has also analysed the samples of Coca Cola and Pepsi Cola procured from the USA. No pesticide residues were detected by CSE in the Coca Cola and Pepsi samples procured from the USA manufactured by the same multinationals.

III. REPORTS OF GOVERNMENT LABORATORIES

1.24 CSE's Report was very widely covered by electronic as well as print media. The issue was also discussed in Lok Sabha. The Minister of Health and Family Welfare informed the House that she will verify the facts and submit the same in the House. Subsequently Directorate General of Health Services (DGHS) requested the Central Food Laboratory under the auspices of Central Food Technological Research Institute (CFTRI), Mysore and Central Food Laboratory, Kolkata to analyse the samples of soft drinks sent by it. The Minister laid a statement containing the results of these two laboratories in Parliament on 21.8.2003.

(1) Report of CFL ,CFTRI, Mysore

CFL, Mysore

1.25 It has been stated in the Report of CFTRI that Central Food Laboratory(CFL) at Central Food Technological Research Institute(CFTRI), Mysore is a ISO 9001-2000 certified and NABL accredited laboratory under the aegis of Council of Scientific and Industrial Research (CSIR), New Delhi. The CFL is an appellate body under PFA Act, 1954. It has also been stated in the Report that the CFL has recently acquired its expertise and training in Human Resource Development to address the analytical aspects of contaminants like pesticides, heavy metals, aflatoxins, microbial pathogens and toxins. This has helped CFL in carrying out training of participants from customs, industries, public health laboratories, public analysts and participants from other countries.

1.26 It has been reported that this laboratory has state-of-art analytical facility including GC with ECD, NPD, FPD, HPLC with DAD, VWD, FLD and GC-MS with highly experienced and qualified personnel to carry out the specialized fields of testing.

Materials and Methods

Sampling Methodology

1.27 Samples were sent by the Directorate General of Health Services, New Delhi to CFL, CFTRI, Mysore for analysis.The details of the samples received are at Annexure-IV. DGHS had sent duplicate samples 500 ml. each of twelve brands of soft drinks from Delhi for analysis of pesticide residues especially for the ones reported by CSE, New Delhi. The 12 brands of soft drinks were analyzed by CFL for organochlorine insecticides namely HCH isomers (alfa, gamma, beta and delta), DDT and metabolites (pp DDT, DDE and DDD), Endosulfan I, II and Sulfate, Heptachlor Epoxide, Chlordane and organophosphorus insecticides namely Methylparathion, Chlorpyrifos, Fenitrothion and Malathion.

Equipment

1.28 CFL has used HP6890 Gas Chromatograph fitted with Ni^{63} µ-ECD, NPD and Shimadzu GC 2010 with FPD for the quantification of organochlorine and organophosphorus insecticides. The columns used were HP 50+ equivalent to DB-17 and BPX5 equivalent to DB-5. Perkin Elmer Turbomass Gold GC-MS connected to Autosystem XL GC was used for confirmation.

Solvents

1.29 All the solvents used like Methylene chloride, Hexane, Acetone used were of HPLC grade from E-Merck.

Sample Extraction

1.30 The samples were analysed using US Environmental Protection Agency (USEPA) method 8081A for organochlorines by gas chromatography and EPA Methods 8141A for organophosphorus compounds.

Cleanup

1.31 Cleanup was done by USEPA method 3620B using florisil activated at 130°C overnight and cooled in a desiccator before use.

Chemicals

1.32 Pesticide Certified reference standards were obtained from Sigma Chemicals, USA.

Calculation

1.33 All calculations were done as described in USEPA/AOAC method.

Recovery

1.34 Recovery experiments were done in all the twelve brands of soft drinks sent to the laboratory for analysis spiking with 0.1 ppb of pesticides. The recovery was greater than 90%.

Confirmation and quantification

1.35 Confirmation of the pesticide detected was carried out by dual column technique using HP 50+ and BPX 5 columns and GC-MS.

GC-MS Methodology

1.36 GC-MS analysis was carried out by CFL using Perkin Elmer Autosystem XL Gas Chromatograph coupled with Turbo Mass Gold Spectrometer. Selected Ion Monitoring (SIM) technique was employed for the analysis of a mixture of standards (0.05 ppb each prepared in 1 ml hexane) as well as analytical samples for the confirmation of the likely presence of pesticides and also for the determination of their levels in the samples. For each analyte, five most abundant and characteristic peaks (m/z > 100) were selected for monitoring.

GC-MS analytical conditions employed by CFL for the analysis are as follows:—

Inj Temp	:	200° C
Det Temp	:	225° C

EI	:	70 eV
Injection Volume	:	1 μ l direct injection
Carrier gas	:	Helium; 1ml/min
Column	:	Elite-5 (Cross bond 5% diphenyl-95% dimethyl Polysiloxane); 30m, 0.25mm i.d., 0.25µm film thickness
Temp.Program	:	180°(10)/5°/210°C

RESULTS

1.37 A total of 12 brands of soft drinks were tested for 14 organochlorine and organophosphorus insecticides.

Organochlorine pesticide residues

1.38 The details of organochlorine pesticide residues detected by CFTRI are in Annexure—V.

1.39 Lindane was present in 100% of the samples. The concentration ranged from 0.000008 to 0.00014 mg/L. 33% of the samples exceeded EU limit for drinking water in the range 1.1 to 1.4 times the EU limit for drinking water.

1.40 DDT and its metabolites were present in 58% of the samples ranging from 0.00018 to 0.00124 mg/L. DDT and metabolites exceeded the limit in the range 1.8—12.4 times the EU limit for drinking water.

Organophosphorus pesticide residues

1.41 The details of organophosphorus pesticides identified by CFTRI are in Annexure VI.

1.42 Chlorpyriphos was present in 100% of the samples analyzed and it exceeded the limit in 75% of the samples. Chlorpyriphos residue exceeded the EU limit for drinking water by 3.9 to 7.8 times.

1.43 Malathion was not detected in any of the 12 samples analysed by CFTRI.

(2) Report of CFL, Kolkata

1.44 CFL, Kolkata did not provide any information, in its analysis report of the different brands of soft drinks provided by DGHS, on materials used and methods adopted by it. The details of the samples received by CFL, Kolkata are at Annexure—VII. In reply to a question of the Committee, it has submitted the following information on equipments used and procedure adopted by it during the analysis:—

1.45 Equipments used

(i) Gas chromatograph Model 5890 Series II (Hewlett Packard, USA) with Auto Sampler and Auto Injector and Ni^{63} Selective Electron Capture Detector for Organochlorine and Nitrogen Phosphorus Detector for Organophosphorus compounds.

(ii) Nitrogen Gas Generator

(iii) Hydrogen Gas Generator

(iv) Rotary Vaccum Evaporator

(v) Capillary Column Used

DB-17 coated with 50% phenyl and 50% Methyl Siloxane, length 30m, ID 0.25mm and film 0.25µm.

(vi) Column used for cross checking:

DB-5 coated 5% Diphenyl and 95% Dimethyl Polysiloxane, length 30m, ID 0.25mm and film 0.25µm.

(vii) GC conditions:

Carrier Gas Nitrogen, Flow Rate 0.4ml/min, Volume of Injection 2µ l

Injector Temp.-270°C

Oven Temp. kept at 120°C with hold time 1 minute then from 120°C to 205°C at a rate of 25°C per minute with a hold time 1 min and then finally from 205°C to 290°C at a rate of 2°C per minute with a hold time 12 minutes.

The time length for total run: 59.9 minutes

The detector is maintained at 320°C

The result and calculation are made using Chemstation Software Version

A 05.01 from Hewlett Packard, USA

1.46 Procedure Adopted

(a) The sample was homogenised and filtered through Whatman No. 1 filter paper.

(b) 500 ml of the filtered sample was taken in a 1 litre capacity beaker. PH of the sample was measured with a pH Meter (Metrohm, Switzerland, Model: 716 Titron) and the pH of the sample was found acidic 2.4-3.3)

(c) The sample was neutralised by (N/10) NaOH solution [AR grade NaOH was dissolved in Milli-Q water (Millipore Corportation, USA]

(d) The neutralised sample was transferred into a separatory funnel (I litre capacity) quantitatively.

(e) To it 20 ml of saturated NaCl solution was added. A.R. Grade NaCl activated at 450°C, ≤ 4 hrs. was used for this purpose.

(f) 100 ml CH_2Cl_2 (HPLC grade Merck) was added and shaken for 2-3 minutes and allowed to separate (approx. 30 minutes required for clear separation of the two layers)

(g) The lower H_2Cl_2 layer was collected in another 1 litre capacity separatory funnel.

(h) Extraction with 100 ml CH_2Cl_2 was repeated twice.

(i) The combined extract (CH_2Cl_2) was filtered through anhydrous Na_2SO_4 (ACS Grade), activated at 450°C ≤ 4 hrs. The filtrate was collected in a 500 ml round bottom flask.

(j) Concentrated to 1—2 ml using rotary vaccum evaporator (Eyela, Japan).

(k) Quantification of florisil by Lauric acid method:—

Thus, 20 gms of florisil used for column preparation.

(l) Preparation of column:—

Column id: 20 mm.

Column length: 25 cm.

Florisil (Aldrich, USA) [activated overnight at 130°C].

Mesh size: 60—100

Na_2SO_4: 1-2 cm in length at the top of the florisil,

Glass Wool

Sequentially Glass Wool, Florisil and Na_2SO_4 were taken in the column and re-eluted with 100 ml n-Hexane.

(m) To the extract at step (j), 10 ml CH_2Cl_2 was added, and the extract poured on the top of the column.

(n) Sequentially (i) 100 ml n-Hexane (ii) 100 ml of 30% CH_2Cl_2 in n-Hexane and finally (iii) 100 ml CH_2Cl_2 was passed through the column.

(o) The entire eluant from the column at step (m) & (n) was collected in 500 ml round bottom flask.

(p) Evaporated to dryness using rotary vaccum evaporator.

(q) Final volume of the residue was made upto 5 ml in a duly calibrated and graduated centrifuge tube with Methyl-tertiary-butyl-ether (HPLC grade).

(r) Determination of residue by Gas Chromatograph.

The details of the organochlorine and organophosphorus pesticide residues found by CFL, Kolkata are in Annexures VIII and IX respectively.

IV. COMPARISON OF METHODS, PROTOCOLS AND EQUIPMENTS USED BY THE THREE LABORATORIES

1.47 The details of the various methods, protocols and testing equipments used by CSE, CFL-CFTRI and CFL, Kolkata are summarised in Annexure—X.

1.48 In a written reply to a query of the Committee, whether the methodology adopted by CSE is wrong as per prescribed USEPA methodology, CFTRI has stated as below:—

(i) CSE has quoted that they have adopted EPA method for organochlorine and organophosphorus insecticides (8081 and 8141). However, they have deviated the column clean-up for pesticide residues wherein they have eluted the column with Hexane and Dichloromethane mixture. In the EPA procedure (3620B) florisil column cleanup is with Ethyl ether and hexane mixture. We are not aware why this deviation has been done. The rate of elution of column with 5 ml/min of Dichloromethane is too fast and no cleanup is achieved. Hence we have done at 2 ml/min which cleans up the material and we get a better baseline. CSE clarified in this regard that the Gas Chromatographic technique is used for qualitative and quantitative analysis of the components of a mixture. It is a highly sophisticated technique which can be used only by experts who have to optimise parameters to get the best resolution. According to the given methodology, "the analyst is permitted to modify GC column, GC conditions, concentration techniques (*i.e.* evaporation techniques), internal standards or surrogate compunds". CSE has further stated that hexane and

dichloromethane mixtures have also been recommended for clean-up. CSE has also clarified that the elution flow rates of the solvents have to be optimised by the analyst. The flow rates etc. given in the method are only indicative.

(ii) While carrying out GC analysis, CSE has chosen higher oven temperature ramp (25°C/min) resulting in higher oven temperature within a shorter period. As very high temperature is reached in shorter duration, there will be poorer resolution of residues and they may get merged into a single peak resulting in higher area and thus showing higher value for the pesticide residues, whereas in EPA, the temperature rise is 2.8°C/min. We have followed the oven temperature ramp of 2°C/min giving us better results and excellent resolution and not merging of peaks. In reply to the above contention, CSE stated in a written note that the conditions such as carrier gas flow rate, temperature of injector, detector temperature and temperature programme specified in US EPA methodology are indicative and not rigid. They are optimised in actual practice during experiments and may, therefore, vary with column and instrument used.

(iii) The pesticide confirmation suggested by EPA is dual column and GCMS whereas CSE has followed dual column and TLC. We have used the latest development of GCMS which is confirmatory firmly based on scientific literature and is the state-of-art.

(iv) The presence or absence of Malathion should have been confirmed by GCMS by CSE instead of TLC confirmatory keeping in view of the instability of Malathion and proper resolution in GCMS that happens for Malathion. In this regard, CSE clarified that USEPA methodology describes the "analytical conditions for a second gas chromatographic column that can be used to confirm the measurements made with the primary coloumn". This method does not say that the results need to be confirmed by GCMS. This method further states that the GCMS method 8270 is also recommended as a confirmation technique, if sensitivity permits and further states that "GCMS may not be used for confirmation when concentrations are below 1µg/µL in the extract". It also states that "Full scan GCMS will normally require a concentration of approximately 10 µg/µL in the final extract for each single-component compound". Since the concentration of residues detected by CSE in soft drinks were below 10 µg/µl, by not using GC-MS, it has not deviated from USEPA methodology.

1.49 CFL, Kolkata observed the following differences in the methods adopted by it and CSE:—

(i) CSE used the calibration table set up relative retention time window of 0.65% whereas CFL, Kolkata used the table set up with the relative retention time window of 0.5% which is more accurate in assessing the retention time of a particular compound.

(ii) CFL, Kolkata used its nitrogen gas generation system producing ultra pure nitrogen of purity 99.999%, CSE remained silent about the quality of carrier nitrogen gas used. Indian Council for Medical Research (ICMR) also expressed similar opinion in this regard. CSE in a written reply stated that it also used ultra pure high purity nitrogen which is 99.99 UHP pure.

(iii) The variation in results will occur between manual and auto injection systems.

1.50 Srisol Research Foundation, in its memorandum submitted to the Committee, has pointed out the following deviations on the methods used by CSE:—

(i) The EPA methods used by CSE have not been validated for use on a complex matrix such as cola beverages. Therefore, there could be several co-extractives that co-elute with the target analytes resulting in potential overestimation of concentrations.

(ii) Some of the deviations to EPA's recommended GC conditions (such as temperature program) and columns may cause co-elution and misidentification of the target analytes. CSE's position in this regard is that the USEPA method used by CSE for its tests is recommended for determining the concentration of various organochlorine and organophosphorus pesticides in extracts from solid and liquid matrices which include products like soft drinks.

(iii) The CSE report does not provide enough information of the Analytical Quality Control (AQC) procedures to make any concrete judgements about the quality of the results.

1.51 In regard to analytical challenges in sub ppb level detection in complex matrices, Vimta Labs Ltd., Hyderabad, has stated in its memorandum as follows:—

(i) **Matrix Interference:** Beverages have many components like sweeteners, coloring agents, preservatives, acids which require extreme care during sample preparation and extraction. Otherwise there is every possibility of non target compounds co-eluting with the target analytes and could cause wrong/overestimated results. In this regard, CSE replied that it is aware of the problems that arise while handling a complex matrix and has always taken the appropriate measures to counter those problems. Scientific methodologies clearly exist for complex materials, and CSE adopted these methodologies.

(ii) **Sample injection:** If manual injection is used, no more than 2 micro litres should be used. Larger injection volumes could cause sample to be retained near the injection port and result in carryover from one sample to the next. CSE in this regard stated that it used no more than 2 µL for injections onto the GC columns.

(iii) **Carrier gas:** At sub ppb detection levels not using the recommended gas (*e.g.* Helium) could effect separation efficiency of the peaks leading to misinterpretation of the results. CSE clarified in this regard that in scientific literature, it is well-documented that the carrier gas must be an inert or non-reactive gas. Nitrogen is such an inert or non-reactive gas.

Gas Chromatograph Mass Spectrometer (GCMS)

1.52 It has been stated in the note submitted by the Ministry of Health and Family Welfare that CFTRI has also conducted an additional sophisticated test using GCMS method for identification of the molecular structure of all the pesticides contained in the samples. The Committee had also been informed that this confirmatory test was not done by CSE. In regard to GCMS, the Director, CFTRI during his evidence stated, "In the analysis of soft drinks, GCMS is a very important technique to confirm it. Without that, there can be doubts".

1.53 In regard to confirmatory methods for organic residues and contaminants, EU Commission Directive 96/23/EC specifies the following as quoted from the Official Journal of European Communities dated 17.8.2002:-

> "Confirmatory Methods for organic residues or contaminants shall provide information on the chemical structure of the analyte. Consequently methods based only on chromatographic analysis without the use of spectrometric detection are not suitable on their own for use as confirmatory methods". "Mass spectrometric methods are suitable as confirmatory methods following either an on-line or off-line chromatographic separation".

1.54 Codex Alimentarius Commission in its Report of the thirty-fourth session on the Codex Committee on pesticide residues (Alinorm 03/24) has *inter-alia* stated that for qualitative

confirmation (identity) the use of mass spectral data, or a combination of techniques based on different physico-chemical properties, is desirable. Residue data obtained using mass spectrometry can represent the most definitive evidence and, where suitable equipment is available, it is the confirmatory technique of choice.

Findings on Malathion

1.55 Malathion is an organophosphorus pesticide. According to CSE, Malathion was present in 97% samples analysed by it with an average concentration of Malathion (0.0087 mg/l) which is 87 times higher than the EU limit for drinking water. CFTRI and CFL, Kolkata could not find Malathion in any of the samples tested by them. In this regard, Director, CSE made the following submissions during evidence:—

> "If you look at the first difference of Govt. laboratories, a very big difference has come because of Malathion....But we are sure we found Malathion. Govt. laboratories did not find Malathion. So, what could be reasons? I mean, since we have got the reports of Govt., we have also tried to re-examine it. Obviously, we should not assume that we were correct. We should try and re-investigate why the difference?.... First, we reconducted the experiment using both an ECD as well as NPD detectors. Basically, looking at the detectors, we redid the experiment to see whether we were still getting Malathion peak or not. We did this experiment once again using two different columns of different polarity."

1.56 In this regard, the Director, CSE also made the following visual presentation to the Committee:—

(i) Peak re-detected by ECD and NPD detectors.

(ii) Reconfirmed by using two columns of different polarity.

1.57 The Director, CSE further narrated the re-experiments on Malathion as under:—

> "So what we did was to experiment using a standard of Malathion that was oxidised using hydrogen peroxide. Malathion got oxidised to Malaxaon and the Malathion peak disappeared in the chromatograph. So, we repeated this experiments with the sample of soft drinks. And repeating it, we showed that there was a peak of Malathion in the soft drink. Then we treated that sample with our hydrogen peroxide and Malaxaon peak was detected, which essentially confirms the presence of Malathion and that it was not an impurity."

1.58 In this regard, the Head of CFL, CFTRI, Mysore during the evidence stated,"We have tested the sample for Malaxaon also by using bromination and H_2O_2 treatment. However, we have not found Malaxaon also. Actually in the soft drinks because it is pH 2.8 or something like that, there is no chance of formation of Malaxaon. It is in acid condition. You get ester of Mercapto Succinic Acid and Dimethylthiophosphoric acid and not Malaxaon." CSE in a written reply has stated in this regard that presence of a degradation product like Mercapto Succinate in soft drinks does not affect this reaction and is aware that no useful purpose is likely to be served in attempting to convert Mercapto Succinate (a component of Malathion) back to Malathion.

1.59 In regard to another experiment conducted by CSE to confirm the presence of Malathion, the Director, CSE informed the Committee, "We did another experiment. One of the peak issues with Malathion is, as I said, it degrades very fast and hydrolyses when it becomes alkaline. New USEPA methodology, which we have followed to do the testing, needs the sample to be extracted at a neutral pH. But soft drinks are highly acidic.... I think, what we had done was because they

are highly acidic and the process requires that we extracted at a level you add NaOH to make it neutral. Now during the extraction, just in case the pH is raised above 'seven', the Malathion will get hydrolysed. For each unit of increase in the pH, the hydrolysis increases ten times. We repeated this experiment and confirmed it in our laboratory, and we found that the soft drink at neutral pH showed Malathion. But at alkaline pH the Malathion was completely hydrolyzed. So, from all these experiments, we are as clear, and as confident as possible that we did find Malathion".

1.60 In this regard another representative of CSE stated during the evidence as under:—

> "Soft drink pH was 2.2 or 3.2. So, You added NaOH, a Alkali, to bring pH to neutral value. Sir, if you are not measuring it properly or if you are not careful, and you put extra alkali (NaOH) and then pH increases, let us say to 12, and Malathion disappears, then what will happen? Therefore, Sir, in any experimental work, there are certain sources of error.... Therefore, possibly, work being done elsewhere, and they have not been careful about it. Therefore, they could not detect Malathion. We had also, in our experiments in the standard tried to detect Malaxaon. The work that was done outside, they have not tried to detect Malaxaon. If Malaxaon appears, that means, Malathion was there. This is what we have reconfirmed".

1.61 During the evidence, Director, CFTRI clarified the position of CFTRI in regard to care taken by it during estimation of Malathion as follows:—

> "Malathion extracted by EPA method has been defined. PH of the extraction will not change during extraction as dichloromethane is a neutral solvent. PH will not exceed at any point. Extreme care has been exercised to ensure that pH does not cross 'seven' at any time during estimation of Malathion. It is very important. That is where the accreditation in terms of following the procedure is very important. Even if it crosses to 7.2, your estimation is wrong. It is not allowed to go to 7.2. So, care has to be taken."

1.62 A copy of presentation of CSE was made available to CFTRI and its comments on the presentation are as under:—

(a) CSE reported the presence of Malathion in soft drink beverages which they analysed. CFTRI, Mysore and CFL, Kolkata did not find Malathion in the samples that they had analysed. One of the reasons could be CSE samples are obtained from a different batch and also collected in the month of May. CFTRI and CFL analysed the samples that were collected by DGHS and that were sent in the month of August. CFTRI adopted the same method reported by CSE as indicated by DGHS for extraction and analysed by GLC-FPD. The peaks were confirmed by dual column technique and reconfirmed by GC-MS as a final confirmatory test, which only CFTRI had done and not CSE. The above two techniques (Both GC and GC-MS) with spiking of Malathion further confirmed their absence in the sample but were clearly present in spiked samples of soft drinks as determined by CFTRI.

(b) CSE indicates that the pH of the extract may change during pre-treatment and therefore Malathion is destroyed and hence not detected. This contention is not valid for the following reasons:

(i) Recovery experiments conducted takes care of such minor variations if any. These have been performed by CFTRI and validated. The recovery was more than 70% efficiency of spiked samples. If there was a destruction of Malathion as claimed by CSE during extraction, then even these samples would not have shown any Malathion

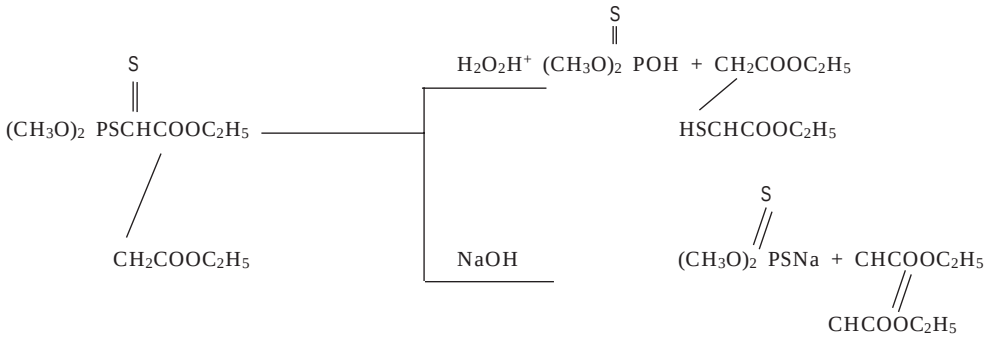
residue at all. But the results show that the spiked samples give a Malathion peak. Hence the argument advanced by CSE is not correct. However in the case of Malathion recovery is relatively less due to the unstable nature of the molecule.

(ii) The solvent used in the extraction is dichloromethane, which is a neutral solvent. It does not contribute to either acidity or alkalinity during the extraction as claimed by CSE. Thus, the CSE contention that the pH would change during extraction is not at all scientifically correct.

In this regard, CSE stated in a return reply that CSE never said that according to EPA methodology, the sample has to be extracted at neutral pH. To do that, alkali needs to be added during sample pre-treatment to bring the pH to 7. CSE also used dichloromethane as a solvent.

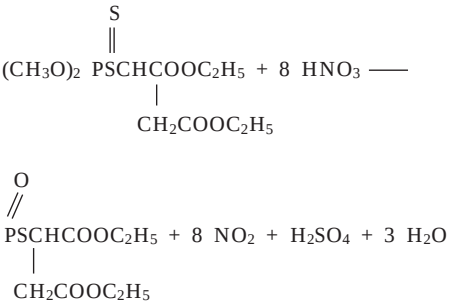
1.63 CFTRI has also explained that latest experiment conducted by CSE by adding alkali to the extractant and finding the destruction of Malathion has no relevance to EPA method. According to the EPA method it is very clear that one should not cross neutral pH. No purpose is served by doing such experiments, as it would not simulate the natural condition of EPA method for organophosphorous insecticides. CSE should have looked for alkaline degradation products instead of Malaxaon or Malathion molecules which are crucial. In this regard, CFL, Kolkata has made the following submission to the Committee:—

(i) Malathion is unstable *i.e.* undergoes hydrolysis both in acidic and alkaline medium. Hydrolysis of Malathion follows different paths in acidic and alkali media. In acid medium the main products of hydrolysis are dimethyl dithophosphoric acid and ester of mercapto succinic acid, while in alkaline medium the salt of dimethyldithiophosphoric acid and the ester of fumaric acid are formed:



The net result, Malathion is no longer Malathion owing to hydrolysis.

(ii) When Malathion is oxidized by strong oxidizing agents, the thiono sulfur atom is split off and the corresponding ester of thiolophosphoric acid is formed:



(iii) Thus Malathion could not be detected by CFL, Kolkata. This is to mention here that CFTRI, Mysore also could not detect Malathion in any of their samples whereas CSE identified Malathion which was 87 times of EU limit for drinking water. It is against a chemical trustism. In this regard, CSE in a written reply submitted that it did not look for degradation products of Malathion and Malaxaon as this was not the purpose of its study. We ensured that the pH of the samples was neutral before extraction. CSE has not reported finding of Malaxaon in its soft drink samples.

1.64 Director, CFTRI made the following submission during the evidence regarding unstable nature of Malathion:—

> "Malathion is an unstable molecule and degradation is rapid below pH 3. I want to point out here that the soft drink pH is 2.8. So, if there is degradation pattern or suppose you take a sample which is manufactured today you may find Malathion. May be after three months, it will degrade and you may not find. This is one of the reasons because of the instability of the molecule and the chemistry of it".

1.65 CFTRI also informed the Committee that the presence or absence of Malathion depends upon the sample analysed.

1.66 Central Pollution Control Board Laboratory conducted an independent analysis of samples of 6 brands of soft drinks collected from various markets in Delhi. CPCB had detected Malathion in all the six samples tested by it (Annexure-XI). Four of them exceeded the EU limit for drinking water. CPCB used Agilent 6890 Series II Plus Series GC with 5973 Network for analysis of organophosphorous pesticides in extracted soft drink samples. The samples were analysed by injecting 1-2 µL of soft drink sample into GC-MS (SIM Mode). Their results come close to the results reported by CFL and CFTRI.

1.67 After CSE Report, Directorate of Health Services, Government of Kerala had sent a sample each of Coca Cola and Pepsi of soft drink for analysis to Shriram Institute for Industrial Research, Bangalore which is one of the NABL accredited laboratory for testing pesticide residues in water. This laboratory had found 0.7 ppb of Malathion in the sample of Pepsi and 9.9 ppb of Malathion in Coca Cola analysed by it. Protocol used by this laboratory was AOAC Chap.10/GC-MS(Annexure-XII).

V. DIFFERENCES IN THE RESULTS OF THE THREE LABORATORIES

1.68 A comparative chart on total pesticide residues detected by CSE, CFTRI and CFL, Kolkata is at Annexure-XIII. It is evident from the results reported by all the three laboratories that there are significant differences. Moreover, the analysis of results of individual pesticides present in the samples tested by CSE, CFTRI and CFL clearly reveals that there are wide variations in the results between CSE and the Govt. laboratories. However, the presence of pesticide residues is a scientific finding of all the three laboratories (Annexure-XIV).

1.69 The following reasons have been adduced by CFTRI for variations between the results of CSE and CFTRI:—

(i) Variation in batch number and date of manufacture;

(ii) Interfering substances (colours, preservatives and flavours, etc.);

(iii) Extraction and clean-up procedure not perhaps adequate;

(iv) Confirmatory tests by GC-MS;

(v) Calibration of equipments and glasswares must be done routinely as results are in ppb;

(vi) Authentic Pesticide Standards and purity of chemicals used must be established;

(vii) Instrument sensitivity for trace level analysis need to be assured continuously;

(viii) Analytical skill of the analyst and his/her training and the samples handled routinely makes a difference;

(ix) Validation of the methodology if any deviation from standard procedure;

(x) Accreditation is very important for standardization of measurements (Laboratory accreditation is absolutely essential and must be mandatory where analysis is done involving public safety and claims are made which involves not only the safety of the customer and consumer but also the correct scientific claims).

1.70 CFTRI has claimed that all the above variations many a time become additive in error bars or sometimes cancel each other by giving wrong results and hence internal spiking of standards and networking of laboratories for validation and carry validation on a continuous basis both nationally and internationally is a must. Accreditation and quality system should be mandatory and perhaps there is no choice on this.

1.71 Vimta labs Limited, Hyderabad in its memorandum has specified that the highly specialised area of pesticide residue analysis especially at sub-parts per billion level calls for the following:—

(i) Laboratory's expertise and experience including knowledge of international procedures adopted;

(ii) Special laboratory designs to avoid contaminations during the testing process;

(iii) High pure chemicals and consumables required in trace analysis;

(iv) Reference standards with traceability;

(v) Suitable equipment: GC-ECD/FPD/PFPD, GCMS-MS, LCMS-MS;

(vi) LCMS-MS deployment is becoming order of the day globally;

(vii) Clean power supply to assist chromatographic equipment to maintain stable base lines.

VI. BATCH NUMBERS OF SAMPLES OF SOFT DRINKS

1.72 The details of the batch numbers, date of manufacture, manufacturers etc. of the samples of soft drinks analysed by the three laboratories are given in Annexures I(CSE), IV(CFL-CFTRI) and VII(CFL,Kolkata).

1.73 Perusal of the above mentioned details reveals that CSE analysed three samples of each of 12 brands of soft drinks and has taken the average of the results of the three samples of each of the brand. In this regard it is pertinent to note that each of the three samples of all the 12 brands of soft drinks were from different batches and date of manufacturing was also different in most of the samples. CSE samples were collected in May 2003 while samples sent by DGHS to Mysore and Kolkata were collected in August, 2003.

1.74 In regard to samples analysed by CFTRI, Mysore and CFL, Kolkata, 6 samples were bearing different batch numbers and rest of the samples were of the same batch and date of manufacture.

1.75 CSE purchased its samples of soft drinks from the open market in Delhi. However, 19 out of the 36 samples came from one bottling unit in Jaipur, 15 from one bottling unit in Hapur Tehsil in Ghaziabad and one from a bottling unit in Jodhpur and one from a bottling unit in Mathura (Annexure-I). 12 samples of soft drinks tested by CFTRI, Mysore and CFL, Kolkata were sent from Delhi by DGHS, New Delhi. In the case of both CFTRI and CFL seven samples were sent from the bottling plant located at Jaipur and five from the bottling plant situated in Ghaziabad. The samples of soft drinks tested by CSE were manufactured in the months of March, April and May, 2003. The exact dates of manufacture of the samples are given in Annexure-I. The samples of soft drinks sent by DGHS to CFTRI, Mysore were manufactured in the months of March, April, May, June and July, 2003. The exact dates of manufacuture of the samples are given in Annexure-IV. The samples of soft drinks sent to CFL, Kolkata were manufactured in the months of April, May, June and July, 2003. The exact dates of manufacture of samples are given in Annexure-VII.

1.76 Since the batch numbers of samples tested by CSE and CFTRI were different, CFTRI has stated in its 'Report of analysis of pesticide residues in soft drink samples sent by DGHS' as follows:—

> **"As the samples analysed at CFL, CFTRI, Mysore were entirely from a different batch than the CSE samples, the results obtained are not comparable with the results of CSE".**

1.77 During the evidence, the Director, CSE also stated that the differences in the results of different laboratories could possibly be due to different batch numbers.

1.78 In regard to the comparison of results of CSE and CFL, Kolkata, it has been stated by CFL, Kolkata in a written reply as follows:—

1. CFL, Kolkata analysed 12 different brands of soft drinks having batch numbers different from those of the samples analysed by CSE, New Delhi.
2. The manufacturing date of different brands of samples of soft drinks for CFL, Kolkata had been May/June/July, 2003 whereas with CSE the manufacturing dates were March/April/May, 2003. The samples analysed by both the laboratories are totally different. Hence the results cannot be compared.

1.79 As such, CSE, CFTRI and CFL, Kolkata have all put forward the difference in batch numbers and manufacturing dates as one of the reasons for variations in their results. CFTRI, Mysore has stated in a written reply that this should have been taken care of by DGHS in picking up the market samples sent for analysis to both CFL, Mysore and CFL, Kolkata. However, the results of both CFL Mysore and CFL, Kolkata and CSE's results do show the presence of pesticides in soft drinks. The levels may be different and some of the pesticides may be present in one laboratory but absent in the other. Therefore, CFTRI strongly feels that the committee must take the cognisance of pesticide residues as a common scientific finding from all the three laboratories.

VII. ACCREDITATION STATUS OF THE LABORATORIES

1.80 Laboratory accreditation is a procedure by which an authoritative body gives formal recognition of technical competence for specific tests/measurements based on third party assessment and following international standard.

1.81 National Accreditation Board for Testing and Calibration Laboratory (NABL) is an autonomous body under the aegis of Dept. of Science and Technology, Government of India, and is registered under the Societies Act. NABL has been established with the objective to provide Government, Industry Associations and Industry in general with a scheme for third-party assessment of the quality and technical competence of testing and calibration laboratories. Government of India has authorised NABL as the sole accreditation body for Testing and Calibration laboratories in India. NABL has established its Accreditation System in accordance with ISO/IEC Guide 58, which is followed internationally.

1.82 NABL provides means to the laboratories to let them know whether they are meeting the bench mark meant for determining their own competence, to demonstrate their global equivalence in testing, to know the current trend of scientific and technical factors to update their working like estimation of uncertainty in measurements and apply this factor for giving opinion on a product. NABL conducts courses for the laboratories to make them understand the global standard and requirements.

Accreditation Status of CSE

1.83 In reply to a query during the evidence, whether CSE applied for accreditation or not, the Director, CSE stated, " No, because it takes time. You have to run the laboratory for some time. If you look at the accreditation of laboratories, these are really a handful of laboratories which are accredited. In fact, we are practising what is called good laboratory practices. We are going to apply. It takes a little time to establish". In regard to the above contention of CSE, the Secretary, Department of Science and Technology stated during evidence that NABL is a voluntary third party accreditation programme. There is no compulsion in this country. In fact, in any other places also it is voluntary in nature.

1.84 When it was asked why some institutions apply for accreditation and others not, the Secretary, Deptt. of Science and Technology replied:

> "Those institutions who are carrying out tests on products which are in the international market place and if those are from accredited laboratories, then their test results could be accepted.... Some institutions do not come to us because, say, you have an equipment for accreditation. We would ask them whether this equipment regularly get calibrated or not. Has it been tested for its worthiness after its installation? Is it being operated by people who are qualified to operate this equipment? Sometimes, there are embarrassing questions.... Obviously, such labs do not get accreditation. It takes time for giving accreditation. It is because first we ask them to prepare a manual before making an application. When we send our expert team to visit those laboratories to determine their compliance to our norms and tell them where all they are lagging. There is an opportunity for them to get it corrected. Then they come back to us saying that they have corrected all those non-conformances. Then again an Expert Committee examines the submitted facts and then if they are satisfied with requirements, accreditation is given. This procedure takes time. There is an advantage in taking accreditation and that is why people come to us. We do not pressurize anybody to do it".

1.85 When it was asked how they evaluate the results of a non-accredited laboratory, the Secretary, Deptt. of Science and Technology replied, "We make no comments because I do not know what he has. So, I cannot comment on those results". In regard to CSE, he stated, "CSE has not come to us. So, I cannot say what is their competence". To the very reason, he expressed his inability to comment on the results of CSE. However, during the course of the evidence, he had further stated in this regard, "I have only said that they have not been

accredited by us. I have not said that their results are not reliable or reliable. The truth of the matter is that till this controversy erupted, there was no requirement of anybody's seeking pesticide residues in drinking water to this level. So, obviously, the laboratories did not come for accreditation. When there is need, they will do it".

Accredited Status of CFTRI and CFL, Kolkata

1.86 In regard to accreditation status of CFTRI, Mysore, the Secretary, Deptt. Of Science and Technology stated:—

> "CFTRI, Mysore is one of the CSIR laboratories. They have got accreditation for close to 200 measurements. Pesticide residue in drinking water is not one of them. So, if there is a result from the CFTRI on pesticide residue, I will say, 'Sorry, I have no comments on that'."

1.87 He had also confirmed that CFL, Kolkata is not an accredited laboratory. It has also been confirmed by NABL that if an accredited laboratory carries out tests in other areas for which it is not accredited then the accreditation status does not cover such tests. It was further confirmed by the Secretary, Deptt. of Science & Technology that no laboratory in the country has been accredited for analysing soft drinks.

1.88 Subsequently, CFTRI, Mysore, and CFL, Kolkata were asked whether they have accreditation for testing pesticide residues in drinking water. The replies of CFTRI and CFL, Kolkata are given under:—

CFTRI

CFTRI is an approved testing laboratory as an appellate laboratories under the PFA Act, 1954 CFTRI, Mysore has been certified by ISO-9001 for Research and Development and testing of food from 21st April, 2000. Therefore, under ISO-9001, all the tests conducted on foods, prepared foods including water and soft drink beverages follows international system of quality assurance and the tests conducted under such provisions are internationally accepted for the Quality Systems which include use of Standards and Reference Materials. CFTRI, Mysore was also accredited by NABL for Chemical and Biological Testing from 31st December, 2001 *vide* Certificate No. T-0379 and T-0380 which included the CFL laboratory at CFTRI. The scope of accreditation in the field of chemical testing under certificate number T-0379 includes food, food grains and prepared foods for the analysis of pesticides. The CFTRI has clearly defined food and prepared food as approved by the management before going for accreditation and also wherever standards were not available at the time of accreditation, commitment was given for acquisition of reference materials and certified reference material for the analysis of any other pesticides from time to time since the procedure of experiment remains the same. The testing of pesticides under NABL requires authentic reference standards with certificate of purity traceable to NIST, USA or the national standard (NPL, New Delhi). Therefore, drinking water testing has been included under the scope of testing.

CFL, Kolkata

The laboratory published about 500 scientific and research papers in national and international journals. This scientific work frequently brings the capability and also the deficiency to the fore as many adjudicating scientists of India and abroad examine the work at the level of current state-of-the-art. No adverse comments, *suo motu* or solicited, came forward. Hence, there had

not been any idea or suggestion for accreditation of the laboratory neither there had been any demand in this regard; the relevant institution (NABL), appeared on the scene much later. Very recently the laboratory has initiated the process to undergo accreditation by NABL with the idea for its enhancement of credibility.

CONCLUSIONS/RECOMMENDATIONS

1.89 As regards the first terms of reference of the Committee, the Committee would like to divide it in two components, the first one is the qualitative (detection and identification) aspect and the second is the quantitative one (estimation and confirmation). So far as qualitative aspect is concerned, the Committee are of the view that CSE findings are correct on the presence of pesticide residues in carbonated water in respect of three samples each of 12 brand products of Pepsico and Coca-cola analyzed by them. CSE tested 36 samples for 16 organochlorine pesticides, 12 organo phosphorus pesticides and 4 synthetic pyethroids, which together constitute a list of 32 most commonly used pesticides in India. CSE detected the gamma isomer (Lindane) in all the 36 samples and three other isomers of hexachlorocyclohexane (commonly called HCH or BHC) in some of the samples at varying levels. DDT and its metabolites were detected in 29 out of 36 samples. Among the organo phosphorus ones, chlorpyrifos was detected in all the 36 samples in varying concentrations and malathion in 35 out of the 36 samples at different levels. None of the four synthetic pyrethroids was found in any of the 36 samples.

1.90 The Committee have however, noted that 19 of the 36 samples came from one bottling unit in Jaipur, 15 from one bottling unit in Hapur Tehsil in Ghaziabad, one from a bottling unit in Jodhpur and one from bottling unit in Mathura.

1.91 CFL-CFTRI (Central Food Laboratory at Central Food Technological Research Institute, Mysore) and CFL, Kolkata (Central Food Laboratory, Kolkata) analyzed independently samples of the same 12 brands collected and sent to them by Directorate General of Health Services. Both laboratories also detected the presence of organochlorine and organophosphorus pesticide residues. The presence of pesticide residues, therefore, is a common scientific finding of all the three laboratories. The Committee would, therefore, conclude that CSE stands corroborated on its finding pesticide residues in the carbonated water. So far as non-detection of malathion by the two laboratories is concerned, the Committee attribute the same to the variations in different batch numbers, manufacturing locations and also the dates of collection and analysis. The absence of malathion in the Mysore and Kolkata analysis have been scientifically explained by CFTRI. GCMS method has been applied to confirm the absence of malathion, reinforced by spiking samples and analysis. The Committee also note that the presence of malathion was also reported by the laboratory under the Central Pollution Control Board and Shriram laboratory (Bangalore) and hence out of the five laboratories three had detected malathion in the samples tested by them.

1.92 With regard to the quantitative aspect, the results of CSE on the one hand and CFL-CFTRI and CFL, Kolkata on the other vary widely. The Committee have no hesitation in admitting that as explained by different experts who deposed before the Committee, variations in an analytical research is a well known factor. It can arise due to host of other factors such as differences in (a) the manufacturing locations, (b) date of manufacture, (c) batch number of products, (d) temperature conditions of storage at the stocking place/retail end, (e) the laboratories due to the differences in the analytical techniques/procedures, (f) structural stability and (g) characteristics of the chemical molecule in question etc. In the instant case, there have undoubtedly been variations in the samples which had different batch numbers and also were manufactured at different locations. Though all the three laboratories have employed the same

analytical procedure namely US Environmental Protection Agency Method 8081A for organochlorine and 8141A for organophosphorus pesticide, differences have been noticed in the way the procedure was performed as enumerated in Annexure X, with the result that the differences could be significant.

1.93 Moreover, CFL of CFTRI was able to apply GC Mass spectrometry combination for confirmation of its results—the importance of which has been highlighted by a number of experts who appeared before the Committee. Besides, though CSE has reported that the concentration level of pesticide identified in carbonated water was far in excess of the limit laid down in EU directives, however, the Committee are of the view that comparing residue level in any article of food on a percentage basis could have been avoided because EU norms were not adopted at that point of time in our country. The results of CFL, Mysore and CFL, Kolkata however come closer to each other in terms of the number of times the total pesticides level exceeded the EU limit, in the specific batches. For the results to be compared in the quantitative terms, all the three laboratories should have adopted the same protocol in the design, conduct and interpretation of results of the study. Besides, CFL-CFTRI and CFL Kolkata are among the four laboratories established under the Prevention of Food Adulteration Act, 1954 with a mandate to carry out the functions entrusted under the PFA Act, as amended and notified on 30 December, 2002. The broad jurisdiction of these four laboratories has been notified under the PFA Rules, 1955. These are, therefore, approved and authorized laboratories to conduct food analysis including beverages and packaged drinking water. In addition CFTRI under which CFL functions has been accredited by NABL for both chemical and biological testing. CFTRI is also an ISO/ 9000:2000 certified organization. On the other hand CSE has not cited any accreditation from NABL or certification from ISO (International Standards Organization) to support its analytical competence. This aspect was highlighted by several organizations in their evidence and presentations before the Committee particularly CII, FICCI, ICMR and CPCB. CFL, Kolkata also does not have accreditation from NABL. Accreditation is a formal recognition of the competence of a testing laboratory and gives credence for data acceptance—a fact which has been recognized internationally also.

1.94 The European Union in fact has a long list of guidelines and directives concerning the performance of analytical methods and interpretation of results. (Council Directive 96/23 EC). The importance of adopting confirmatory methods for arriving at the authenticity of the results is equally important, since as per the EU Directive also confirmatory methods for organic residues or contaminants provide information on the chemical structure of the analyte. Consequently, methods based only on chromatographic analysis without the use of spectometric detection are not suitable on their own for use as confirmatory methods. The fact however remains that such a test was not done by CSE. Moreover, it would have been appropriate if the evaluation of tests was conducted on the same samples by two or more laboratories in accordance with the predetermined conditions. The Committee note that although the pesticide residues were found in all the test reports with quantitative variations, however, while citing EU norms/limits for pesticides, the CSE adopted the USEPA method for analytical purposes. The Committee feel that CSE could have adopted the EU specified methodology to reach a final conclusion of pesticide residues and its follow up.

1.95 Though the results of the Central Pollution Control Board which had conducted an independent testing through their laboratory, come closer to the findings of CFL-CFTRI and CFL, Kolkata, the percentage reported by Shriram laboratory which had tested only one sample each of Coca Cola and Pepsi is quite high. In view of the fact that these laboratories also did not test identical samples and the dates of manufacturing as well as locations are different, the quantitative results reported by them cannot be compared.

1.96 The Committee, however, find that the CSE findings are correct on the presence of pesticide residues in carbonated water strictly in respect of the 36 samples of 12 brand names analyzed by them. The Committee also appreciate the whistle blowing act of CSE in alerting the nation to an issue with major implications to food safety, policy formulation, regulatory framework and human and environmental health.

ANNEXURE I

DETAILS OF THE SOFT DRINK SAMPLES PURCHASED BY CSE

S.No.	Name	Place of purchase	Date of purchase	Manufacturer	Date of manufacture	Expiry date	Batch Number	Other Information
1	2	3	4	5	6	7	8	9
1.	Pepsi-1	Mayur Vihar	22/5/03	Varun Beverages Ltd., Plot No. 159, RIICO Industrial Estate, Phase-III Boranada, Jodhpur-342001	9.5.03	Best before three months from manufacture.	PN-99	Pepsi is the registered Trademark of Pepsico. Inc.USA.
2.	Pepsi-2	Malviya Nagar	12/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	20/4/03	Best before three months from manufacture.	P.03.76.06:06	Pepsi is the registered Trademark of Pepsico. Inc.USA.
3.	Pepsi-3	INA Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	2/4/03	Best before three months from manufacture.	P.03.54.01:50	Pepsi is the registered Trademark of Pepsico. Inc.USA.
4.	Mountain Dew-1	Meharchand Market	15/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	14/4/03	Best before three months from manufacture.	MO.03.19.10:00	Mountain Dew is the registered Trademark of Pepsico. Inc.USA.
5.	Mountain Dew-2	INA Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	13/3/03	Best before three months from manufacture.	MO.03.13.15:09	Pepsi is the registered Trademark of Pepsico. Inc.USA.
6.	Mountain Dew-3	Malviya Nagar	12/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	28/4/03	Best before three months from manufacture.	MO.03.26.17:12	Pepsi is the registered Trademark of Pepsico. Inc.USA.
7.	Diet Pepsi-1	INA Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	8/5/03	Best before two months from manufacture.	DP.03.11.13:21	Pepsi is the registered Trademark of Pepsico. Inc.USA.
8.	Diet Pepsi-2	Malviya Nagar	12/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	19/4/03	Best before two months from manufacture.	DP.03.9.14:25	Pepsi is the registered Trademark of Pepsico. Inc.USA.
9.	Diet Pepsi-3	Jor-Bagh Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	8/5/03	Best before two months from manufacture.	DP.03.11.18:21	Pepsi is the registered Trademark of Pepsico. Inc.USA.
10.	Mirinda Orange flavour-1	Malviya Nagar	12/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	22/4/03	Best before three months from manufacture.	MO.03.24.22:08	Mirinda is the registered Trademark of Pepsico. Inc.USA.
11.	Mirinda Orange flavour-2	INA Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	2/5/03	Best before three months from manufacture.	MO.03.27.15:22	Mirinda is the registered Trademark of Pepsico. Inc.USA.
12.	Mirinda Orange flavour-3	Mayur Vihar	22/5/03	Varun Beverages Ltd., Dautana, Chatta, Distt. Mathura-282401	5/5/03	Best before three months from manufacture.	L3	Mirinda is the registered Trademark of Pepsico. Inc.USA.
13.	Mirinda lemon flavour-1	INA Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	30/4/03	Best before three months from manufacture.	ML.03.9.21:21	Mirinda is the registered Trademark of Pepsico. Inc.USA.
14.	Mirinda lemon flavour-2	Malviya Nagar	12/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	5/4/03	Best before three months from manufacture.	ML.03.07.15:23	Mirinda is the registered Trademark of Pepsico. Inc.USA.
15.	Mirinda lemon flavour-3	Meharchand Market	17/6/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	30/5/03	Best before three months from manufacture.	ML.03.13.17:43	Mirinda is the registered Trademark of Pepsico. Inc.USA.
16.	Blue Pepsi-1	Prithvi Raj Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	13/4/03	Best before three months from manufacture.	PB.03.19.13:57	Pepsi is the registered Trademark of Pepsico. Inc.USA.
17.	Blue Pepsi-2	INA Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	2/4/03	Best before three months from manufacture.	PB.03.18.21:20	Pepsi is the registered Trademark of Pepsico. Inc.USA.

1	2	3	4	5	6	7	8	9
18.	Blue Pepsi-3	INA Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	13/4/03	Best before three months from manufacture.	PB.03.19.21:28	Pepsi is the registered Trademark of Pepsico. Inc.USA.
19.	7-up-1	Prithvi Raj Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	15/3/03	Best before three months from manufacture.	S.03.02.19.06	7-up is the registered Trademark of Pepsico. Inc.USA.
20.	7-up-2	INA Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	16/3/03	Best before three months from manufacture.	S.03.02.00.43	7-up is the registered Trademark of Pepsico. Inc.USA.
21.	7-up-3	Khan Market	14/5/03	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur-302018	15/3/03	Best before three months from manufacture.	S.03.02.20:24	7-up is the registered Trademark of Pepsico. Inc.USA.
22.	Coca Cola-1	Malviya Nagar	12/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	24/4/03	Best before two months from manufacture.	BN 724	For and behalf of Coca-Cola , Company Coca-Cola Plaza, Atlanta GA 30313, USA
23.	Coca Cola-2	INA Market	14/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	5/4/03	Best before two months from manufacture.	BN 512	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
24.	Coca Cola-3	INA Market	14/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	26/4/03	Best before two months from manufacture.	BN 738	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
25.	Fanta-1	INA Market	14/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	30/4/03	Best before 1.5 months from the date of manufacture.	BN 780	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
26.	Fanta-2	Jor Bagh Market	14/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	29/4/03	Best before 1.5 months from the date of manufacture.	BN 776	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
27.	Fanta-3	Malviya Nagar	12/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	8/4/03	Best before 1.5 months from the date of manufacture.	BN 537	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
28.	Limca-1	Meharchand Market	15/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	27/4/03	Best before two months from manufacture.	BN 747	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
29.	Limca-2	Malviya Nagar	12/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	27/4/03	Best before two months from manufacture.	BN 757	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
30.	Limca-3	INA Market	14/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	27/4/03	Best before two months from manufacture.	BN 753	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
31.	Sprite-1	Mayur Vihar	12/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	30/4/03	Best before two months from manufacture.	BN 787	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
32.	Sprite-2	INA Market	14/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	1/5/03	Best before two months from manufacture.	BN 796	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
33.	Sprite-3	Malviya Nagar	12/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	1/5/03	Best before two months from manufacture.	BN 791	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
34.	Thums up-1	INA Market	14/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	24/4/03	Best before two months from date of manufacture.	BN 720	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
35.	Thums up-2	Jor Bagh Market	14/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	24/4/03	Best before two months from date of manufacture.	BN 727	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA
36.	Thums up-3	INA Market	21/5/03	Hindustan Coca-Cola Beverages Pvt. Ltd., Tehsil-Hapur, District-Ghaziabad, UP	7/4/03	Best before two months from date of manufacture.	BN 525	For and behalf of Coca-Cola Company, Coca-Cola Plaza, Atlanta GA 30313, USA

Note: 1: All the samples purchased from Delhi were sealed in plastic bottles of 500 ml capacity.

DETAILS OF THE SOFT DRINK SAMPLES PURCHASED FROM USA AND ANALYSED FOR PESTICIDE RESIDUES.

S.No.	Name	Place of purchase	Date of purchase	Manufacturer	Date of manufacture	Expiry date	Batch Number	Other Information
1.	Coca Cola	USA-Longs Drug Store, 1451 Shattuck Ave Berkeley CA 94709, USA	27/6/2003	Btottled under the authority of the Coca-Cola Company by a member of the CCE bottling group Atlanta, Georgia-30339	—	SEP0103	UYF09305	—
2.	Pepsi	USA Longs Drug Store 1451 Shattuck Ave Barkeley CA 97709, USA	27/6/2004	Manufactured by local bottlers for the Pepsi bottling group Inc. Somers N. Y 10589, under the authority of Pepsiico. Inc.	—	Jul2103	17320 A041331	—

ANNEXURE II

ORGANOCHLORINE PESTICIDE RESIDUES IN SOFT DRINK SAMPLES TESTED BY CSE

Sl.No.	Brands	Batch No.	Residues (mg/L)											
			α-HCH	βHCH	βHCH	Average of brands—Lindane	βHCH	DDT	DDE	DDD	Total DDT+ Metabo-lites	Average of brands—DDT+ Metab-olites	Total Organo-chlorines	Average of brands—Total Organochl-orines
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	Pepsi-1	PN-99	ND	ND	0.0015	0.0015	ND	ND	0.0017	ND	0.0017	0.0016	0.0032	0.0032
2.	Pepsi-2	P.03.76.06:06	ND	ND	0.0016		ND	ND	0.0012	ND	0.0012		0.0028	
3.	Pepsi-3	P.03.54.01:50	ND	0.0003	0.0014		ND	ND	0.0018	ND	0.0018		0.0035	
4.	Mountain Dew-1	MO.03.19.10:00	ND	ND	0.0028	0.0025	ND	ND	0.0010	ND	0.0010	0.0008	0.0038	0.0033
5.	Mountain Dew-2	MO.03.13.15:02	ND	0.0001	0.0019		ND	ND	0.0006	ND	0.0006		0.0026	
6.	Mountain Dew-3	MO.03.26.17:12	ND	ND	0.0027		ND	ND	0.0008	ND	0.0008		0.0035	
7.	Diet Pepsi-1	OP.03.11.18:21	ND	ND	0.0007	0.0008	ND	ND	ND	ND	ND	ND	0.0007	0.0008
8.	Diet Pepsi-2	OP.09.9.14:25	ND	ND	0.0009		ND	ND	ND	ND	ND		0.0009	
9.	Diet Pepsi-3	OP.03.11.20:21	ND	ND	0.0008		ND	ND	ND	ND	ND		0.0008	
10.	Mirinda orange-1	MO.03.24.22:08	ND	ND	0.0030	0.0031	ND	0.0019	ND	ND	0.0019	0.0019	0.0049	0.0050
11.	Mirinda orange-2	MO.03.27.15:22	ND	ND	0.0032		ND	0.0020	ND	ND	0.0020		0.0052	
12.	Mirinda orange-3	L3	ND	ND	0.0031		ND	0.0018	ND	ND	0.0018		0.0049	
13.	Mirinda lemon-1	ML.03.9.21:21	ND	ND	0.0044	0.0042	ND	0.0039	ND	ND	0.0039	0.0042	0.0083	0.0084
14.	Mirinda lemon-2	ML.03.07.15:23	ND	ND	0.0036		ND	0.0052	ND	ND	0.0052		0.0088	
15.	Mirinda lemon-3	ML.03.13.17:43	ND	ND	0.0046		ND	0.0035	ND	ND	0.0035		0.0081	
16.	Blue Pepsi-1	PB.03.19.13:57	ND	ND	0.0010	0.0018	0.001	ND	ND	ND	ND	0.0001	0.0020	0.0022
17.	Blue Pepsi-2	PB.03.18.21:20	ND	ND	0.0020		ND	ND	0.0003	ND	0.0003		0.0023	
18.	Blue Pepsi-3	PB.03.19.21:28	ND	ND	0.0024		ND	ND	ND	ND	ND		0.0024	
19.	7-Up-1	S.03.02.19:06	ND	ND	0.0022	0.0020	ND	ND	0.0012	ND	0.0012	0.0013	0.0034	0.0036
20.	7-Up-2	S.03.02.00:43	ND	0.001	0.0013		ND	ND	0.0007	ND	0.0007		0.0030	
21.	7-Up-3	S.03.02.20:24	ND	ND	0.0025		ND	0.0006	0.0013	ND	0.0019		0.0044	
22.	Coca Cola-1	BN 724	ND	ND	0.0033	0.0035	ND	ND	0.0001	0.0006	0.0007	0.0009	0.0040	0.0044

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
23.	Coca Cola-2	BN 512	ND	ND	0.0038		ND	ND	ND	ND	ND		0.0038	
24.	Coca Cola-3	BN 738	ND	ND	0.0034		ND	ND	0.0004	0.0017	0.0021		0.0055	
25.	Fanta-1	BN 780	ND	0.0003	0.0013	0.0015	0.002	0.0020	0.0011	ND	0.0031	0.0033	0.0067	0.0060
26.	Fanta-2	BN 776	ND	ND	0.0018		ND	0.0034	0.0005	ND	0.0039		0.0057	
27.	Fanta-3	BN 537	ND	0.001	0.0015		ND	0.0026	0.0004	ND	0.0030		0.0055	
28.	Limca-1	BN 747	ND	0.0001	0.0016	0.0017	ND	0.0028	ND	ND	0.0028	0.0030	0.0045	0.0047
29.	Limca-2	BN 757	ND	ND	0.0019		ND	0.0030	ND	ND	0.0030		0.0049	
30.	Limca-3	BN 753	ND	ND	0.0017		ND	0.0031	ND	ND	0.0031		0.0048	
31.	Sprite-1	BN 787	ND	0.00074	0.0008	0.0014	ND	ND	0.0013	ND	0.0013	0.0009	0.0028	0.0027
32.	Sprite-2	BN 796	ND	ND	0.0012		ND	ND	0.0014	ND	0.0014		0.0026	
33.	Sprite-3	BN 791	ND	0.0003	0.0023		ND	ND	ND	ND	ND		0.0026	
34.	Thums up-1	BN 720	ND	0.00053	0.0011	0.0011	ND	ND	0.0002	ND	0.0002	0.0002	0.0019	0.0015
35.	Thums up-2	BN 727	ND	ND	0.0012		ND	ND	0.0003	ND	0.0003		0.0015	
36.	Thums up-3	BN 525	ND	ND	0.0009		ND	ND	0.0003	ND	0.0003		0.0012	
	Number of samples in which pesticides identified		0	9	36		2	13	20	2	29		36	
	% of total samples in which pesticide residues identified		0	25	100		6	36	56	6	81		100	
	EEC limit (mg/l)		0.0001	0.0001	0.0001		0.0001	0.0001	0.0001	0.0001	0.0001			
	Average		0	0.0001	0.0021	0.0021	0.0001	0.0010	0.0005	0.0001	0.0015	0.0015	0.0038	0.0038
	Deviation of average value from EEC limit		Within norms	1	21	21	1	10	5	1	2			
	Minimum Amount		0	0.0000	0.0007	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0007	
	Deviation of minimum value from EEC limit		Within norms	Within norms	7	8	Within norms	Within norms	Within norms	Within norms	Within norms	1		
	Maximum Amount		0	0.0010	0.0046	0.0042	0.0020	0.0052	0.0018	0.0017	0.0052	0.0042	0.0088	
	Deviation of maximum value from EEC limit		Within norms			42						42		

Note: 1. Average of triplicate.

2. ND—Not detected.

3. α—endosulfan β—endosulfan and endosulfan sulfate, heptachlor, aldrin, Chlardane, dieldrin, methoxychlor and synthetic pyrethroides-permethrin cypermethrin, fenvalerate and deltamethrin were also analysed and were not detected.

ANNEXURE III

ORGANOPHOSPHORUS PESTICIDE RESIDUES IN SOFT DRINK SAMPLES TESTED BY CSE

Sl.No.	Brands	Batch No.	Residues (mg/L)					
			Chlorpyrifos	Average of brands—Chlorpyrifos	Malathion	Average of brands—Malathion	Total organophos-phorus	Average of brands—Total Organophos-phorous
1	2	3	4	5	6	7	8	9
1.	Pepsi-1	PN-99	0.0054	0.0062	0.0123	0.0093	0.0177	0.0155
2.	Pepsi-2	P.03.76.06:06	0.0070		0.0072		0.0142	
3.	Pepsi-3	P.03.54.01:50	0.0063		0.0083		0.0146	
4.	Mountain Dew-1	MO.03.19.10:00	0.0036	0.0038	0.0060	0.0069	0.0096	0.0108
5.	Mountain Dew-2	MO.03.13.15:02	0.0016		0.0051		0.0067	
6.	Mountain Dew-3	MO.03.26.17:12	0.0063		0.0097		0.0160	
7.	Diet Pepsi-1	OP.03.11.18:21	0.0039	0.0032	0.0036	0.0031	0.0075	0.0063
8.	Diet Pepsi-2	OP.09.9.14:25	0.0027		0.0020		0.0047	
9.	Diet Pepsi-3	OP.03.11.20:21	0.0029		0.0037		0.0066	
10.	Mirinda orange-1	MO.03.24.22:08	0.0069	0.0055	0.0128	0.0091	0.0197	0.0146
11.	Mirinda orange-2	MO.03.27.15:22	0.0046		0.0056		0.0102	
12.	Mirinda orange-3	L3	0.0050		0.0090		0.0140	
13.	Mirinda lemon-1	ML.03.9.21:21	0.0082	0.0072	0.0208	0.0196	0.0290	0.0268
14.	Mirinda lemon-2	ML.03.07.15:23	0.0059		0.0164		0.0223	
15.	Mirinda lemon-3	ML.03.13.17:43	0.0076		0.0215		0.0291	
16.	Blue Pepsi-1	PB.03.19.13:57	0.0034	0.0050	0.0063	0.0075	0.0097	0.0125
17.	Blue Pepsi-2	PB.03.18.21:20	0.0074		0.0090		0.0164	
18.	Blue Pepsi-3	PB.03.19.21:28	0.0042		0.0072		0.0114	
19.	7-Up-1	S.03.02.19:06	0.0024	0.0025	0.0105	0.0104	0.0129	0.0130
20.	7-Up-2	S.03.02.00:43	0.0030		0.0118		0.0148	
21.	7-Up-3	S.03.02.20:24	0.0022		0.0090		0.0112	

1	2	3	4	5	6	7	8	9
22.	Coca Cola-1	BN 724	0.0043	0.0042	0.0140	0.0137	0.0183	0.0179
23.	Coca Cola-2	BN 512	0.0045		0.0091		0.0136	
24.	Coca Cola-3	BN 738	0.0038		0.0180		0.0218	
25.	Fanta-1	BN 780	0.0066	0.0061	0.0170	0.0093	0.0236	0.0154
26.	Fanta-2	BN 776	0.0068		0.0062		0.0130	
27.	Fanta-3	BN 537	0.0050		0.0047		0.0097	
28.	Limca-1	BN 747	0.0029	0.0030	0.0068	0.0071	0.0097	0.0101
29.	Limca-2	BN 757	0.0035		0.0073		0.0108	
30.	Limca-3	BN 753	0.0026		0.0072		0.0098	
31.	Sprite-1	BN 787	0.0016	0.0015	0.0000	0.0013	0.0016	0.0028
32.	Sprite-2	BN 796	0.0010		0.0015		0.0025	
33.	Sprite-3	BN 791	0.0020		0.0024		0.0044	
34.	Thums up-1	BN 720	0.0024	0.0024	0.0067	0.0073	0.0091	0.0096
35.	Thums up-2	BN 727	0.0021		0.0071		0.0092	
36.	Thums up-3	BN 525	0.0026		0.0080		0.0106	
	Number of samples in which pesticides identified		36		35			
	% of total samples in which pesticide residues identified		100		97			
	EEC limit (mg/l)		0.0001		0.0001		0.0001	
	Average		0.0042	0.0042	0.0087	0.0087	0.0129	
	Deviation of average value from EEC limit		42	42.0000	87			
	Minimum Amount		0.0010	0.0015	0.0000	0.0013	0.0016	
	Deviation of minimum value from EEC limit		10	15	Within norms	13		
	Maximum Amount		0.0082	0.0072	0.0215	0.0196	0.0291	
	Deviation of maximum value from EEC limit			72		196		

Note:
1. Average of triplicate.
2. ND—Not detected.
3. Dichlorvos, diazinon, monocrotofos, phosphamidon, malaoxon, methyl-parathion, quinalphos, phenthoate, profenofos and ethion were also analysed and were not detected.

ANNEXURE IV

DETAILS OF SAMPLES RECEIVED BY CFL (CFTRI), MYSORE

Number of samples received : 12 Nos. (2 x 500 ml each)
Received Date : 09.08.2003

Sl.No.	Name of the Product	Name of the manufacturer	Date of manufacture	Best Before Date	Batch No.
1	2	3	4	5	6
1.	Limca	Coca Cola Beverages Pvt. Ltd., Tehsil Hapur, Dist. Ghaziabad	11.07.03	2 Months from the date of manufacture	1649
2.	Diet Pepsi	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur	28.07.03	2 Months from the date of manufacture	OP.03.17
3.	Pepsi	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur	09.07.03	3 Months from the date of manufacture	P.03.164
4.	7Up	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur	20.06.03	3 Months from the date of manufacture	No. S.03.12
5.	Fanta	Bottled by Hindustan Coca Cola Beverages Pvt. Ltd., Tehsil Hapur, Ghaziabad	12.06.03	1.5 Months from the date of manufacture	B.N. 1373
6.	Mirinda (Lemon Flavour)	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur	30.05.03	3 Months from the date of manufacture	ML.03.13
7.	Mountain Dew	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur	10.07.03	3 Months from the date of manufacture	MD 03.33
8.	Thums Up	Bottled by Hindustan Coca Cola Beverages Pvt. Ltd., Tehsil Hapur, Ghaziabad	04.06.03	1.5 Months from the date of manufacture	1276
9.	Coca Cola	Bottled by Hindustan Coca Cola Beverages Pvt. Ltd., Tehsil Hapur, Ghaziabad	18.07.03	2 Months from the date of manufacture	1677

1	2	3	4	5	6
10.	Mirinda (Orange Flavour)	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur	22.07.03	3 Months from the date of manufacture	MO.03.56
11.	Sprite	Bottled by Hindustan Coca Cola Beverages Pvt. Ltd., Tehsil Hapur, Ghaziabad	29.05.03	2 Months from the date of manufacture	1195
12.	Blue Pepsi	Jai Drinks Pvt. Ltd., Jawahar Lal Nehru Marg, Jaipur	02.04.03 16.03.03	3 Months from the date of manufacture	PB.03.18 PB.03.17

ANNEXURE V

ORGANOCHLORINE PESTICIDE RESIDUES IN SOFT DRINKS (MG/L) DETECTED BY CFTRI, MYSORE

Sl. No.	Brand Name	α-HCH	β-HCH	γ-HCH	δ-HCH	Total HCH	DDT	DDE	DDD	Total DDT+ Metabolites	Total Organo-chlorines (OC)
1.	Limca	ND	ND	0.000009	ND	0.000009	ND	ND	ND	ND	0.000009
2.	Diet Pepsi	ND	ND	0.000046	ND	0.000046	0.00018 (1.8)	ND	ND	0.00018	0.000226
3.	Pepsi	ND	ND	0.000008	ND	0.000008	ND	ND	ND	ND	0.000008
4.	7Up	0.0001	ND	0.000094	ND	0.000194	ND	ND	ND	ND	0.000194
5.	Fanta	0.0002 (2)	ND	0.00013 (1.3)	ND	0.00033	ND	ND	ND	ND	0.00033
6.	Mirinda (Lemon Flavour)	0.0004 (4)	ND	0.00005	ND	0.00045	0.00022 (2.2)	0.00066 (6.6)	ND	0.00088	0.00133
7.	Mountain Dew	0.0003 (3)	ND	0.00009	ND	0.00039	ND	ND	ND	ND	0.00039
8.	Thums Up	0.0003 (3)	ND	0.00007	ND	0.00037	ND	0.00048 (4.8)	ND	0.00048	0.00085
9.	Coca Cola	0.0003 (3)	ND	0.00014 (1.4)	ND	0.00044	ND	0.00088 (8.8)	ND	0.00088	0.00132
10.	Mirinda (Orange Flavour)	0.0003 (3)	ND	0.00011 (1.1)	ND	0.00041	ND	0.0008 (8)	ND	0.0008	0.00121
11.	Sprite	0.0003 (3)	ND	0.00003	ND	0.00033	ND	0.0008 (8)	ND	0.0008	0.00113
12.	Blue Pepsi	0.0005 (5)	ND	0.00013 (1.3)	ND	0.00063	ND	0.00124 (12.4)	ND	0.00124	0.00187

ND = Not detected

Note : Figure given in the parenthesis indicates number folds higher than European Norms for Packaged Drinking Water (0.0001 mg/L for individual pesticides and 0.0005 mg/L for Total Pesticides)

Repeatability, Reproducibility and Trueness of the results as per the Alinorm 3/24 of Codex Alimentarius commission *i.e.* "Report of the 34th session of the Codex Committee on Pesticide Residues (The Hague, The Netherlands, 13—18 May-2002) as reported in the Joint FAO/WHO Food standard programme of CAC, 30th June-5th July, 2003.

ANNEXURE VI

ORGANOPHOSPHORUS PESTICIDE RESIDUES IN SOFT DRINKS (MG/L) DETECTED BY CFTRI, MYSORE

Sl.No.	Brand Name	Chlorpyrifos	Malathion	Total Organophosphorus (OP)	Total OC+OP
1.	Limca	0.00002	ND	0.00002	0.000029
2.	Diet Pepsi	0.00004	ND	0.00004	0.000266
3.	Pepsi	0.000017	ND	0.000017	0.000025
4.	7Up	0.00039 (3.9)	ND	0.00039	0.000584 (1.6)
5.	Fanta	0.00054 (5.4)	ND	0.00054	0.00087 (1.74)
6.	Mirinda (Lemon Flavour)	0.00078 (7.8)	ND	0.00078	0.00211 (4.2)
7.	Mountain Dew	0.00061 (6.1)	ND	0.00061	0.00102 (2.0)
8.	Thums Up	0.00063 (6.3)	ND	0.00063	0.00100 (2.0)
9.	Coca Cola	0.00070 (7.0)	ND	0.00070	0.002 (4.0)
10.	Mirinda (Orange Flavour)	0.00050 (5.0)	ND	0.00050	0.00171 (3.4)
11.	Sprite	0.000498 (4.9)	ND	0.000498	0.001628 (3.2)
12.	Blue Pepsi	0.00076 (7.6)	ND	0.00076	0.00263 (5.2)

ND = Not detected

Note : Figure given in the parenthesis indicates number folds higher than European Norms for Packaged Drinking Water (0.0001 mg/L for individual pesticides and 0.0005 mg/L for Total Pesticides)

Repeatability, Reproducibility and Trueness of the results as per the Alinorm 3/24 of Codex Alimentarius commission *i.e.* "Report of the 34th session of the Codex Committee on Pesticide Residues (The Hague, The Netherlands, 13—18 May, 2002) as reported in the Joint FAO/WHO Food standard programme of CAC, 30th June—5th July, 2003.

ANNEXURE VII

DETAILS OF SAMPLES RECEIVED BY CFL, KOLKATA

Sl.No.	Name of the Product	Name of the manufacturer	Date of manufacture	Best Before Date	Batch No.
1.	Pepsi	Jai Drinks Pvt. Ltd., Jaipur	9.7.2003	3 months from date of manufacture	P.03.164
		Varun Beverages Ltd., Jodhpur	Samples not available		
2.	Diet Pepsi	Jai Drinks Pvt. Ltd., Jaipur	28.7.2003	2 months from date of manufacture	P.03.17
3.	Mountain Dew	Jai Drinks Pvt. Ltd., Jaipur	10.7.2003	3 months from date of manufacture	MD 03.33
4.	Mirinda Orange	Jai Drinks Pvt. Ltd., Jaipur	22.7.2003	3 months from date of manufacture	MD.03.50
		Varun Beverages Ltd., Mathura	Samples not available		
5.	Mirinda Lemon	Jai Drinks Pvt. Ltd., Jaipur	30.5.2003	3 months from date of manufacture	ML.03.13
6.	Blue Pepsi	Jai Drinks Pvt. Ltd., Jaipur	19.4.2003	3 months from date of manufacture	PB 03.19
7.	7 Up	Jai Drinks Pvt. Ltd., Jaipur	20.6.2003	3 months from date of manufacture	SO 3.12
8.	Coca Cola	Hindustan Cola Beverages Ltd., Ghaziabad	18.7.2003	2 months from date of manufacture	1677
9.	Fanta	Hindustan Cola Beverages Ltd., Ghaziabad	10.6.2003 9.6.2003	1.5 months from date of manufacture	1346 1338
10.	Limca	Hindustan Cola Beverages Ltd., Ghaziabad	11.7.2003	2 months from date of manufacture	1645
11.	Sprite	Hindustan Cola Beverages Ltd., Ghaziabad	29.5.2003	2 months from date of manufacture	1202
12.	Thums Up	Hindustan Cola Beverages Ltd., Ghaziabad	4.6.2003	1.5 months from date of manufacture	1276

ANNEXURE VIII

ORGANOCHLORINE PESTICIDE RESIDUES FOUND BY CFL, KOLKATA

Sl. No.	Brands	Batch No./ Mfg. Date	α-HCH mg/L	β-HCH mg/L	γ-HCH (Lindane) mg/L	δ-HCH mg/L	DDT mg/L	DDE mg/L	DDD mg/L	Total DDT + Metabolites mg/L	Total Organo-Chlorine mg/L
1.	Pepsi	P.03.164 09.07.03	ND	ND	ND	ND	0.00009	ND	ND	0.00009	0.00009
2.	Diet Pepsi	P.03.17 28.07.03	ND	ND	ND	ND	ND	ND	ND	ND	ND
3.	Mountain Dew	MD.03.33 10.07.03	ND	ND	0.00006	ND	0.00015	0.00008	ND	0.00023	0.00029
4.	Mirinda Orange	MD.03.50 22.07.03	ND	ND	0.00008	ND	0.001	0.00008	0.00025	0.00137	0.00141
5.	Mirinda Lemon	ML.03.13 30.05.03	ND	0.0001	0.0007	ND	0.0001	ND	0.00015	0.00025	0.00105
6.	Blue Pepsi	PB.03.19 19.04.03	ND	ND	ND	ND	0.0001	0.00012	ND	0.00022	0.00022
7.	7 Up	S.03.12 20.06.03	ND	ND	0.00005	0.00006	0.00006	0.00006	ND	0.00012	0.00023
8.	Coca Cola	1677 18.07.03	ND	ND	0.00007	0.00006	ND	0.00007	ND	0.00007	0.0002
9.	Fanta	1346 10.06.03	0.0001	ND	0.00017	ND	0.0002	ND	0.00024	0.00044	0.00071
10.	Limca	1645 11.07.03	ND	ND	0.00009	0.00007	0.00006	ND	ND	0.00006	0.00022
11.	Sprite	1202 29.05.03	ND	ND	0.00007	ND	ND	ND	ND	ND	0.00007
12.	Thums Up	1276 04.06.03	ND	0.0003	0.00006	ND	0.0001	0.00007	ND	0.00017	0.00053
Number of Samples in which Pesticides identified			1	2	9	3	9	6	3		
% of Total Samples in which Pesticides identified			8.33	16.67	75.00	25.00	75.00	50.00	25.00		

ND = Not Detected

ANNEXURE IX

ORGANOPHOSPHORUS PESTICIDE RESIDUES FOUND BY CFL, KOLKATA

Sl. No.	Brands	Batch No./ Mfg. Date	Chlorophyrifos mg/L	Malathion mg/L	Total Organophosphorus mg/L
1.	Pepsi	P.03.164 09.07.03	ND	ND	ND
2.	Diet Pepsi	P.03.17 28.07.03	0.00036	ND	0.00036
3.	Mountain Dew	MD.03.33 10.07.03	0.0009	ND	0.0009
4.	Mirinda Orange	MD.03.50 22.07.03	0.0012	ND	0.0012
5.	Mirinda Lemon	Ml.03.13 30.05.03	0.00069	ND	0.00069
6.	Blue Pepsi	PB.03.19 19.04.03	ND	ND	ND
7.	7 Up	S.03.12 20.6.03	0.0001	ND	0.0001
8.	Coca Cola	1677 18.07.03	0.0004	ND	0.0004
9.	Fanta	1346 10.06.03	0.0011	ND	0.0011
10.	Limca	1645 11.07.03	0.0002	ND	0.0002
11.	Sprite	1202 29.05.03	0.00005	ND	0.00005
12.	Thums Up	1276 04.06.03	0.0001	ND	0.0001
Number of Samples in which Pesticides identified			10	0	
% of Total Samples in which Pesticides identified			83.33	0	

ND = Not Detected

ANNEXURE X

COMPARISON OF METHODS FOR ORGANOCHLORINE AND ORGANOPHOSPHORUS PESTICIDE RESIDUES

	EPA Method	CSE Method	CFTRI Method
	1	2	3
EXTRACTION	Method: 3510 Sample Quantity: 1L	Method: 3510 Sample Quantity: 500 ml	Method: 3510 Sample Quantity: 500 ml
CLEAN-UP TECHNIQUE	Method 3640 (Gel Permeation Chromatography) 3630 (Silica gel clean-up) and 3620 B (Florisil column cleanup) 1st Elute: 200ml Ethyl Ether/Hexane (6/94) 2nd Elute: 200ml Ethyl Ether/Hexane (15/85) 3rd Elute: 200ml Ethyl Ether/Hexane (50/50) 4th Elute: 200ml 100% Ethyl Ether	3620 B (Florisil column cleanup) 1st Elute: 100 ml Hexane 2nd Elute: 100ml 30% DCM in Hexane 3rd Elute: 100 DCM	3620 B (Florisil column cleanup) 1st Elute: 100ml Hexane 2nd Elute: 100ml 30% DCM in Hexane 3rd Elute: 100 VOml DCM
INSTRUMENT CONDITIONS			
COLUMN USED	DB-608/DB-5 and DB 1701 30m x 0.53 mm—ID Fused silica capillary column	COLUMN 1 DB-17 Capillary column 30m x 0.25 mm id x 0.25 µm film Column 2 DB-5 capillary column 30m x 0.25 mm id x 0.25 µm film	COLUMN 1 HP 50 + Capillary column 30m x0.25 mm id x 0.25 µm film Column 2 BPX-5 Capillary column 30m x 0.25 mm id x 0.25 µm film
OVEN			
COLUMN 1	DB-5 column for Organochlorine 140°C for 2 minute @2.8°C/min to 270°C, 1 min	For Organochlorine 120°C for 1 minute @25°C/min to 205°C for 1 @25°C minute @2° C/Min to 290°C for 12 minutes For Organophosphorus 120°C for 1 minute @25°C/min to 205°C for 1 minute @2°C/min to 290°C for 1 minute	For Organochlorine and Organophosphorus 180°C for 25 minutes 2°C/min to 210°C for 10 minutes

	1	2	3
COLUMN 2	For Organophosphorus 120°C for 3 minutes @5°C/min to 270°C for 10 minutes	Not available	For Organochlorine and Organophosphorus 150°C for 12 minutes 2°C/min to 200°C for 15 minutes
Injector	250°C	Splitless, 270°C for both OC & OP	Splitless, 220°C for both OC & OP
Detector	ECD 320°C	ECD 320°C, NPD 300°C	ECD 250°C
Carrier	He & N_2, 6 ml/min	N_2: 0.4ml/min for organochlorine 1.3ml/min for organophosphorus	N_2: 1 ml/min for column 1& 0.8 ml/min for column 2

ANNEXURE XI

RESULTS OF PESTICIDES ANALYSIS IN SOFT DRINKS BY CENTRAL POLLUTION CONTROL BOARD

(Concentrations in µg/L)

Organochlorine Pesticides
(Varian Star 3400_{CX}GC with ECD)

Organochlorine Pesticide	Coca Cola	Pepsi	Limca	Sprite	Mountain Dew	Mirinda Orange
a-BHC	0.020	0.040	0.052	0.037	0.171	0.060
β-BHC	0.096	0.426	0.226	0.142	0.064	BDL
y-BHC (Lindane)	BDL	0.148	BDL	BDL	BDL	BDL
Aldrin	BDL	BDL	0.084	BDL	0.013	0.018
a-Endosulphan	BDL	BDL	0.151	BDL	0.020	0.767
Dieldrin	0.024	0.033	0.073	0.010	0.065	0.076
p,p'—DDE	0.238	0.079	1.496	0.034	0.515	0.234
β-Endosulphan	BDL	0.098	0.255	BDL	0.081	0.112
o,p-DDT	0.067	BDL	BDL	0.025	0.576	0.424
p,p'-DDT	BDL	0.074	0.468	BDL	BDL	BDL
Total Organochlorine Pesticides Residue	0.445	0.898	2.805	0.249	1.505	1.690

Organophosphorus Pesticides
(Agilent 6890 plus Series GC with 5973 Network MSD)

Organophosphorus Pesticides						
Malathion	0.017	0.354	0.438	0.020	0.362	0.187
Chlorpyrifos	0.029	0.278	0.378	0.056	0.955	0.180
Total Organophosphorus Pesticides Residue	0.046	0.632	0.816	0.075	1.317	0.367
Total Pesticides Residue	0.491	1.531	3.621	0.324	2.822	2.057
Number of Times exceeding EU Standard	—	3.1	7.2	—	5.6	4.1

European Standard for Individual Pesticide in Drinking Water : 0.100 µg/L

European Standard for Total Pesticides in Drinking Water : 0.500 µg/L

BDL = Below Detection Limit

ANNEXURE XII

A UNIT OF SHRIRAM SCIENTIFIC & INDUSTRIAL RESEARCH FOUNDATION

BANGALORE—560 048

Telegram: SHRILAB. Telephone: 841015, 8410175

TEST CERTIFICATE NO. BG/30659

DOR: 03-10-03	Reg. No.	310-101-0012
DOS: 03-10-03	Date	28-10-2003
DOC 20-10-03	Your Ref. No.	AFB/71421/2003/Dated 01-10-2003.

To

Directorate of Health Service
Thiruvananthapuram
Kerala

Attn. Dr. V.K. Rajan
Director of Health Service

Sample Particulars: One sample of PEPSI informal sample No. IPS No. 6/03-04 Batch No. 275, D/M 30/4/2003, Date of Drawing 26/9/2003, Place: Kazhakuttam was received.

Sl. No.	Tests	Results	Detection Limit	Protocol
I. Residual Pesticides				
1.	Gama-SHC Lindane-3, ppb	1.0	—	AOAC Chap. 10/BC-MS
2.	P.P.-DDT, ppb	BDL	0.1	AOAC Chap. 10/GC-MS
3.	Ethyl parathion, ppb	BDL	0.1	AOAC Chap. 10/BC-MS
4.	Malathion, ppb	0.7	—	AOAC Chap. 10/BC-MS
5.	Carbofuran, ppb	BDL	0.1	AOAC Chap. 10/BC-MS
6.	Carbaryl, ppb	BDL	0.1	AOAC Chap. 10/BC-MS
II. Heavy Metalas 1				
1.	Lead (an pb) ppm	BDL	0.1	AOAC/AAB
2.	Cadmium (an Cd) ppm	BDL	0.1	AOAC/AAB

Note: BDL Denotes below detection limit

Authorised Signatory
Scientist

A UNIT OF SHRIRAM SCIENTIFIC & INDUSTRIAL RESEARCH FOUNDATION

BANGALORE—560 048

Telegram: SHRILAB. Telephone: 841015, 8410175

TEST CERTIFICATE NO. BG/30660

DOR: 03-10-03 Reg. No. 310-101-0013
DOS: 03-10-03 Date 28-10-2003
DOC: 20-10-03 Your Ref. No. AFB/71421/2003/Dated 01-10-2003.

To

Directorate of Health Service
Thiruvananthapuram
Kerala

Attn. Dr. V.K. Rajan
Director of Health Service

Sample Particulars: One sample of COLA informal sample No. IPS No. 6/03-04 Batch No. 275, D/M 30/4/2003, Date of Drawing 26/9/2003, Place: Kazhakuttam was received.

Sl. No.	Tests	Results	Detection Limit	Protocol
I. Residual Pesticides				
1.	Gama-SHC Lindane-3, ppb	32.0	—	AOAC Chap. 10/BC-MS
2.	P.P.-DDT, ppb	0.4	—	AOAC Chap. 10/BC-MS
3.	Ethyl parathion, ppb	BDL	0.1	AOAC Chap. 10/BC-MS
4.	Malathion, ppb	9.9	—	AOAC Chap. 10/GC-MS
5.	Carbofuran, ppb	BDL	0.1	AOAC Chap. 10/BC-MS
6.	Carbaryl, ppb	BDL	0.1	AOAC Chap. 10/BC-MS
II. Heavy Metalas 1				
1.	Lead (an pb) ppm	BDL	0.1	AOAC/AAB
2.	Cadmium (an Cd) ppm	BDL	0.1	AOAC/AAB

Note: BDL Denotes below detection limit

Authorised Signatory
Scientist

ANNEXURE XIII

COMPARISON OF THE RESULTS OF CFL (CFTRI), MYSORE AND CSE, NEW DELHI AND CFL, KOLKATA

Sl.No.	Brand	CFL (CFTRI), Mysore		CSE, New Delhi		CFL, Kolkata	
		Total Pesticide Residues OC+OP (mg/L)	No. of folds higher than EEC Limits	Total Pesticide Residues OC+OP (mg/L)	No. of folds higher than EEC Limits	Total pesticides	Higher than EEC
1.	Limca	0.000029	Below EEC limits	0.0148	30	0.00042	Within limit
2.	Diet Pepsi	0.000266	Below EEC limits	0.0071	14	0.00036	Within limit
3.	Pepsi	0.000025	Below EEC limits	0.0187	37	0.00009	Within limit
4.	7 Up	0.000584	1.6	0.0166	33	0.00033	Within limit
5.	Fanta	0.000087	1.7	0.0214	43	0.00181	3.62
6.	Mirinda (Lemon Flavour)	0.000211	4.2	0.0352	70	0.00174	3.48
7.	Mountain Dew	0.00102	2.0	0.0141	28	0.00119	2.38
8.	Thums Up	0.00100	2.0	0.0111	22	0.00063	1.26
9.	Coca Cola	0.002	4.0	0.0223	45	0.0006	1.2
10.	Mirinda (Orange flavour)	0.00171	3.4	0.0196	39	0.00261	5.22
11.	Sprite	0.001628	3.2	0.0055	11	0.00012	Within limit
12.	Blue Pepsi	0.00263	5.2	0.0147	29	0.00022	Within limit

EEC limit for total pesticide residues: 0.0005 mg/L.

ANNEXURE XIV

PRESENCE OF PESTICIDES AS A COMMON SCIENTIFIC FINDING

Sl.No.	Pesticide	CSE New Delhi	CFL CFTRI, Mysore	CFL Kolkata
1	2	3	4	5
1.	DDT	√	√	√
2.	BHC	√	√	√
3.	Chlorpyriphos	√	√	√
4.	Lindane (Y-BHC)	√	√	√
5.	Malathion	√	ND	ND
6.	Parathion	ND	ND	ND
7.	Fcnitrothion	ND	ND	ND
8.	Carbaryl	ND	ND	ND
9.	Aldicarb	ND	ND	ND
10.	Methyl Parathion	ND	ND	ND
11.	Carbofuran	ND	ND	ND
12.	Dimethoate	ND	ND	ND
13.	Phosalone	ND	ND	ND
14.	Monocrotophos	ND	ND	ND
15.	Ethion	ND	ND	ND
16.	Dichlrorvos	ND	ND	ND
17.	Propoxur	ND	ND	ND
18.	Diazinon	ND	ND	ND
19.	Fenthion	ND	ND	ND
20.	Phosphamidon	ND	ND	ND
21.	Endosulfan	ND	ND	ND
22.	Cypermethrin	ND	ND	ND
23.	Deltamethrin	ND	ND	ND

1	2	3	4	5
24.	Fenvalcrate	ND	ND	ND
25.	Permethrin	ND	ND	ND
26.	Altrazinc	ND	ND	ND
27.	Simazinc	ND	ND	ND
28.	Captafol	ND	ND	ND
29.	Accphatc	ND	ND	ND
30.	Dithiocarbamate	ND	ND	ND
31.	Metalaxyl	ND	ND	ND
32.	Fosetyl Aluminium	ND	ND	ND

ND—Not Detected. √-Detected

DDT includes its metabolitics.

BHC includes its isomers.

22, 23, 24 and 25 are the synthetic pyrethroids.

CHAPTER II

SECOND TERM OF REFERENCE

CRITERIA FOR SETTING STANDARDS FOR SOFT DRINKS, FRUIT JUICE AND OTHER BEVERAGES

SOFT DRINKS (CARBONATED WATER/SWEETENED AERATED WATER)

2.1 According to the PFA Act 1945, "A01.01—CARBONATED WATER means potable water impregnated with carbon dioxide under pressure and may contain any of the following singly or in combination. Sugar, liquid glucose, dextrose monohydrate, invert sugar, fructose, Sorbitol, honey, fruit and vegetables extractives and permitted flavouring, colouring matter, preservatives, emulsifying and stabilising agents, acids, (citric acid, fumaric acid, tartaric acid, phosphoric acid, lactic acid, ascorbic acid and malic acid), edible gums such as (guar, karaya, arabic, carobean, furcellaran, tragacanth, gum ghatti, edible gelatin, albumin, licorice and its derivatives) salts of sodium, calcium and magnesium, vitamins, caffeine." Carbonated water constitutes a defined and homogenous range, designated by a generic denomination and utilizing some common list of additives. Carbonated water includes the beverages which comply with this definition, which utilize these additives and which do not claim to be part of adjacent categories such as fruit juices and nectars, dairy drinks, mineral waters, etc.

The Market

2.2 As per a note furnished to the Committee, globally, carbonated soft drinks are the third most consumed beverages. *Per-capita* annual consumption of carbonated soft drinks is nearly four times the *per capita* consumption of fruit beverages. Soft drink consumption is growing by around 5% a year, according to Global Soft Drinks 2002 (Zenith International, 2002). Total volume reached 412,000 million litres in 2001, giving a global *per-capita* consumption of around 67.5 litres per year.

2.3 North America is the largest soft drinks market with 27 per cent of total world soft drink sales and a consumption of 48 gallons per person per year (192 litres/person/year). The European market accounts for 21 per cent, with a *per capita* consumption of 12.7 gallons per year (50.8 litres/person/year). The fastest growth in soft drink consumption is in Asia and South America. Carbonated drinks are the biggest soft drinks sector with 45% of global volume. The five fastest growing soft drink markets between 1996 and 2001 were from Asia, East Europe and the Middle East. The five fastest developing markets during 2001 and 2006 are all expected to come from Asia. Amongst them Pakistan is predicted to have the highest percentage growth rate while India is expected to make sizeable volume gains, as affluence spreads to more of its vast population. Indonesia, China and Vietnam complete the top five for future growth.

Indian Scenario

Market

2.4 According to Government estimates soft drinks marketed in India were 6540 million bottles in March 2001. The market growth rate, which was around 2-3% in 80s, increased to 5-6% in the early 90s and is presently 7-8% per annum.

Consumption

2.5 *Per capita* consumption in India is among the lowest in the world at 6 bottles per annum compared to 80 bottles in Thailand and 800 bottles in USA. Delhi market has highest *per capita* consumption in the country with 50 bottles per annum.

Types

2.6 Non-alcoholic soft drinks beverage market can be divided into fruit drinks and carbonated water. Soft drinks available in glass bottles, aluminium cans or, PET bottles. Carbonated water can also be divided into cola products and non-cola products. Cola Products like Pepsi, Coca Cola, Thums Up, and Diet Coke, Diet Pepsi etc. Non-Cola products based on the types of flavours available can be divided into Orange, Cloudy Lime, Clear Lime and Mango.

Soft Drinks Ingredients

2.7 As per a note furnished to the Committee, the major ingredients of soft drinks include the following:—

Water

2.8 The major ingredient of soft drinks is water and it accounts for 86%-92% of the soft drink composition.

Aromatic Substances

2.9 Aromatic substances are added to soft drinks to give a pleasant taste and better stability to the taste. These could be natural aromatic substances like caffeine obtainable from a variety of leaves, seeds and fruits. Identical aromatic substance can be obtained more simply and cheaply, in purer forms from raw materials other than plant raw materials and have characteristics which correspond exactly with their natural equivalents.

Sweeteners

2.10 There are many different types of sweeteners like sugar (sucrose). It is highly nutritious and is the invaluable carrier of the fruit aromas. It is made from sugar-beet or sugar cane or sweeteners found naturally in many fruits and vegetables. Two simple types of sugars found in fruits are fructose (fruit-sugar) and glucose (grape-sugar). There are also low-calorie artificial sweeteners like saccharin and aspartame (nutra-sweet). Saccharin, is a non-nutritious sweetener which is extremely sweet, stable, gives no energy (no calories). Aspartame is a nutrient-sweetener built up of two amino-acids, aspartic acid and phenylalanine (200 times sweeter than sucrose).

Carbon dioxide

2.11 Carbon dioxide is another important ingredient added to the soft-drinks in liquid form. It makes the drink refreshing through its stimulation of the mouth's mucous membranes adding a sensation that the soft drink is colder than it actually is. The carbon dioxide also brings out the aroma since the carbon dioxide bubbles 'drag with them' the aromatic components. It also checks microbiological growth.

Acids

2.12 The most common acids used in soft drinks are citric acid, phosphoric acid and malic acid. The function of acids in the drink is said to balance the sweetness.

Colouring matter

2.13 Colour is added to soft drinks to make them presentable and attractive to consumers. Brown drinks are coloured with caramel (when sugar is heated, its colour changes to brown, it becomes less sweet and acquires a burnt taste) or beta-carotin, which is also the dominant colouring agent in carrots and oranges.

Preservatives

2.14 Preservatives like sodium benzoate and potassium sorbate are added to increase the life of the product. Sulphur dioxide can also be used as a preservative.

Antioxidants

2.15 Antioxidants are substances, which prevent reactions that destroy aromatic substances in soft drinks. The most common antioxidant used is ascorbic acid, *i.e.* Vitamin C.

Other additives

2.16 Emulsifying agents, stabilizing agents and thickening agents are also added so that the contents of the drinks remain evenly distributed. Examples of stabilizing agents and thickening agents are pectin, which is obtained from citrus fruits or apples, and alginates and carragenan, which is obtained from algae.

Manufacturing Process

2.17 The production of soft drinks begins by making a syrup of sugar and water and an aromatic concentrate mixture (soft drink concentrate) made of raw fruit-juice, other aromatic agents as well as an acid. Soft drinks are acidified either by the addition of fruit juice or by the inclusion of an acid such as that found naturally in fruits (malic or citric acid) or phosphoric acid which is generally used in cola drinks. The components are then mixed into a soft drink concentrated syrup.

2.18 The water used is treated to remove the oxygen to avoid reactions which destroy the aromatic substances (oxidation). In case of carbonated drinks, the water is 'carbonated' with carbon dioxide under high pressure. All the air is removed to prevent froth formation when the package is opened. The syrup and the carbonated water are mixed in the correct proportions. The drink is then bottled, canned or put into other packaging for retail sale.

LICENCE TO SOFT DRINK INDUSTRIES UNDER FPO 1955

2.19 Soft drink industries are granted licence under the Fruit Products Order, 1955, which is a statutory Order issued under the Essential Commodities Act,1955 and is administered by the Ministry of Food Processing Industries. Under this Order, a licence is granted to the manufacturers of fruit products covered under FPO, 1955. This licence is given after inspection of the premises of manufacturer as to the compliance of necessary dimensions and hygienic conditions of the place of manufacture. The other aspect looked into before grant of FPO licence is as to whether the water being used for the manufacture of product is potable or not. Towards this end, sample of water is taken and chemical and microbiological tests are conducted.

2.20 A big lacuna found by the Committee was that under FPO 1955, the definition/standards for potable water has not been notified. The Ministry of Food Processing Industry informed the Committee that by practice, potable water is expected to conform to the World Health Organisation/BIS drinking water norms, which has been followed uniformly under the FPO. FPO only stipulates that the level of pesticides should be below detectable limit and have not been quantified.

2.21 From the information furnished to the Committee it is noted that Coca Cola CSD manufacturing locations in India are 52 out of which Company Owned Bottling Plants are 27 and Franchisee Owned Bottling Plants are 25. PepsiCo India Holdings Pvt. Ltd. manufacturing locations in India are 38 out of which Company Owned Plants are 17 and Franchisee owned plants are 21. As per the Ministry of Food Processing Industries note the total turnover of these two products of two companies is estimated to be around Rs. 4000 crore per year. The production by other FPO Licensees (home scale and cottage scale approx. 900 number) of fruit juices, Sweetened Areated Water (SAW) and ready to serve beverages is estimated to be around Rs.300 crore and by others (about 400 number) is approximately Rs. 2000 crore.

PRESENT REGULATIONS FOR SOFT DRINKS UNDER PFA ACT

2.22 Standards for Soft drinks have been prescribed under PFA ACT, 1954 and Rules, 1955 under item A.01.01 of Appendix B, under the category of Carbonated Water. This includes plain carbonated water and sweetened carbonated water.

2.23 From the two mandatory regulations it is noted that under FPO, 1955 standards for Sweetened Aerated Water/carbonated water (soft drinks) does not include water quality standards as part of soft drink quality standards. It just mentions that water should be potable without giving any direction about the meaning of potable water.

2.24 PFA, 1954 also mentions that water in the soft drinks has to be potable without giving any quality standards for the potable water. However, it specifies microbiological contaminant standards for the final soft drinks.

2.25 Both FPO and PFA do not specify standards for inorganic and organic chemicals and pesticides for soft drinks. Both under FPO and PFA, standards have been set for carbonated drinks, and some of the soft drinks intended for consumption after dilution.

BIS STANDARDS FOR SOFT DRINKS

2.26 While standards for carbonated beverages under the FPO, 1955 and PFA 1954 are mandatory regulations for the soft drinks, there is also a voluntary Standard of Bureau of Indian Standards for soft drinks (IS 2346 : 1992).

2.27 The voluntary BIS standard for carbonated beverages (soft drinks) (IS 2346:1992) however specifies the quality of water to be used in the manufacturing of soft drinks and its standards for microbiological parameters and heavy metals are for the final product.

2.28 According to BIS specification, the water used in the manufacture of soft drinks should meet the water quality standards for processed food industry IS 4251:1967. The water quality standards for processed food industry IS 4251 : 1967, has specified standards for bacteriological, physical and chemical tolerances, but does not mention pesticides.

2.29 From a note furnished by Bureau of Indian Standards (BIS), Committee noted that Drinks and Carbonated Beverage Sectional Committee, FAD 14 which is the BIS technical committee for developing standards in the field of all alcoholic and non-alcoholic drinks and other beverages including test methods for the same, conducted meetings for the review and revision of present voluntary standards of BIS. FAD 14 decided to revise IS2346:1992 Carbonated Beverages and made it more broad based as observed in other countries. The Committee deliberated in detail on the title so as to cover soft drinks and other ready to serve beverages which are water based and decided to use the title Ready to-serve non-alcoholic beverages' so as to cover all sweetened as well as unsweetened, carbonated as well as non-carbonated, flavoured and other type of water based ready-to-serve beverages.

2.30 The scope of the revised standards, however, do not include medical beverages, pure fruit vegetable juices or those containing or derived from dairy products. The technical recommendations on the standards for ready-to-serve non-alcoholic beverages which emerged out of the deliberations of FAD 14 were stated to be as under:—

"(a) There is a need to regulate this product through a national standard as it is a value added processed food and consumed by all sections of the population including the vulnerable section like children and needed vigilant control to safeguard public health specially in a tropical country like India.

(b) The standard should include as far as possible a wide range of ingredients that could be used in the formulation of this product.

(c) The raw material ingredients should specifically state the quality and safety requirements so as to ensure a safe end-product. Limits for physical, chemical and microbiological parameters should be well defined as they are critical to safety. The consumer Organizations, NGOs, ICMR, CSIR, etc. strongly recommended that the end-product standard should include pesticide residue limits also in each case as pesticide residue contamination should not be allowed in the end-product. On the other hand CII, FICCI, Coca-cola and Pepsi representatives strongly recommended that consumer safety is ensured by following the international practice of fixing MRLs on raw agricultural commodities and water and no pesticide residue limits are recommended on the finished ready to-serve non-alcoholic beverages. They were supported by the agricultural scientists.

(d) The quality of water is vital, as it is the base of this product and, therefore, its specified quality and safety standards should be strictly adhered to.

(e) Hygienic requirements should be very specific as often this industry uses reusable containers and in order to safeguard public health, strict observance of hygienic practices were necessary, as also observed in some other country regulations/standards.

(f) Packaging requirements in keeping with the latest packing materials should be included in the standard.

2.31 BIS technical Committee FAD, 14 proposed that the technical recommendations on ready to serve non-alcoholic beverages will be suitably modified into the draft Indian Standard and proposed as a National Standard in due course.

2.32 From CSE report, the Committee note that the soft drink industry remains not only unregulated but it is also exempted from the provisions of industrial licensing under the Industries (Development and Regulations) Act, 1951. It gets a one time license to operate from the

Ministry of Food Processing Industries, which includes a no objection certificate from the local government and a water analysis report from a public health laboratory. It also requires a no objection certificate from the concerned State Pollution Control Board. There is no mandatory requirement for Environment Impact Assessment or citing regulations for the industry. Its use of water— largely unpriced ground water—is not regulated.

PROPOSED STANDARDS FOR SOFT DRINKS AS PER DRAFT NOTIFICATION ISSUED BY MINISTRY OF HEALTH AND FAMILY WELFARE

2.33 After finding of pesticide residues in soft drink samples by Centre for Science and Environment (CSE) a draft notification was issued by the Ministry of Health and Family Welfare specifying the pesticides and heavy metals limits in soft drinks, fruit juice and other beverages. Draft notification no.GSR 685 (E) (Annexure-I) dated 26th August 2003, issued by the Ministry of Health and Family Welfare *inter alia* stipulates the amount of insecticide residues in carbonated water and soft drink concentrates (after dilution as per direction) as follows:—

Pesticide residues considered individually

not more than 0.0001mg/litre

Total pesticide residues—

not more than 0.0005 mg/litre

2.34 The above norms are the same norms which have been made applicable for packaged drinking water *w.e.f.* 1.1.04.

2.35 From the files of the Ministry of Health and Family Welfare pertaining to issue of Draft notification, it was noted that draft notification was approved by the Minister for Health and Family Welfare on 14.08.2003 and was sent to press on 25.08.2003. Asked by the Committee as to why issue of above draft notification was not stopped once it was decided that JPC was going to be constituted, the Ministry of Health and Family Welfare in a written note furnished to the Committee stated as under:—

> "The process for issue of draft notification was approved by Hon'ble HFM before the constitution of the JPC, though the draft notification was issued thereafter, for inviting objections and suggestions. The draft notification is subject to re-examination in the light of comments received from various sources on such draft notification."

2.36 The Chairman of the JPC, Shri Sharad Pawar wrote to the Union Minister of Health and Family Welfare to extend the date for inviting the suggestions and objections on the above draft notification. Consequently, the Ministry of Health and Family Welfare extended the time period of draft notification for inviting objections and suggestions till 31st December, 2003 *i.e.* by 127 days and issued a revised draft notification No.GSR 769(E) (Annexure-II) dated 29.09.2003.

2.37 The Committee, noted that when first draft notification No. GSR 685(E) was issued, only 30 days time was given for inviting objections and suggestions on the draft notification.

2.38 Asked by the Committee as to why the time for inviting suggestions on draft notification was restricted to 30 days only and the basis for extending the time period from 30 days to 127 days, the Ministry of Health and Family Welfare in its note further stated:

> "There is no set standard for giving time for sending the comments on notification. The time can be given on the basis of the importance of the subject. In the present case 30 days time was given because the matter was of urgent public importance. On earlier

occasions in some cases less than 30 days time had also been given. In this specific case the period of 30 days was extended to 127 days based on the letter received from Chairman, Joint Parliamentary Committee on Pesticide Residues."

2.39 The Committee asked the Secretary, Ministry of Health and Family Welfare who gave his oral evidence before the Committee to explain the present norms for carbonated water and packaged drinking water.

In reply Health Secretary stated:

"Sir, under the existing PFA rules, there is no limit set for pesticides residue in soft drinks. The limits are set for bottled drinking water actually. There it is mentioned that it should be below the detectable limits. That is how it is mentioned. There is no quantitative standard which has been fixed for the pesticide residues. That means essentially it is left to the laboratories which are testing the samples to see whether the below "**detectable limits**" is achieved or not. As you improve the technology and as you go for new methods of detection, this detectable limit will be come much lower and lower. There is a need to set quantitative norms instead of just leaving it to laboratories to fix the limit. One of the reasons why we went from the detectable limit to the quantitative standards to set an absolute standard so that can be the basis for testing for everybody. But so far as soft drinks are concerned, there is no specific norm set for pesticides in the notification except saying that it should be below detectable limits."

2.40 Asked to explain the present EU norms for soft drinks, Health Secretary in his reply stated:

"No specific norms for soft drinks but because water constitutes major component of the soft drinks, the norms for water is the same as we have now notified that norm applies to the soft drinks also."

CRITERIA TO INITIATE A NEW STANDARD UNDER PFA ACT

2.41 As per a note submitted by the Ministry of Health and Family Welfare, new standard under PFA Act is initiated as per the criteria under Section 23 of PFA Act, 1954.

2.42 Section 23 of the Prevention of Food Adulteration Act, 1954 lays down the procedure for amendment of Prevention of Food Adulteration Rules including procedure prescribing amending the standards of food products. As per this provision, any proposal in respect of initiation of a new standard under PFA Act is considered by the Central Committee for Food Standards, which is a statutory Committee under the Act. On the basis of the recommendation of CCFS, the draft notification is published for inviting comments. Composition of CCFS is given in Annexure-III.

2.43 The Committee noted that revised norms for water were adopted for bottled drinking water which have come into effect from 1.1.04 after due deliberations and recommendation of Central Committee for Food Standards, which deals with setting of standards for various food items under PFA Act.

2.44 However strangely, CCFS was not consulted before issuing draft notification No. GSR 685(E) dated 26 August, 2003, stipulating pesticide residue standards in soft drinks, fruit juice and other beverages.

2.45 When asked by the Committee as to why CCFS was not consulted before issue of draft notification, in reply, the Ministry of Health and Family Welfare in their note furnished to the Committee stated as under:

> "The draft notification proposing requirements of pesticide residues and other contaminants was issued as per the provisions contained in Section 23 of the PFA Act, 1954. The matter was of public importance, so the draft notification was issued without prior consultation with CCFS. As provided under Section 23 of the Act, the CCFS may be consulted within six months of the making of the rules."

2.46 Since water is the major constituents of carbonated water (92%) and the norms for pesticide residues in bottled water are proposed to be extended to soft drinks as well, *vide* the draft notification issued by the Ministry of Health and Family Welfare, the Committee first discussed in detail various issues which led to adoption of EU water norms for pesticide residues in bottled water.

2.47 During evidence the Committee asked the representatives of the Ministry of Health and Family Welfare as to whether other norms were also considered before adopting EU water norms and the justification due to which CCFS recommended EU water norms for bottled drinking water. In reply, Secretary Ministry of Health and Family Welfare stated:

> "....The issue before the Committee was that we should have the best standards because people are paying for this water. We did not examine the standards available in the whole world. We were concentrating on the issue that our people should have the best and the European norms are very high and people are paying for this bottled water. That was at the back of the mind of the experts. This is what was recommended. I will say that these recommendations were advisory in nature."

2.48 Asked further as to whether the decision of CCFS of considering and recommending only EU norms was a correct one. In reply, DGHS during his evidence stated:

> "If you look at the limited point from the point of view of public health, then probably the recommendations were correct. It is because people should have the best. This is not something that everyone consumes. The Committee was conscious of the fact that these are very stringent norms and the normal water that we take from the tap probably would have far more pesticide content than other things that we take. It was weighing on the minds of the members of this Committee that people who pay high amounts for this bottled water must have the best."

2.49 BIS in their presentation informed the Committee that they had considered limits and norms of WHO, USEPA and other agencies before adopting EU norms.

2.50 Giving justification behind the recommendation made by CCFS for adopting EU water norms for bottled water, Secretary, Ministry of Health and Family Welfare stated as under:

> "There are about 49 pesticides for which norms are prescribed by various countries in the world. The WHO norm for the pesticides covers only 24 pesticides out of these 49 pesticides. The WHO norm does not cover all the 49 pesticides which are found in the underground water. It prescribes only for 24 pesticides.
>
> So far as the US EPA is concerned, the norms are prescribed only for 21 of these 49 pesticides for which limits need to be set. Whereas, the EU norms set a limit for all these 49 pesticides. That is one of the important factors which weighed with the Committee while taking the decision."

2.51 On the concern expressed by Committee that the Ministry of Health and Family Welfare had merely copied EU norms, without considering other norms and applied them for bottled water, the Health Secretary stated:

> "I once again, submit to the Hon'ble Committee that these norms are something which these people can easily meet. The bottled drinking water manufacturers can very easily get to the EU standards without investing in much of a capital equipment or anything of the sort and without much of an increase in the price of the bottle. So, when people are entitled to the best standards and when norms are available for pesticides, the Committee and the Government thought that these are the best norms that should be available to the people."

2.52 The Committee asked about the expenditure which would be incurred for achieving EU water norms. In reply, the Health Secretary stated :

> "……But here, when we looked at what will be the additional cost that the bottled water manufacturers have to incur if the norm has to be prescribed, it is coming to a marginal amount. At the most, for one bottle, it may cost 50 paise or a rupee more. Today, we are paying Rs.15 or 20 for a bottle of quality drinking water. If somebody has to pay one more rupee, he will pay. I think a person who can afford to pay Rs. 20 can afford to pay Rs. 21 also. It is not that one is burdened too much."

2.53 On the proposed standards for soft drinks and other beverages, Secretary, Ministry of Health and Family Welfare during his evidence before the Committee stated:

> "So far as soft drinks and other fruit juices are concerned, the draft notification mentions these norms, but the point is, in a soft drink, it is not just water there are many other constituents like sugar and other additives which have their own pesticide standards. So, definitely we look at soft drinks as a bottled product comprising of water and all these things."

2.54 The Committee pointed out that soft drinks besides water contain other ingredients also and it was not possible to equate soft drinks with water and asked as to why EU norms for water were made applicable to soft drinks as well. In reply, Health Secretary stated:

> "...the draft notification is only meant to initiate a debate on this issue and invite claims and objections from different interested parties and then it again goes to an Expert Committee. It deliberates and then the final notification is issued. So, in most of our notifications, between the draft notification and the final notification, there are a lot of variations."

2.55 The Committee also invited representatives of Association of Indian Bottled Water Manufacturers to tender evidence before them. When asked by the Committee as to what were the methods and equipments available to make water free from all contamination, in reply the President of Association of Indian Bottled Water Manufacturers stated "There are lots of technologies available". Asked further as to whether through the above methods water impurity could be removed, his reply was in affirmative. Asked by the Committee about the cost of purification and treatment of water, in reply, representative of Bottled Water Manufacturers Association stated:

> "processing cost is relatively small, very small. EU and WHO will not make a difference."

2.56 Asked to indicate exactly the expenditure incurred for purification and processing of water, the witness stated:

"May be two paise to four paise; including standardisation of the product and everything."

2.57 The Committee asked the views of two major soft drink manufacturing companies *viz.* Coca Cola India and Pepsi Co India Holdings Private Limited on the proposed standards for soft drinks and the standards for soft drinks in other countries. In reply Coca Cola India in their note furnished to the Committee stated:

"..... proposed standards on pesticide residues do not follow the guidelines for setting standards for foods as per Codex Alimentarius. World wide standards are made only on agricultural commodities and not on finished products. Standards should be based on sound science and risk analysis. The above standard (GSR 685 E) is not based on scientific risk assessment nor does it consider any generally applied risk analysis principles. This proposed standard is based on the EC regulation for pesticides in potable water that is not even intended for multi-ingredient foods like soft drinks in Europe, only to the water used on the manufacture of foods and beverages. Soft drinks contain other ingredients in addition to water, such as sugar and other plant derived materials that are permitted to contain acceptable levels of pesticide residues. The European norm for water was based on the technical limit of quantification and it was recognized that not all countries will be able to meet this level of quantification. It is generally understood that product containing agricultural ingredients such as sugar and juice cannot be regulated as water.

The only common standard in other countries is that water used as an ingredient in manufacture of soft drinks and other processed food industries should meet the same standards as laid down for drinking water. We are not aware of any country that regulates pesticides in a composite food like soft drinks as proposed in the draft notification. This is not done in the Europe nor in the United States and would be contrary to the prevailing international practice. It is well recognized by regulatory authorities worldwide that agricultural ingredients such as sugar and juice may contain low levels of pesticide residues and, therefore, soft drinks are not regulated as water."

2.58 Criticising the setting of standards for pesticide residues in water as per EU norms for soft drinks, Coca Cola India in its note further stated:

"We would like to dispel the myth that "the regulations for drinking water can be applied to soft drink despite complexity of the matrix." This can be substantiated by the communication received from The Executive Office of Health and Human Services of the Commonwealth of Massachusetts (USA), which clearly states that " ... While water may be the primary ingredient in a carbonated, non alcoholic beverage, the finished product's analytical profile can be and usually is, affected by the addition of syrups, fruits, etc. It is our belief that one cannot utilize the same standards for two products with significantly different ingredients.

Soft drinks contain many other ingredients apart from water such as sugar, carbon dioxide, acidulants, preservatives, colouring and flavouring agents. Soft drinks contain ingredients which can interfere with the accurate determination of pesticide residue levels. The limits of determination for pesticides residues in a food matrix like soft drink will be quite different from the limit of determination for accurate detection in water. These are the two important reasons why simply adopting drinking water standards is also not appropriate for soft drinks or other composite food products. Pesticide application should be more

effectively managed at the source in the agricultural sector. Government, therefore needs to establish Maximum Residue Limits(MRL) for farm products & Raw Agricultural Commodities (RAC) only as the most effective, enforceable control point in the entire food chain. This can be achieved by adopting Good Agricultural Practices (GAP). Hence Pesticide Residue standards on complex, processed foods and beverages are not required. While the Government should adopt a high level of health protection in the development of food law it should apply such a law in a non-discriminatory manner."

2.59 Pepsi Co. India holding Private Limited gave following views on setting of standards of limits for pesticide residues in water in soft drinks:

"As far as the proposed pesticide residue limits on finished beverages are concerned, it is not possible for any manufacturer (anywhere in the world) of beverages containing fruits, vegetables, sugar etc. which are of agriculture origin would be in a position to achieve these norms consistently. It is more important to fix pesticide residue norms on treated water which is used as an ingredient to prepare finished beverages, in line with WHO drinking water standards. The limits of heavy metals in finished beverages should be in line with CODEX as per our stated national policy of harmonization of food safety laws."

2.60 Both Pepsi Co. India and Coca Cola India vehemently opposed the setting of Indian Standards are for bottled drinking water to soft drinks as well on the plea that these standards were same as EU norms which were not based on any scientific criteria. They pleaded that standards for water used for manufacturing soft drinks should be based on WHO guidelines for water.

2.61 The Committee asked both the representatives of Pepsi Co. India and Coca Cola India as to what was the quality of water being used in their plants for manufacturing soft drinks. In reply a representative of Pepsi Co. India during his evidence before the Committee stated:

"Till February, when the CSE report was out our processes were engineered to deliver at least up to the Indian guidelines, up to the USEPA guidelines and WHO guidelines in which after that particular date when we are now checking our water against EU water norms. When we checked water against EU water norms, we were pleasantly surprised that our processes were engineered to even meet the EU water norms.

Till that time, the EU water norm was not even on the table. Therefore, over the past many years that we have been operating in the country we have been delivering water in accordance with international guidelines and we discovered this year that they are also meeting the EU water norms as such. We have been supplying clean water to the Consumers. There is no ambiguity about that."

In this regard, a representative of Coca-Cola India stated as under:

".....the big allegation against us was that we are not cleaning up water. We have gone on record to say that all our 52 plants meet treated water as per EU norms or Indian Standard norms."

2.62 The Committee asked the representatives of Pepsi Co. India as to whether they check the quality of sugar before adding it in the soft drink. In reply, a representative of Pepsi Co. India stated as under:

"No Sir, because that is not the practice any where".

2.63 Asked further as to whether they have the latest technology to clean the sugar so as to make it totally free from pesticides. In reply, a representative of Pepsi Co. India during evidence stated as under:

> "..... yes, there are some technologies available for reducing pesticide residues from the sugar itself. It means using hot carbon treatment and, like you have quoted other major cola companies, we have exactly the same process of using hot carbon treatment which can reduce to some extent but not all the extent. If you have seen the data which has been given, the fact is that in 50 per cent of the cases it has been reduced and in the rest 50 per cent of the cases, it has not been reduced. These are not really evolved technologies and hence, the possibility of something coming out of the sugar and rightly so, it is not illegal because the farmer is using what is being recommended. All these exist."

2.64 On cleaning up of sugar, a representative of Coca-Cola India stated as under:

> "We cannot guarantee about sugar because the amount we will reduce will depend on the intake of the sugar. It will depend on batch to batch. We have shown you that we are taking all possible steps to clean the sugar coming, including buying the right sugar, authorizing the mills etc."

2.65 Representatives of CSE appeared before the Committee to tender their oral evidence. The Committee asked CSE as to why the pesticides found in soft drinks were compared with EU limit for individual pesticides in water. In reply, representative of CSE during her evidence before the Committee stated as under:

> "We chose EU norms because it is the cheapest to implement in this country. Let us be very clear because it is for single pesticide and multiple pesticides residue. You do not put in the money that you have to regulate 100 different pesticides and test different pesticides. You have a single value. As environmentalists, we very strongly believe that it is cheaper for you to pre-empt the problem. Therefore, you have to have tight systems and tight standards today because you are too poor to clean up. We have consistently made the point that even if the West can pay to clean up, you are too poor to clean up. What will rural India do? They cannot buy bottled water. Therefore, we have to put into place the most stringent requirements today and then, insist that they get followed— if not today, by tomorrow or day after or day after— but we have to have the willingness to say that health and public health cannot be jeopardised."

2.66 Asked by the Committee to explain as to how standards for soft drinks should be set. In reply, representative of CSE during her evidence before the Committee stated:

> "Standards for soft drinks are set on the basis of the MRLs of the ingredients. With multiple residues, it will be the sum of the MRLs of the various commodities as proportionately present. Therefore, if you take soft drinks and if you look at the FPO, Fruit Products Order, it says that a minimum of five percent sugar is allowed in soft drinks and three percent could be other constituents. We do not know about what other constituents are. No company has made it public. We know that caffeine is in it, but we do not know of other things that are part of other constituents. Ninety-two percent has to be water. Therefore, you would set the MRL by setting five percent of sugar MRL plus three percent of other MRLs."

2.67 In a subsequent note CSE stated as under:

> ".....To set the pesticide standard for the finished product (ready to drink) you would calculate : (5% of sugar MRL) + (3% of other MRL) + (92% of water MRL).
>
> As there is no MRL-standard-for sugarcane (hence sugar) for DDT, lindane, chlorpyrifos, malathion in the Indian law, that is, the Prevention of Food Adulteration Act or even in EU standards or USEPA, or CODEX, there can be no acceptable limit for these pesticides in sugar. Therefore, there will be no allowance for 5 per cent of the sugar MRL.
>
> Similarly, there is no information about what constitutes 3 per cent of the soft drink and no MRL can be accepted.
>
> Therefore, the MRL for the finished product would be as follows:
>
> = (5% of sugar MRL) + (3% of other MRL) + (92% of water MRL)
>
> = 0 + 0 + 92% of water MRL = 92% of water MRL
>
> In other words, the MRL of the finished soft drink would be 8 per cent less than the MRL set for water, or even more stringent than the water MRL."

2.68 Asked by the Committee as to whether above method of calculation of MRL for soft drinks was correct. In reply, Ministry of Health and Family Welfare in their note furnished to the Committee stated as under:

> "The MRL of pesticide residues has to be fixed on the final products. Because the ingredients used in preparation of food products are processed during manufacturing the final products. Water is the principal constituent in soft drinks. The other ingredients used in the products are food additives and sugar. Food additives are not agricultural products so there are no chances of presence of pesticide residues in these products. The maximum amount of sugar used in these products is 5 percent. Sugar (5 percent) is not likely to increase the pesticide residues in soft drinks."

2.69 The Committee asked the views of the Ministry of Food Processing Industries on setting of pesticide residues standards in soft drinks. In reply the Ministry of Food Processing Industries in their note stated as follows:

> "The finished products consist of a number of ingredients. For example, the Sweetened Aerated Waters (also called soft drink) are manufactured by mixing water, sugar, additives like preservatives, colours, flavours etc. and addition of carbon-di-oxide. Even if it is assumed that the processing water will have the limits of pesticide residues as per EU norms, pesticide residues will come in the final products by virtue of sugar and other ingredients. It is technically not feasible to bring out the levels of pesticide residue in sugar. Therefore, it will not be technically feasible and practicable to prescribe the levels of pesticide residue at par with the level of packaged drinking water."

2.70 Giving his views on practice of setting of standards elsewhere and the standards that should be fixed for soft drinks, Secretary, Ministry of Food Processing Industries during his evidence before the Committee stated as under:

> "The CODEX and other international norms follow the principle of residue limits for all final products. It should be derived on a product to product basis as summation of MRL. This is the point our Health Secretary had also made that if Coca-Cola consists of water plus sugar, additives and preservatives, then we have to sum the pesticide residue to each one of these ingredients and then arrive at the residue for the final product."

2.70A. As per a note furnished to the Committee, the standards of soft drinks have been prescribed by the following countries :

1. Brazil
2. Chile
3. South Africa
4. Australia
5. Japan; and
6. People Republic of China

On perusal of these standards it has been observed that in many of the countries requirements of metal contaminants have been prescribed. Japan has prescribed the standards of water to be used in manufacture of carbonated beverages. Requirement of pesticide residues in carbonated beverages has not been prescribed which means that these products should be free from pesticide residue because these are not agricultural produce and hence there is no likelihood that pesticide residues will be present in these products.

2.71 Giving their views on the methodology of calculation of MRL for finished products, CFTRI in their note furnished to the Committee stated:

> "Perhaps the better way of calculation of MRL would be based on dietary intake value including water. The total intake of pesticide through all sources of food and water shall not exceed the ADI. The MRLs are calculated based on the total consumption of the specific product mg/person/day and not based on individual ingredients present in that product. This is not scientifically justified. The total quantity of pesticide ingested is compared with ADI to know the safety of the pesticide consumed. The total consumption of a particular agricultural commodity must also include finished product and also on consumption pattern. In this process, since soft drinks are in question, the MRLs be calculated including their calculated average daily intake also. Such food pattern change does happen in a changing society and we must give corrections to MRL dynamically from time to time and revisit it but finally adhering to the highest food safety aspect for the consumer."

2.72 At present, MRLs for pesticide residues have not been laid down under FPO 1955 and PFA 1954 with regard to SAW (soft drinks), fruit juices and other beverages. In a note furnished by the Ministry of Food Processing Industries, the Committee were informed that in view of recent deliberations on the need for scientifically arriving at MRLs of pesticide residues of various food items, the Ministry of Food Processing Industries sent samples of soft drinks and other fruit products covered under FPO, 1955 to CFTRI, Mysore to assess the present levels of pesticide residues in these products and has also asked the National Institute of Nutrition, Hyderabad to start work to assess the acceptable daily intake of these products to work out the safe limits.

Use of Ground Water

2.73 CSE has in their report *inter alia* stated that use of water by soft drink manufacturers is unpriced and unregulated. The Committee asked the manufacturers of major soft drink companies *viz*. Pepsi Co. India and Coca Cola India about the extent of use of water by them and

whether they were paying any price for using water as raw material. In reply, Pepsi Co. India holding in their note furnished to Committee stated :

> "Pepsi Co. has in total 15 operational bottling plants throughout the country. The Company has taken the required approvals from the concerned authorities for use of water in the manufacturing of soft drinks and is paying the water charges as applicable throughout the country. The position of water charges paid by the Company in various parts of India is given in Annexure-IV."

2.74 On the question of payment of price, the Coca Cola India stated:

> "The water is not free. At all manufacturing facilities we pay water cess charges. Also number of units are being charged for water from irrigation department and industrial development corporation".

2.75 In a subsequent note, Coca Cola India stated that all the bottled water plants of the company have applied for registration with Central Ground Water Authority alongwith registration fee duly paid as indicated below:-—

S.No.	Plant Name	Location	Cm/L No. (ISI Mark)	CGWA Whether Applied	Registration fee paid	Remarks
1	2	3	4	5	6	7
1.	HCCB Pvt. Ltd.	Bhopal	8519889	Not Applicable	Not Applicable	Not required as they are using water from Govt. supply.
2.	HCCB Pvt. Ltd.	Ahmedabad	7377890	Yes	No fee required	First Application on Aug. 02, then it was communicated that it is not required, again reapplied on May 03.
3.	HCCB Pvt. Ld.	Wada	7314563	Yes	Rs. 1000 per Borewell. Done for 12 Borewells	Renewal for the Registration done in Oct. 03 and the registration valid till 2005. All Borewells External lab reports are sent to the authority.
4.	HCCB Pvt. Ltd.	Goa	7334266	Yes	Rs. 1500 per Borewell. Done for 1 Borewell	Applied in July 2001, contained in July 2003.
5.	Surbhi Milk Foods & Beverages Ltd.	Ahmedabad	7373680	Yes	Rs. 1000 per Borewell. Done for 2 Borewells	Applied in Oct. 2002. Assessed in April 03 Certification not obtained till date.
6.	Kothari Beverages Ltd.	Shahapur	7323564	Yes	Rs. 1000 per Borewell. Done for 1 Borewell	Applied in July 2001 and got in July 2003
7.	Kothari Beverages Ltd.	Nadiad	7316466	Yes	Rs. 2000	Applied first on Jan 01, Reapplied on March 03, but no response till date.
8.	Sri Vinayaka Products Ltd.	Mumbai	7429479	Not Applicable	NA	Not required as they are using water from Govt. supply.
9.	Maestro Industries	Pune		Not Applicable	NA	Not required as they are using water from reservoir.
10.	HCCB Pvt. Ltd.	Bidadi	6262060	Yes	Rs. 1000 per Borewell	Applied in 1998 at the time of plant commissioning, the four borewells have been registered at 84 KL/ day applied for re-registration in 2003 for higher capacity, but no response on that till date.
11.	South India Beverages Pvt. Ltd.	Bangalore	6319770	Yes	Rs. 1000 per Borewell. Applied for 2 Borewells	Applied in 2001, assessment by local authority happened in 2003 till date no certificate obtained.

1	2	3	4	5	6	7
12.	Nest Foods Beverage Co.	Cochin	6300547	Yes	Rs. 3000 per Borewell. Done for 1 Borewell	Applied in July 2003 got communication from CGWA, that the plant is not under notified area so not applicable.
13.	Bharatiyam Foods & Bev.	Bidadi	6395988	Yes	Rs. 1000 for 1 Borewell	Applied in May 2003 assessment by local authority happened in July 2003, till date no certificate obtained.
14.	M.V.R.	Nagalapuram	6389791	Yes	Rs. 4700 for 1 Borewell	Applied in July 03 got no objection certificate from Ground Water Authority at the State level.
15.	S.R. Mineral Water Pvt. Ltd.	Chennai	6270160	Yes	Rs. 1000 for 1 Borewell	Applied in Oct. 2001 till date no response from them.
16.	HCCB Pvt. Ltd.	Guwahati	5146356	Not Applicable	NA	Not required as they are using surface water.
17.	Global Aqua Pvt. Ltd.	Dankuni	5147863	Yes	Rs. 2000	
18.	Crystal Springs Pvt. Ltd.	Taratala	5146558	Not Applicable	NA	Not required as it is not within the critical zone.
19.	Brahmanand Mineral	Jamshedpur	5148663	Yes	Rs. 2000	
20.	HCCB Pvt. Ltd.	Dasna	8413570	Yes	Rs. 1000 per Borewell. Done for 3 Borewells	Applied on 2001, got registration in 2001. The certificate is yet to be collected.
21.	Brindavan Beverages Ltd.	Bareilly	9366996	Yes	Rs. 2000	
22.	Kandhari Beverages Ltd.	Baddi	9296395	Yes	Rs. 2000	
23.	Ludhiana Beverages Ltd.	Ludhiana		Yes	Rs. 2000	
24.	Moon Beverages Ltd.	Sahibabad	8473558	Yes	Rs. 1000 per Borewell. Applied for 3 Borewells	Valid upto 2005.
25.	IFCA Bottling Co. Ltd.	Jammu	9330066	Yes	Rs. 3000	
26.	Satyam Food Specialities Pvt. Ltd.	Jaipur	8538994	Yes	Not required	No fee required as communicated by the Authority.
27.	Moon Beverages Ltd.	Unnao	9328180	Yes	Rs. 2000 per Borwell. Done for 1 Borewell	Applied on 2002, got the registration in July 2003.
28.	Sri Sarvaraya Sugars Ltd.	Sathupally	6278277	Yes	Rs. 1000 per Borewell	Applied in 2002, got the certiication in July 2003.
29.	Himjal Beverages Pvt. Ltd.	Hyderabad	6319366	Yes	Rs. 5000	

2.76 The Committee asked the representatives of Association of Indian Bottled Water Manufacturers during evidence as to whether they were paying any charges for using ground water, in reply their representative stated : "No there is No charge. Nobody has asked for it."

2.77 Asked by the Committee as to whether permission is taken from Gram Panchayat or any local body for drawing ground water, in reply, he stated:

> "No Sir. But in some places you are required to have the permission for digging boring wells, like in Mumbai where you have to take the permission of the Municipal Corporation. I do not know about other places whether the permission is required or not."

ROLE OF CENTRAL GROUND WATER AUTHORITY

2.78 The Central Ground Water Board (CGWB) has been constituted as an Authority on the directions of Hon'ble Supreme Court of India taking into consideration "the urgent need for regulating the indiscriminate boring and withdrawal of ground water in the country". Central Ground Water Authority (CGWA) is exercising powers conferred, under Environment Protection Act, 1986, for regulating the quantitative aspects of ground water resources.

2.79 As per the notification dated 14.01.1997, the CGWA has been constituted for "the purposes of regulation and control of Ground Water Management and Development...." The functions of the Authority are further specified at para 2 (iii) which reads as under:

> "to regulate indiscriminate boring and withdrawal of ground water in the country and to issue necessary regulatory directions with a view to preserve and protect the ground water."

2.80 To a question by the Committee as to whether Central Ground Water Authority was charging any money for use of ground water by soft drink and bottled water industries, CGWA in their note furnished to the Committee stated:

> "As water is State subject, the issues relating to pricing policy for use of ground water and various legal aspects involved are examined and decided by the State. State Pollution Control Boards except J&K are reported to levy and collect cess from industries under Water (Prevention and Control of Pollution) Cess Act, 1977. In addition to this, it is also reported that in some States, industries located in industrial development areas are charging for use of ground water at rates decided by the concerned States."

2.81 Pointing out the mandate of CGWA which *inter alia* requires them to regulate and control ground water management and development in the country, the Committee asked as to whether any money was being charged by CGWA from soft drink manufacturing companies for using ground water. In reply the Secretary, Ministry of Water Resources stated:

> "So far as we know, the Government is charging no money for this purpose.
>
> Secondly, you are aware of the statutory position. The statutory position about the ownership of the ground water is this. Whoever has the land is the owner of the water which can be extracted from the land. That is the position of the Act. If an agriculturist takes out water from his land, it is his land. The Government has nothing to do with it. So, this is the statutory position."

2.82 The Committee pointed out that the extraction of water by industrial houses could lead to over exploitation of water and asked as to whether any steps were being taken by the Ministry of Water Resources and Central Ground Water Authority in this regard. In reply, the Secretary of Ministry of Water Resources further stated:

> ".....Now we have made a detailed procedure for entertaining applications for extraction of ground water for industrial purposes in which we asked them to give details like depth of the borewell/tubewell, what will be the diameter of the borewell/tubewell, horse power of the machine which will extract water, for how many hours would that work, then distance of borewell from septic tank, soap-pit, sewer line or any source of contamination, quality of water which is going to be extracted, that is, pH colour, odour and various other parameters, distance from any other borewell, well and tubewell nearby, etc.

In fact, as far back as 1998, the Chairman, Central Pollution Control Board wrote to us and also to all the Chairmen of the State Pollution Control Boards and of Union Territories that industries must observe a discipline. It must be ensured that indiscriminate grant of permission to industries to extract water should not result in a situation—which you mentioned—that exploitation should not result in a situation where water become scarce for concentrated urban areas, for that matter even in village areas. So, this is the kind of precaution that we have got."

2.83 Asked to comment on the impact of over exploitation of ground water on the water supply in the adjacent areas, Secretary, Ministry of Water Resources stated:

"..... I think, our ground water authorities are monitoring the situation. This is not the case.

Secondly, wherever industrial units are going to be set up, they have to take water from somewhere."

2.84 To a question as to whether there should be a policy to restrict commercial use of ground water in water scarce areas. In reply, the Ministry of Water Resources in their note stated:

"Yes commercial use of ground water in water scarce areas need to be regulated."

284A. To a question as to whether water being used for commercial purposes should be charged, Secretary, Ministry of Water Resources stated:

"I think, in some point in future we might have to consider it. I think this is my personal opinion end this is not the considerate opinion of the Ministry but I think some kind of levy or some charge might be there only for industrial purposes."

2.85 For regularising usage of ground water, the Secretary, Ministry of Water Resources, stated:

".....As you might be aware, eighty per cent of the drinking water needs of the country are being met from ground water and only twenty per cent needs are being met from surface water. What we need to do is to regulate it in a proper manner and not to have a complete ban or clamp a total shut down of use of ground water for industrial purposes. As you rightly said, the precautions like avoiding over exploitation, like avoiding any hardship to neighbouring areas, neighbouring urban population or neighbouring rural population must be observed very strictly. We will certainly try to do that and we will, after your direction, do that even more vigorously in future."

2.86 When asked as to why CGWA was not restraining the extraction of water for private commercial activities through notification, CGWA in their note furnished to the Committee stated:

"The notification of the areas for regulating ground water development is done on the basis of ground water resource evaluation of large area like blocks/watersheds in consultation with State Governments after incorporation of water level data records collected by the States. As already clarified CGWA intervenes in areas, where there is over-exploitation of ground water. In case of heavy withdrawal of ground water by private commercial activities resulting in decline of ground water level, necessary action for notification of that block/watershed is taken by CGWA."

2.87 The Committee pointed out that one of the functions of CGWA pertained to the study in the field of ground water pollution and environment and asked as to whether the authority had initiated any action in this regard. In reply the Chairman, CGWA stated:

> "Primarily, we are looking into the over exploited aspects and along with that, we are going into the qualitative aspects regarding inorganic elements. In case of qualitative aspects, we do testing in our labs on a regular basis and, in case, we find that the quality has been affected because of over exploitation, we notify that area."

2.88 Asked further as to what CGWA was doing to test the percentage of noxious elements including the insecticides in potable water, the Chairman, CGWA stated:

> "….. So far as the issue of pesticide residues is concerned, the Board is not doing anything. However, we have a plan to introduce the testing of various pesticide elements…. We have already started testing the arsenic elements. We have tested in West Bengal, then we have started testing in Bihar and will start in other parts of the country also on a regular basis. Earlier, it was not done, but we are in the process of starting that. I think, this year, we will start testing the arsenic elements."

CENTRAL AND STATE LEGISLATION ON WATER

2.89 In view of unchecked and unregulated over exploitation of ground water, the Committee asked as to whether Ministry of Water Resources and CGWA had ever initiated any action for making a Central Legislation on water. In reply, the Ministry of Water Resources in their note furnished to the Committee stated:

> "The issue of enactment of Central Legislation on regulation and control of ground water was considered in the year 1989 in consultation with the Ministry of Law. They had opined that:
>
> "The ground water cannot be covered under item 54 or item 56 of the Union List of the Indian Constitution. It may rather be emphasized that the underground water is covered under the State list item no. 17 within the water and water supplies etc."."

2.90 They were again requested in September, 2003 to tender their advice in the matter. They advised as under:

> "The above view is the correct legal and constitutional position. The above note was also shown to the then Additional Secretary. We once again reiterate the view taken *vide* note dated 20.10.1989."

2.91 The matter was subsequently considered and the Ministry of Law was requested to indicate if Central Legislation in the matter could be considered under Article 252 of the Constitution. The advice of the Ministry of Law is as under:

> "Article 252 of the Constitution in respect of subject falling under State List, empowers the Parliament to legislate for two or more States by consent and adoption of such legislation by any other State. ***** In view of above provisions of Article 252 of the Constitution, if the requirements of said Article are fulfilled, then it will be possible for Parliament to make Law to regulate and control the development of ground water, which falls under State List."

Under Article 252, Parliament could pass an act in the matter only if Resolutions to that effect are passed by both the Houses of Legislatures of two or more States and the Act so passed shall apply to such States only and any other State by which it is adopted afterwards by Resolution passed in that behalf by the House or, where there are two Houses, by each of the Houses of the Legislature of that State. So far, none of the State Legislatures has passed such Resolution. Therefore, the requirement of Article 252 of the Constitution are presently not fulfilled.

Under these circumstances, it is considered that purpose of enactment of central legislation will be served, if the State Governments enact legislation for regulation/development of ground water resources."

2.92 Asked further as to whether any of the States had enacted legislation pertaining to use of water. In reply, the Ministry in their note stated:

"The Ministry of Water Resources had circulated a Model Bill for adoption of the States to regulate over-exploitation of ground water as early as 1970. The Model Bill was modified and re-circulated in September, 1992 and June, 1996 to States/Union Territories requesting them to take necessary action for enactment. The salient features of the Model Bill are as follows:

Establishment of Ground Water Authority by the State/Union Territory Government to frame broad policies for administration of the legislation.

Empowering the State/Union Territory Government to control and/or regulate in public interest, the extraction or use or both in any form, in any area so notified, based on a report from the Ground Water Authority.

Requiring users of ground water to seek permission from the State Ground Water Authority to sink a well in the notified area for any purpose including domestic use made either on a personal or community basis.

With a view to bringing equity in the distribution of the resource, the 'Small' and 'Marginal' farmers have been exempted from seeking prior permission for construction of a well/ .tubewell provided the water is intended to be used exclusively for personal purposes excluding commercial use. Such users shall, however, have to inform the Authority of their intentions to construct a well/tubewell.

Registration of existing users in the notified as well as non-notified areas in the States/UTs.

Manually driven wells e.g. hand pump, or wells where water is drawn by rope or bucket, have been exempted from the Bill.

So far, the Government of Goa, Tamil Nadu, Lakshadweep, Pondicherry and Kerala have enacted legislation in this regard. "Andhra Pradesh Water, Land and Tree, Act 2002" has been enacted by the Government of Andhra Pradesh with effect from April, 2002. Gujarat Ground Water Authority has also been formed by the Government of Gujarat for control and regulation of ground water resources.

The salient features of these legislation are as follows:

1. **Goa**—"The Goa Ground Water Regulation Act, 2002 (Goa Act 1 of 2002)" was adopted on 25.1.2002.

(a) It provides for Creation of Ground Water Cell in consultation with whom, an area can be declared as:

(i) Scheduled area

(ii) Water scarcity area

(iii) Over-exploited area

(b) The legislation prohibits any person from transporting ground water from a source of water in Scheduled area.

(c) The Ground Water Officer may take steps for prohibiting sinking of new wells, except for drinking purpose, in areas declared as Water Scarcity Areas or as over-exploited areas.

(d) The Ground Water Officer can also direct the owner of existing well in over-exploited areas to stop extraction of water forthwith and to close or seal the well on payment of compensation.

(e) The Ground Water Officer has also been authorized for acquisition of any well or water source from its owner in public interest for providing water for drinking purposes.

(f) It also envisages taking protection measures for public drinking water source and existing ground water structures in non-scheduled areas.

2. **Tamil Nadu**—Tamil Nadu Ground Water (Development and Management) Act, 2003 was adopted on 04.3.2003.

(a) It provides for conjunctive use of surface and ground water.

(b) Electrical energy not to be supplied for energizing wells sunk in contravention of the provisions of this Act.

(c) New provision like inviting/response to proposed notification of areas, periodic assessment of ground water resources in notified area, consultation with body etc., have been made.

3. **Lakshadweep**—Lakshadweep Ground Water Development and Control (Regulation) Act, 2001 was adopted on 01.11.2001. It is on the lines of Model Bill.

4. **Pondicherry** —Pondicherry Ground Water (Control and Regulation) Act, 2002 was adopted on 04.03.2003.

5. **Kerala** —Kerala Ground Water (Control and Regulation) Act, 1997 was adopted on October, 2002.

6. **Andhra Pradesh**—"Andhra Pradesh Water, Land and Tree Act, 2002" was adopted on 19.04.2002.

The Act provides for constitution of Water, Land and Trees Authority, which will, *inter-alia* take ground water protection measures like registration of well, prohibition of water pumping in certain areas, permission for well sinking near drinking water source, protection of public drinking water sources, registration of drilling rigs, prohibition of water contamination etc. The act also provide measures to improve ground water resources by rain water harvesting structures, re-use of water etc."

2.93 Asked as to what steps had been taken by the Ministry of Water Resources and CGWA to pursue the matter with State Governments. The Ministry of Water Resources in their note further stated as under:

"The matter has been repeatedly pursued with the State Governments at different levels and the following reminders were sent to them:

1. From Union Minister for Water Resources on 13.09.1996
2. From Union Secretary, Ministry of Water Resources on 09.12.1996.
3. From Union Minister of State for Water Resources on 04.08.1999.
4. From Union Minister for Water Resources on 01.02.2002.
5. From Union Secretary, Ministry of Water Resources on 05.09.2002.
6. From Joint Secretary (Admn.), Ministry of Water Resources on 27.03.2003.
7. From Union Secretary, Ministry of Water Resources to Secretary Water Resources/Irrigation of 25 States/UTs on 23.09.2003 and 20.10.2003.

The matter has also been discussed with the representatives of the State Governments during meetings held with them from time to time in connection with various issues relating to water resources at different levels and they have been requested to expedite such legislation. The last round of such discussions were held at the level of Secretary (WR) in August-September, 2003."

SAFETY OF SOFT DRINKS

2.94 Centre for Science and Environment in their report had *inter alia* stated that the number of times the pesticide residues in soft drinks were higher than EU limits for water ranged from 11 to 70 time in 6 samples out of 12 samples tested by them. CFTRI Mysore and CFL, Kolkata had also reported that the number of times the pesticide residues were higher than EU limits ranged from 1.2 to 5.22 times in 9 out of 12 samples tested by them.

2.95 Pointing out that despite detection of pesticides in soft drinks above EU limits, how the soft drinks manufacturing companies claimed that their products were safe and were within EU limits, in reply, Pepsi Co India Holding in their note furnished to the Committee stated as under:

"(a) There are no existing EU standards for pesticide residues in finished soft drinks. The only standard specified for pesticide residue in soft drinks stipulates that the water used to manufacture soft drinks need to conform to EU drinking water guidelines. Treated water in all our plants currently conform to EU norms.

(b) In addition, pesticide residues are controlled on the raw agricultural commodities by ensuring that Good Agricultural Practices (GAPs) are employed.

(c) We are, therefore, within EU standards for the treated water used for beverage production, and all applicable raw materials which comprise our beverage.

(d) In fact, products manufactured by us in India, from a quality perspective, can be sold anywhere within the member States of the EU."

2.96 Elaborating further, Pepsi Co in their note furnished stated:

"First of all, we would like to state that comparing finished product pesticide residue results with any drinking water norms is incorrect and unscientific. This is never done anywhere in the world.

We also note the variability of the results from the two most respected laboratories in the country (CFTRI and CFL). The possible reasons for this variability are the analytical challenges which are there when analyzing complex matrices at sub-ppb levels.

However, even if the highest reported residues are assumed to be present all the time in all the soft drinks, their level is less than 0.1% of the respective Acceptable Daily Intakes (ADIs). This miniscule level gives us the confidence that our products are safe. Additionally, compared to any other refreshment beverages for example nimboo pani, tea, and coffee, where the MRLs are 100 to 1000 times higher than the reported results in soft drinks, further reinforces our belief that our product is safe compared to any other food/beverages normally consumed."

2.97 Coca Cola India gave following justification for the safety of their products:

"The EC norms for water do not apply to soft drinks even in Europe. Analytical results conducted in independent laboratories in India and in Europe (in Holland and in the U.K.) do show that our ingredient water meets the stringent European standards for potable water. Therefore, our soft drinks would be acceptable in Europe as well.

There are no standards for pesticide residues for soft drinks in EU or CODEX. There are standards for water that is to be used in manufacture of food products. Our treated water results confirm that water meets all local as well as EU norms."

EFFECT OF PESTICIDE IN SOFT DRINKS ON THE HEALTH

2.98 The CSE mainly found 4 pesticides in the soft drinks which were— Lindane, DDT and its metabolites, Malathion and Chlorpyrifos. The CSE stated that these pesticides were harmful for the health of the human being. Giving the harmful effects of each of the above four pesticides, the CSE in their reply *inter alia* stated:

"Lindane

Lindane is absorbed through respiratory, digestive or cutaneous routes and accumulates in fat tissues. It damages human liver, kidney neural and immune systems and induces birth defects, cancer and death.

Chronic administration results in endocrine disruption in birds as well as in mammals.

DDT and its metabolites

DDT (dichlorodiphenyltrichloroethane) and its metabolites were detected in 81% of the soft drink samples. They have been linked to altered sexual development in various species, to a decrease semen quality and to increased risk of breast cancer in women.

Chlorpyrifos

Chronic exposure to chlorpyrifos has been shown to cause immunological change. Comparison of chronic health complaints of twenty-nine individuals exposed to chlorpyrifos with respect to peripheral lymphocyte phenotypes; autoantibodies (nucleic acids and

nucleoproteins, parietal cell, brush border, mitochondria, smooth muscle, thyroid gland, and central nervous system/peripheral nervous system myellin) and compared with 3 control groups (*i.e*. 1 positive 2 negative) showed an increase in CD 26 expression, a decrease in percentage of CD5 phenotype, decreased mitogenesis in response to phytohemagglutinin and concanavillion, and an increased frequency of autoantibodies.".

Malathion

It has been shown to cause birth defects in a variety of wildlife and at levels lower than other pesticides. When administered to adult animals, malathion and related thiophosphonates stimulate and subsequently inhibit, the nicotinic sites in skeletal muscle, resulting in muscle weakness and paralysis. Neonates (newborn babies) are far more sensitive to these agents than adults, mainly because of a slower rate of detoxification of the metabolite (the metabolite in this case would be the liver breakdown product of malathion— malaxon which has been shown to be far more toxic than malathion itself)."

2.99 Asked as to whether any study had been conducted to find out the effect of different pesticide on human health, the Ministry of Health and Family Welfare in their note furnished to the Committee stated:

"Aldrin—Aldrin has been toxicological evaluated by JECFA. The Acceptable Daily Intake (ADI) of Aldrin is 0.0001 mg/kg. Aldrin has been banned for use in the country.

Lindane—Lindane has been toxicological evaluated by JECFA. The Acceptable Daily Intake (ADI) of Lindane is 0.001 mg/kg. The use of lindane in the prescribed doses in storage and public health programme is not likely to cause any health hazard.

Endosulphan— Endosulphan has been toxicological evaluated by JECFA. The Acceptable Daily Intake (ADI) of Endosulphan is 0.006 mg/kg. The use of endosulphan in the prescribed doses in storage is not likely to cause any health hazard."

2.100 Besides the harmful effect of pesticide found in soft drinks, CSE stated about the adverse impact on health of other ingredients of soft drinks as follows:

"There is a growing concern in the medical and scientific communities about the harmful effects of some major ingredients of soft drinks, namely, carbon dioxide, artificial sweeteners like aspartame, saccharin, acesulfame-K etc., flavouring agents like caffeine, acids like phosphoric acid, some preservative and excessive sugar.

I.*Caffeine*

A methylated xanthine, caffeine is a mildly addictive stimulant drug, used in soft drinks, as a so-called "flavoring agent". The FPO, 1955 allows 200 mg/l (ppm) caffeine in soft drinks or 60 mg per average bottle of soft drink (300 ml).

In a study conducted by the renowned Institution Johns Hopkins Medicine (Johns Hopkins Hospital) in 2000 and funded by the National Institute on Drug Abuse, USA, it was found that, despite claims of the soft drink manufacturers, caffeine could not be detected as a flavour in soft drinks— and its use in soft drinks is more to do with addiction to the soft drinks than flavour.

Large amounts of caffeine consumption can cause diseases and disorders such as insomnia, nervousness, anxiety, irritability, and deviations from the normal heart rate. A major concern about caffeine is that it increases the excretion of calcium in urine, which

increases the risk for osteoporosis in heavy caffeine consumers. Some epidemiological studies correlate exposure to caffeine during pregnancy to the occurrence of congenital malformations, fatal growth retardation, miscarriages (spontaneous abortions), behavioural effects and maternal fertility problems.

The ill effect of caffeine can be gauged by the fact that the US FDA (US Food and Drug Administration) issued an advisory in 1981 warning that "Pregnant women should avoid caffeine-containing foods and drugs, if possible, or consume them only sparingly." The US FDA still maintains that advisory as its official policy.

II. *Artificial low-calorie sweeteners*

Low-calorie sweeteners are non-sugar substances that are added to food and drink products instead of sugar. They have sweetness many times greater than conventional sugar. Artificial sweeteners like saccharin, aspartame and acesulfame-K have been linked with numerous diseases like cancer increasingly.

Saccharin has been linked in human studies to urinary-bladder cancer and in animal studies to cancers of the bladder and other organs. The safety or acesulfame-K, which was approved in 1998 for use in soft drinks in the USA, has been questioned by several cancer experts. Acesulfame-K use in the soft drinks is also allowed under the Indian PFA, 1955.

Aspartame is a potent neurotoxin and endocrine disrupter. Carefully controlled clinical studies show that aspartame is not an allergen. However, certain people with the genetic disease phenylketonuria (PKU), those with advanced liver disease, and pregnant women with hyperphenylalanine (high levels of phenylalanine in blood) have a problem with aspartame because they do not effectively metabolize the amino acid phenylalanine, one of aspartame's components. High levels of this amino acid in body fluids can cause brain damage. Therefore, US FDA has ruled that all products containing aspartame must include a warning to phenylketonurics that the sweetener contains phenylalanine. This provision has also been included in the Indian PFA and needs to be strictly enforced.

III. *Sugar*

The average bottle of soft drink (300 ml) contains about 15 grams of sugar, if we follow the specifications of soft drink quality given by the FPO, 1955, PFA, 1955 and IS 2346:1992. That's 5 teaspoons of sugar. It is highly unlikely that an average individual would eat 5 teaspoons of sugar at a time every day, and eat it more than once a day. But by consuming soft drinks, that's exactly what we end up doing.

It is well documented that diets high in refined sugar promotes obesity, which increases the risks of diabetes, high blood pressure, stroke, and heart disease. Sugary soft drinks also promote tooth decay. The high sugar content is a major reason why health professionals are concerned about frequent consumption of soft drinks.

IV. *Acids and Carbon Dioxide*

Dentists around the world are reporting complete loss of the enamel on the front teeth in teenaged boys and girls, who habitually drink soft drinks. The culprit is phosphoric acid in soft drinks, which causes tooth rot, as well as digestive problems and bone loss.

Phosphoric acid has also been associated with calcium loss and kidney stones in numerous medical studies. Acidic drinks increase dentin permeability by opening dentinal tubules leaving a dentin surface completely uncovered and removing the smear layer.

Dental cavities are often associated with consumption of carbonated beverages because the amount of sugars that are consumed is important in forming caries caused by the bacteria mutans streptococci, which is a part of dental plaque. Lactobacillus and Actinomyces viscosus are two other kinds of bacteria that adversely affect teeth and survive well in very acidic environments, produce high amounts of acid from sugars and other types of acid.

A common problem that is associated with the consumption of a large quantity of soft drinks is the increased acid levels throughout the body causing gastronomic distress due to the inflammation of the stomach and erosion of the stomach lining leading to painful stomach ache as the stomach which maintains a very delicate acid-alkaline balance can be set out of balance by the consumption of a large number of soft drinks, which can create a constant acid state leading to indigestion and gassiness.

Carbon dioxide emitted from soft drinks is a waste product that humans excrete and can be harmful when ingested at high levels. Large amounts of sugar, bubbles caused by carbon dioxide, and phosphoric acid that are found in soft drinks remove nutritious minerals from bones allowing the bones to become weak and increasing the risk from them to break. This is done by the phosphoric acid disruption the calcium-phosphorus ratio, which dissolves calcium from the bones."

2.101 On the effect of pesticides on the health of human being in the Status Paper of National Institute of Nutrition entitled "Impact of Long Term Consumption of Pesticide residues on Health in India: Issues Needing of Further Research" has *inter-alia* stated as under:

"The Health effect issues

1. Published scientific work:

   Considerable work has been carried out during the last several years in different parts of the world to find out the impact of long term consumption of pesticide residues on human health. Some of these summarized below:

(i) Reproduction disorders in women:

Epidemiological studies carried out have focused more on relationship between employment in agriculture and the incidence of congenital malformations, miscarriages, low birth weight, small for gestational age, pre-term delivery and still-births. The results of the analyses indicated that employment in agriculture increases the risk of congenital malformations to infants such as Orofacial cleft, birth marks in the form of haemangioma, as well as muscoloskeletal and nervous system defects but also significant risk of reproductive disorders. The US collaborative Prenatal Project of National Institute of Health and 12 universities strongly suggest that DDT use increases pre-term births.

(ii) Chronic nervous system effects:

A recent study which investigated chronic nervous system effects of long term occupational exposure to DDT by comparing the neurobehavioural performance of

retired Malaria Control workers with a reference group of retired guards and drivers indicated that DDT exposed workers did worse on tests assessing various neurobehavioral functions than controls and the performance significantly deteriorated with increasing years of DDT application. Mexican children living in agricultural areas relying on the use of pesticides and comparing them to the children living in non-agriculture community indicated differences in developmental skills. Neuromuscular deficits in terms of coordination and stamina drawing and memory problems were found with the children in the agricultural communities.

(iii) Risk of human cancer:

Risk of several types of cancers such as pancreatic cancer, non-Hodgkin's lymphoma, breast cancer, leukemia, liver and biliary tract cancer in humans exposed to DDT have been documented.

(iv) Impaired lactation:

Higher levels of metabolite of DDT in maternal milk have been associated with shorter duration of lactation.

(v) Oestrogenic effects:

Pesticides such as DDT, endosulfan, dieldrin were assigned oestrogenic potencies. The environmental oestrogens can enhance or inhibit the action of endogenous hormones.

2.102 Pointing out the CSE contention that due to high risk from caffeine, soft drinks Companies were forced to sell non-caffeinated soft drinks in the US & Europe, the Committee asked the soft drinks manufacturers to give reason for selling non-caffeinated soft drink in USA & Europe and selling caffeinated soft drinks in India. In reply the Coca Cola India stated:

"The per capita consumption of soft drinks in USA & Europe are many folds higher than in India. The Company conducts market research to find out the preferences & needs of the consumers and develops products to suit the consumer needs. Based on such needs Company had launched non-caffeinated products in countries like USA & Europe. However the caffeinated products continue to have very high demand and the de-caffeinated sale is <10% because caffeine in our product is used as a flavour. Based on the consumer research, Coca-Cola India had also launched Diet Coke in India. Currently the sales of Diet Coke are less than 0.5% of total sales. Our consumer research studies do not indicate need for such products in the near future.

The Coca Cola Company sells caffeinated soft drinks in every country in which we do business, including the USA and all countries in Europe. Caffeine-free cola-products are sold in some countries, because market research has shown that a significant number of consumers want the choice between caffeinated and caffeine-free versions of some of our cola products. If consumers in India show a significant interest in caffeine-free cola products, then these products will be offered in India along with caffeinated cola products. We do provide several non caffeinated soft drinks in India, such as Limca, Sprite & RTS beverages like Maaza.

Caffeine is not a harmful or "high risk" food ingredient. According to a comprehensive review recently conducted by Canadian health officials, "The possibility that caffeine ingestion adversely affects human health was investigated based on review of (primarily) published human studies obtained through a comprehensive literature search. Based on the data reviewed, it is concluded that for the healthy adult population, moderate daily

caffeine intake at dose levels up to 400 mg day ..... is not associated with adverse effects such as general toxicity, cardiovascular effects, effects on bone status and calcium balance (with consumption of adequate calcium), changes in adult behaviour, increased incidence of cancer and effects on male fertility."

It is not true that in USA soft drink companies have been forced to sell non-caffeinated soft drinks due to high risk from caffeine. It is out of consumer preference to drink beverages without caffeine than any other reasons like in overseas there are decaffeinated coffee available.

While many soft drinks are caffeine-free, some contain a small amount of caffeine as part of the flavor profile. An 8-ounce serving of Coca-Cola classic has no more than 31 milligrams of caffeine, which is about one-quarter the amount found in coffee, and about one-half of the caffeine content of tea.

According to the FDA, there is no evidence to show that caffeine in carbonated beverages would render these beverages injurious to health. Numerous studies have examined the relationship between caffeine and various diseases.

The bulk of scientific research does not support a link between caffeine consumption and heart disease, hypertension or irregular heart rate. Results of studies looking at a possible connection between caffeine and cancer confirm the position of the American Cancer Society, which states that 'there is no indication that caffeine ..... is a risk factor in human cancer'. Also, both the National Cancer Institute and the American Medical Association has reported no connection between caffeine intake and fibrocystic breast disease. And, studies involving thousands of pregnant women also fail to show an increased risk of birth defects even among the heaviest caffeine consumers."

2.103 About the reason for selling non-caffeinated soft drinks in USA and Europe and selling caffeinated soft drinks in India, PepsiCo India stated as under:

"Caffeine is a naturally occurring substance found in the leaves, seeds or fruits of at least 63 plant species worldwide, including cocoa beans, kola nuts and tea leaves. Caffeine is also added to some foods and beverages for flavor. It contributes to the overall flavor profile of those foods in which it is added. The most commonly known sources of caffeine are coffee, tea, some soft drinks and chocolate. The amount of caffeine in food products varies depending on the serving size, the type of product and preparation method. With teas and coffees, the plant variety also affects caffeine content.

Is Caffeine Safe?

In 1958, the U.S. Food and Drug Administration (FDA) classified caffeine as Generally Recognized As Safe (GRAS). In 1987, the FDA reaffirmed its position that normal caffeine intake produced no increased risk to health. In addition, both the American Medical Association and the American Cancer Society have statements confirming the safety of moderate caffeine consumption.

At the levels contained in cola beverages, caffeine has been deemed safe by the US Food and Drug Administration and other international food authorities. Coffee has 3 times the amount of caffeine found in colas; tea has more than twice the caffeine level. Caffeine is also naturally present in chocolate.

Sensitivity to caffeine's effects varies greatly among individuals. Most physicians and researchers today agree that it's perfectly safe for pregnant women to consume caffeine. Daily consumption of up to 300 mg/day (approximately two to three 8 oz. cups of brewed coffee) has been shown to have no adverse consequences during pregnancy. Consumption of caffeine from cola beverages is usually significantly below that amount. However, it is wise for pregnant women to practice moderation in consumption of all foods and beverages."

2.104 Though major soft drinks manufacturing companies justified the use of caffeine for the purpose of flavour and stated that it is fully safe, the representative of CSE during her evidence before the Committee stated that caffeine is added by soft drink manufacturers for the purpose of addiction.

2.105 In the report of Drinks and Carbonated Beverages Sectional Committee, FAD 14 of BIS, the proposed technical recommendation on ingredients it has *inter-alia* been stated that:

"Caffeine (IS 11911)—The Quantity of caffeine shall not be more than 200 mg/kg."

NOTE 1. This requirement is as per PFA.

2. The consumer organisations, NGOs, Government institutions like NIOH, ICMR, NSI etc. have recommended.

(a) 145 ppm caffeine in cola drinks and the absence of caffeine in decaffeinated cola drinks. The group recommends the adoption of the best practice for caffeine in carbonated beverages in the world. The best practice is currently that of Australia and we recommend that the same be followed for India also. Many countries follow similar practice. For example China allows only 150 ppm caffeine in only in Cola beverages. Currently under PFA, 200 ppm caffeine is allowed in carbonated beverages and no differentiation has been made between the Cola beverages and other beverages. The result is that even non-cola beverages like Pepsico's 'Mountain Dew' contain one of the highest amounts of caffeine.

(b) In case caffeine content exceeding 145 ppm is allowed in some energy drinks, where caffeine is added as stimulant and not as flavour as it is done in Cola drinks, the caffeine content of more than 145 mg/l may be allowed. However, the labeling requirement as mentioned below shall be adhered to.

1. The label on a package of formulated caffeinated beverage must include advisory statements to the effect that:

   (a) The beverage contains (mention amount) caffeine;

   (b) In decaffeinated 'cola drinks' the caffeine should be absent; and

   (c) The beverage is not recommended for:

      (i) children; and

      (ii) pregnant or lactating women; and

      (iii) individuals sensitive to caffeine.

2. The label on a package of formulated caffeinated beverage must include an advisory statement to the effect that:

'Consume no more than [amount of one-day quantity (as cans, bottles or ml)] per day'.

2.106 To the allegation of CSE that consumption of large quantity of soft drinks leads to increase in acid level throughout the body causing gastro-economic distress, the representatives of both the Companies have stated that there is no credible scientific evidence that acidic beverages remove minerals from the body and there is no danger to consume acidic beverages.

2.107 As regards the safety of phosphoric acid, they stated that the level of phosphorous consumed in a normal diet including cola beverages is not great enough to influence calcium balance and is not a risk factor in the development of osteoporosis and kidney stones. Since soft drinks provide only 2-3 per cent of the total phosphorous in the human diet, their use does not lead to calcium loss.

PRESERVATIVES IN SOFT DRINKS AND THEIR EFFECT ON HEALTH

2.108 As per a note furnished by the Ministry of Health and Family Welfare, Sulphur Dioxide, Benzoic Acid and Ascorbic Acid and its salts have been allowed as preservatives in soft drinks under PFA Rules, 1955. The ADI of preservations was stated to be as under:

Sl. No.	Name of the preservatives	Acceptable Daily Intake (ADI) mg/kg Body Weight
1.	Sulphur Dioxide	0-0.7
2.	Benzoic Acid	0-5
3.	Ascorbic Acid and its calcium/sodium/ potassium salts calculated as ascorbic acid	0-25
4.	Sodium and/or Potassium Nitrite expressed as Sodium Nitrite	0-0.06
5.	Nitrate	0-3.7
6.	Propionic Acid	Not specified (very low toxicity)
7.	Nisin	0-33000

2.109 On the impact of the above preservatives over the health of human beings, the Ministry of Health and Family Welfare stated:

"All these preservatives have been evaluated by the Joint WHO/FAO Expert Committee on Food Additives (JECFA) and the ADI shown above have been allocated by JECFA on the basis of toxicological evaluation of each preservatives. The use of these preservatives in the food products upto the prescribed requirements are not likely to cause any health hazard.

The Ministry of Health and Family Welfare, however, had not conducted any survey to assess the harmful effects of various preservatives."

PLANTS OF COCA COLA AND PEPSI CO INDIA AT PLACHIMADA AND PALAKKAD IN KERALA

2.110 BBC in July, 2003 came out with a story stating that waste product from Coca Cola Plant in India which the Company provides contains toxic chemicals. It was further stated that the chemicals were traced in investigation by BBC Radio 4's 'Face The Facts' programme prompted scientists to call for the practice to be halted immediately. The lab's senior scientist, David Santillo, said "What is particularly disturbing is that the contamination has spread to the water supply—with levels of lead in a nearby well at levels well above those, set by the World Health Organisation."

2.111 A non-Governmental organization in their Memorandum furnished to the Committee stated as dangerous the features of one of the largest Cola plants in Asia, located in Plachimada, Palakkad district of Kerala, owned by Hindustan Coca Cola Beverages Pvt. Ltd. (HCCBPL). It further stated that the situation where the Pepsi Cola Plant is operating ten kilometers away from Plachimada, is no different.

2.112 The NGO further stated:

"Agricultural operations have also been affected due to the operations of Coca Cola company within a short span of three years. The working of the HCCBPL factory at Plachimada has brought untold misery to the people in the surrounding villages.

After the Cola plant started production, the water levels in the open wells in the area were affected. When protests arose, the Cola company is said to have let into the earth waste water through shallow tubewells. This mixed with surface water, led to the rise of water levels in the wells. However, these waters proved to be contaminated.

The operation of the Coca Cola Plant in Plachimada has led to various environmental problems: pollution of water, ground water depletion, reduced crop yields and skin disorders and other physical ailments among the inhabitants. The factory is releasing waste water to the tune of 1.5 to 3 lakh litres per day.

The licence to the Company was given by the Perumatti Panchayat under certain conditions. As per the laws, the Company has to first get a land use certificate for industrial purpose which was not done. It applied for installation of one pump but started drawing water through borewells without prior sanction and began indiscriminate use of ground water. The District Medical Officer who stipulated certain conditions like protection of public health needs, observation of factory laws, had also instructed that before commencing production there should be a final fitness certificate obtained. But the Cola company did not abide by these.

When the Panchayat asked for details, failing to comply with which they cancelled the licence, the company disputed the very powers of the Panchayat and resorted to the path of litigation than observing the laws and the conditions on the basis of which the licence was issued.

On 3 November, 2003, the Perumatti Panchayat sought information on various matters relating to the functioning of the plant and violations by the company. HCCBPL in its reply failed to provide the details sought by the Panchayat and instead asked the Panchayat to reply to their questions."

2.113 Perumatti Gram Panchayat filed a petition before the Hon'ble High Court of Kerala.

2.114 In view of the revelations made in BBC report and objections raised by NGO, the Committee asked both the soft drink manufacturing companies to clarify the position on the working of their plants in Kerala. On the working of their plant in Plachimada, Kerala, Coca Cola India stated as under:

> "1. Ground Water Levels and quality
>
> The Coca-Cola Plant at Palakkad, Kerala, not only complies with all local regulatory requirements but also adheres to the stringent global company standards. It is certified to Environment Management Systems ISO 14001 and independent studies from Government agencies concerned with the environment have given our plant a clean bill of health.....
>
> Recognizing the concerns of local people we have commissioned studies into our impact on the water supply and the State Government has also conducted their own tests. Reports from Kerala State Ground Water Board, Central Ground Water Board and an eminent scientist from National Geophysical Research Institute in Hyderabad have, in the last year, confirmed that the plant's operation is not impacting the water supply to the local villages or depleting the aquifer."

2.115 On the functioning of their Plant at Palakkad, PepsiCo India *inter-alia* stated as follows:

> "While the factual position is that Palakkad area has plenty of water in the aquifers with no sign of deficiency of water at all, we do everything possible as a responsible corporate citizen to conserve water through good water management system. We use/draw a fraction of water through bore-wells and only two bore-wells out of 7 are used by rotation which helps recharging of aquifers. In addition, once again as a responsible corporate citizen, we take extra steps to conserve water. We have been practicing extensively techniques of water conservation."

2.116 With all the rain water harvesting structures, the net recharge into the ground water is more than the water drawl, thus maintaining a positive water balance in the site.

Recharging of Water

2.117 From the details given by the representatives of PepsiCo India, Committee were informed that annual consumption of water by PepsiCo India at their plant was 300 million gallons per year. Out of which 30 million gallons water every year is recharged *i.e.*, 10% of the total water consumed.

2.118 Giving details of recharging the ground water at their plant by Coca Cola India, a representative of Coca Cola India during evidence stated:

> "We are recharging the ground-water. We are recharging the ground water in our Palghat Plant to the extent of 50 per cent."

2.119 In view of allegations against major soft drink manufacturing companies regarding over exploitation of ground water and causing environmental pollution, the Committee sought the views of the Ministry of Water Resources, Central Ground Water Authority, the Ministry of Environment and Forests and Central Pollution Control Board on their role in checking environment pollution which was allegedly being caused by various plants of soft drink manufacturing companies.

2.120 In a note furnished to the Committee CPCB *inter-alia* stated that they had tested the samples of raw water as well as treated water from different bottling plants in the country and found high levels of cadmium and heavy metals in the sludge from the effluent treatment plants of some of the units.

2.121 As regards M/s Hindustan Coca Cola Beverages Plant at Palghat, Kerala, CPCB in their note stated that the sludge from the effluent treatment plant was hazardous as cadmium (Cd) content was found to be more than 50 mg/kg.

2.122 Accordingly, CPCB have advised the State Board to direct the concerned units to dispose of sludge of ETP as per Hazardous Waste (Management and Handling) Rules, 1989 where heavy metal concentrations are exceeding the limits.

2.123 On the action taken by Kerala State Pollution Control Board (KSPCB) to the advice of CPCB, in a note furnished to the Committee, KSPCB stated:

> "A joint sampling was conducted by the officers of the Board along with the officers of the Central Pollution Control Board at the Coca Cola factory on 12.09.2003. Sludge analysis revealed cadmium content upto 338.8 mg/kg. The Central Pollution Control Board has therefore advised the State Board to direct the Company to dispose of the effluent treatment sludge as per the Hazardous Wastes Rules.
>
> More detailed study will be done under different production scenario in future. Samples of raw water from individual wells of and around the factories need be analysed. Samples of raw materials like sugar, lime, soda ash, ferrous sulphate and activated carbon and the intake water need also be analysed. Action in this regard is being taken.
>
> In compliance with the Board's instruction, the Coca Cola Company has applied for authorization under the Hazardous Wastes Rules. The application is under processing."

2.124 The Committee were informed by State Government of Kerala that petition No.34292/03 filed by Perumutti Gram Panchyat before the High Court of Kerala has been disposed of by the Hon'ble High Court on 16.12.2003.

2.125 In the judgement given by Hon'ble High Court of Kerala, it has *inter-alia* been stated:

> "In view of the above authoritative statement of the Hon'ble Supreme Court, it can be safely concluded that the underground water belongs to the public. The State and its instrumentalities should act as trustees of this great wealth. The State has got a duty to protect ground water against excessive exploitation and the inaction of the State in this regard will tantamount to infringement of the right to life of the people guaranteed under Article 21 of the Constitution of India. The Apex Court has repeatedly held that the right to clean air and unpolluted water forms part of the right to life under Article 21 of the Constitution. So, even in the absence of any law governing ground water, I am of the view that the Panchayat and the State are bound to protect ground water from excessive exploitation. In other words, the ground water, under the land of the 2nd respondent, does not belong to it. Normally, every land owner can draw a reasonable amount of water, which is necessary for his domestic use and also to meet the agricultural requirements. It is a customary right. But, here, 510 kilolitres of water is extracted per day, converted into products and transported away, breaking the natural water cycle. A portion of the rain water is stored as ground water and the balance flows away. The ground water stored in normal circumstances is partially depleted by moderate extraction

for domestic and agricultural purposes and also by evaporation through vegetation on the surface. Again, when the rains come, the underground reservoirs called aquifers get recharged and the cycle goes on. If there is artificial interference with the ground water collection by excessive extraction, it is sure to create ecological imbalance. No great knowledge of Science or Ecology is necessary to infer this inevitable result. If the 2nd respondent is permitted to drain away this much of water, every land owner in the area can also do that and if all of them start extracting huge quantities of ground water, in no time, the entire panchayat will turn a desert..... Therefore, I feel that the extraction of ground water, even at the admitted amounts by the 2nd respondent is illegal. It has no legal right to extract this much of national wealth. The Panchayat and the State are bound to prevent it. The duty of the Panchayat can be correlated with its mandatory function No.3 under the third schedule to Panchayat Raj Act namely, "Maintenance of traditional drinking water sources" and that of the State to Article 21 of the Constitution of India. Though ground water is not expressly mentioned, Section 218 of the Act makes the Panchayat, the custodian of all natural water resources. Therefore, the action taken by the Panchayat against the 2nd respondent to prevent extraction of ground water has to be upheld. So Ext.P6 order, to the extent it allows the 2nd respondent to continue the extraction of water till the Panchayat decides the matter with the help of experts, cannot be sustained. Even assuming the experts opine that the present level of consumption by the 2nd respondent is harmless, the same should not be permitted for the following reasons.

The underground water belongs to the general public and the 2nd respondent has no right to claim a huge share of it and the Government have no power to allow a private party to extract such a huge quantity of ground water, which is a property, held by it in trust.

If the 2nd respondent is permitted to draw such a huge quantity of ground water, then similar claims of other land owners will also have to be allowed. The same will result in drying up of the underground aqua-reservoirs."

2.126 An expert Committee has been appointed by the High Court of Kerala on 20th December, 2003 to study the matter and file the report. The Committee is learnt to have planned to commence work by Ist January, 2004.

CARBONATED WATER CONCENTRATE

2.127 Carbonated water concentrate is used in the manufacturing of soft drinks. Registration Certificate for manufacture of these concentrate is issued by the Ministry of Finance, Central Excise Department. While the ingredients used in the manufacture of soft drinks and its constitution are kept confidential by the soft drink manufacturers, Coca Cola India and PepsiCo India informed the Committee that they had installed concentrate manufacturing plants in India. Giving further details about the manufacture of concentrates, Coca Cola India in their note furnished to the Committee stated:

"Concentrate is manufactured in India. Our concentrates begin with flavouring ingredients. All of these flavouring ingredients are tested to confirm the specifications guaranteed by the supplier and approved in Atlanta, Georgia, before the supplier is allowed to ship flavourings to concentrate plants around the world. The specifications and testing procedures are the same no matter where the product is being shipped. We base our use of flavours on the Flavour and Extract Manufacturers Association of North America list

of flavours which are Generally Recognised As Safe (FEMA-GRAS). For other ingredients such as colourings, preservatives, minerals, salts and vitamins, we use Codex specifications and our own global standards and test to confirm our suppliers guarantees. The concentrate plant performs similar tests on ingredients they receive directly from suppliers. All our ingredients are food grade quality. Further, all food additives used in our products in India have been cleared by the Central Committee for Food Safety of India based on JECFA (Joint FAO/WHO Expert Committee on Food Additives) standards.

Further whenever concentrates or ingredients are imported, the Indian Customs Authorities are required to test samples *vide* circular No.PHO/JNP/F1/2471-2500 dated 17th July, 2003."

2.128 PepsiCo India gave the following details regarding concentrate being used by them:

"Soft drinks produced by us in India, use the concentrate manufactured in India at our plant located at Village Channo, district Sangrur, Punjab. The ingredients used to make concentrate are from the same international suppliers which supply to all our other concentrate manufacturing locations throughout the world. These suppliers have gone through detailed supplier approval process by our Central Research and Development. Concentrate produced at Channo is of the same quality and standard as anywhere else in the world and all PepsiCo plants throughout the world are authorized to source their concentrate requirements from Channo. In fact Channo has exported concentrates to Europe as well as to South Asia."

2.129 Asked by the Committee as to whether pesticide analysis of soft drink concentrate is done, in reply, PepsiCo India stated:

"It is finished product made from a mixture of various ingredients like preservatives, colour, flavours, sequestering and buffering agents, emulsifying and stabilizing agents etc. As such it is a 'finished product' for use by bottling plants. In keeping with the current national and international practice followed through out the world, pesticide residue testing is not done."

LIABILITY OF FRANCHISEE PLANTS

2.130 Out of a total of 52 Plants of Coca Cola India as many as 25 are franchisee owned plants. PepsiCo India has 21 franchisee owned plants out of a total of 38 plants being run by them in India. The Committee asked both the Companies to explain their legal liability and control over franchisee plants. In reply, Coca Cola India in their note furnished to the Committee stated:

"All Indian bottlers of Coca Cola Company, whether franchisee or company owned, have signed SIBA (Standard International Bottlers Agreement) which is renewed on a periodical basis. The Bottlers Agreement is uniform across the world and in India and both the Franchisee and the company owned Bottler execute a similar agreement.

The Coca Cola Company has only one Quality System for its entire bottling systems (Company Owned & Franchisee Owned) around the world. The control mechanism includes issuing Quality, Environment & Safety standards, conducting review and assessments, diligently monitoring the operations on an on going basis. The Company has a franchise manager for Franchisees and Regional Technical & Quality Managers who ensures constant monitoring. The Company also provides technical assistance and training to the people and system capability. It will be not out of place to mention here that

while 10% of the Company's employees are engaged in quality monitoring activities, 25-30 Quality Operation Trainee Executives (QUOTEs) are employed each year by Bottlers and trained by the Company to continuously augment the quality monitoring resources.

In this regard we also wish to draw your kind attention to clause 18A of the Bottlers agreement which states as under:

The Bottler covenants and agrees that in preparing, packaging and distributing the Beverages, the Bottler shall at all times conform to the standards, including quality, hygienic, environmental and otherwise, establishes in writing from time to time by the Company and comply with all legal requirements.

Further being the owner of the Trade Marks under which the Beverage is sold, the Company remains ever vigilant and committed to ensure that the quality of the products manufactured is maintained as per its global quality policies and standard."

2.131 Explaining their position with regard to franchisee plants, PepsiCo India stated:

"Franchisee bottlers are liable for their business and Pepsi has no responsibility in respect thereof. They do business with Pepsi on a principal to principal basis. Franchisee bottlers are exclusively responsible to ensure compliance with all the laws & regulations, including adherence to the standards specified under the Prevention of Food Adulteration Act, 1954 and Fruits Product Order, 1955, in respect of the operations carried out and products manufactured by them. Franchisee bottlers are also required to adhere to all the quality control specifications and other standards laid down by Pepsi from time to time."

FRUIT JUICE AND OTHER BEVERAGES

2.132 Fruit juice and other beverages are covered under clause 2(d) of the Fruit Product Order (FPO), 1955. FPO administered by the Ministry of Food Processing Industry *inter-alia* lays down specifications and quality control requirement of fruit juice and ready to serve beverages.

2.133 Following Articles are covered under Fruit Products:

(i) Synthetic beverages, syrups and sharbats;

(ii) Vinegar, whether brewed or synthetic

(iii) Pickles;

(iv) Dehydrated fruits and vegetables;

(v) Squashes, crushes, cordials, fruit syrup, barley water, barrelled juice and ready-to-serve beverages, fruit nectars or any other beverages containing fruit juices or fruit pulp;

(vi) Jams, jellies and marmalades;

(vii) Tomato products, ketchup and sauces;

(viii) Preserves, candied and crystallized fruits and peels;

(ix) Chutneys;

(x) Canned and bottled fruits, juices and pulp;

(xi) Canned and bottled vegetables;

(xii) Frozen fruits and vegetables;

(xiii) Sweetened aerated water with or without fruit juice or fruit pulp;

(xiv) Fruit cereal flakes;

(xv) Any other unspecified items relating to fruits and vegetables.

2.134 Fruit Juice: General characteristics of fruit juice under FPO have been defined as under:

> "Fruit juice shall be unconcentrated liquid product expressed from ripe fruit and may contain portions of the pulp and other cellular matter natural to the fruit."

CONSTITUENTS OF FRUIT JUICE

2.135 As per FPO 1955, which is a statutory order issued under the Essential Commodities Act, 1955 the only substances that may be added to sweetened juice/pulp are water, peel oil, fruit essences and flavours, common salt, sugar, invert sugar and/or liquid glucose, ascorbic acid, citric acid, permitted colours and preservatives. The minimum percentage of fruit juice in the final product should be 85% and minimum percentage of total soluble solids in the final product (by weight) should be 10%.

2.136 **Ready to Serve Beverages**:—Under FPO, beverages are mentioned as ready to serve fruit beverages including aerated water containing fruit juice or pulp. As per FPO ready-to-serve beverage should have a good keeping quality and show no sign of fermentation, have a good flavour and be free from objectionable taints and flavours. Ready-to-serve beverages may be carbonated. When frozen, the product may be described as ice squash or ice cordial in conjunction with the name of the fruit such as ice orange squash and the like. The minimum percentage of fruit juice in final product in ready-to-serve beverage should be 10% and minimum percentage of total soluble solids in the final product (by weight) should be 10%.

2.137 As per a note furnished to the Committee by the Ministry of Health and Family Welfare, ready to serve beverage are of many kinds such as:

1. Carbonated water
2. Sherbats
3. Fruits Drinks and Fruit Nectar
4. Fruits Juices
5. Ready to serve tea and coffee
6. Flavoured Milk
7. Lassi

2.138 Water is the principal constituent in these products. Additionally, sugar and food additives are used in all these products. In fruit drink/fruit nectar and juices, fruit pulp are used as one of the ingredients. In tea and coffee beverages, tea and coffee extracts respectively are used as ingredient. In flavoured milk and lassi, milk and curd respectively are used as ingredients."

BIS STANDARDS FOR FRUIT JUICE AND OTHER BEVERAGES

2.139 BIS has formulated Standards for fruit juice and other beverages. The Standards of BIS on fruit juice, alcoholic and non-alcoholic beverages are given in Annexure-V.

The Technical Standards developed by BIS are reviewed by the Sectional Committee responsible, not more than five years of the publication for reaffirmation revision or declaration of obsolescence.

Report of Drinks and Carbonated Beverages Sectional Committee FAD 14 of Bureau of Indian Standards (BIS)

2.140 Drinks and Carbonate Beverages sectional Committee, FAD 14 which is BIS technical Committee for developing Standards in the field of all alcoholic and non alcoholic drinks and ready-to-serve beverages including test methods for the same in their meeting for revision of IS 2346; 1992 (Standard for soft drink) proposed revised standard now to cover all water based non-alcoholic ready-to-serve beverages.

2.141 Pure fruit and vegetables, fruit drinks or beverages made out of powder or syrups or any other dilutable and beverages based out of dairy products have not been included in the above standards.

2.142 The Committee note that on the above revised standards a letter dated 31.12.2003 was written by DGHS to BIS wherein it was *inter-alia* stated:—

> "We do not agree to include products containing fruit and vegetable juices to be included under these standards because different products have been standardized in different categories under PFA Rules and these cannot be covered in one category.
>
> The paragraph that due consideration has been given to PFA Act and Rules is not correct because under PFA Rules, 1955 one product has been categorized under different category so it violates the provision of PFA Rules 1955."

2.143 In their subsequent note furnished to the Committee, Ministry of Health and Family Welfare stated that above letter was not approved at appropriate level in the Ministry and has now been withdrawn.

ISSUE OF LICENCE TO FRUIT JUICE AND OTHER BEVERAGES MANUFACTURING INDUSTRIES

2.144 As per the present provision of law, fruit juice and other beverages manufacturing industries are issued Licence under F.P.O. 1955, administered by the Ministry of Food Processing Industries and their quality is enforced through PFA Act, 1954 of the Ministry of Health and Family Welfare. The licence is granted after the inspection of the premises of the manufacturer and fulfilling of minimum sanitary/hygienic requirements as specified under FPO. The other aspect which is taken into consideration for grant of licence is whether water being used is potable or not. For this, the samples of water are drawn for undertaking chemical and biological testing.

2.145 The Committee noted that while CSE had given its findings on pesticide residues in soft drinks only, surprisingly the Ministry of Health and Family Welfare included fruit juices and other ready-to-serve beverages also in the draft notification issued by them.

2.146 Asked as to why fruit juice and other ready-to-serve beverages had also been included in the draft Notification No. GSR 685(E) dated 26th August, 2003 issued by the Ministry of Health and Family Welfare, and whether it was really logical to prescribe same standard for fruit juice and ready-to-serve beverages, in reply, the Ministry of Health and Family Welfare in their note furnished to the Committee stated as under:

> "The draft notification was just a proposal for inviting objections and suggestions subject to the modifications/changes as may be considered necessary at the time of final notification based on feedback from various sources."

PRESENT LIMITS OF PESTICIDE AND HEAVY METAL RESIDUES IN FRUITS AND VEGETABLES

2.147 PFA Act, 1954 lays down limits for Pesticides and heavy metal residues in fruits and vegetables.

2.148 The Committee noted that Limits of Pesticide Residues prescribed under PFA Rules 1955 for fruits and vegetables are in variance with the proposed limits in finished products as required under draft notification which is evident from the following table:

Name of Pesticide	Name of Food	Existing limits (ppm)	Proposed Limits in Finished Products (ppm)
DDT (DDD, DDE)	Fruits and Vegetables	3.5	0.0001
Malathion	Fruits	4.0	0.0001
	Vegetables	3.0	
Chlorpyrifos	Fruits	0.5	0.0001
	Other-Vegetables	0.2	
	Cauliflower, Cabbage	0.01	
Lindane	Fruits & Vegetables	1.0	0.0001

2.149 The existing and proposed Limits of Heavy Metals content in Beverages and Fruit Juices under PFA Rules are as under:

All Figures in ppm

Item		PFA Fruit Juice
	Existing Limits	Proposed Limits
1	2	3
Lead	1.0	0.01
Copper	5.0	0.05

1	2	3
Arsenic	0.2	0.05
Tin	250	250
Zinc	5.0	5.0
Cadmium		0.01
Mercury		0.001
Chromium		0.05
Nickel		0.02

2.150 FPO, 1955 does not provide any standards for pesticide residue in food products. While PFA 1954 lays down pesticide limit for raw fruits and vegetables it sets no limit for fruit juice and beverage.

2.151 The PFA Act at Rule 65 provides pesticide residue limits in different fruits and vegetables in the range 0.1,1.0, 2.0, 5.0, 7.0, 15.0, 20.0, 30.9 mg/kg *i.e* in raw product. Asked as to how fruit and vegetables juices, fruit beverages, fruit squashes, fruit drinks etc. can meet the Pesticide Residues Limit of 0.0001 mg/litre as proposed in the Draft Notification when the fruits and vegetables have pesticide residue levels as high as 0.1—30.0 mg/kg, in reply the Ministry of Health and Family Welfare in their note furnished to Committee stated:

> "The maximum residue limits for certain pesticides have been prescribed for fruits and vegetables in raw. When the product is prepared out of fruits and vegetables a process is involved. The process is washing, pealing, cutting and extraction of juice or preparation of any other products. In this process pesticide residues are removed. Because water is the principal constituent in these products, so the requirements for pesticide residues and metals were proposed at par with that of packaged drinking water."

2.152 Pointing out that present Limit of Pesticide and heavy metals under PFA, 1954 in fruits and vegetables were many times higher than the limits set under draft notification which food and other beverages industries are required to achieve in the final product *i.e.* fruit juice and other beverages, the Committee asked the Ministry of Food Processing Industries to state as to whether it was possible to achieve the proposed norms for fruit juice and other beverages. In reply during his evidence before the Committee Secretary, Ministry of Food Processing Industries stated as under:

> "Under existing norm under PFA Act 1954 DDT residue in fruits and vegetables should not be more than 3.5 ppm. To bring it down to .0001 ppm from 3.5 ppm overnight is not feasible technologically similarly for Malathion, from the current limit to the proposed limit you have to multiply it by thousand times to get that level. So technically it is not feasible to do that."

2.153 Asked as to whether the Ministry of Food Processing Industries had at any time taken up the matter with the Ministry of Health and Family Welfare expressing difficulties in reducing the pesticide and heavy metals residues from present level to the level prescribed under draft

notification. In reply, Ministry of Food Processing Industries in their note furnished to the Committee stated as follows:

> "Yes, Ministry of Food Processing Industries has taken up this matter at Secretary level as well as in CCFS meeting. The Ministry of Food Processing Industries had taken up the matter at Secretary level with Ministry of Health and Family Welfare on the criteria as well as setting up of standards for pesticide residues in the soft drinks, fruit juices and other beverages. The representative of this Ministry also raised these issues in the CCFS meeting, but, the views of this Ministry has not been reflected properly in the minutes. Accordingly, this Ministry wrote to the Chairman of CCFS to amend the minutes. The issues of the Ministry are that these standards should be arrived at on a scientific basis and not on a knee-jerk reaction basis."

2.154 When asked by the Committee as to what were the norms being followed internationally for setting pesticides limits in ready-to-serve beverages, the Ministry of Food Processing Industries in their audio-visual presentation before the Committee stated:

> "Pesticide residue limits are referenced for raw agricultural commodities. CODEX and other International Norms follow the principle that Maximum Residue Limits (MRL) for all finished final products should be derived on a product to product basis as a summation of MRLs."

2.155 The Committee asked Secretary, Ministry of Food Processing Industries to give his views on setting of standards for fruit juice and other beverages. In reply Secretary, during evidence stated:

> "The standards for pesticide residues and contaminants for end products should be based on CODEX. This is the internationally acceptable standard. 167 countries are following it. We can also follow it. It will safeguard our exports. The two cardinal principles, as I have explained, are the maximum residue limit, which is derived from good agricultural practice, and acceptable daily intake which follows the health risk assessment. If the proposed norms are enforced, the food processing industry will have to source raw materials from abroad.
>
> As we understand, the object of the standard is to mitigate health risk to Indian population. So, if the health risk is the paramount consideration, then we have to evolve our own database and we have to keep our food habits into account. What is our food habit? What is our data? What is our baseline data? As of today, how much of pesticide residue, how much of heavy metal is entering in various raw products? We have to have a baseline data and then, take into account the pattern of consumption of processed and non-processed foods. We are eating raw fruits, raw vegetables and municipal water. In addition to that, we are taking processed foods. So, we have to see what is the basket of processed and non-processed foods, what are the current levels of contaminants and pesticides in processed and non-processed foods, pesticide usage in agriculture and public health programme. After taking into account all these things, our own institutions like ICMR and National Institute of Nutrition have to derive database and then, fix the standard. Then, of course, we have to consult all the stakeholders before notifying it."

2.156 Giving justification of following CODEX norms and difficulties in achieving the proposed norms, laid down under draft notification, Secretary Ministry of Food Processing Industries stated:

> "My humble submission is that CODEX norm is the norm which is relevant for the purposes of export. It is being followed by 167 countries and we should also fall in line with CODEX

norms. If the object is to facilitate exports, then the logical thing to do would be to follow CODEX norms. I have just tried to explain how CODEX norms have been fixed. They are based on two fundamental concepts of maximum residue limit and ADI. We have to apply the same concept here. Except that, in our case, our food habits are different. We consume more wheat and more rice. So, for rice and wheat, our standards will have to be more stringent than even CODEX because foreigners do not consume so much of wheat and rice in their consumption basket. So, taking into account our own habits of food consumption, we will have to set these norms. Now, if you want to protect the Indian industry, they must be able to source raw materials from within the country. If I prescribe norms which are so stringent that he will stop buying apples and grapes in India and start importing them from abroad, that is not a happy state of affairs when we want to expand our own horticulture and agriculture. Therefore, if you want to fix a standard even for health consideration, you have to first compile a baseline data of what is the pesticide and heavy metal residue in our agricultural and horticultural products. Then, you have to see from the health perspective what limit should be set. Once you know that, then over a period of time—you cannot do it overnight—you have to change agricultural process. If the DDT residue is unacceptably high, then you have to change agricultural practice and stop use of DDT both in agriculture and horticulture as well as public health programme. Until and unless you do that, you cannot conform to the standard. That is my humble submission."

2.157 To a question as to why CODEX norms should be preferred *vis-a-vis* EU norms, Secretary, Ministry of Food Processing Industries during his evidence stated:

"EU norm is not based on any scientific assessment of health risk factor. It is based on some idealistic standard, that is, one part per billion. That is an idealistic standard which virtually means 'zero', whereas the CODEX is a realistic standard."

2.158 To a question by the Committee as to whether codex norms were fully safe from the point of view of health under Indian conditions. In reply, Secretary, Ministry of Food Processing Industries stated as under:

"Suppose, I say that the CODEX standard is not acceptable, then what is the basis for that? On what grounds is it not acceptable? Is it because of health risks? If it is so, then an institution under the ICMR like the National Institute of Nutrition and the Central Food Technology Research Institute in Mysore have to determine based on the present level of heavy metals and pesticides in various products and the quantity that is being ingested —whether it is in conformity with the Acceptable Daily Intake (ADI). If it is in conformity with the present standards then there is no need to revise the standard. But, if it is proved that it is higher than the ADI, then your question is 100 per cent correct. Then, under such circumstances, we will have to revise the standards. Then the question that will come up before us is : "How we should revise it?" But, the first determination itself has not been made, to the best of my knowledge."

2.159 The Committee invited the representatives of All India Food Processors' Association to tender their oral evidence before them and sought their views as to whether it was possible to reduce pesticide residues in fruit juice to the level as stated in draft notification. In reply, their representative stated:

"Coming to the issue of fruit juice and ready to drink beverages, as you are aware, the primary ingredients for these are fresh fruits, vegetables, milk, sugar, water, citric acid, colour and flavours — for products where there is a need for flavour to be added to the product.

The industry uses fruits and vegetables as raw materials. In turn these are processed to make juice, pulp and concentrate. Prevention of Food Adulteration (PFA) Act has fixed MRLs for pesticide residues in raw fruits and vegetables. The MRLs in the final product cannot be less than the permissible limits of the sum of ingredients, depending upon the level of dilution.....Sir, we use raw materials that we get from the farmers or the market. So, there is no technology, which has been developed, where during processing, you can separate out the pesticide residues from the fruit pulp. If it is done, it will be very costly and it will not be viable to have any fruit juice at all. I am saying this because once it enters the system, it is impossible to separate it.

Therefore, what we are going to submit is that the pesticide residue limit in the final products has to be dependent on the pesticide residue limit in the raw material. There cannot be any dichotomy on this issue. I will give you some examples.....

For grapes, the PFA allows 32.75 ppm pesticides. So, when you are making grape juice, it will contain the same amount of pesticide and when you are diluting it, it would come down to 3.28 ppm of pesticide with 10 per cent juice.

Similar is the case with tomatoes also. Tomato puree or tomato ketchup, which has 50 per cent tomato pulp, will necessarily have 16.35 ppm of pesticide. If any law says that it must be reduced, then there has to be an intermediate process, which is not technologically possible today. Given the current level of pesticide residues in fruits and vegetables, it would be practically impossible to reduce the minimum residue levels in fruit juices and beverages to EU norms for drinking water. As long as we have the permitted levels in raw fruits, we cannot reduce it in the final product.....

2.160 Emphasising the need for separate safety standard for fruit juice and vegetables, the representative of All India Food Processors Association further stated:

"...Worldwide, the practice is that they fix the standards for primary agricultural products. Nowhere, in any country, not even in US or European Union, do they have standards for pesticide residues in finished products. If we do it in India, it will be first time in the world. There are good reasons as to why they do not do it because once it is in raw materials, there is no way you can take them out. Once you make the raw material safe, then the finished product will be automatically safe because the food processors do not use pesticides or no one injects pesticides into the product. We only carry what is there is the raw materials."

READY-TO-SERVE BEVERAGES

2.161 Ready to serve beverages like tea, coffee, lassi, etc. are milk based: Asked by the Committee as to whether pesticides can be removed from milk and milk based products, in reply another representative of Food Processors Association of India stated:

"Milk is also a raw material. We are saying, fix the MRL for raw milk before you fix for the milk products. We cannot fix a standard for the finished product without fixing the standard for the raw material.

There is no technology available where pesticides can be removed from milk and milk products. As it was explained, it comes from the fodder or water that the animals drink and finally it goes to the milk. There is no technology available to remove pesticides hundred per cent."

2.162 Representative of Ministry of Food Processing Industries during his evidence before the Committee had stated that most juices, ready to drink teas, and sugar sweetened finished beverages would not be able to meet the proposed standard. Asked to give their comment to above statement, the Ministry of Health and Family Welfare in their note furnished to Committee stated:

"Tea and coffee based drinks, milk based drinks are not likely to meet the requirements for pesticide residues for packaged drinking water."

2.163 The Committee asked the representatives of CFTRI to clarify as to whether it was correct to apply standards of drinking water to fruit based beverages, milk and milk products. In reply CFTRI in their note furnished to the Committee stated as under:—

" It is not correct to apply standards of drinking water to fruit based beverages, milk and milk products. The MRL for water and food vary depending upon the toxicity of the chemical particularly Acceptable Daily Intake (ADI), Dietary intake, residue level in food commodities and, comparison of total ingestion of pesticides from all sources of food in a day per person per kg body weight with the ADI values. Also intake water which can be purified by various techniques like reverse osmosis, micro-filtration to reduce and minimize contaminant cannot be used for fruit juices, milk and milk products. Also in these products the technological limitations to process after any contamination has occurred is very difficult and hence good manufacturing practice and declaration of the label such as `Safe for use by the Consumer' is a better proposition. Therefore, it is not scientifically justifiable to apply standards of one commodity to another commodity."

MRL FOR PESTICIDES RESIDUE IN FRUIT JUICE AND VEGETABLE BEVERAGES

2.164 MRL for pesticide residue have not been laid down under FPO 1955 and PFA 1954 with regard to fruit juice and other beverages. The Committee were informed by the Ministry of Food Processing Industries (FPI) that in view of recent deliberation on the need for scientifically arriving at MRL of pesticide residue of various food items the Ministry of Food Processing Industries sent samples of fruit products covered under FPO, 1955 to CFTRI, Mysore to assess the present level of pesticide residues in them. On receipt of existing levels of pesticide residues in the products, a study may be undertaken through National Institute of Nutrition, Hyderabad to assess the acceptable daily intake of these products and to work out the safe limits.

2.165 Asked to give details of the findings of CFTRI and follow up steps taken by the Ministry of Food Processing Industry, the Ministry in their note furnished to Committee stated as under:—

"The Ministry of Food Processing Industries has also sent the samples of other fruit and vegetable products such as juices, beverages etc. to CFTRI, Mysore, for testing the presence of pesticide residues. The test results have not been received.

Ministry of Food Processing Industries has asked the National Institute of Nutrition, Hyderabad to start work to assess the acceptable daily intake of these products and to work out the safe Limits and also to submit a project proposal indicating cost and other expenditure for financial assistance from this Ministry."

DEFECTIVE PACKAGING

2.166 During evidence, the Committee pointed out that certain Indian consignments sent from India have been rejected due to defective packaging or their container being rusty and asked as to whether due attention was being given to the quality aspect of finished food products. In reply representative of All India Food Processors Association stated as under:

> "The Hon. Member's statement about packaging is absolutely right. Yes, it was there and it is still there today. There are two reasons for this. If we have to go for the latest technology like Tetra-Pack technology, the plant costs about Rs. 10 crores. Today, can the small scale industry afford to invest Rs. 10 crores on this? ...What you say is absolutely right. It is well taken but at the same time the technology for making cans has also changed recently. If you see the outer packing of cans, today we go only for lacquer coated cans. Many exporters have faced big problems because of rusting of cans.
>
> Many consignments have been mainly from Saudi Arabia even if there is a slightest rust on the can. Today, what has happened is that the latest technology has come of coating the cans with lacquer. After we finish the product, the cans are oiled with vegetable oil on the top so that even if we keep the cans for a longer time, they do not get rusted. Gradually, it has taken a little time for the industry to know the problems because most of the can units are in small scale sector."

2.167 On the issue of defective package, another representative of All India Food Processor's Association stated as under:

> "Sir, the industry was in infancy. It is slowly improving. The economics of the industry is not so far that good. Technological innovations have to be adapted. They are taking time. But I can assure you that this process has already started and some smaller units are also trying to pack in tetra pack now.
>
> As far as the question of cans is concerned, these are called Open Top Sanitary (OTS). Only four to five units in the country are making them. They are very specialised units. The Tin Plate Company of India is manufacturing some parts. Except that, almost 80 per cent of this tin plate is not Indian. They fabricate improvements like lacquer coating which are coming now. That will help. Plus, the environmental conditions are there which have to be taken into account.
>
> Final thing is the awareness of the processor. If a stock is left for four to five months, the environment has its affect, therefore, that stock should not be sent and something else has to be done with it. We are generating awareness about this. It is a multi-point aspect."

AMENDMENT OF FPO, 1955

2.168 Asked as to whether the Ministry of Food Processing Industries had any proposals to amend FPO, 1955 and further strengthen it to strictly enforce the safety standards for food products and other beverages, in reply, a representative of the Ministry of Food Processing Industries stated as under:—

> ".....We have a Fruit Product Advisory Committee. We had held three meetings in the last two years and decided upon a number of amendments. .....taking into account the new developments, we have already proposed a number of amendments. They are being vetted by the Ministry of Law and justice. We will soon come out with further amendments on this issue."

2.169 From the amendments proposed by the Ministry of Food processing industries it is noted that no proposal has been made for setting pesticide limit in food products.

CONCLUSIONS/RECOMMENDATIONS

2.170 The Committee note with deep concern that the soft drink (Carbonated water/Sweetened Aerated water) industry in India with an annual turnover of Rs. 6000 crores is unregulated. It is exempted from Industrial licensing under the Industries (Development and Regulation) Act, 1951 and gets a one time license to operate from the Ministry of Food Processing Industries under the Fruit Products Order (FPO) 1955 and a no objection certificate from the local government and the State Pollution Control Board.

2.171 What further dismays the Committee is the fact that whatever action has been taken recently by the concerned Ministries is only as a result of the findings of an NGO with respect to the presence of pesticides in the soft drinks rather than any systematic approach based on scientific studies. For instance the Ministry of Health and Family Welfare which is a nodal Ministry for laying down standards of safety for all food items suddenly became alive to the entire issue only after Centre for Science and Environment—NGO based in New Delhi published its report on the presence of pesticides in soft drinks on 5th Aug, 2003. It issued a draft notification No. GSR 685 dated 26.8.2003 prescribing the same standards for soft drinks, fruit juices and other beverages as prescribed for packaged drinking water which were notified again after the Report by the same NGO was made public and under which EU norms for individual and total pesticides have been prescribed, without trying to ascertain as to how under the same notification soft drinks could be clubbed with fruit juices particularly when the MRLs fixed in the case of raw fruits and vegetables happen to be much higher under the existing provisions of the PFA Act, 1954. The Ministry did not take the opinion of the Central Committee on Food Standards (CCFS), which is a statutory Committee under the Act for laying down standards for various food items. This step of the Ministry according to their own admission was in a way unprecedented. The plea taken by the Ministry, therefore, that it had issued the said notification under the provisions contained in the bye-laws and section 23 of the PFA Act because the matter was of public importance, is not at all acceptable to the Committee. The Ministry further submitted that Government approved the draft notification on 14.8.2003 and issued the same on 26.8.2003, in between JPC was also constituted to look into the matter. Though normally the time allowed for inviting objections is 90 days but under the aforementioned draft notification only 30 days were allowed, with the result that the JPC had to intervene and take up the matter with the Government, which agreed to extend the date by 31.12.2003. The Draft notification naturally resulted in raising concerns about the feasibility and practicability of implementing these identical standards for soft drinks and fruit juices, from not only the Chambers of Industry representing the manufacturers of the soft drinks, fruit juices and other ready-to-serve beverages but also from the other Govt. Agencies *viz*. Ministry of Food Processing Industries, APEDA and CFTRI etc.

2.172 The Committee, therefore, feel that in future the modifications in the standards should not be done in haste but should only be taken after full scientific studies based on proper risk assessment and after holding wide consultations in the CCFS and its sub-committees where the Ministries, experts, scientists, trade and industry, farmers' representatives, consumer organizations as well as the States/UTs are represented. Moreover, keeping in view the vital issue of the health of the population of our country, the revision of standards has to be an ongoing and regular process which should draw the serious attention of all the concerned ministries and particularly of the Ministry of Health and Family Welfare which is at the center-stage for administering food laws and implementation of various health programmes.

2.173 The Committee are of the view that Codex matters are of very serious nature under WTO regime. It is therefore necessary that Indian delegations are not under prepared and should have the required technical qualification and experience to discuss complex technical matters in Codex meetings. The Committee, therefore, desire that scientists must head the Codex teams representing India in all Codex meetings and these should not be headed by the bureaucrats from different ministries as is the present practice, since the latter often lack required professional/ technical knowledge and do not have expertise and relevant experience. It is also desirable that all position papers on all agenda papers are submitted to the Head of the Govt. Department before the Codex meetings. The technical experts, must submit detailed independent reports to the Government, after attending Codex meetings.

2.174 The Committee note that soft drinks under the PFA Act, "A01.01 are defined as Carbonated Water meaning potable water impregnated with carbon dioxide under pressure and may contain other ingredients such as sugar, liquid glucose, dextrose, invert sugar, fructose, honey, fruit and vegetable extractives and permitted flavouring, colouring matter, preservatives, emulsifying and stabilising agents etc. The major ingredient of soft drinks is water which accounts for 86%-92% of the total soft drink composition. Besides water, soft drinks contain sugar varying from 5 to 10%, carbon dioxide, acids like citric acid, phosphoric acid and malic acid which are added to balance and the concentrate. It is however extremely surprising that though water is the major constituent, so far neither it has been defined properly nor the standards laid down either under PFA, FPO or BIS certification scheme are monitored and enforced effectively. The only stipulation with regard to the water mentioned under FPO in the Second Schedule Part 1 (A) is that the water used in the manufacture shall be potable and if required by the Licensing Officer it shall be got examined chemically and bacteriologically by any recognized laboratory, but the same has not been defined. Further FPO mentions limits of poisonous metals (lead, copper, arsenic, tin, Zinc etc.) in fruit products but makes no mention of pesticide residue levels either in the water used in the manufacture of juices or in the beverages. The norms about quality and standard for the potable water that is used by the soft drink manufacturers has not been prescribed. The irony is that only at the time of issuing the license, a certificate from a recognized laboratory is insisted upon. The other condition that is stressed upon is that the premises should be maintained in a hygienic way. Similarly, under the Prevention of Food Adulteration Act, 1954 and Rules 1955, under item A.01.01 of Appendix B, water under the category of carbonated water only mentions that water has to be potable but no quality standards except for the microbiological contaminant standards for the final soft drinks are specified. Like FPO, PFA also does not specify any standards for inorganic and organic chemicals and pesticides for soft drinks.

2.175 Apart from these two mandatory regulations, there is also a voluntary specification of BIS for Carbonated beverages (IS 2346:1992). It specifies the quality of water to be used in the manufacturing of soft drinks which should meet the water quality standard for the processed food industry IS 4251:1967, which in turn specifies standards for bacteriological, physical and chemical tolerances but does not mention pesticides. It is only recently that the Ministry of Health and Family Welfare issued notification No.GSR.554(E) Dated 18.7.2003 prescribing standards of 0.0001mg/litre for individual pesticides and 0.0005 mg/litre for total pesticides for the packaged drinking water which are in conformity with the standards of EU and these norms have already been enforced w.e.f. 1.1.2004. The packaged drinking water has also been brought under the definition of 'Food' in the year 2001. The same norms however, have been prescribed in the notification issued on 26.8.2003 for the soft drinks and other beverages on the plea that water is the main constituent in these. From the depositions made before the Committee by the Coca-Cola, Pepsico, Delhi Jal Board, Indian Bottled Water Manufacturers Association and a few others

including the Ministry of Health and Family Welfare, it was made amply clear that it is not difficult to meet the new norms for water since most of the manufacturers have already installed the requisite equipment which is not very costly and they are already meeting the new standards. In fact the Bottled Water Manufacturers Association as well as the Ministry of Health & Family Welfare, had also clarified that the processing charges involved in processing the water are almost negligible. The Committee were also informed by a number of experts that the technology for removing the pesticides from water already exists and these can be removed to any level.

2.176 The Committee are of the view that Carbonated beverages cannot be clubbed with fruit juices, because these are different products with different specifications and the existing law already differentiates between these products. Moreover, the soft drinks do not form part of the nutritious diet, and though the present per-capita consumption of the soft drinks is not much in our country as compared to other countries like United States or European countries, but the trend towards more consumption is gradually growing in the entire Asian region and in future can expand to a significant extent in India also. The Committee are therefore, of the considered opinion that the water used in manufacturing the soft drinks should be in conformity with the new norms which have already been notified under notification No. GSR 554(E) dated 18.7.2003 so that the consumers are not deprived of the best standards.

2.177 Though it has been stated by some manufacturers of soft drinks that there is a possibility of pesticides entering into the beverages through sugar, the Committee are not inclined to accept the same and desire that this requires to be investigated in detail. The following may be considered while investigating:

According to the Package of Practices provided by Extension Departments, most of the sugarcane farmers are using only three to five types of pesticides. Most of the pesticides in sugarcane cultivation are used at the time of pre-planting stage, planting stage and first six months of crop growth (February to June). In case there is any insect or disease attack on the crop, two or three types of pesticides are used till harvesting. This time gap between spray of pesticide and sugar extraction only results in degradation of pesticides. According to Current Science Vol. 85, No.10 25th Nov. 2003, under tropical conditions microbial activities in soil are high, hence degradation of pesticides is also faster. According to sugar technologists, the refining process of sugar from sugarcane juice involves boiling, clarification by lime, sulphur dioxide gas, centrifugation of massecuite to remove molasses and sugar crystal. Sugar produced by crystalization is a process, which itself ensures the purity of the product and reduces impurities like dust, dirt and pesticide residues. According to United States Department of Agriculture's Pesticide Data Program (USDA-PDP) supplemented with information from Food and Drug Administration Centre for Food Safety and Applied Nutrition (FDA/CFSAN) on Organophosphorus Chemicals on Food Crops, "a knowledge of highly refined nature of sugar and syrups supported by the limited residues data mentioned above is the basis of assumption that negligible residues of pesticides would be expected to occur in sugar and syrups".

2.178 This indicates that the number of pesticides present in carbonated water and the levels may not be from the sugar source.

2.179 Carbonated water manufacturers have already mentioned before JPC that they have foolproof process to select and treat the sugar and this treatment is uniform worldwide to ensure good quality sugar syrup for the products. These companies are already purifying the sugar syrup with Hot Carbon Treatment Process, which is effective in reducing most of the pesticide residues to below detectable level or below 0.1 ppb levels. The Committee feel that sugar, therefore, can not be the only source of pesticide residues.

2.180 If the pesticides could be controlled to a large extent by adopting new water standards for packaged drinking water and also by subjecting sugar syrup through hot carbon process, the only other ingredients through which there is a chance of pesticides entering is either through the concentrate or other acids or flavours and colours etc. which also constitute about 3-4% of all the ingredients used in the manufacture of the soft drinks. So far as concentrate is concerned, it is not subjected to any quality testing by the Government laboratories under PFA.

2.181 So far as other ingredients are concerned, their percentage is not significant. The Committee therefore opine that in case the standards of water are strictly adhered to and the entry of pesticides could be checked to a large extent by prescribing MRLs for all the pesticides which are used in the case of sugarcane, this problem can be tackled to a large extent. The Committee have observed from the oral/written evidence tendered before them that EU and others have formulated their norms keeping in view their environment, agricultural practices, pesticide usage, etc. The Committee have also noted that EU norms are not based on any toxicological criteria or any realistic basis, but are a surrogate for zero. Moreover, these norms are often used as non-tariff barriers by the European countries against the developing nations, to protect their agriculture, trade and industry. For various agro-based products EU standards for produce within the European Union are much liberal compared to products imported from developing countries—for example, the different MRL stadards for cane sugar vs. beet sugar and apple vs. mangoes, etc. The Committee, therefore, recommend that India should formulate its own food standards, which are based on scientific criteria, protects the interest and health of its people and are in keeping with the internationally acceptable norms. The Committee therefore recommend that standards for carbonated beverages, which are best suited for the Indian conditions need to be fixed in the overall perspective of public health. These standards should also be stringent enough. The reason that the other countries have not fixed such limits, should not dissuade our law makers in attempting to do so, particularly when a vulnerable section of our population who are young and constitute a vast national asset are consuming the soft drinks. In Committee's view therefore, it is prudent to seek complete freedom from pesticide residues in sweetened aerated waters. 'Unsafe even if trace' should be the eventual goal.

2.182 The other area of concern to the Committee is the use of ground water by the soft drink manufacturing companies as well as bottled water manufacturing companies. The Committee find that though these companies are extracting huge amount of ground water but they are not being charged anything for using the water. The only charges that they pay is a petty amount as water cess which is being levied by the State Pollution Control Boards under Water (Prevention & Control of Pollution) Cess Act. States also do not seem to have uniform procedure in this regard as in some States, industries located in the industrial development areas are charged for use of ground water at rates decided by the concerned States and in others there is no such practice. Though the Secretary, Ministry of Water Resources tried to put forth the legal position in this regard before the Committee by stating that no charges can be levied on the use of ground water because legally speaking the land and the resources located under it belong to the owner who is free to use his assets in the manner he likes, but in view of the recent judgement delivered by the Hon'ble High Court of Kerala on 16.12.2003 in the case of Plachimada plant of Coca Cola India, the stand taken by the Secretary loses relevance. The Hon'ble High Court has opined in no uncertain terms that the use of water is free only in case the same is used for the domestic or agricultural use by the owner and since ground water belongs to the public, its commercial use has to be adequately restricted and even in the absence of any law governing ground water, the Panchayat and State are bound to protect ground water from excessive exploitation. The Secretary however had assured the Committee that in future perhaps the water if used for commercial and industrial purpose will have to be charged. The Committee

however, note with utter dismay that the Central Ground Water Authority (CGWA) which has been constituted as an authority on the directions of the Hon'ble Supreme Court of India, taking into consideration the urgent need for regulating the indiscriminate boring and withdrawal of ground water in the country, has so far hardly taken any concrete steps to properly regulate or coordinate effectively the extraction of ground water for industrial purposes. Taking into account that the water level in many parts of the country is getting depleted alarmingly, the Committee desire that this requires to be properly regulated so that at least on account of indiscriminate use of water for commercial purposes the level does not go down further. The Central Ground Water Authority must take immediate steps in this regard and also impress upon the State Governments to do so without further loss of time. The Committee note that water being a State subject, the central legislation cannot be enacted unless the concerned state legislatures pass a resolution and only a few states have enacted laws to regulate over-exploitation of ground water. The Committee desire that the Ministry of Water Resources must pursue the matter vigorously with the States and impress upon them the need to regulate water particularly for commercial purposes and also fix the price for water after taking into account the price being charged for water which is being used for domestic purposes.

2.183 In India a variety of pesticides have been used for the last several years both in the agriculture as well as health programmes and these include the environmentally persistent organochlorine compounds such as DDT, BHC, Aldrin, Endosulphan etc. There is already published scientific work by the National Institute of Nutrition, Hyderabad and National Institute of Occupational Health which has established that long term consumption of DDT can cause reproduction disorders in women, cause chronic disorders and also cause different types of cancers. Pesticides such as DDT, Endosulphan and Dieldrin have been assigned oestrogenic potencies. Other than the scientific papers published, there have been flood of reports both in the print and electronic media on the harmful effects of pesticides. The most recent media report is on Endosulphan in cashew plantations in Kasargode district of Kerala, which has caused a variety of health problems in a few villages in the area ranging from cerebral palsy to congenital neurological disorders. Besides the harmful effects of pesticides, it has also been alleged by CSE that the other major ingredients of soft drinks namely, carbon dioxide, certified sweetners like aspartame, saccharine, acesulfame-K etc. and flavouring agents such as caffeine and phosphoric acid are also injurious to health.

2.184 At present however no survey has been carried out to establish the daily intake of various food items including water, soft drinks and other beverages, which can be used for deciding the intake rate of pesticides. There is therefore an urgent need to initiate research studies on total exposure. Surveillance studies to identify high risk area, seasons, foods, high risk population groups etc. to pesticide residues especially organochlorines need to be undertaken in different agro-climatic zones of the country. The data needs to be combined with dietary intake studies. Thus exposure assessment from multiple exposure routes needs to be calculated so as to qualify the aggregate exposure. The Committee therefore suggest that in order to achieve this, a co-ordinated research project should be undertaken by the ICMR involving CSIR, Indian Agricultural Research Institute, National Institute of Occupational Health, National Institute of Nutrition, Vector Control Research Center and various other research centres. It is expected that building up of a vast data base on pesticide residues, its occurrence in food and environment, total intake by humans along with the long term effects of pesticides on the health will go a long way in taking appropriate control measures.

2.185 The Committee find that soft drink companies are selling non-caffeinated soft drinks in every country besides the caffeinated ones including the United States and all countries in

Europe. In India their production of non-caffeinated soft drinks is very little, as only Limca, Sprite and Mazza are stated to be non-caffeinated. Though the soft drink manufacturers have contended that more non-caffeinated products can be made available in India also provided there is a demand from the consumers, the Committee desire that at least option should be made available to the consumers to choose between the two. It is therefore desirable that all brands should include caffeinated and non-caffeinated drinks. They also desire that there should be no difference in the quality of products being marketed in India as compared to those which are being sold in the USA or other European countries.

2.186 The Committee have been informed that Drink and Carbonated Beverages Sectional Committee FAD 14 which is BIS Technical Committee have decided to revise IS 2346-1992 which are standards for carbonated beverages and make it more broad based. In their report, the Technical Committee has advocated for restricting the use of caffeine in carbonated beverages as has already been done by some countries like Australia and China. They have also desired that the label on the caffeinated beverage must include advisory statements to the effect that the beverage contains caffeine and the same is not recommended for children, pregnant or lactating women and individuals sensitive to caffeine. The Committee desire that this recommendation be implemented based on best practices globally regarding caffeine regulations and its effects on human health. However, the Ministry may consider bringing down the present limit of 200 ppm in carbonated beverages as prescribed under PFA.

2.187 The Committee were informed that due to operation of Coca Cola and Pepsico plants at Plachimada in District Palakkad in Kerala, agricultural operations have badly been affected. It has been alleged that operations of these plants have resulted in causing pollution of water, depletion of ground water, reduced yield in crops, skin disorders and other ailments among the inhabitants. The allegations have mainly been made against the Hindustan Coca Cola Beverage Private Ltd. plant at Plachimada. The High Court of Kerala, where a case was filed by the Perumatti Gram Panchayat against the company has delivered the judgement on 16.12. 2003 according to which the extraction of ground water even at the admitted amounts has been declared illegal. An expert Committee has also been appointed by the High Court of Kerala on 20th December, 2003 to study the entire matter and file a report. The Committee were however informed that the application of the company regarding alternative source of water as well as power is pending with the State Government for the last more than four years. The Committee strongly recommend that the entire issue should be resolved and the company should also take into account the strong sentiments of the local people and various environmental issues positively. The State government must intervene in this regard and take necessary steps to resolve this serious issue. The Committee have been informed that the Hon'ble Supreme Court of India has constituted recently a Monitoring Committee on Hazardous Waste Management. One of the terms of reference of this Committee serviced by the Ministry of Environment and Forests is to oversee the implementation of hazardous waste management and submit a report to the Court on quaterly basis. It has jurisdiction over the entire country. The Committee suggest that implementation of discharge of effluent sludge in Palakkad and Plachimada be also monitored by the above Monitoring Committee.

2.188 The Committee also find that though huge amount of ground water is being extracted by both the Coca Cola and Pepsico plants at Plachimada and Palakkad respectively, but the efforts made in recharging the water are not commensurate enough. While the Hindustan Coca Cola plant is recharging the water to the extent of 50% of the total water used, the position is far from satisfactory in the case of Pepsico plant which is recharging merely 10% of the total water used. Taking into account the importance of preserving our ground water resources which

are vitally important for all sections of society, the Committee strongly recommend that provision in this regard needs to be incorporated in the relevant Act making it mandatory for those who use the water for commercial purposes to recharge ground water to the maximum extent possible.

2.189 The Committee note that more than half of the total plants of Coca Cola India and Pepsico India Holding Private Limited are franchisee owned plants. Out of 52 plants of Coca Cola India, 25 are franchisee owned plants. Pepsico India has 21 Franchisee owned plants out of a total of 38 plants in India. They also note that all bottlers of Coca Cola company whether franchisee or company owned have signed Standard International Bottlers Agreement (SIBA) which is uniform across the world and the quality control system for the company owned and franchisee owned plants is the same. However, Pepsico India has not even signed the agreement and have stated that Franchisee bottlers are liable for their business and the company has no responsibility in respect thereof. Thus even though franchisees bottlers are required to adhere to quality control specification and other standards of parent company, they have no legal liability over their action and inaction.

2.190 The Committee consider these explanations tendered by Pepsico and Coca Cola India unsatisfactory in the context of the findings of Pesticide residues in their brand of soft drinks. The Committee feel that the existence of a bottlers agreement can not absolve the producers and marketers of their responsibility towards ensuring freedom from contamination of the beverages sold to the consumers. Whether its own bottling units or a franchisee bottling units, it is the absolute responsibility of the brand owner who selects the bottlers, provides the processing technology quality know-how, the concentrate and finally markets the end products, to ensure that consumers get a product which is in conformity with the prescribed norms of quality and safety. The Committee therefore, recommend that onus for maintaining the quality should lie with the parent companies/brand owners and its compliance should be ensured.

FRUIT JUICE AND OTHER BEVERAGES

2.191 Fruit juice and other Beverages are covered under Clause 2 (d) of the Fruit Products Order, 1955 as fruit products. As per FPO, fruit juices are defined as unconcentrated liquid product extracted from ripe fruit and may contain portions of the pulp and other cellular matter natural to the fruit. FPO specifices that percentage of fruit juice in the final product should not be less than 85% and total soluble solids in the final product by weight should not be less than 10%.

2.192 Other beverages under FPO mentioned as ready-to-serve fruit beverages including aerated water containing fruit juice or pulps, should have a good flavour and be free from objectionable taints and flavours and show no sign of fermentation. FPO specifices that minimum percentage of fruit juice in the final product i.e. ready-to-serve beverages should be 10% and minimum percentage of total soluble solids in the final product (by weight) should be 10%.

2.193 Carbonated water, Sherbat, Fruit drinks and fruit nectar, flavoured milk and lassi are some of examples of ready-to-serve beverages.

2.194 Like soft drinks, the fruit juice and other beverages manufacturing industries are issued license under FPO, 1955 and their quality is enforced through PFA Act, 1954.

2.195 Besides minimum sanitary and hygienic requirements other conditions required for grant of licence under FPO is that water should be potable. BIS has formulated standards for fruit juice, alcoholic and non-alcoholic beverages which are voluntary in nature.

2.196 As already commented earlier Draft Notification No. GSR 685 dated 26.8.03 issued by the Ministry of Health & Family Welfare as a sequel to the detection of pesticides residues in soft drink samples, besides soft drinks prescribes pesticide limit for fruit juice and other beverages also. The Committee are unable to understand the logic behind clubbing of fruit juice and other beverages with soft drinks.

2.197 Fruit juices are multi-component systems where water is an ingredient but not the main ingredient. Ready-to-serve beverages are mainly derived from agriculture products like fruit, tea, coffee, milk for which MRLs for pesticides prescribed in PFA are many times higher. The technology like reverse osmosis, micro filtration, ozonation etc. which are used for purifying water cannot be used for fruit juice, milk and milk products . Further more, water in fruit juices derive essentially from the fruits and raw horticulture and plantation produce which identifies with the fruit juice. Under PFA 1954, MRLs of pesticide in fruit and vegetable products, which are the raw material for preparation of fruit juice, vary from 0.1-30.0 mg/kg. The Committee have been informed by the representatives of Ministry of Food Processing Industries, All India Food Processors Association, that it is not technologically feasible to bring down the present level of pesticide residue in fruit and vegetable to 0.0001 ppm as stipulated in draft notification. The Committee are surprised with the argument advanced by the Ministry of Health and Family Welfare that in the process of washing, peeling, cutting and extraction of juice pesticide residues are removed. The above statement of the Ministry of Health & Family Welfare is completely vague and illogical and not based on any scientific assessment. It does not indicate as up to what level the pesticides are removed by the above process. It seems the Ministry of Health & Family Welfare is merely concerned with laying of standards without scientifically assessing as to whether they can be achieved to the desired levels and enforced properly.

2.198 It seems, it is only after Committee's repetitive query to the Ministry of Health and Family Welfare about the rationale of clubbing fruit juice and other beverages with soft drinks that the wisdom seems to have dawned upon the Ministry of Health & Family Welfare as they have now stated in their latest reply that tea and coffee based drinks are not likely to meet the requirements for pesticide residues for packaged drinking water. They had also asked the Bureau of Indian Standards which is in the process of revising standards (IS2346:1992) for carbonated beverages *vide* their letter No. P.15021/8/2003-PH(Food) dated 31.12.2003 to make it more broad based and not to include products containing fruit and vegetable juices in the revised standards. This letter has however, been withdrawn recently according to Ministry as it was not approved at the appropriate level in the Ministry.

2.199 Secretary, Ministry of Food Processing Industries, representatives of All India Food Processors Association and others have drawn the attention of the Committee towards non-availability of any technology in the world to reduce pesticide residues to the level of 0.0001ppm from the present levels in fruits and vegetables. The representatives of Ministry of Food Processing Industry in the 49th meeting of CCFS held on 26th Sept., 2003, have also raised objections on laying down of standards for processed food and vegetable products under PFA which, as alleged by them, were not even properly reflected in the minutes of the meeting.

2.200 Fruit juice and other ready-to-serve beverages have nutritional value. Even if some technology is developed to clean them from the pesticide residues, the Committee are not sure whether the nutritional value of the raw products used for extracting juices will be ultimately retained in the fruit juice as well.

2.201 Soft drinks market is dominated by two global giants with access to state-of-the-art technologies and techniques and thus would be expected to show the way to better food safety. Fruit juices and beverages are primarily in the small and medium sectors and are labour

intensive. There are millions of fruit and vegetable farmers who provide the raw materials and thus constitute a principal support base to the fruit juices and beverages units. Given the current levels of pesticide residues allowed in raw fruits and vegetables, and given the socio-economic ground realities, the fruit juices and beverages industry needs to be treated differently compared to the carbonated water sector. The same standards cannot apply to them equally. Pesticide residues in food are a phenomena related to agricultural practices as they enter the soil and plant systems and work their way into the food chain. It is not a manufacture related issue and, therefore, it will not be fair or proper to apply the carbonated water and packaged water (pesticide) residue levels to the fruits and vegetable juices and such beverages.

2.202 The Committee, therefore, recommend that standards notified under draft notification for pesticide residue should not be made applicable for fruit juice and other beverages.

2.203 The Committee note that Ministry of Food Processing Industries have sent samples of fruit and vegetable juice and beverages to CFTRI, Mysore for testing the presence of pesticide residue and also asked National Institute of Nutrition, Hyderabad to assess the daily intake and safe limits of these products.

2.204 The Committee desire that on the basis of test results of CFTRI, Mysore and assessment from National Institute of Nutrition, Hyderabad, steps may be taken in consultation with CCFS for fixing residue limits of pesticide residue in fruit juice and beverages based on consumption pattern and safe limits (ADI).

2.205 The Committee also recommend that institutions like ICMR, National Institute of Nutrition, CFTRI etc. should evolve database taking into account our food habits with regard to consumption of processed and non-processed food, level of contaminants, and pesticides in these food products, their conformity with acceptable daily intake, usage of pesticide in agriculture and public health programme and based on their database. Standards for fruit juice and other beverages may be fixed after due deliberations in CCFS. Incidentally, European Directive (97/41/EC) provides for a system to set MRLs in processed products and composite foodstuffs, based on the MRLs fixed for raw agricultural products. Such guidelines may also be consulted.

2.206 The Committee note that Indian consignments of food products being exported from India have many a time been rejected merely on account of defective packaging. Due to high cost of packaging, food processing industries, which are mainly in the small scale sector, have not been able to adopt state-of-the-art technology. In view of stringent norms for packaging of export products and the inability of our food processing units to adopt state-of-the-art technology for packaging, the Committee recommend that Public Sector Undertakings like Hindustan Machine Tools etc. may be asked to make available cost effective packaging technology for the food products being exported by food processors in small scale units.

2.207 The Committee note that fruit products advisory Committee of the Ministry of Food Processing Industries has proposed amendments to Fruit Products Order, 1955, which, as stated by them are being vetted by the Ministry of Law and Justice. From the details of amendments, the Committee find that they mostly pertain to labeling, microbiological requirements, methods of analysis, sampling defects and contaminants. No mention of pesticide residue in food products and legal definition of potable water has been made in the proposed amendments. In view of the need for setting of pesticide residue limit in fruits, vegetables and other food products on a scientific basis and setting quality standards for potable water, the Committee desire that necessary provisions for defining potable water and setting of pesticide residue limits in fruits, vegetables/juices may also be incorporated in the proposed amendments, in consultation with CCFS.

CHAPTER III

PESTICIDES AND GOOD AGRICULTURE PRACTICES

PESTICIDES REGULATIONS

3.1 Pesticides regulations are governed in India under following Acts/Rules:

1. The Insecticides Act, 1968 and Rules, 1971
2. The Environment (Protection) Act, 1986
3. Hazardous Waste (Management & Handling) Rules, 1989
4. Water (Prevention & Control of Pollution) Act, 1974
5. Air (Prevention & Control of Pollution) Act, 1981
6. Prevention of Food Adulteration Act, 1954
7. The Factories Act, 1948
8. Bureau of Indian Standards Act

3.2 The Committee have been informed that pesticides Consumption in some of the major countries, is as follows:

USA	:	7.0 Kg/ha
Europe	:	2.5 Kg/ha
Taiwan	:	17 Kg/ha
Japan	:	12 Kg/ha
Korea	:	6.6 Kg/ha
India	:	0.5 Kg/ha

3.3 From the above it is noted that in India pesticide consumption is far less *vis-a-vis* other countries. However, we have the problem of pesticide residue in food products which mainly percolate from fruit and agriculture crops wherein pesticides are used to kill pests. Giving reasons for more pesticide residue in food products in India *vis-a-vis* other countries, representative of CSE during her evidence before the Committee stated that other countries were using degradable pesticides. Pesticides used by them are not persistent. However in India due to more use of persistent pesticide, their residues remain in food products.

3.4 Due to problem of persistence of pesticide residues in food and agricultural products, as also lack of awareness on the part of farmers with regard to judicious use of pesticides, the Committee called for detailed information from the Ministry of Agriculture, Central Insecticides

Board and Registration Committee, which are the Government agencies entrusted with the task of registration, regulation and usage of pesticides in the country. Their representatives were also called before the Committee to tender their oral evidence on the subject.

3.5 As per a note furnished to the Committee by the Ministry of Agriculture pesticides mainly enter into food products due to following reasons:

(i) Indiscriminate use of chemical pesticides

(ii) Non-observance of prescribed waiting periods

(iii) Use of sub-standard pesticides

(iv) Wrong advice and supply of pesticides to the farmers by pesticide dealers

(v) Continuance of DDT and other uses of pesticides in Public Health Programmes

(vi) Effluents from pesticides manufacturing units

(vii) Wrong disposal of left over pesticides and cleaning of plant protection equipments

(viii) Pre-marketing pesticides

(ix) treatment of fruits and vegetables

USE AND REGULATION OF INSECTICIDES AND PESTICIDES

3.6 The Ministry of Agriculture regulates the manufacture, sale, import, export and use of pesticides through the 'Insecticides Act, 1968' and the rules framed thereunder. Central Insecticides Board (CIB) constituted under Section 4 of the Act advises Central and State Governments on technical matters. The Registration Committee (RC) constituted under Section 5 of the Act approves the use of pesticides and new formulations to tackle the pest problem in various crops. The monitoring of pesticides residue levels in food comes under the purview of Union Ministry of Health and Family Welfare.

INSECTICIDES ACT, 1968

3.7 The Insecticides Act, 1968 regulates import, manufacture, sale, transport and distribution and use of insecticide, with a view to prevent risk to human beings or animals and the matters connected therewith. This Act was passed by the Parliament in the Nineteenth year of Republic of India and came into force on 01.03.1971.

CENTRAL INSECTICIDES BOARD (CIB)

3.8 A Central Insecticide Board (CIB) has been constituted under Section 4 of the Insecticides Act, 1968 to advise Central Government and State Governments on technical matters *viz*.:

(i) Safety measures necessary to prevent risk to human beings or animals in manufacture, sale, storage, distribution and use;

(ii) Assess suitability for aerial application;

(iii) Specify shelf-life;

(iv) Advise residue tolerance limit and waiting period;

(v) Suggest colorization;

(vi) Recommend inclusion of chemicals/substances in the Schedule or insecticide;

(vii) Other functions incidental to these matters.

3.9 Director General of Health Services, Ministry of Health and Family Welfare is *ex-officio* Chairman of CIB. Board consists of 28 members, out of which 16 are *ex-officio* and 12 are nominated members.

REGISTRATION COMMITTEE (RC)

3.10 A Registration Committee (RC) has been constituted under Section 5 of the Insecticides Act, 1968 to register insecticides after scrutinizing formulae, verifying claims of efficacy and safety to human beings and animals, specify the precautions against poisoning and any other function incidental to these matters. To assess efficacy of the insecticides and their safety to human beings and animals, the RC has evolved exhaustive guidelines/data requirements which *inter-alia* includes residue in crops on which the insecticides are intended to be used. The onus lies with the importers/manufacturers to generate data relating to the insecticides for which registration are sought.

3.11 The Committee were informed that so far 181 pesticides have been registered for regular use in the country.

MRL

3.12 While the Registration Committee (RC) registers pesticides for their usage, their MRL in food and commodities are prescribed by the Ministry of Health and Family Welfare under PFA (Act), 1954 and rules framed thereunder. MRL is established taking into account the toxicological data of the pesticide as well as the trials on crops under good agricultural practices.

3.13 During evidence the Committee asked as to whether MRL for all the 181 pesticides that have been registered for regular use in the country have been fixed. In reply, a representative of the Ministry of Agriculture during his evidence before the Committee stated:—

> "When the Insecticides Act came into being, there were certain pesticides that were already in use and they were called 'deemed to be registered' pesticides. The basic problem relates to deemed to be registered pesticides where data has not yet been fully given by the industry."

3.14 On fixing of MRLs, DGHS during his evidence stated:

> "Sir, for 71 pesticides, tolerance limits have already been notified under PFA. For 50 pesticides, they are already finalised and the draft notification has been issued by the Ministry of Health and Family Welfare. So, it makes 121. Then, there are 27 pesticides which do not require fixation of tolerance limits. 32 pesticides are still left where tolerance limits are to be fixed, of which, for 24 pesticides, data has been submitted to the Ministry of Health and for 8 pesticides, it was suggested by Department of Agriculture and Cooperation that the CODEX norms may be accepted for the time being because the data is not available and it is being collected. This gives the complete picture of the pesticides about MRL fixation.
>
> Sir, therefore at present, only 32 pesticides are there for which MRLs have to be fixed. Data for 24 pesticides has been submitted and they mostly relate to deem to be registered pesticides."

3.15 Asked further to give the reasons for not fixing MRLs for all the 181 pesticides registered for regular use in the country, DGHS stated as under:

> "Sir, 27 pesticides do not have to have MRLs. Out of total 181 pesticides, I have mentioned the status of 121 pesticides. Seventy-one pesticides have been notified. For 50 pesticides, action has already been completed and time for submission of comments on notification is over. Only two objections have been received. Out of rest 62, 27 pesticides do not require to have MRLs and rest are only 35. Sir, I may also read the minutes of the meeting taken by Secretary (Agriculture), where Joint Secretary of Health Ministry was also there. They have decided and I may quote : "It has been further decided that the review of the MRLs for 71 pesticides may be undertaken at a later stage when MRLs for all the registered pesticides have been fixed." So, it is a continuous process."

3.16 Asked by the Committee as to whether any pesticide had been registered without fixing MRL, in reply, representative of the Ministry of Health and Family Welfare further stated:—

> "The Agriculture Secretary took a meeting in June, 2003 where the Joint Secretary of the Department of Health was also present. They analysed the laid down guidelines .... It was decided that henceforth unless the RC fixes a Maximum Residue Limit, they would not register the pesticide."

3.17 Expressing concern over registration of some of the pesticides without fixing MRLs, Committee asked as to what were the reasons for registering pesticides without fixing MRL, in reply, representative of the Ministry of Health and Family Welfare stated:—

> "Sir, now we have said that the Registration Committee will not register it. It was clarified that the registration should be approved—after MRL has been calculated and finalised—by the Registration Committee. This is the decision that was arrived at in the meeting taken by the Secretary, Agriculture."

3.18 When the Committee asked as to whether amendment in the Insecticides Act, 1968 was required to further strengthen it so that no pesticide is registered by notification or rule but only by law, in reply, representative of the Ministry of Agriculture stated:—

> ".... Basically, we have already got powers with us."

3.19 Asked further as to why these powers were not used, the representative of the Ministry of Agriculture stated:

> "Sir, once this issue of MRL came up, we have fixed some guidelines for this. But if you feel that it should be strengthened by law, then it can be amended."

3.20 In a subsequent note furnished to the Committee, the Ministry of Agriculture stated that proposals for Amendments to the Insecticides Act, 1968 were being finalised. Some of the main amendments proposed to the Act were stated to be as under:

> "1. Misbranded pesticides in the existing Act are being reclassified as misbranded, substandard and spurious.
>
> 2. Increasing the punishment and making graded punishment commensurate with the gravity of offence.

3. BIS certification being made mandatory condition for grant of final certificate of registration of the product.

4. Provision for cancellation/suspension of Registration Certificates by Registration Committee.

5. Provision of qualified person to be kept at distribution/retail points.

6. Exempting the retailers from the requirement of licence for sale of household insecticides.

The basic purpose behind these proposals is to ensure stringent punishment for offenders under the Act and that farmers in the country get quality pesticides."

DEEMED PESTICIDES

3.21 Asked as to why MRLs of deemed pesticides has not been fixed so far, representative of Ministry of Agriculture stated:

"I have said earlier that in 1968, actually, the Act came into being. In 1971 we have started registration. Prior to that, already there were some pesticides being used in the country. So, that is why, they were given what is called the deemed registration status. I think, the data, probably, at that time was not complete. Many of them are already phased out. We would like to actually verify which one is still existing or being widely used."

3.22 Asked to explain the reasons for not mentioning waiting period in case of deemed pesticides, the Ministry of Agriculture in their note stated:

"Presently 181 pesticides stand approved for use in the country. Out of these 71 pesticides belonging to deemed registered category are used in the country. Waiting periods for some pesticides are not mentioned on the leaflets due to non-availability of data on residues on the crops against which the products are approved. To overcome the gaps, the Registration Committee has constituted an Expert Group to examine total data available with the pesticide industry and the Registration Committee Secretariat to recommend the waiting period. Report of the Expert Group is awaited."

BANNED PESTICIDES

3.23 The Committee asked about the use of banned pesticides and the extent of their usage, in reply, the representative of the Ministry of Agriculture stated:

"We have to get the information about it. This information probably we have to collect from the States."

3.24 Pointing out that residues of certain pesticides like DDT, Lindane, which are totally banned for use in agriculture programmes and permitted for restricted use in health programme only, were being found in food and vegetables products, the Committee asked the reasons for the same. In reply, a representative of the Ministry of Agriculture stated:

"Sir, DDT and BHC are both banned. There is an order that mentions that only 10,000 metric tonnes of DDT are to be permitted under the malaria programme.

In the past two years or three years only 3,000 metric tonnes to 5,000 metric tonnes have really been used under the malaria programme. So, that is the reason for the pesticide residue being found in the samples. The Health Ministry is administering it, but ultimately the health departments of the State Government have to implement it. We cannot really rule out whether any pesticide from the health programmes might be getting leaked for use in agriculture though we have no proof of it."

3.25 Elaborating further on causes of presence of pesticides being used in health programmes, in food items and steps taken for their judicious usage, DGHS during evidence stated:

"BHC is banned for public health use. If there is some residue which is detected in the food, it obviously means that it has not decayed and it is persisting. Regarding DDT, its use in public health is permitted by the WHO. It is the cheapest insecticide for public health problems. In the early 1950s, malarial deaths used to be almost a million in the country. Then, drastically, it came down to near zero during 1965. In spite of the population becoming triple, the number of cases reported is only two million as of now. CoS has mandated that the use could be up to 10,000 metric tonnes. There is a Committee under the Health Secretary's Chairmanship which, every year, gives a mandate. It has always been less than 10,000; it may be around 8,000 or 6,000. Every year, they assess the situation and they decide. There are certain guidelines, I will just read it out.

'That the residual spraying for malaria is done strictly for indoors. The spraying is confined to inner walls with fixed doses. The spraymen are trained to apply correct doses without allowing any slippage, and the equipment delivering the spray are also properly calibrated. The insecticide is never directed against any water body. It stays on the walls for 12 weeks. Due to rains and sunlight, it is supposed to disappear very quickly.'

These are the guidelines for DDT use in public health and it is being monitored by a Committee under the Chairmanship of the Secretary (Health) on a year to year basis."

3.26 The Committee pointed out that in Kasargod area in Kerala, certain pesticides were being used indiscriminately which had caused a lot of health problems to the habitants of that area, leading to public agitation also the Committee asked as to what steps had been taken to stop indiscriminate/injudicious use of pesticides. In reply, DGHS during evidence stated:

"We have reviewed and made a study of the entire data. There were about three other pesticides which were commonly used in that area. This was the first point we have noted.

The second thing is that this was happening and whatever health related thing was projected was only from one place although the use of Endo-Sulphan is there in many other plantation (PCK) areas. The health record also says that whatever deficiencies they have pointed out being due to Endo-Sulphan is not correct and we are looking into it."

3.27 The representatives of Ministry of Agriculture further elaborated on the issue of use of Endo-Sulphan in Kasargod, Kerala as under:

"Sir, first of all I would like to inform the august Committee here that the Registration Committee mentioned by my colleague had appointed an expert committee to look into this report and that committee submitted its report to the Government (Department of Agriculture and Cooperation). This Committee included scientists from ICAR, scientists

from All India Institute of Medical Sciences and scientists from other institutes. They submitted a report. They said that the problems of health were localised and opined that the said health problems did not bear any linkage with the use of Endo-sulphan. But still, taking precautions, the Government of India has ordered that Endo-sulphan will not be used in these PCK plantations in that area. Also, those blocks will observe a pesticide holiday for five years and in this period no kind of pesticide will be used in those villages. This is what we have decided and the decision of Government of India has been communicated to the Government of Kerala.

The aerial spraying of any pesticide is not allowed generally... Government of India specifically gives permission for undertaking aerial spraying. We have also taken a decision that henceforth aerial spraying of Endo-sulphan will be totally banned. Nobody will henceforth be allowed to undertake any kind of aerial spraying of Endo-sulphan. These are the three major decisions that we have already taken. We have communicated these decisions to the Government of Kerala. The matter is still in the High Court, which had earlier banned the use of Endo-sulphan pending a decision by the Government of India on the Report of Expert Group."

GOOD AGRICULTURAL PRACTICES

3.28 Asked to indicate the efforts being made by the Ministry of Agriculture to educate farmers for judiciously using the pesticides and adopting good agricultural practices, a representative of the Ministry of Agriculture during his evidence before the Committee stated:

"We have already taken some steps to minimise pesticides residues. We are strictly enforcing the provisions of Insecticides Act, 1968 and we have also started educating farmers about ill effects of pesticides, need-based use of chemical pesticides, use of recommended dosage, correct application techniques, observance of prescribed waiting period, practices of Integrated Pest Management (IPM) and benefits of organic farming.

Integrated Pest Management is an eco-friendly approach for pest management encompassing cultural, mechanical, biological methods and need-based use of chemical pesticides with preference to use of biopesticides, biocontrol agents and indigenous innovation potential.

Now, I would like to highlight on Government of India's efforts on Integrated Pest Management. Since the 8th Plan, we have established 26 Central IPM centres. Six new Centres are being planned in six States during the Tenth Plan. Farmer's Field Schools are being conducted. Season Long Training in major crops is being undertaken for master trainers. Grant-in-aid is provided to State Governments for establishment of State Bio-control Laboratories. Twenty-nine such laboratories have been established. We are also undertaking awareness campaign through public media. Government of India has also prepared IPM packages. Fifty one crops have been covered so far with the help of ICAR. We have sent these packages to all the State Governments for implementation.

In short, the impact of IPM in two decades has been the reduction in consumption of chemical pesticides from 65,462 MT during 1994-95. It has come down to 47, 020 MT during 2001-02. Similarly, there has been an increase in use of bio-pesticides from 219 MT during 1996-97 to 902 MT during 2001-02.

Pesticides consumption has been substantially reduced in rice and cotton which are main pesticide-consuming crops. But pesticides sustain food production and control vector borne diseases. Hence, the pesticides are social need. IPM cannot entirely replace the use of pesticides. Therefore, the Ministry of Agriculture through ICAR started an All-India Coordinated Research Project on Pesticide Residues way back in 1984-85.

The aims of the project were to develop protocols for safe use of pesticides by recommending "good agricultural practices" based on multinational "supervised field trials"; to recommend waiting period/pre-harvest interval so that the residues in the food commodities remain well within the prescribed safe limits; and monitoring of pesticide residues in agricultural produce."

3.29 The Committee asked further as to whether the Ministry of Agriculture had initiated any national monitoring programmes to regulate the proper usage of pesticides. In reply, a representative of the Ministry of Agriculture stated:

"We have a network of residual management particularly in the raw part, not in water or in the process. But from agriculture point of view, we have a very huge programme, an All India Coordinated Residual Management Programme. I think, the network is already existing there."

USE OF BIOPESTICIDES

3.30 As per a note furnished to the Committee consumption of biopesticide out of total consumption of pesticides in India during the last three years was as under:

	Pesticide in MTs	Biopesticide	% of biopesticide
1990-00	46,195	874	1.89%
2000-01	43,584	683	1.56%
2001-02	47,929	902	1.88%

3.31 Noting that biopesticide formed only a meagre percentage of total pesticides used in the country, the Committee asked as to what further steps were being taken to encourage use of bio-pesticides. In reply, Ministry of Agriculture in their note furnished to the Committee stated:

"The concerted efforts at the central and state level to popularize IPM approach among the farmers has created significant awareness in favour of biopesticides/bioagents. Moreover, the IPM is an inherent and important component of various schemes *viz*., Technology Mission on Cotton (TMC), Technology Mission on Oilseeds and Pulses (TMOP), Technology Mission on Integrated Horticultural Development for NE, J & K, Himachal Pradesh, Uttaranchal, Technology Mission on Coconut Development etc. besides the scheme "Strengthening and Modernisation of Pest Management" approach in India being implemented by the Directorate of PPQ&S, DAC. The steps taken to encourage the use of biopesticides/bioagents are summarized as under:

(i) The guidelines for registration of biopesticides have been simplified.

(ii) Farmers, local entrepreneurs, NGOs have been encouraged for production of the same with assistance of ICAR (KVK) and Department of Biotechnology (DBT).

(iii) Central assistance as grants-in-aid provided to PDBC (ICAR) for research, development and production of biocontrol agents.

(iv) Grants-in-aid provided to the States/UTs for infrastructural development for production of biocontrol agents and biopesticides by establishing SBCLs.

(v) The Farmer's Field Schools (FFSs), training-cum-demonstration are playing major role in the promotion and popularization of biopesticides and biocontrol agents among the users.

(vi) Commercialization of biopesticides is allowed during the validity of provisional registration for 2 years which is also extendable for another 2 years when the applicants have made efforts to generate data to obtain regular registration under Section 9(3).

(vii) The Government is also promoting organic farming in the country which emphasises enhanced use of bio-fertilizers and biopesticides, besides advocating greater use of organic manures, compost and vermi compost as substitutes for chemical pesticides and fertilizers."

3.32 Giving details of steps being taken by the Ministry of Agriculture to promote organic farming and reduce conventional farming methods, the Ministry further stated in their note:

"To safeguard against ill-effects of indiscriminate use of chemical fertilizers and pesticides the Government has envisaged two major initiatives, first being organic farming through Integrated Nutrient Management and the other being the Integrated Pest Management Approach.

For promotion of organic farming, the Government has taken the following initiatives:

(i) A Centrally sponsored scheme on 'Balanced and integrated use of fertilizers' was formulated in the 8th Plan and continued in the 9th Plan under which 21 compost production plants were established in different States during 1993-1998. Further assistance was given to various State Governments for setting up of 9 mechanized compost plants for increasing production of organic nutrients. The said scheme has now been subsumed in the Macro Management Scheme since October, 2000.

(ii) A National Project on Development and Use of bio-fertilizers has been established with a view to enhance production and distribution of bio-fertilizers, quality control of bio-fertilizers and propagation of the use of bio-fertilizers through demonstrations and farmer fairs. Under this scheme Government has assisted 83 units with a amount of Rs. 11.07 crores. As a result, there are 122 bio-fertilizers production units in the country with annual production capacity of 18,500 metric tonnes. The estimated production is 10,000 metric tonnes.

(iii) The Ministry of Agriculture had constituted a task force on organic farming to suggest measures to promote organic farming in the country in the year 2000. Most of the recommendations of the task force have been accepted and as a result the Department of Agriculture and Cooperation has formulated a National Project on Organic Farming with an outlay of Rs. 99.58 crores, the main components of which includes setting up of a National Institute of Organic Farming, capacity building for promotion of organic farming, support to commercial compost production units, training programmes and field demonstrations as well as market development.

(iv) Apart from the above initiatives, the Ministry of Commerce, Government of India has launched the National Programme for Organic Production (NPOP) and also notified accreditation agencies in the country apart from setting up of National Standards, Accreditation Criteria, Certification/Inspection Procedure and the Organic Logo. The above initiatives have been taken by the Ministry of Commerce to promote production and export of organic products."

PERSISTENT AND HAZARDOUS PESTICIDES

3.33 Asked as to whether any regular monitoring programme to phase out pesticides which are persistent and hazardous had been started. In reply, Ministry of Agriculture in a note furnished to Committee stated:—

> "The persistent and hazardous pesticides are phased out by the Government after their use and ill effects associated therewith are reviewed by the Expert Committee duly constituted for the purpose."

3.34 Pointing out that present efforts for inculcating the habit of judicious use of pesticides, and preventing the use of banned/restricted pesticides for agricultural purposes was not delivering the desired results, the Committee asked as to what further efforts were being contemplated by the Ministry. In reply, a representative of the Ministry of Agriculture stated as under:

> "This is done through either Doordarshan or Radio campaigns in regional languages. We are now taking up organic farming also on a very large scale. Basically we are also targeting the farmer. Once we left everything to the farmers. But he has to be educated. Sometimes, he finds that it is a very effective way and he would like to have one or two sprays more. To check on such things is very difficult. Even for the State Departments of Agriculture, which are monitoring this, it is very difficult to check it. Therefore, we are trying to educate."

PESTICIDE RESIDUES IN IMPORTED FOOD PRODUCTS

3.35 During evidence Committee asked about the mechanism for testing and monitoring the quality of imported food products. In reply, a representative of the Ministry of Agriculture stated:

> "Any agricultural produce, plant and plant material coming into the country is tested for presence of pests/diseases in our quarantine stations. We have 29 quarantine stations already established."

3.36 When the Committee pointed out that above checks were done for biological reasons, the representative of the Ministry of Agriculture stated:

> "For residues there is nothing, Sir."

3.37 The Committee pointed out that grapes being exported by farmers from our country were being rejected due to high pesticide residues and asked what were the proposals for setting up residue checking labs for the benefit of farmers in grape growing area. In reply, a representative of the Ministry of Agriculture stated:

> "We already have labs but they are not enough now..."

3.38 The Committee were informed that a farmer has to pay Rs. 4,000 to Rs. 5,000 to get pesticide residues checked in his products from Government labs.

3.39 During their deposition before the Committee representative of CSE informed that a lot of Tea consignments exported to Germany and Europe were being rejected. Giving reasons for rejection of tea consignment, representative of CSE stated:

> "One of the key issues for the rejection of the tea consignments was that pesticides that we detected in the tea, say, in Germany, there were no MRLs set for those pesticides in India even. Therefore, what Germans very clearly said that these are illegal even in your law, which is why, if you look at all the discussions that are taking place in the Tea Board today who are really working to define what is allowed in tea. Therefore , it is not how much is allowed, but also what is allowed and then educating the farmers to say only this is allowed."

CONCLUSIONS/RECOMMENDATIONS

3.40 The health and environmental problems arising from pesticide use in developing countries have received wide spread recognition. The Food and Agriculture Organisation (FAO) of United Nations has adopted the International Code of Conduct on the Distribution and Use of Pesticides (the FAO Code) to address the issues. The earlier code has been amended to include a section on Prior Informed Consent (PIC) to enable governments to prohibit imports of certain hazardous pesticides. Many of the organochlorine pesticides are included in the Persistent Organic Pollutant (POP) category and are to be phased out gradually.

3.41 Pesticides sustain food production and control vector born diseases. They are vital for crop production and instrumental in continuous increase in food production. The consumption of pesticide in India is one of the lowest in the world. India uses a low amount of 0.5 kg/hectare pesticide compared to 7.0 kg/hectare by USA, 2.5 kg/hectare by Europe, 12 kg/hectare by Japan and 6.6 kg/hectare by Korea. However, despite the low consumption of pesticides, India has more problem of pesticide residues *vis-a-vis* other countries and these have entered into food products and underground water because of non-prescribed use of chemical pesticides, wrong advice and supply of pesticides to farmers by vested interests, non observance of prescribed waiting period, pre-marketing pesticide treatments during storage and transport, use of sub-standard pesticides, effluents from pesticide manufacturing units, continued use of persistent pesticides for public health programmes; lack of awareness and lack of aggressive educational programmes for farmers/consumers.

3.42 Ministry of Agriculture regulates the manufacture, sale, import, export and use of pesticides through the 'Insecticide Act, 1968' and the rules framed thereunder. Central Insecticide Board (CIB) constituted under Section 4 of the Act advises Central and State Government on technical matters. The Registration Committee (RC) constituted under Section 5 of the Act approves the use of pesticides and new formulations to tackle the pest problem in various crops. The monitoring of pesticide residues levels in food comes under the purview of Union Ministry of Health and Family Welfare.

3.43 While the Registration Committee (RC) registers pesticides for their usage, the MRLs in food commodities are prescribed by Ministry of Health and Family Welfare under the PFA (Act), 1954 and rules framed thereunder. The maximum residue limit (MRL) for pesticide is the maximum concentration of a residue (expressed in mg per kg) which is legally permitted in food commodities. MRL is established taking into account the toxicological data of the pesticide as well as that of the residues on crops under Good Agricultural Practices (GAP).

3.44 At present 181 pesticides are registered in the country. The Committee, note with dismay that out of 181 pesticides, MRLs for 71 pesticides only have been fixed under the PFA Act, 1954.

3.45 Out of these thirty-two pesticides are still left for which MRL is yet to be fixed. Of these 32 pesticides, registration data for 24 pesticide is stated to have already been submitted by the Registration Committee to the Ministry of Health & Family Welfare. The Committee desire that MRLs for these 24 pesticides may be fixed without any further delay. As regards 8 pesticides, the Committee take serious note that no data is available and therefore CODEX norms are being adopted for the time being. The Committee, therefore, desire that the Registration Committee should call for the data from manufacturers in due course of time and furnish the same to Ministry of Health & Family Welfare so that MRLs for these can also be fixed without further delay.

3.46 The Committee were anguished to note that pesticides were being registered by the Registration Committee even when no MRLs had been fixed. It is only after the CSE came out with their report on presence of certain pesticides in the bottled water in the month of February, 2003, that a decision was taken by the Ministry of Agriculture in the meeting chaired by Secretary, Agriculture in June 2003 to discontinue this practice. The Committee desire that this should now be strictly enforced. In order to rule out any possibility of registering the pesticide by way of notification/rule, the Committee recommend that Insecticide Act 1968 should be suitably amended by inserting a suitable clause in this regard.

3.47 The Committee also desire that a review of existing MRLs of the pesticides may be made at regular intervals, in the light of scientific developments and revision of ADI, if any. There is scope to exceed acceptable daily intake (ADI) if high MRLs have been set because ADI is a safety milestone and should not be allowed to be breached and the basic purpose of setting realistic MRLs is to ensure that we remain well within allocated ADI for that pesticide.

3.48 The pesticides which were being used before 1971 *i.e.* prior to coming into force of the Insecticide Act, 1968 and rules 1971 were included as "deemed as registered pesticides". The Committee note that many of the MRLs of the "deemed registered pesticides" have not been fixed so far. The reasons given by the Ministry of Agriculture, for not fixing MRLs for deemed pesticides, that at that time, their usage data was not complete, is not convincing as the Committee feel that even if this data at that time was not complete or available, Registration Committee should have asked the manufacturers of these pesticides to supply the data and fix their MRLs. Though many of the deemed pesticides are already phased out, the Committee desire that MRLs of deemed pesticides which are still in use may be fixed without any further delay.

3.49 The Committee note that waiting period for deemed pesticides are not mentioned on the leaflets due to non-availability of the residue data on the crops in which the products are applied. To overcome the gap, the Registration Committee has constituted an expert group to examine data available with the pesticide industry and the Registration Committee so as to recommend the waiting period. The Committee desire that in the light of recommendations of expert group regarding waiting period, steps may be taken to ensure that the same is invariably mentioned on the leaflets. Farmers should also be educated to observe the prescribed waiting period.

3.50 The Committee note that residues of certain pesticides like DDT, Lindane, which are totally banned for use in Agriculture and permitted for restricted use in health programmes only, have been found in food and vegetable products. Also due to aerial spray of Endosulphan in

Kasargod area in Kerala, the inhabitants suffered health problems. The Committee have been informed that use of Endosulphan has since been banned in that area.

3.51 The Committee also find that neither the Ministry of Agriculture nor Ministry of Health & Family Welfare have any data about the usage of banned pesticides in the States since inception. The Committee wonder as to how the Ministry of Agriculture which have made claims before the Committee towards Integrated Pest Control Programme are monitoring the very use of pesticides in the absence of such vital data. It does speak volumes about the apathetic attitude of the various functionaries. The Committee however desire that Ministry of Health and Family Welfare in coordination with the Ministry of Agriculture should impress upon the State Governments the imperative need of strictly adhering to the guidelines for usage of DDT, Lindane and other restricted pesticides for health programmes only. The farmers too need to be educated properly in this regard.

3.52 The Committee desire that strict punishment may be provided to the offenders who are found selling banned/restricted pesticides. It has been noted that steps have already been taken by the Ministry of Agriculture by making provision in the Insecticide Act, 1968. The Committee desire that proposal for the amendment to the Act may be expedited so that the farmers in the country get quality pesticides.

3.53 To educate the farmers about ill-effects of the pesticides, need-based use of chemical pesticides and correct application techniques, an integrated pest management programme has also been started by the Government. Integrated Pest Management (IPM) is an eco-friendly approach for pest management that encompasses cultural, mechanical, biological methods and need based use of chemical pesticides with preference to the use of bio-pesticides, bio-control agents and indigenous innovation potential. Ministry of Agriculture has established 26 Central IPM Centres during VIII plan in states and one UT. Six new IPM centres were established in 6 states during Xth Plan. These centres are supposed to conduct Farmers Field Schools (FFSs); Season Long Training (SLT) in major crops; provide grants for establishment of State Bio-Control Laboratories (SBCLs); undertake awareness campaign through public media and prepare and distribute IPM Packages of Practices.

3.54 The impact of IPM is reported to have presumably led to reduction in consumption of chemical pesticides from 65,462 MT during 1994-95 to 47,020 MT during 2001-02. There is a marginal increase in the trend towards use of bio-pesticides from 219 MT during 1996-97 to 902 MT during 2001-02.

3.55 As integrated pest management programme cannot replace the use of pesticides, the Ministry of Agriculture through ICAR has also started an All-India Coordinated Research Project on Pesticide Residues in 1984-85. This programme is aimed to develop protocols for safe use of pesticides by recommending good agricultural practices, based on multi-locational supervised field trials. It is supposed to advise on proper waiting period and pre-harvest intervals so that the residues in the food commodities remain well within the prescribed safe limits (MRLs). Another major thrust has been on monitoring pesticide residues in agricultural produce through 17 co-operative centres. As this programme is confined to monitoring of pesticide residues in raw agricultural produce only its impact has not been fully forthcoming.

3.56 No agency regularly monitors pesticide residues in market samples or undertakes diet basket surveys to assess actual exposure of consumers from pesticide residues in food or water and project health risk, if any. Such activity comes under the purview of Ministry of Health but

no comprehensive regular monitoring programme is being conducted in the country. The Committee feel that such monitoring of food commodities requires to be done extensively and on yearly basis.

3.57 The Committee desire that steps to encourage the use of bio-pesticide, production of bio-control agent and promoting organic farming etc. need to be taken more vigorously.

3.58 The Committee find that the presence of pesticide residues in some cases could have an effect on our exports. The major hurdle which an average farmer faces on this account is firstly that there are inadequate testing facilities which are presently available in the country and secondly the charges for the same are exorbitant ranging from Rs. 4000—Rs. 5000 per sample. The necessity and importance of setting up more laboratories have already been highlighted by the Committee elsewhere in the Report. The Committee however once again reiterate that the existing infrastructure of laboratories may further be strengthened and the services may be offered to the farmers at affordable rates.

ANNEXURE I

MINISTRY OF HEALTH AND FAMILY WELFARE
(Department of Health)

NOTIFICATION

New Delhi, the 26th August, 2003

G.S.R. 685(E).—The following draft of certain rules further to amend the Prevention of Food Adulteration Rules 1955, which the Central Government, without consultation of the Central Committee for Food Standards, proposed to make, in exercise of the powers conferred by the proviso to Sub-section (1) of section 23 of the Prevention of Food Adulteration Act, 1954, (37 of 1954), is hereby published as required by said Sub-section for the information of all persons likely to be affected thereby, and notice is hereby given that the draft rules will be taken into consideration on or after the expiry of a period of thirty days from the date on which copies of the Gazette of India in which this notification is published are made available to the public;

Objections or suggestions, if any may be addressed to the Secretary, Ministry of Health and Family Welfare Government of India, Nirman Bhavan, New Delhi-110011.

The objections and suggestions which may be received from any person with respect to the said draft rules before the expiry of the period so specified will be considered by the Central Government;

DRAFT RULES

(1) These rules may be called the Prevention of Food Adulteration (..... Amendment) Rules, 2003.

(2) They shall come into force on the day of their final publication in the Official Gazette.

2. In the Prevention of Food Adulteration Rules, 1955, in Appendix 'B', (hereinafter referred to as the said Rules)

(I) In rule 22, of the said rules, in the Table,—

(a) against serial number of 14 relating to carbonated water, in column 2 for the entries "600 ml", the entries "1000ml" shall be substituted.

(b) against serial number 27, relating to fruit juice/fruit drink/fruit squash, in column 2, for the entries "400ml" the entries "1000ml" shall be substituted.

(II) In rules 57, of the said rules, in sub rule 2, in the table,—

(a) against serial number 1 relating to lead, in columns 2 and 3, for item (i) and entries relating thereto, the following shall be substituted, namely,—

1	2	3
	Beverages	
	Carbonated water, Fruits and Vegetable juices. Fruit Syrup, Fruit Squash, Fruit beverages or fruit drink, Soft drinks concentrate (after dilution as per declaration), Ready to serve beverages of any kind	0.01

(b) against serial number 2 relating to copper,—

(i) in columns 2 and 3, for item (i) and entries relating thereto, the following shall be substituted, namely,—

1	2	3
	(i) Beverages Carbonated water, Fruits and Vegetable juices. Fruit Syrup, Fruit Squash, Fruit beverages or fruit drink, Soft drinks concentrate (after dilution as per declaration), Ready to serve beverages of any kind,	0.05
	Pulp and Pulp products of any fruit	5.0
	Toddy	5.0

(ii) in columns 2 and 3 item (ii-b) and entries relating thereto shall be omitted.

(c) against serial number 3 arsenic,—

(i) in columns 2 and 3, for item (ii) and entries relating thereto, the following shall be substituted, namely,—

1	2	3
	Beverages Carbonated water, Fruits and Vegetable juices. Fruit Syrup, Fruit Squash, Fruit beverages or fruit drink, Soft drinks concentrate (after dilution as per declaration), Ready to serve beverages of any kind,	0.05
	Pulp and Pulp products of any fruit	0.2

(ii) in columns 2 and 3, the item (ii-c) and entries relating thereto shall be omitted.

(d) against serial number 4 relating to tin in columns 2 and 3, for item (i-aa) and entries relating thereto, the following shall be substituted, namely,—

1	2	3
	(i-aa) Beverages Carbonated water, Fruits and Vegetable juices. Fruit Syrup, Fruit Squash, Fruit beverages or fruit drink, Soft drinks concentrate (after dilution as per declaration), Ready to serve beverages of any kind,	250
	Jam, Jellies and Marmalades, Pulp and products of any fruit.	250

(e) against serial number 5 relating to zinc, in columns 2 and 3,—

(a) for item (i) and entries relating thereto, the following shall be substituted, namely,—

1	2	3
	(i) Beverages	
	Carbonated water, Fruits and Vegetable juices. Fruit Syrup, Fruit Squash, Fruit beverages or fruit drink, Soft drinks concentrate (after dilution as per declaration), Ready to serve beverages of any kind,	5.0
	Pulp and products of any fruit.	5.0
	Other fruits and vegetables products	50.0

(b) item (iii) and entries relating thereto shall be omitted.

(f) against serial number 6 relating to cadmium, in columns 2 and 3 after item (ii) and entries relating thereto, the following shall be inserted, namely,—

1	2	3
	(ii-a) Beverages	
	Carbonated water, Fruits and Vegetable juices. Fruit Syrup, Fruit Squash, Fruit beverages or fruit drink, Soft drinks concentrate (after dilution as per declaration), Ready to serve beverages of any kind,	0.01

(g) against serial number 7 relating to mercury in columns 2 and 3 for the existing entries, the following shall be substituted, namely,—

1	2	3
	(i) Fish	0.5
	(ii) Beverages	
	Carbonated water, Fruits and Vegetable juices. Fruit Syrup, Fruit Squash, Fruit beverages or fruit drink, Soft drinks concentrate (after dilution as perdeclaration), Ready to serve beverages of any kind,	0.001
	(iii) Other foods	1.0

(h) against serial number 9 relating to Chromium in columns 2 and 3, for the existing entries, the following shall be substituted, namely,—

1	2	3
	(i) Refined Sugar	0.02
	(ii) Beverages	
	Carbonated water, Fruits and Vegetable juices. Fruit Syrup, Fruit Squash, Fruit beverages or fruit drink, Soft drinks concentrate (after dilution as per declaration), Ready to serve beverages of any kind,	0.05

(i) against serial number 10 relating to Nickel in columns 2 and 3, the following shall be added in the end, namely,—

1	2	3
	Beverages	
	Carbonated water, Fruits and Vegetable juices. Fruit Syrup, Fruit Squash, Fruit beverages or fruit drink, Soft drinks concentrate (after dilution as per declaration), Ready to serve beverages of any kind,	0.02

(III) in rule, 65 of the said rules after the table under rule (2), the following shall be inserted, namely,—

"(3) the amount of insecticide residues in carbonated water, fruits and vegetable juices, fruit syrup, fruits quash, fruit beverage or fruit drink, soft drink concentrates (after dilution as per direction), and ready to serve beverages of any kind shall be as follows,—

(i) Pesticide residues considered individually	— Not more than 0.0001 mg/litre
	— (The analysis shall be conducted by using Internationally established test methods meeting the residue limits specified herein above).
(ii) Total pesticide residues	— Not more than 0.0005 mg/litre
	— (The analysis shall be conducted by using Internationally established test methods meeting the residues limits specified herein above)";

[No.P.15025/80/2003-PH (Food)]

DEEPAK GUPTA, Jt. Secy.

Note:—The Prevention of Food Adulteration Rules 1955 were published in Part II, Section 3 of Gazette of India *vide* S.R.O. 2106 dated the 12th September, 1955 and were last amended *vide* G.S.R. No. 554(E) dated 18.7.2003.

ANNEXURE II

REGD. NO. D.L.33004/99

THE GAZETTE OF INDIA
EXTRAORDINARY
PART II—SECTION 3—Sub-section (i)
PUBLISHED BY AUTHORITY

No. 469] New Delhi, Monday, September 29, 2003/Asvina 7, 1925

MINISTRY OF HEALTH AND FAMILY WELFARE
(Department of Health)

NOTIFICATION

New Delhi, the 29th September, 2003

G.S.R. 769(E).—In exercise of the powers conferred by the proviso to Sub-section (1) of Section 23 of the Prevention of Food Adulteration Act, 1954 (37 of 1954), the Central Government hereby makes the following amendment in the notification of the Government of India in the Ministry of Health and Family Welfare (Department of Health), number G.S.R. 685(E), dated the 26th August, 2003, published at pages 1 to 6 in Part II, Section 3, Sub-section (i) of the Gazette of India, Extraordinary, dated the 26th August, 2003, namely:—

In the said notification, in the opening paragraph, for the words "thirty days" the words "one hundred and twenty seven days", shall be substituted.

[F. No. P. 15025/80/2003 PH (Food)]

DEEPAK GUPTA, Jt. Secy.

Foot Note:— The principal notification was published *vide* G.S.R. 685(E) dated the 26th August, 2003.

ANNEXURE III

CENTRAL COMMITTEE FOR FOOD STANDARDS (CCFS)

The composition of the Central Committee for Food Standards (CCFS) is laid down under section 3 of the PFA Act, 1954.

The Committee consists of the following members:

(a) Director General of Health Services is *ex-officio* Chairman.

(b) There are 4 Central Food Laboratories functioning under the PFA Act 1954 at Kolkata, Ghaziabad, Mysore and Pune and their Directors are *ex-officio* members.

(c) Two experts to be nominated by the Central Government (MOHFW):

1. The Joint Secretary in charge of PFA Administration, MOHFW, and

2. The Director of the Central Food Technology Research Institute Mysore—are members by designation.

(d) One representative each from Department of Food, Agriculture, Commerce, Defence and Railways nominated by respective Ministry/Department the members by designations.

(e) One representative from each State nominated by respective State Government. The representative nominated by State Government are either Director Health Services or Director Food and Administration or Public Analyst are well qualified and experienced persons in food safety of the State Government. Their nominations are by designation.

(f) Two representatives nominated by Central Government (MOHFW) to represent Union Territories. Director PFA Department, NCT, Delhi and Commissioner Food and Drug Administration, Pondicherry are members of these two UTs by designation.

(g) One representative each by Central Government (MOHFW) to represent the Agricultural, Commercial and Industrial Interest.

The Chairman (processed food), APEDA, New Delhi, the Managing Director, NAFED, New Delhi and the Chairman, Confederation of Indian Industry, New Delhi are members of the committee to represent agricultural, commercial and industrial interest respectively. Their nomination is by designation.

(gg) Five representatives nominated by the Central Government (MOHFW) to represent the consumer interest, one of whom is from hotel industry.

The President, Federation of Hotel and Restaurant Association of India, New Delhi is representing hotel industry and Managing Trustee, Consumer Education & Research Centre,

Ahmedabad; President, Consumer, Guidance Society of India, Mumbai President, Voluntary Organisation in the interest of Consumer Education, New Delhi and the Chairman, National Sports Club of India (NSCI), New Delhi are representing consumer interest on the Committee. Their nomination is by designation.

(h) One representative of medical profession nominated by the Indian Council of Medical Research. The Director, National Institute of Nutrition, Hyderabad is nominated member on CCFS by designation.

(i) One representative nominated by Indian Standards Institution (now Bureau of Indian Standards) The Director (Agriculture and Food), Bureau of India Standards, New Delhi is the member on CCFS by designation.

There are no farmer's representatives as such on the committee however the representative of APEDA and NAFED are representing farmer's interest. The interests of small scale Food Company are being watched by CII, NAFED and APEDA. The composition of the sub-committees constituted by CCFS is at Annex. II. The members are mainly from CCFS. The other experts nominated on these sub-committees are from their respective fields.

The following Central Ministries are the members on the CCFS:

1. Department of Food
2. Ministry of Agriculture
3. Ministry of Commerce
4. Ministry of Defence
5. Ministry of Industry
6. Ministry of Railways
7. Ministry of Supply

Additionally, Ministry of Food Processing Industry and Agricultural Marketing Advisor to the Government of India are permanent invitees in the CCFS because these organisations deal with FPO and Agmark respectively and due to re-organisation of the Ministries these organisations are not covered in Section 3 of the PFA Act, 1954 at present.

All these Ministries and Departments are consulted along with other members of CCFS on all the proposals which are referred to the members of CCFS.

Technical sub-committees and technical groups constituted by CCFS are as under:—

1. Food Laws and Legal Advisory Sub-Committee
2. Label Sub-Committee
3. Food Additives Sub-Committee
4. Edible Oils and Fats Sub-Committee
5. Milk and Milk Products Sub-Committee
6. Pesticide Residues Sub-Committee

7. Analysts Sub-Committee
8. Group on Spices and Condiments
9. Group on Fruits and Vegetable Products
10. Group on Sugar and Confectionery
11. Group on Cereals, Pulses, and their products
12. Group on Packaged Drinking Water and Mineral Water

All the sub-committees and the Expert Groups adopt the same procedure while finalising/ setting the quality norms or safety standards under PFA Act, 1954.

ANNEXURE IV

WATER CHARGES PAID BY PEPSICO INDIA

Annexure to letter dt. 7.1.2004

Location	Source of Water		Charges Paid		Approving Authority	Regulatory requirement for approval
	Internal	External	Internal	External		
1	2	3	4	5	6	7
NORTH						
Bazpur	Borewell	Nil	√		Central Ground Water Authority Delhi	Central Ground Water Authority for sourcing ground water
Satharia	Borewell	Nil	√		Cess Department of UP Pollution Control Board	Approval is required for a new establishment to dig borewell.
Jainpur	Borewell	Nil	√		Pollution Control Board	an intimation is required to be sent to Pollution Control Board after digging the borewell.
SOUTH						
Madurai	Borewell	Local Supplier	√	√	Tamil Nadu Pollution Control Board	Tamil Nadu Pollution Control Board
Mamandur	Borewell	Local Supplier	√	√	Intimation to Pollution Control Board	Intimation to Pollution Control Board
Palakkad	Borewell	Local Supplier procured in 2002	√	√	Earlier it was Pollution Control Board. Now it is District Collector until Kerala Ground Water Authority is nominated	Earlier Pollution Control Board used to give approvals. Now District Collector does.
Neelamangla	Borewell	Local Supplier	NA	√	Not Applicable in Karnataka State	Pollution Control Board for effluent water discharge as per PCB regulations.
Kumbalgodu	Presently Borewell Not being used as water quality bad.	Local Supplier has borewell outside the plant.	Nil	√	Not Applicable in Karnataka State	Pollution Control Board for effluent water discharge as per PCB regulations.
WEST						
Bahruch	Nil	GIDC provided water	Nil	√	GIDC	As part of the lease deed, GIDC has to provide the water.
Naroda	Borewell	GIDC	√	√	GIDC	GIDC permission required for borewell.

1	2	3	4	5	6	7
Roha	Nil	MIDC	Nil	√	MIDC	MIDC permission is required.
Chembur	Nil	Municipal Water Supply	Nil	√	BMC	BMC
Aurangabad	Nil	MIDC	Nil	√	MIDC	Municipal Corporation License
Mahul	Nil	Municipal Water Supply	Nil	√	BMC	BMC
EAST						
Sonarpur	Tube Wells	Nil	Nil	√	Approval by Central Ground Water Board. Permission to install deep tube well by Municipality	Approval by Central Ground Water Board. Permission to install deep tube well by Municipality

ANNEXURE V

(1) Standards on Bottled Waters

(i) IS 13428:1998 Packaged natural mineral water.

(ii) IS 14543:1998 Packaged drinking water (other than natural mineral water)

(2) Standards on Non-Alcoholic Beverages

(i) IS 2346:1992 Carbonated beverages

(ii) IS 12544:1988 Non-alcoholic beer

(iii) IS 13019:1991 Soft drink concentrate [Earlier title on Non-alcoholic beverages bases (concentrate)] for domestic used.

(3) Standards on Alcoholic Beverages

(i) IS 3811:1988 Rum

(ii) IS 3865:2001 Beer

(iii) IS 4100:1988 Gin

(iv) IS 4449:1988 Whiskies

(v) IS 4450:1988 Brandies

(vi) IS 5286:1988 Vodka

(vii) IS 5287:1989 Country spirit (distilled)

(viii) IS 7058:1995 Table wines

(ix) IS 8538:1988 Toddy

(x) IS 14326:1995 Cashew fenny

(xi) IS 14327:1995 Coconut fenny

(xii) IS 14398:1996 Fortified wines

(4) Standards on Fruit Juices

(i) IS 3881:1993 Tomato juice

(ii) IS 4935:1968 Synthetic syrups

(iii) IS 4936:1968 Fruit squashes

(iv) IS 5800:2003 Orange juice preserved exclusively by physical means

(v) IS 7732:2003 Apple juice preserved exclusively by physical means

(vi) IS 8713:2003 Mango juice preserved exclusively by physical means

(vii) IS 15088:2001 Lemon juice preserved exclusively by physical means

(viii) IS 15089:2002 Pineapple juice preserved exclusively by physical means

(ix) IS 15095:2002 Concentrated pineapple juice preserved exclusively by physical means

(x) IS 15273:2003 Concentrated orange juice preserved exclusively by physical means

CHAPTER IV

OTHER ISSUES

DRINKING WATER

4.1 Water is an elixir of life. In our country the following agencies are directly or indirectly connected with regulating, monitoring and laying down standards of water:

1. Ministry of Health and Family Welfare
2. Bureau of Indian Standards under the Ministry of Food and Consumer Affairs and
3. Ministry of Rural Development
4. Ministry of Urban Development
5. Ministry of Environment and Forests
6. Ministry of Water Resources
7. Local Bodies

4.2 The Ministry of Health and Family Welfare administers the Food Adulteration Act, 1954 and "Food" under Clause 2(v) of the Act reads as under:—

"Food" means any article used as food or drink for human consumption other than drugs and water and includes:

(a) any article which ordinarily enters into, or is used in the composition or preparation of, human food,

(b) any flavouring matter or condiments, and

(c) any other article which the Central Government may having regard to its use, nature, substance or quality, declare by notification in the official Gazette, as food for the purposes of the Act."

4.3 Surprisingly the definition does not include drinking water under the category of food. Only packaged water has been declared as food *vide* notification GSR 202(E) dated 21 March, 2001.

4.4 Indian Council of Medical Research (ICMR) informed the Committee that there is wide spread contamination of water and food items in India which is reflected in high levels of pesticides in blood, fat and human secretions, and therefore, in order to address the problem of pesticide residues in soft drinks, fruit juice and other beverages, where water is the main constituent, it is highly imperative to have a check over the quality of water which goes into their making. Thus, if we could standardize the quality of water which will go into the making of these drinks, it will address the problem to a considerable extent.

4.5 Though under the EU norms the same standards apply to all kinds of water, and there is no differentiation between packaged or drinking water, the Secretary Health during the course of evidence stated:

> "The EU norms for water applies to all kinds of water including the water that comes from tap for drinking. Whereas, our norms which we have notified and which would take effect from 1st January, apply to bottled drinking water, it is not for other water. It is because under the PFA Act, water is still not covered as an item under food category. In fact, that is a very big lacuna in the Act."

4.6 It was pointed out by the Committee as to why water has not so far been included under the definition of food when way back in 1994 the Committee on Subordinate Legislation has specifically made a recommendation in this regard, the Secretary stated:

> "Sir, you are right. There was a Committee on Subordinate Legislation of the Parliament which at a point of time recommended that even for normal drinking water, there has to be norms. But somehow or the other, water has not been added to the definition of food in PFA Act all along. I would like to submit to the Committee that now the Ministry of Health is coming forward with an amendment to the PFA Act proposing that water should be added to the definition of food. Once it is added there would be a need for a group of experts who have to sit and look at the norms that need to be fixed for the normal drinking water. As you rightly said that average citizens of the country are entitled to much safer drinking water, whatever be the source of supply and it is just not the bottled drinking water."

4.7 The Bureau of Indian Standards (BIS) an autonomous body under the administrative control of the Department of Consumer Affairs, is the national standards body of the country, which was earlier called Indian Standards Institution (ISI) and came into existence on 6th Jan, 1947 as a registered society. This set up was provided a statutory status through an Act of Parliament dated 26 Nov., 1986 and BIS came into existence as national standards body of India on 1st April, 1987. The main functions of BIS include preparation and implementation of standards, operation of certification schemes both for products and systems, organization and management of testing laboratories, creating consumer awareness and maintaining close liaison with international standard bodies. Presently more than 17000 Indian standards are in force. Out of these 12000 are voluntary and about 4500 are mandatory. There are about 118 items which are under the compulsory certification scheme of BIS.

4.8 The Bureau of Indian Standards have been laying down the standards from time to time for the natural mineral water, drinking water as well as packaged drinking water. The standards for the natural mineral water were prescribed for the first time in the year 1992 and these were revised subsequently in the year 1998. The drinking water standards were laid down for the first time in 1983 and these were revised and updated in 1991(IS 10500) and presently these standards are again under revision. The standards for packaged drinking water (IS 14543) were first formulated in January 1998, according to which the standards as far as pesticides are concerned were specified as 'below detectable level'. Based on the decision of the Drinks & Carbonated Beverages Sectional Committee, FAD 14, second amendment was issued in September, 2000 incorporating new packaging materials, new techniques etc. Thereafter, Gazette Notification, GSR No. 760(E) dated 29 September, 2000 was issued by the Ministry of Health & Family Welfare incorporating packaged drinking water standards under the PFA Rules and making the BIS certification mark on the product compulsory *w.e.f.* 29 March, 2001. However recently after the

report on the presence of pesticides was brought out by the Centre for Science and Environment—a non-governmental organisation—the standards were revised to align the standards with the Gazette notification issued on 18 July, 2003. The standards for individual pesticides have now been prescribed at 0.0001mg/litre and for total pesticides at 0.0005mg/litre. The entire chronology with respect to the standards which were prescribed by BIS are at Annexure-1.

4.9 When the Committee wanted to know as to why the EU norms were adopted, the Secretary, Ministry of Health and Family Welfare stated:

> "...Once the CSE report came out, there was a huge public outcry about the safety of bottled drinking water. Then the Central Committee of Food Standards which is a technical Committee under the PFA Act looked at the norms available in India and they found that they are inadequate. They found that these norms should be improved. The Committee had recommended to the Government that we should have better norms. So these norms have been notified."

4.10 The Committee were informed that the Committee was headed by the Director General, Health Services. While elucidating further, the Director General replied:

> "When this report came, then our standards were only below detectable limits and the method of testing detectable limits was by the Packed Column method. As you know, detection method of pesticides in water is by TLC and GLC methods. TLC method is available everywhere but the GLC method is available at some places. To be very specific, this Committee was a large Committee representing States and Central Food Laboratories and other people. The issue before the Committee was that we should have the best standards available in the whole world. We are concentrating on the issue that our people should have the best and the European norms are very high and people are paying for this bottled water. That was at the back of the mind of the experts. That is what was recommended."

4.11 On being asked whether the other norms were also considered or not, BIS stated in writing that the Technical Committee had met on 7 & 8 February, 2003 and had taken into consideration the limits laid down by WHO, CODEX, USFDA, and EU.

4.12 While further explaining the reasons for adopting EU standards, the Secretary Health informed the Committee that there are about 49 pesticides for which norms are prescribed by various countries in the world. The WHO norm for pesticides covers only 24 pesticides out of these 49 pesticides and their norms do not cover those pesticides which are found underground. So far as USEPA is concerned, the norms are prescribed for only 21 out of the 49 pesticides, whereas, the EU norms set a limit for all these pesticides. This was stated to be one of the very important factors which weighed at that time.

4.13 When asked by the Committee as to when the culture of packaged water had entered the country, the representative of BIS informed that the culture of packaged water had come to India in the eighties and in 1992 a standard was made, for natural mineral water. However, the first specification in the case of packaged drinking water was made in the year 1998. The Committee were also informed that the specification for carbonated water was specified in 1963 and the same was revised in 1973, and again in 1992.

4.14 The President of the Association of Indian Bottled Water Manufacturers informed the Committee that the manufacturers have been bottling water since 1967 and the ground water that is being used as a raw material is not priced.

4.15 The Committee were also informed that BIS is testing 32 pesticides. BIS has only 8 laboratories which are owned by them for testing various products including food items. These are:

(i) Central Laboratory, Sahibabad
(ii) Western Regional Laboratory, Mumbai
(iii) Eastern Regional Laboratory, Kolkata
(iv) Southern Regional Laboratory, Chennai
(v) Bangalore Branch Office, Bangalore.
(vi) Patna Branch Office, Patna
(vii) Guwahati Branch Office, Guwahati
(viii) Northern regional laboratory, Mohali

4.16 Facilities for packaged drinking water are available only in the Central Laboratory, Sahibabad and testing facilities for Western Regional Laboratory, Mumbai are under trial. None of the BIS laboratories are equipped with GCMS technique. Besides, BIS also utilizes the services of 9 outside private laboratories under BIS Lab Recognition Scheme for testing of various food products. Out of these 9 laboratories, only 6 laboratories can test pesticide residues upto 0.0001 mg/litre precision level. BIS further stated in writing that with the present infrastructure, 8-10 samples of pesticide residues can be tested per month in the Central Laboratory. However, testing facilities have been planned for augmentation through modernization. Presently, testing of pesticide residues requirement is applicable in sample of packaged drinking water only, amongst the samples of food and food additives received in the laboratories. The BIS also stated in writing that there is shortage of Scientific Cadre Officers, and it hampers the smooth and efficient discharge of the various activities.

4.17 The Committee were also informed by the representatives of the Ministry of Food and Consumer Affairs that when the print and electronic media had highlighted some shortcomings in the quality of the bottled water on 5th February, 2003 mentioning that residues of extremely harmful pesticides were found in popular brands of bottled water sold in Delhi and Mumbai, the Department of Consumer Affairs constituted a Committee on the same day under the Additional Secretary of the Ministry to look into the entire issue. In fact the reports in the media were based on an independent study conducted by Centre for Science and Environment (CSE), an NGO. The Committee was asked to address the issues relating to adequacy of prescribed standards for packaged drinking water and natural mineral water and their enforcement. It was also required to ascertain the effectiveness of testing facilities available with BIS. The Committee which made an in-depth examination of the working of BIS came out with the following main recommendations:—

(i) BIS should overhaul its procedures. There is a need to have greater transparency and in the light of this, draft standards, list of licensees be put on web-site and updated at monthly intervals. The possibility of placing test reports of samples drawn from factory or market on the web may also be considered.

(ii) Efforts be made to prescribe standards for the normal drinking water by making it pollution free.

(iii) The provisions of product certification in BIS Act, 1986 and BIS (Certification) Regulations 1988 are basically the same as they were under ISI (Certification Marks) Act, 1952. It needs to be considered whether those provisions, which were more appropriate for a voluntary certification system are adequate to provide safety for certifying the quality of every single/container of packaged water and ensure the safety of public health. This needs to be examined by a technical Committee.

(iv) There is also a need to review permissible limits of contaminants in other food products under PFA.

(v) Water re-charging system should be made mandatory for the industry and before renewal of license, a NOC from the concerned monitoring agencies should be obtained.

(vi) Some guidelines regarding selection of sites for installation of packaged drinking water industry are also required to ensure their location in pollution free areas.

(vii) Disposal of wastes from the water purification plants also need to be monitored.

(viii) BIS should recognize only those labs, which have NABL Accreditation.

(ix) In the European directives, it is found that frequency of sampling and analysis for water varies according to the capacity of production. Based on this, as well as comments from several scientific bodies, BIS may consider the desirability of linking the frequency of testing with the production.

(x) BIS does not pay anything towards TA/DA for participation in meetings of the Technical Committee, therefore at times it is alleged that vested interests, particularly of the big industrial houses, influence the standard formulation activity of BIS. There is, therefore, an urgent need to get over this problem.

4.18 The Committee were informed that drinking water supply is a State subject and it is, therefore, the responsibility of the State governments to provide safe drinking water to the population by abstracting surface/ground water, treating and disinfecting before supply to the community. The Union Government acts only as a facilitator in this regard. Overall water policy of the country is formulated by the Ministry of Water Resources. At Central level there are two agencies which are concerned with the supply of drinking water in the country.

4.19 In regard to rural areas, it is the Department of Drinking Water Supply under the Ministry of Rural Development and for urban areas, it is Central Public Health and Environmental Engineering Organisation (CPHEEO) under the Ministry of Urban Development & Poverty Alleviation.

DEPARTMENT OF DRINKING WATER SUPPLY

4.20 The Ministry of Rural Development (Deptt. of Drinking Water Supply) has stated in a note submitted to the Committee that the planning, design and implementation of rural water supply scheme are taken up by the States themselves. However, the Union Government extend policy, technological and financial support to the State Governments. The State Governments are to implement the rural water supply programmes as per the norms and standards for quality and quantity prescribed by the Deptt. of Drinking Water Supply. Various activities undertaken at the State/GOI level for ensuring supply of drinking water in the rural areas are coordinated by the Deptt. of Drinking Water Supply. The quality norms prescribed by the Deptt. of Drinking Water Supply/CPHEEO/BIS are to be adopted in the implementation of rural water supply schemes.

CENTRAL PUBLIC HEALTH AND ENVIRONMENTAL ENGINEERING ORGANISATION

4.21 Central Public Health and Environmental Engineering Organisation (CPHEEO), the technical wing of the Ministry of Urban Development & Poverty Alleviation deals with drinking water supply (supplied through piped network) for urban areas only. CPHEEO acts as a facilitator and helps the State Water Supply Agencies/Urban Local Bodies by way of formulating and providing technical guidelines for planning, designing, execution and operation and maintenance of water supply and sanitation projects. To provide guidance in this regard, CPHEEO brought out a manual on "Water Supply and Treatment". Third Edition—revised and updated, May, 1999. CPHEEO informed the Committee that the guideline values for physical, chemical and bacteriological parameters of drinking water that have been indicated in the manual are only recommendatory and not mandatory on the part of the State Water Supply Departments/Water Utilities to follow since water is a State subject. CPHEEO has no statutory power to set/fix up standards for drinking water.

4.22 In regard to CPHEEO guidelines, the Secretary (Ministry of Urban Development) stated during the evidence that these guidelines which include qualitative norms for supply of tap water are based on a combination of WHO and BIS standards. When asked about their views on the acceptability of EU guidelines for drinking water, a representative of the Ministry of Urban Development stated:

> "Acceptance of the EU guidelines may be slightly stricter. In our condition, it may not be possible to adopt those things. However, the WHO guidelines are universally accepted. They are in vogue in many countries. We also follow them. In certain cases, our norms are stricter than the BIS specifications. So, that way, as far as drinking water is concerned, the guidelines that are given are safe to be adopted and used".

4.23 Apart from above mentioned agencies, there are other agencies involved in monitoring of water quality in the country. They are Central Ground Water Board Central Pollution Control Board and Water Quality Assessment Authority.

CENTRAL GROUND WATER BOARD

4.24 The Central Ground Water Board is a scientific organization, functioning under the Ministry of Water Resources, with a mandate to develop and disseminate technologies and monitor and implement national policies for the scientific and sustainable development and management of India's Ground Water Resources including their exploration, assessment, conservation, augmentation, protection from pollution and distribution, based on principles of economic and ecological efficiency and equity.

4.25 Central Ground Water Board have some basic parameters which they monitor from time to time. They are pH, Electrical conductivity, Carbonate, Bicarbonate, Chloride, Sulphate, Nitrate, Fluoride, Phosphate, Calcium, Magnesium, Sodium, Potassium, Total Hardness, Silica, Iron, Boron and total dissolved solids. CGWB further informed the Committee that it also undertakes special studies on the above mentioned parameters and also parameters like Aluminium, Arsenic, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Nickel, Selenium, Strontium and Zinc.

4.26 During the evidence, the Secretary, Ministry of Water Resources further stated in regard to functions of CGWB as follows:

> "Then, we do studies when we are called upon to make studies either through some complaint or by some State Governments or by some legal authority. We did a study in collaboration with the Central Pollution Control Board in April, 1999 for the National Capital Territory of Delhi and we found presence of pesticides in 15 out of 127 samples".

4.27 In this study Aldrin in 3 (max 0.078 mg/l) and Dieldrin in 12 (0.091 mg/l) samples were above WHO guidelines (0.03 mg/l). The Secretary further stated:

> "We also did a Special Study for Pesticides in Guntur District in April, 2003 in area of 640 sq. km. the principal crops there were cotton, chilly and paddy. The shallow water table there is 2-5 metres and the pesticide consumption is high. In 5 samples, the total pesticide residue which is Organochlorines was very high as compared to the allowable content of 0.001 mg as per "BIS standards". The Secretary further informed the Committee that they conducted a study and found that movement of pesticide to ground water would be there to a greater degree in cases of shallow water tables. If the water table is shallow, then pesticide would travel into the water table and contaminate it. If it is very deep, then it is unlikely to contaminate water".

4.28 CGWB has set up a network of 15000 hydrograph stations for monitoring ground water quality throughout the country. When asked about the functions of these stations, the Secretary (Water Resources) said, "These 15000 stations monitor quality, and they also monitor levels of ground water every year. The idea is that they are fairly representative in the whole country to see where the levels of ground water are going so that certainly we do not find ourselves in a situation where the ground water has gone to non-sustainable level. If there are danger signals, we should bring it to the notice of the State Government, ask them to take remedial steps. We have done that in many cases".

4.29 CGWB has made the following suggestions to check the pollution of ground water :

1. Mass awareness and education programmes would be very useful to protect ground water from pollution, particularly in areas, where recharge of ground water has been taken up and also in areas where drinking water is being supplied from wells.

2. Close coordination of various Central and State Government agencies to strengthen the Monitoring programme of ground water protection.

3. Upgradation of technology to identify potential areas where ground water can get polluted so as to ensure corrective measures in time.

4. Water quality standards should be revised as per needs and implemented strictly to ensure unpolluted ground water. The standards should be based on national priorities and technical capabilities.

5. R&D activities will have to be stepped up to develop techniques for protection and conservation of water resources. R&D programme will have to be expanded to carry out studies on pollution due to agricultural, industrial and municipal wastes.

6. The use of certain toxic materials may be prohibited or restricted. The regulations may include controls on use of chemical fertilizers and pesticides, location of landfills and sewage treatment plants, housing density and ban on deforestation.

4.30 CGWB made the following recommendations to ensure potable quality of ground water for the use by citizens:

(a) In order to ensure potable quality of ground water, there is a need for integrated approach involving public health professionals, water providers, natural resource managers, industry and the public.

(b) The polluters have to be identified and must be forced to pay for pollution.

(c) A risk-benefit approach has to be adopted in developing safety standards. Every improvement in quality increases cost. A balance has to be maintained between cost and risk.

(d) Efforts should be made to conserve water, recycling of wastewater and supplementing freshwater by desalination of sea water in coastal regions.

(e) To prevent pollution it is necessary to treat human wastes and industrial effluents before they are discharged in natural water resources. Run offs from agriculture also need to be managed.

(f) WHO guidelines may be adopted and implemented to provide safe water to all people and thereby eliminate water related diseases.

CENTRAL POLLUTION CONTROL BOARD

4.31 Central Pollution Control Board maintains 784 Water Quality Monitoring Stations mainly on the major river courses. Out of the 784 monitoring stations, 181 are underground quality stations. In this regard the Chairman, CPCB stated during the evidence that the monitoring of pesticides and residues in these underground monitoring stations are not done on a regular basis but it is done from time to time *i.e.* once in three years. This was further clarified by the Secretary (Environment & Forests) during the evidence as follows:

> "On the question of primary mandate, the CPCB has an on-going programme of testing water source samples across the country. The Chairman of CPCB has mentioned a number of stations from which it has collected samples both with respect to surface water and ground water. The reason why this is not done on a daily or a weekly basis has to do with the fact that testing of water for pesticide residue is a very time consuming and expensive process. And also, the ground water quality does not vary very much over a period of time. So, if we test it for one year, then we can be certain that, unless environment conditions change very significantly, the test results would be valid for a period of three to five years. That is why, that is not done at more frequent intervals. But there is an on-going process with respect to the monitoring of surface and ground water quality throughout the country. There are a very large number of stations from where samples are collected."

4.32 Summary of the findings of CPCB regarding pesticide pollution in ground water is at Annexure-II.

WATER QUALITY ASSESSMENT AUTHORITY

4.33 The Secretary, Ministry of Environment and Forests during his deposition before the Committee had stated, "Sir, water quality in the country is being monitored by several different agencies, namely, Central Water Commission, State Government agencies, State Ground Water Board, State Pollution Control Board, Central Ground Water Board, Central Pollution Control Board and National River Conservation Directorate.... The multiplicity of agencies involved in water quality management in the country, has led to lack of uniformity in monitoring parameters, frequency of monitoring, locational norms for sampling stations, standardisation of analytical and sampling protocols, calibration of instruments, training of technical staff, and setting up databases. In this situation, it is difficult to generate and analyse data for formulation of policies and

schemes to address issues of water quality. To remedy this problem, the Ministry of Environment & Forests constituted the Water Quality Assessment Authority with effect from 29th May, 2001. The Authority is empowered to exercise powers under Section 5 of the Environment (Protection) Act, 1986 for issuing directions and for taking measures with respect to matters referred to in clauses (ix), (xi), (xii) of section 3 (2) of the Environment (Protection) Act, 1986. These relate to:

(ix) Carrying out and sponsoring investigations and research relating to problems of environmental pollution.

(xi) Establishment of recognition of environmental laboratories and institutes to carry out the functions and restrict such environmental laboratories and institutes under the EP Act.

(xii) Collection and dissemination of information in respect of matters relating to environmental pollution.

(xiii) Preparation of manuals, codes or guides relating to prevention, control and abatement of environmental pollution.

Besides these, the Authority can, *inter-alia* direct agencies to standardise water quality monitoring methods, ensure proper treatment of waste water to restore the water quality of surface and ground waters, take up R&D activity related to water quality management and promote recycling and reuse of treated waste water.

4.34 The WQAA is still in its formation stage and is in the process of setting up various expert groups and task forces. The WQAA also informed the Committee that the mandate of the WQAA is limited to direct the concerned agencies to maintain uniformity in monitoring of national water resources. Laying down of suitable safety standards for drinking water and beverages does not however fall under the purview of the Water Quality Assessment Authority.

4.35 The Water Quality Assessment Authority has so far held two meetings; the first on 26.9.03 and the second on 14.05.03. During its first meeting it was decided to constitute an Expert Group for review of the present Water Quality Monitoring programme and suggest measures for bringing uniformity in sampling procedure, selection of parameters, frequency of monitoring, methods of analysis, data entry, data analysis and reporting so that data generated by each agency is comparable and of known quality. In this regard the Secretary (Environment & Forests) and the Chairman of WQAA stated during the evidence that the draft protocol has been finalised, and is under technical scrutiny in Ministry of Environment and Forests. Some of the important recommendations of Expert Group for its uniform implementation are as under:

(i) The recommended protocol identifies different types of stations both under surface and ground water category *viz.* baseline, Trend and Trend-cum-Surveillance/impact. This categorization is based on the extent to which the water at site is polluted, the Baseline station being the least polluted by the human activity. Number of parameters and its frequency for monitoring differs at each type of stations.

(ii) There is an urgent need for developing two referral laboratories, one with Central Water Commission and the other with Central Ground Water Board.

(iii) Quality assurance test *viz.* analytical quality control test 'within laboratory' and 'inter-laboratory' must be performed by all laboratories for ensuring reliability in data generation.

4.36 In the first meeting, it was also decided to constitute the State Level Water Quality Review Committees. In this regard it has been informed that Water Quality Review Committees are constituted in 30 States/UTs out of 35 States/UTs in the Country.

4.37 In the second meeting held on 14th May 2003 the Authority generally accepted and approved the report of the Expert Group. Water Quality monitoring Committee, Working Group, Task Force etc. were decided to be constituted for carrying out the functions and assisting the WQAA effectively. As a follow up to 2nd meeting Water Quality Monitoring Committee has been constituted to advise the Water Quality Assessment Authority on the matters relating to works of Water Quality Assessment Authority and the State Level Water Quality Review Committees. A task force is constituted to deal with development and review of water quality information and monitoring system. A Working Group is constituted to take up studies on minimum flows in rivers.

PESTICIDE RESIDUES LIMITS PRESCRIBED BY VARIOUS AGENCIES FOR DRINKING WATER

Water Quality in the European Union

4.38 As per the Council Directive 98/83/EC on the quality of water intended for human consumption which was adopted by the Council on 3rd November, 1998, the main thrust of the European Commission Directive is review of parametric values, and where necessary strengthens them in accordance with the latest available scientific knowledge. The main changes in parametric values :

* Lead : reduced from 50 µg/l to 10µg/l, 15 years transition period to allow for replacing lead distribution pipes.
* Pesticides : Values for individual substances and for total pesticides retained (0.1 µg/l/0.5 µg/l), plus additional, more stringent ones introduced for certain pesticides (0.03 µg/l)
* Copper: Value reduced from 3 to 2 mg/l
* Standards introduced for new parameters like trihalomethanes, trichloroethene and tetrachloroethene, bromate, acrylamide etc.

4.39 The Directive came into force on 25th December, 1998. Member states had 5 years *i.e.* until 25th December, 2003 to ensure that the drinking water complied with the standards set, except for Besmate (10 years), Lead (15 years) and Trihalomethanes (10 years).

WHO guidelines for drinking water quality

4.40 The World Health Organization published the first edition of "Guidelines for drinking water quality"in the years 1984 and 1985. The guidelines were revised in 1988. WHO guideline values for pesticides are given in Annexure-III

4.41 In its guidelines WHO has stated that the primary aim of the guidelines for drinking water quality is the protection of public health. The guidelines are intended to be used as a basis for the development of national standards that, if properly implemented, will ensure the safety of drinking-water supplies through the elimination, or reduction to a minimum concentration, of constituents of water that are known to be hazardous to health. It must be emphasized that the guideline values recommended are not mandatory limits. In order to define such limits, it is necessary to consider the guideline values in the context of local or national environmental,

social, economic, and cultural conditions. In regard to nature of the WHO guidelines on drinking water, it has been stated:

(a) A guideline value represents the concentration of a constituent that does not result in any significant risk to the health of the consumer over a lifetime of consumption.

(b) The quality of water defined by the Guidelines for drinking-water quality is such that it is suitable for human consumption and for all usual domestic purposes, including personal hygiene. However, water of a higher quality may be required for some special purposes, such as renal dialysis.

(c) When a guideline value is exceeded, this should be a signal; (i) to investigate the cause with a view to taking remedial action; (ii) to consult with, and seek advice from, the authority responsible for public health.

(d) Although the guideline values describe a quality of water that is acceptable for lifelong consumption, the establishment of these guideline values should not be regarded as implying that the quality of drinking-water may be degraded to the recommended level. Indeed, a continuous effort should be made to maintain drinking-water quality at the highest possible level.

(e) Short-term deviations above the guideline values do not necessarily mean that the water is unsuitable for consumption. The amount by which, and the period for which, any guideline value can be exceeded without affecting public health depends upon the specific substance involved. It is recommended that when a guideline value is exceeded, the surveillance agency (usually the authority responsible for public health) should be consulted for advice on suitable action, taking into account the intake of the substance from sources other than drinking-water (for chemical constituents), the toxicity of the substance, the likelihood and nature of any adverse effects, the practicability of remedial measures, and similar factors.

(f) In developing national drinking-water standards based on these guideline values, it will be necessary to take account of a variety of geographical, socioeconomic, dietary, and other conditions affecting potential exposure. This may lead to national standards that differ appreciably from the guideline values.

(g) In the case of radioactive substances, screening values for gross alpha and gross beta activity are given, based on a reference level of dose.

WHO Guideline Values (maximum limit) of pesticide residues in drinking water are in Annexure-III.

Indian Standard—Drinking Water—Specification by Bureau of Indian Standards

4.42 BIS published IS 10500;1983 Drinking Water Specification and subsequently this standard was revised in 1991 based on the information available about the nature and effect of various contaminants till that time. This standard was prepared with the following objectives:

(a) To assess the quality of water resources, and

(b) To check the effectiveness of water treatment and supply by the concerned authorities.

4.43 The Standard specifies physical, chemical, bacteriological and other requirements along with reference to test methods. The standard desires the absence of pesticides in drinking water. This has been detailed as follows:

Sl.No.	Substance	Requirement (Desirable Limit)	Undesirable effect outside the desirable limit	Permissible limit in the absence of alternate source
Xxix	Pesticides Mg/l, max	Absent	Toxic	0.001

4.44 The above specification of BIS is currently under revision. Proposed specification for pesticides are as follows:

Sl.No.	Substance	Requirement (Desirable Limit)	Undesirable effect outside the desirable limit	Permissible limit in the absence of alternate source
(viii)	Pesticides Mg/l, max	0.0005 total 0.0001 individual	Toxic	0.001

4.45 BIS stated that the above revision of the standard is felt necessary to upgrade the requirements of the standard and to align with the internationally available specifications on drinking water. In this regard, the following were considered:

(i) EU directives relating to the quality of water intended for human consumption (80/778/EEC)

(ii) USEPA standard—National Primary Drinking Water standard

(iii) WHO guidelines for Drinking Water Quality

4.46 BIS has stated in reply to a question that the adoption of this Indian Standard is voluntary in nature. As on date there is no BIS licence for this product.

CPHEEO's guidelines for drinking water

4.47 In the manual on Water Supply and Treatment brought out by CPHEEO, the guideline values for physical, chemical and bacteriological parameters of drinking water have been given. In the said guidelines 'acceptable' and 'course for rejection' for various parameters including pesticides have been indicated. The guideline values of pesticides in the manual are as under:

S.No	Characteristics	*Acceptable	** Cause for Rejection
31.	Pesticides (total mg/l)	Absent	Refer to WHO guidelines for drinking water quality Vol. I - 1993

NOTES :

* The figures indicated under the column 'Acceptable' are the limits upto which water is generally acceptable to the consumers.

** Figures in excess of those mentioned under 'Acceptable' render the water not acceptable, but still may be tolerated in the absence of an alternative and better source but upto the limits indicated under column "Cause for Rejection" above which the sources will have to be rejected.

4.48 BIS and CPHEEO have stated that their standards are only recommendatory and are not mandatory. The Ministry of Urban Development and the Ministry of Rural Development have also stated that the States should follow WHO/BIS/CPHEEO guidelines while supplying drinking water to the masses. In this regard it is pertinent to note that Chief Executive Officer, Delhi Jal Board informed the Committee, "Though the Act (The Delhi Water Board Act, 1998) does not lay down any parameters for drinking water, we are following IS 10500 standard at our plants for drinking water".

CONCLUSIONS/RECOMMENDATIONS

4.49 Water is an elixir of life and its importance as an item of food needs hardly to be spelt out. It is however, most disconcerting to note that even after fifty years of the enactment of the Prevention of Food Adulteration Act, 1954, the necessity of including it under the definition of 'Food' has not been felt. This is despite the fact that the recommendation to this effect had been made by no less than a Parliamentary Committee on Subordinate Legislation, way back in 1994. The Ministry cited resource constraint as the main cause for non-implementation of this recommendation. The fact remains that almost a decade has elapsed and the Ministry has still not taken any concrete steps in this regard. This therefore, speaks volumes about the concern that the Ministry of Health has in our country towards the health of the people. It is, therefore, not surprising that no legal standards for monitoring the quality of ordinary drinking water have so far been prescribed under the Act. It is only recently that the wisdom seems to have dawned upon the authorities who have at last realized now that there is a big lacuna in the Act which needs to be remedied by way of amendment which they are contemplating to bring forth. The Committee recommend that section 2(v) of the PFA Act which defines 'Food' should be amended without further loss of time.

4.50 The Committee are equally alarmed to note that though the culture of packaged drinking water came to India in the eighties, the first time that any standards were laid down by the Bureau of Indian standards—a national body for standards, was only in 1998 *i.e.* almost after a decade. During this period no check whatsoever was being exercised on the quality of water being sold by the manufacturers of this water by the authorities. The manufacturers, therefore, took full advantage of such an unregulated regime by charging heavily for the water which, according to the admission of the BIS itself, was being sold after filling the bottles from the municipal water without any processing ! Even in 1998 when the standards were laid down, these were only voluntary in nature. The limits of pesticides prescribed under these were 'below detectible limit' and were not even quantified. It was only in 2001 that the packaged water was brought under the compulsory certification scheme of the BIS and included under the definition of 'Food' *vide* GSR No. 202(E) dated 21 March, 2001. The Committee wonder whether the situation could be more alarm ing than this.

4.51 It is only recently that when the CSE brought out a report on 4th February, 2003 with respect to the presence of pesticides in some samples of bottled water and highlighted the hazardous effects of such pesticides on human health in their report, that the Technical Committee of BIS thought of convening an urgent meeting and recommended new standards. These standards were ultimately notified by the Ministry of Health and Family Welfare under Notification No. GSR. 554(E) dated 18th July, 2003 and have already been implemented *w.e.f.* 1.1.2004. The limits prescribed for individual pesticides has now been prescribed at 0.0001mg/litre and for total pesticides it is 0.0005 mg/litre.

4.52 The Bureau of Indian Standards, which was given a statutory status by an Act of Parliament, came into existence as a national standards body of India on 1st April 1987 and is mandated to prepare and implement standards, is another body which needs to be strengthened. Though it is supposed to monitor the quality of various food products by getting the same tested, the reality is that it hardly has any laboratories of its own. The Committee note that it has only eight laboratories out of which only one laboratory is equipped to test pesticides. None of these laboratories is equipped with GCMS technology and none of these is accredited by NABL, which is indicative of the type of technical competence which these laboratories have! BIS also has a system of recognizing private laboratories and has nine laboratories under this scheme out of which only six are equipped to test the pesticides. The number of samples drawn by these laboratories are negligible and in no way related to the quantum of production. The Bureau is also saddled with the problem of shortage of technical manpower which in turn has adversely affected its monitoring operations. Non official experts are however, not attending the meetings of the Bureau because they do not get allowances. This needs to be looked into. The Committee, also strongly advocate that a thorough review of the working of this organization should be taken up forthwith with a view to removing all the bottlenecks which are hampering its operations and should be headed by an eminent scientist who can infuse dynamism in its working so that it becomes a national standards body in the real sense of the term. The various recommendations made by the Committee which was appointed on 5th August under the Chairmanship of the Additional Secretary, Department of Consumer Affairs, are of important nature which the Committee fully endorse and the same should be implemented fully.

4.53 The Committee also fail to understand as to what is the rationale for BIS to monitor 32 pesticides. Many other pesticides which are otherwise found in the ground water do not appear among these, while those which are unlikely are included. The Committee recommend that this list needs to be reviewed with a view to including all relevant pesticides which are actually found in water sources in the country. There is also an urgent need to establish more state-of-the-art laboratories and suitably increase the number of samples handled by them.

4.54 The Committee find that the drinking water supply is a State subject and, therefore, it is primarily the responsibility of the respective State Governments to provide safe drinking water to the people. The Central Government acts only as a facilitator in this regard. At the Central level there are two agencies which are concerned with the supply of drinking water in the country. It is the Department of Drinking Water Supply under the Ministry of Rural Development in regard to rural areas and Central Public Health and Engineering Organization under the Ministry of Urban Development and Poverty Alleviation for urban areas. Though the norms for quality of water have been laid down by both these agencies, these are only recommendatory in nature. The implementation part vests with the State Governments. Besides these two, there are a host of other agencies which are operating water quality network in the country. These include the Central Ground Water Board/Authority, Central Pollution Control Board, Central Water Commission, Public Health Department, Water Supply Authorities, Industries and Educational Research Institutes. It is, however, noted that all these agencies are working more or less independent of each other and there is hardly any co-ordination among these. The result is that at present there seems to be total confusion as one agency does not know what the other is doing and very often there is a great deal of overlapping. The Committee note that in order to address this problem of multiplicity and with a view to bringing the various agencies on a single interactive platform, an initiative has been taken by the Government by constituting Water Quality Assessment Authority on 29th May, 2001. The Committee however, find that though under the notification this Authority has been empowered with a number of functions with regard to the water management including drawing action plans for quality improvement in water bodies and

monitoring the implementation of different schemes, so far not much headway has been made as only two meetings of the Authority have been held so far. The Committee have their doubts as to whether the Authority will act as an effective apex body so far as monitoring the quality of water is concerned, since it does not seem to have been empowered to take any legal action against other agencies in case of any type of default. The Committee, therefore, strongly recommend that there should be a single organization at the apex level which should be responsible for enforcement and monitoring the quality standards for the drinking water in the country and the role of all other agencies should be defined clearly so that there is no scope of any ambiguity left so far as their respective functions are concerned. This apex body should be able to effectively exercise control over others so that close co-ordination and uniformity in approach could be achieved.

4.55 Since there is enough scientific data to prove that most of the serious diseases and deaths particularly in rural areas, are caused due to the unsafe drinking water, it is the primary duty of the State to make safe drinking water available to the people. The Committee find that BIS is revising the standards for drinking water and has recommended the same standards for drinking water as are now applicable in the case of packaged drinking water. Though these standards are only voluntary, the Committee wonder as to what is the scientific basis for adopting such standards, particularly when there are hardly any state-of-the-art laboratories of BIS which are presently equipped to test the pesticide residues in water. The Committee are of the considered view that norms for drinking water should be formulated based on scientific studies and should be such which are achievable. It is at the same time very essential that these standards are made legally enforceable. Earnest efforts in this regard must be initiated immediately.

4.56 The Committee take serious note of the fact that in the constitution of the Central Ground Water Board there is no representative of the Central Insecticides Board and likewise in the latter, there is no representative from the Central Ground water Board. In the absence of these, the Committee fail to comprehend as to how the authorities are monitoring the levels of pollution in the water or for that matter even allowing registration of the pesticides. The Committee desire that this lacuna needs to be addressed immediately.

4.57 Finally, the Committee would like to record their displeasure on the weakness of the enforcement system which has resulted in the appearance of spurious brands of packaged drinking water in the market. This menace has to be dealt with on the lines of the sure (none is spared), swift (fast processing of case) and severe (deterrent punishment) approach proposed by the Mashelkar Committee to curb the spurious drugs menace in the country. The Prevention of Food Adulteration Act as recommended in the last Chapter of this report should be suitably amended. Surveillance of drinking water quality has to be a continuous exercise.

ANNEXURE I

CHRONOLOGY OF BIS STANDARDS FOR DRINKING WATER AND THEIR ADOPTION UNDER PFA ACT

1983	:	BIS published IS 10500 : 1983 Drinking Water Specification
1991	:	First revision of IS 10500 by BIS
1992	:	BIS published IS 13428 : 1992 Packaged Natural Water Specification
1994	:	BIS Standards for Natural Mineral Water was notified under PFA Rules, 1955
1998	:	First revision of IS 13428 by BIS
1998	:	BIS published IS 14543 : 1998 Packaged Drinking Water Specification
2000	:	Ministry of Health and Family Welfare Notification No. GSR 759(E) dated 29.9.2000 (w.e.f. 29.3.2001) for Mineral Water and Notification No. GSR 760(E) dated 29.2.2000 (w.e.f. 29.3.2001) for Packaged Drinking Water—These two products to be sold under Compulsory Certification Scheme of BIS.
2001	:	Ministry of Health & Family Welfare Notification No. GSR No. 202(E) dated 21.3.2001—Central Government declared Packaged Drinking Water as an item of food.
2003	:	BIS amendment on IS 13428 : 1998 Packaged Natural Mineral Water regarding maximum limit of the pesticide residues (Individual : 0.1µg/l and total : 0.5 µg/l)
2003	:	BIS amendment on IS 14543 : 1998 Packaged Drinking Water regarding maximum limit of the pesticide residues (Individual : 0.1 µg/l and total: 0.5 µg/l)
2003	:	Ministry of Health & Family Welfare Notification No. GSR No. 554(E) dated 18.7.2003—Pesticide Residue limit in packaged Drinking Water (Individual : 0.1 µg/l and total : 0.5 µg/l)
2004	:	Notification No. G.S.R. No. 554(E) came into effect.

ANNEXURE II

SUMMARY OF FINDINGS OF CPCB REG. PESTICIDE POLLUTION IN GROUND WATER

Sl.No.	State	Location	Pesticide Pollutant (µg/l)		Remarks
1	2	3	4		5
1.	Andhra Pradesh	Bollaram—Patancheru	Aldrin Dieldrin Lindane Op-DDT	4.400 3.925 2.050 1.945	High value of pesticides
2.	Himachal Pradesh	Kala Amb	Lindane DDT Endosulfan Aldrin Dieldrin	2.093 0.272 0.323 0.458 0.092	High concns. of pesticides
3.	Himachal Pradesh	Parwanoo	Aldrin Dieldrin Lindane DDT Endosulfan	0.063 0.008 1.572 0.276 0.080	Lindane and DDT in high concns.
4.	Jharkhand	Dhanbad	BHC Aldrin Endosulfan Dieldrin DDT	4.744 1.411 1.11 0.483 7.364	High values of pesticides in water samples from tube wells as well as dug wells
5.	Karnataka	Bhadravathi	Aldrin Dieldrin Lindane DDT	0.520 110.0 18.600 280.000	Pesticides value exceeded the desirable limit
6.	Madhya Pradesh	Korba	Aldrin Dieldrin Lindane DDT	0.222 1.294 17.440 10.074	Significant concn. of pesticides attributed to their excessive use in agriculture

1	2	3	4		5
7.	Madhya Pradesh	Ratlam Nagda	Aldrin Dieldrin Endosulfan DDT BHC	2.328 0.715 1.320 1.203 15.136	Pesticide contamination in ground water at all sub-soil levels of dug wells and borewells/ handpumps
8.	Maharashtra	Chembur	Aldrin Dieldrin DDT Endosulfan BHC	1.733 0.215 0.256 0.262 7.571	Pesticide concn. not very significant. However, substantial concn. observed during October —possibly due to application of pesticides in wells at the time of plague syndrome
9.	Uttar Pradesh	Singruli	Aldrin Dieldrin Lindane DDT	1.724 1.677 12.324 3.392	High concn. of Lindane at all locations
10.	West Bengal	Durgapur	BHC Aldrin Endosulfan Dieldrin DDT	4.556 0.519 1.165 0.250 7.308	Total pesticide level at all locations exceeded the desirable limit
11.	West Bengal	Howrah	BHC Aldrin Endosulfan Dieldrin DDT	6.704 0.791 4.876 0.675 9.804	High values of pesticides in both dugwell as well as tubewell samples

Guidelines for drinking-water quality

SECOND EDITION

Volume 1

Recommendations

World Health Organization
Geneva
1993

C. Pesticides

	Guideline value (µg/litre)	Remarks
	1	2
alachlor	20[b]	for excess risk of 10^{-5}
aldicarb	10	
Aldrin/dieldrin	0.03	
atrazine	2	
bentazone	30	
carbofuran	5	
chlordane	0.2	
chlorotoluron	30	
DDT	2	
1,2-dibromo-3-chloropropane	1[b]	for excess risk of 10^{-5}
2,4-D	30	
1,2-dichloropropane	20 (P)	
1,3-dichloropropane		NAD
1,3-dichloropropene	20[b]	for excess risk of 10^{-5}
ethylene dibromide		NAD
heptachlor and heptachlor epoxide	0.03	
hexachlorobenzene	1[b]	for excess risk of 10^{-5}
isoproturon	9	
lindane	2	
MCPA	2	
methoxychlor	20	
metolachlor	10	
molinate	6	
pendimethalin	20	
pentachlorophenol	9 (P)	
permethrin	20	
propanil	20	

	1	2
pyridate	100	
simazine	2	
trifluralin	20	
chlorophenoxy herbicides other than 2,4-D and MCPA		
2,4-DB	90	
dichlorprop	100	
fenoprop	9	
MCPB		NAD
mecoprop	10	
2,4,5-T	9	

D. Disinfectants and disinfectant by products

Disinfectant by-products	Guideline value (mg/litre)	Remarks
monochloramine	3	
di-and trichloramine		NAD
chlorine	5	ATO. For effective disinfection there should be a residual concentration of free chlorine of ≥0.5 mg/litre after at least 30 minutes contact time at pH<8.0
chlorine dioxide		A guideline value has not been established because of the rapid breakdown of chlorine dioxide and because the chlorite guideline value is adequately protective for potential toxicity from chlorine dioxide
iodine		NAD
bromate	25[b] (P)	for $7x10^{-5}$ excess risk
chlorate		NAD
chlorite	200 (P)	
chlorophenols		
2-chlorophenol		NAD
2,4-dichlorophenol		NAD
2,4,6-trichlorophenol	200[b]	for excess risk of 10^{-5}, ATO
formaldehyde	900	
MX		NAD

Disinfectant by-products	Guideline value (mg/litre)	Remarks
trihalomethanes		The sum of the ratio of the concentration of each to its respective guideline value should not exceed 1
bromoform	100	
dibromochloromethane	100	
bromodichloromethane	60[b]	for excess risk of 10^{-5}
chloroform	200[b]	for excess risk of 10^{-5}
chlorinated acetic acids		
monochloroacetic acid		NAD
dichloroacetic acid	50 (P)	
trichloroacetic acid	100 (P)	
chloral hydrate (trichloroacetaldehyde)	10(P)	
chloroacetone		NAD
halogenated acetonitriles		
dichloroacetonitrile	90 (P)	
dibromoacetonitrile	100 (P)	
bromochloroacetonitrile		NAD
trichloroacetonitrile	1 (P)	
cyanogen chloride (as CN)	70	
chloropicrin		NAD

[a](P)—Provisional guideline value. This term is used for constituents for which there is some evidence of a potential hazard but where the available information on health effects is limited; or where an uncertainty factor greater than 1000 has been used in the derivation of the tolerable daily intake (TDI). Provisional guideline values are also recommended: (1) for substances for which the calculated guideline value would be below the practical quantification level, or below the level that can be achieved through practical treatment methods; or (2) where disinfection is likely to result in the guideline value being exceeded.

[b]For substances that are considered to be carcinogenic, the guideline value is the concentration in drinking-water associated with an excess lifetime cancer risk of 10^{-5} (one additional cancer per 100000 of the population ingesting drinking water containing the substance at the guide-line value for 70 years). Concentrations associated with estimated excess lifetime cancer risks of 10^{-4} and 10^{-6} can be calculated by multiplying and dividing, respectively, the guideline value by 10.

In cases in which the concentration associated with an excess lifetime cancer risk of 10^{-5} is not feasible as a result of inadequate analytical or treatment technology, a provisional guideline value is recommended at a practicable level and the estimated associated excess lifetime cancer risk presented.

It should be emphasized that the guideline values for carcinogenic substances have been computed from hypothetical mathematical models that cannot be verified experimentally and that the values should be interpreted differently than TDI-based values because of the lack of precision of the models. At best, these values must be regarded as rough estimates of cancer risk. However, the models used are conservative and probably err on the side of caution. Moderate short-term exposure to levels exceeding the guideline value for carcinogens does not significantly affect the risk.

[c]NAD—No adequate data to permit recommendation of a health based guideline value.

[d]ATO—Concentrations of the substance at or below the health-based guideline value may affect the appearance, taste, or odour of the water.

MULTIPLICITY OF REGULATORY AUTHORITIES IN INDIA

4.58 So far as soft drinks, fruit juices and other beverages are concerned, the Ministry of Food Processing Industries is the licensing authority and the Ministry of Health and Family Welfare is the regulatory authority. Likewise the multiplicity of laws, enforcement and standard setting agencies pervade the different sectors of food. This creates confusion in the minds of consumers, traders and manufacturers about overriding primacy of one provision or the other. Confederation of Indian Industry also informed the Committee that investors are shy, partly because of a myriad of complex laws which inhibits innovation and discourages value addition. A chart showing the names of the Ministries and the laws administered by them in the food processing sector is at Annexure-I. In regard to the multiplicity of laws in the food processing sector, a representative of All India Food Processors Association stated during their appearance before the Committee as follows:

> "Today when I say that laws are one of the hindrances to us, I mean that there are nine different Ministries and umpteen laws with which the food processor has to face.... We have a number of institutions and a number of standards making bodies. There is more than 8-10 standard making bodies..... but most of them do not have adequate scientific manpower. Standards are quite often knee-jerk reactions; they are not based on scientific approach; they are not transparent; they are with little or no participation of stakeholders, except of BIS; the stakeholders, the processors and the consumers are not consulted in most of the other standard making bodies. They are just Government bodies making fiats. There are many agencies for enforcement. There are a whole lot of inspectors who interpret the rules in their own way. The State Governments have their own rules. Some States like Maharashtra, West Bengal, U.P., etc. have amended PFA (Act). The municipal authorities also have their own rules. Even gram panchayats have powers in this area. So, what we need is to have one single law which covers the entire gamut so that the processor or the consumer can refer to a single law. We would like all the present laws to be repealed and merged into a single law called 'food law'; it should be a self contained legislation".

4.59 Confederation of Indian Industry (CII) informed the Committee that many organizations *viz*. Bureau of Indian Standards, Central Committee for Food Standards (CCFS) under PFA Act, Fruit Products Order (FPO) under the Ministry of Food Processing Industries. Ministry of Rural Development under 'Agmark' and Meat Food Products Order (MFPO), Export Import Council under EXIM Policy, etc. lay down standards in the food sector and the standards are different from each other and also alleged that the procedure for formulation of standards differs widely from one organization to another. CII had also pointed out the overlapping and contradictory provisions in PFA versus FPO, PFA versus Packaged Commodity Regulation Act and PFA versus Vegetable Products Order. It is the CII's view that the plethora of laws and multiple controls have led to a system which is over regulated and under administer assuring neither food safety nor quality and that we need a single integrated food law. In this regard, CII and All India Food Processors Association have made the following proposals:

* A single integrated food law with the convergence of all Central and State laws—to be called "The Food Act";
* An autonomous "Food Regulatory Authority" to recommend amendments in laws, to formulate rules and procedures and to supervise implementation;
* A "Council of Food Standards" to lay down standards and continuously upgrade them; and
* A "Food Safety Administration" for inspection and enforcement.

4.60 In regard to monitoring food contaminants, the Director, CFTRI, during his evidence before the Committee stated as under:

> "There is a need for an autonomous networking body for monitoring contaminants. Today, it is being done by various Ministries, namely, PFA is under the Ministry of Health and Family Welfare, Insecticide Act is implemented by the Ministry of Agriculture, BIS comes under the Ministry of Commerce and FPO comes under the Ministry of Food Processing Industries. Probably, there is a need for a high level autonomous body which is being everything and addresses this boldly and in a dynamic fashion".

MODERN INTEGRATED FOOD LAW

4.61 In his Budget Speech, 2002, the Minister of Finance has, *inter-alia*, stated, "A multiplicity of regulations for foods standards under the Prevention of Food Adulteration Act, the Food Products Order, the Meat Food Products Order, the Bureau of Indian Standards and MMPO, affect the food and food processing sectors. They need to be modernized and converged. The Prime Minister has decided to set up a Group of Ministers (GoM) to propose legislative and other changes for preparing a modern integrated food law and related regulations". Subsequently, a GoM was constituted by the Government to propose legislative and other changes for preparing a Modern Integrated Food Law and related regulations by converging and modernizing the existing laws and to bring about a single statute for regulation of food products. This law is expected to take into account the international scenario and modern developments so as to create an enabling environment and promote self-compliance by the Food Processing Industries. The Ministry of Food Processing Industries has been given the responsibility to service the GoM. The Ministry of Food Processing Industries has informed the Committee that it has drafted a Bill on the Modern Integrated Food Law, which is under the consideration of GoM.

Guiding Principles of Modern Integrated Food Law

4.62 Guiding principles of Modern Integrated Food Law to establish a national framework for setting food standards based on rigorous science and assessed risk and to guide all parts of the system in food.

4.63 Single window to :—

- — guide units engaged in marketing, processing, handling, transportation, and sale of food.
- — Inform Government response in respect of strategic issues like GM foods, traceability, Irradiation, Packaging etc. and in the overall context of risk assessment and risk communication.

4.64 Single reference point for standards, regulations and enforcement agencies.

4.65 Salient Features of the New Modern Integrated Food Law

1. Single reference point for matters relating to Food Safety & Standards, regulations and enforcement.
2. Covers all foods including Genetically Modified organic foods, nutraceuticals, functional foods, organic foods etc. but excluding primary foods as being defined in the proposed bill.

3. No cross referencing with other Food Laws.
4. Shift from strict regulatory regime to self compliance.
5. Gradation of penalties as per the gravity of offences.
6. mechanism for civil redressal. Provisions of deterrence through economic costs for minor offences.
7. Mechanizm for traceability.
8. Accreditation and notifying mechanism for accreditation, certification bodies and food testing laboratories.
9. Single set of standards for domestic consumption, import.
10. Independent and transparent.
11. Control through implementation of safety management systems in food chain.
12. Transparency through appeal panels.
13. More emphasis on food Category System rather than individual food products.
14. The use of science based on risk assessment, risk management and risk communication in setting up of standards.
15. Scientific and technical inputs to Government in the crisis management procedures, implementation with regard to food safety.
16. Introduction of rapid alert system in case of food emergencies.
17. Contribution to the development of international technical standards for food and sanitary and phyto-sanitary standards.
18. Consistency between international technical standards and domestic standards while ensuring high level of protection to the consumers.
19. Open and transparent public consultations, directly or through representative bodies during the preparation, evaluation and revision of food standards.
20. Risk management/enforcement taking into account the results of risk assessment.
21. Fix responsibility on food manufacturers/food business operators to ensure that a food, which it has imported, produced, processed, manufactured or distributed is in compliance with the domestic food laws.
22. Matters relating to scientific and technical assistance, scientific studies, collection of data, identification of emerging risks, networking of organisations operating in the same field etc.

FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA

4.66 Food Safety and Standards Authority of India which will provide regulatory framework for all parts of the system and notify standards, codes of practice, oversee capacity building, data generation for risk assessment and risk management, provide technical assistance and the early warning system on strategic issues concerning food.

4.67 The Authority shall for the purpose of promoting the manufacture, processing and sale of safe and wholesome food, have the duty to:

1. promote and coordinate the development of uniform risk assessment methodologies in the field of manufacture, processing and sale of food;

2. commission scientific studies necessary for the accomplishment of its tasks;

3. search for, collect, collate, analyze and summarize scientific and technical data regarding fixing of standards;

4. undertake action to identify and characterize emerging risks in relation to consumption of food and introduce rapid alert system to monitor and forward messages on the health & nutritional risks of food;

5. establish a system of network of organizations operating in the field of food;

6. provide scientific and technical assistance to the Central Government and State Governments in the implementation of crisis management procedures with regard to safety of food and setting up mechanism to recall contaminated and unsafe foods;

7. provide scientific and technical assistance to the Central Government and State Governments for improving cooperation with international organizations in the field of manufacture, processing and sale of safe food;

8. specify maximum limits for use of food additives, and maximum limits for contaminants, pesticide residues and residues of veterinary drugs;

9. ensure that the public and interested parties receive rapid, reliable, objective and comprehensive information in the field of manufacture, processing and sale of safe food;

10. undertake any other task assigned to it by the Central Government to carry out the objects of this Act;

11. the coordination and supervision of implementation of the provisions of this Act by formulating the procedures required from time to time to achieve the objects of this Act;

12. the collection of opinion and feedback from all concerned in the food chain, generating awareness of food safety matters;

13. notifying standards and guidelines, after previous publication, in relation to articles of food meant for human consumption;

14. notifying accredited laboratories and research institutions for the purposes of this Act;

15. specifying the procedure for entry and approval of any article of food imported into India;

16. notifying the procedures for the enforcement of quality control and inspection in relation to commodities intended for export;

17. notifying independent agencies for certifying industrial units which comply with food safety management systems;

18. specifying an appropriate system for enforcing various standards notified under this Act;

19. specifying the authorities for taking samples of any article of food, laying down guidelines for testing of such samples by accredited laboratories and subsequent follow up of the test results for appropriate action under this Act;

20. promoting the procedure of self-compliance by industrial units with the standards and food safety management systems;

21. notifying the procedure for registration of industrial units for the manufacture, processing and sale of safe food, the authority empowered to register such units, the fees payable therefor, the deposit of any sum as security for the performance of the conditions of such registration and the circumstances under which such registration may be cancelled or security may be forfeited;

22. laying guidelines for the continued utilisation, as far as practicable, of existing staff and infrastructure available in various Departments of the Government of India and of the State Governments dealing with various laws relating to food, to ensure better compliance with the standards and guidelines notified by the Authority under this Act.

MEETINGS OF GROUP OF MINISTERS

4.68 Two meetings of Group of Ministers have been held so far. The first meeting of GOM was held under the Chairmanship of the Minister of Law and Justice on 27.01.2003. In this meeting, the GOM had directed that the Secretary, Ministry of Food Processing Industries will call a meeting of concerned Ministries/Departments and come out with an agreed and common acceptable draft bill for the consideration of GOM in the next meeting. Accordingly, the Secretary, Ministry of Food Processing Industries convened a meeting of Committee of Secretaries on Integrated Food Law on 6.2.2003 to chalk out a common strategy for common acceptable draft bill. In this meeting, there was a consensus around the following points:

1. Need for convergence in existing laws and to modernize them is recognized.

2. In order to quickly achieve the objective of bringing about modern integrated and converged food law one possible route could be to first bring a statute enabling the setting up of an independent developmental and regulatory authority to look into all aspects of existing food laws and recommend new legislation.

4.69 The above recommendations of the Committee of Secretaries was placed before the Group of Ministers (GOM) for their consideration in the second meeting held on 18.03.2003. In this meeting, the GOM observed that two issues need to be clearly established:—

1. International experience in both legislation and instrumentality of the law needs to be studied which can then become the building block for the new law.

2. The areas of convergence and the areas of disagreement between Department of Health on the one hand *vis-a-vis* their comprehensive amendment to the PFA Act and the Integrated Food Law on the other, need to be listed out clearly for decision before the GOM.

4.70 It was agreed by GOM that Secretary, Ministry of Food Processing Industries will coordinate discussions with all Ministries represented in the GOM as well as Secretary, Law Commission and bring out a comparative chart of these issues, namely, the international experience regarding law as well as its instrumentalities.

4.71 As per the directions of GOM, Secretary, Law Commission had undertaken the exercise and recommended following:

> "The Bill prepared by the Ministry of Food Processing Industry can be taken as the base document and improvements can made to it. While revising the draft Bill the shortcomings noticed by the Ministry of Health in the working of the Prevention of Adulteration Act 1954 should be addressed and suitable provisions must be incorporated like civil penalties for contraventions of the Act instead of criminal punishments. Criminal sanctions should be restricted to contraventions of serious nature which must be tried by special courts in a summary way. Trial by Special Court as suggested by the Ministry of Health in their Concept Note on the Amendments to the Prevention of Food Adulteration Act 1954 should also be incorporated in the proposed Act. The proposed Act apart from establishing a Food Safety and Standards Authority of India should empower the Central Government to prescribe standards for food articles. The Central and State Governments shall have the power to recall any food item posing risk to health. They shall also have power to pass suitable orders to deal with any emergency. Contraventions of the provisions of the Act should be subject to civil penalty adjudged by Adjudicating officers appointed by the State Governments. Appeals will lie from the orders of the Adjudicating officer to one man Tribunals to be established by the State Governments. The Prevention of Food Adulteration Act 1954 will have to repealed and the Orders issued under the Essential Commodities Act 1955 in so far as they relate to food will be subsumed under the new Act. In other words the proposed Act will be a comprehensive standard setting legal instrument for food comparable to the international standards. The proposed Act should expressly make it clear that the mandatory provisions will not apply to the primary food producers namely the farmers so that their interests are not adversely affected by the proposed enactment. However the farmers should be encouraged to voluntarily comply with the standards specified by the Act and to facilitate this the Central Government can frame suitable schemes under the Act, offering incentives to such farmers."

4.72 Secretary, Law Commission has further stated that the bill prepared by Ministry of Food Processing Industries, if approved by the GOM, can serve as the working draft which can then be further revised by the Legislative Department keeping in mind the requirements spelt out by Ministry of Food Processing Industries and Ministry of health in their proposed amendments.

4.73 After receiving the comments of Secretary, Law Commission, Ministry of Food Processing Industries convened a meeting of Committee of Secretaries on Integrated Food Law to discuss the recommendations made by Secretary, Law Commission and to come out with an agreed draft bill. The Ministry of Food Processing Industries informed the limit that all the concerned Ministries/Departments were in full agreement with the recommendations made by the Secretary, Law Commission and approach of draft bill except Ministry of health and Family Welfare. It has further been stated that the question raised by Ministry of health and Family Welfare, as to which Ministry will deal with the proposed legislation needs to be decided by the GOM/Cabinet and this is not a legal question on which Secretary, Law Commission can give views. Comments Department of Legal Affairs are as follows:

* Parliament has necessary legislative competence to enact the proposed draft Bill, as the same comes with in the ambit of Article 246 of Constitution.

* The proposal on Integrated Food Law does not have any legal or constitutional objection.

REGULATION IN FOOD—INTERNATIONAL SCENARIO

4.74 In recent years most countries have gone in for comprehensive review of food legislation and structures responsible for administering food safety, quality and export-import issues. The direction of change has been primarily:

* movement from multi-level and multi-departmental control to single line of command;
* creation of larger entities through federation/conglomeration which facilitate inegrated response to strategic issues as evidenced by strengthening of European Union Food Safety Authority and creation of Australia-New Zealand Food Development Authority;
* Increased transparency and clarity of provisions of law with maximum information being made available to the consumer;
* a shift in emphasis from vertical to horizontal standards and from penal regime of self-regulation and consumer empowerment.

4.75 The Ministry of Food Processing Industries has stated in a written reply to a question regarding regulatory practices in other countries that most of the countries like European Union, United Kingdom, USA, Astralia, New Zealand, Malaysia, Canada, Thailand etc. have already taken steps towards establishing a single authority for laying down and regulating standards. CII also stated in their presentation to the Committee that most countries have unified food laws including Indonesia and Pakistan. CII in its international survey of Malaysia, Thailand, Indonesia, Pakistan and Turkey has observed the following practices:

* Focus on in-process quality control rather than product testing;
* Compliance rather than prosecution;
* Compounding of minor/technical violations;
* Possibility of analytical error recognized;
* Statutory protection of manufacturing process and trade secrets;
* Horizontal Food Standards and vertical standards for a few sensitive food articles (Thailand);
* Administrative Sampling (Malaysia);
* 3 tier Quality Tolerance Standards (Thailand).

Quality variation Range	Result
0-10%	Permissible
10-30%	Sub-Standard
30%	Adulterated

* High powered Screening Board to examine cases before prosecution (Thailand)
* Consultation with manufacturer (Indonesia)
* Periodic quality audits of food factories (Turkey)

CONCLUSIONS/RECOMMENDATIONS

4.76 The Committee find that there are multiplicity of laws and regulations dealing with the food safety standards in our country, which is evident from the fact that there are about eight ministries which are dealing with the food laws. This has resulted in many standard making bodies like BIS under the BIS Act, CCFS under the PFA Act, The Ministry of Food Processing under the FPO, Ministry of Agriculture under 'AGMARK' etc. The position with regard to the multiplicity of agencies in the case of drinking water has already been highlighted by the Committee in the earlier chapter. What is of deep concern to the Committee is the fact that very often these bodies are working independent of each other and there is hardly any co-ordination among these. Such a situation has obviously resulted in loose administration and enforcement of the various laws, with the result that consumer is the ultimate sufferer. The concern in this respect was rightly expressed by a number of organizations/bodies/experts who deposed before the Committee. The need to converge all the present laws and to have a single regulatory body was also strongly impressed upon by almost each of them.

4.77 The Committee note that the Ministry of Food Processing Industries are already seized with the problem and the entire issue of an integrated food law and a single Authority is being looked into by a Group of Ministers. The Ministry of Food Processing Industries which is serving the Group of Ministers has already drafted a Bill on the Modern Integrated Food Law. The Bill provides a framework for integration of the existing food laws to bring harmony and convergence in their areas of operation. It also provides for the establishment of an independent Food Safety and Standards Authority of India, which shall be responsible for ensuring availability of safe and wholesome food for human consumption by fostering the use of science in the food industry. Though this is a well conceived notion which will help harmonize various existing food laws, the Committee are unhappy to note that so far not much headway has been made in this regard, as the Group has met only twice since it was constituted. They therefore desire that expeditious steps be taken in this regard to finalize the Bill, without further loss of time by giving it top priority, as it concerns public health and food safety in India.

ANNEXURE

MULTIPLICITY OF LAWS IN FOOD SECTOR

1	2	3
MINISTRY OF HEALTH & FAMILY WELFARE	**MINISTRY OF AGRICULTURE**	**MINISTRY OF FOOD & CONSUMER AFFAIRS**
Prevention of Food Adulteration Act, 1954 (PFA) —Prevention of Food Adulteration Rules, 1955 —Health Food Supplement Bill	Agricultural Produce Marketing Act —Milk and Milk Product Order, 1992	Essential Com. Act, 1955 Standards of Weights & Measures Act, 1976 —Packaged Commodities Rules, 1977 —Consumer Protection Act, 1986 B.I.S. Act, 1986 —VOP Control Order, 1947 —VOP (Std. of Quality), 1975 —SEO Control (Order), 1967
4	5	6
MINISTRY OF COMMERCE (DGFT)	**MINISTRY OF FOOD PROCESSING INDUSTRIES**	**MINISTRY OF RURAL DEVELOPMENT (AMA)**
Imports & Exports Regulations —Export Inspection Agency (EIA) —Tea Board —Coffee Board —Coffee Act & Rules	Fruit Products Order, 1955	Agricultural Produce Grading & Marking Act, 1937 (AGMARK) —Meat Food Products Order
7	8	9
MINISTRY OF FORESTS & ENVIRONMENT	**MINISTRY OF SCIENCE & TECHNOLOGY**	**MINISTRY OF HRD (Department of Women & Child Welfare)**
Trade in Endangered Species Act —Ecomark	Atomic Energy Act, 1962 —Control of Irradiation of Foods Rules, 1991 —G.M. & Organic Foods	Infant Milk Substitutes, Feeding Bottles & Infant Foods (Regulation of Production, Supply & Distribution) Act, 1992—Rules, 1993

OTHER ISSUES

4.78 There are some other related but vital issues which cropped up during the examination of the subject before the Joint Parliamentary Committee and the Committee would not be doing justice if the recommendations relating to these are not made. These are enumerated as under:—

1. **The Committee note that at present, neither there are sufficient number of laboratories in the country nor are these adequately equipped. There are only four Central Food Laboratories now to cater to the entire country. The Committee therefore, strongly recommend that in a country of the size of India there should be an adequate number of modern, world class food analysis laboratories accessible to aggrieved consumers, at affordable charges. The Committee therefore, urge the Government to constitute a Task Force of experts to assess the present situation and recommend measures to (a) upgrade and strengthen the infrastructure in the existing laboratories under the Central and State Governments, (b) assess the need for new dedicated world-class laboratories, (c) ensure that these laboratories have appropriate recognition/ accreditation necessary to be respected in the international fora and in the courts.**

   The Government of India should go for NABL accreditation of all its laboratories responsible for testing of foods for all the parameters specified under various food laws. At least two laboratories which must have international recognition should be set up so that results of foreign laboratories should be cross checked to ensure the quality of foods. It is also important that Indian testing methodologies should not be inferior in any sense in comparison to CODEX, WHO, ISO or AOAC in order to ensure the safety and credibility of Indian products in the market. The laboratories should also have the facilities to test the antibiotic residues, heavy metal contamination and other toxic contaminants in the food items. Testing manuals should be developed for all the parameters and products that are covered under Indian food laws. In case any variation is required in the existing standardized methodologies, this must be specified in the manual itself. The laboratories should also be well equipped with competent qualified personnel in all the States/UTs.

2. **India is fortunate to have substantial reserves of bio-diversity. While vigorous efforts are on by the CSIR and other institutions to explore them for new therapeutic agents, hardly any attention is being given to scouting for new plant protection substances. Farmers can be weaned away from using banned and polluting synthetic pesticides, if better, safer and affordable alternatives are made available to them. The Committee strongly recommend to the Government to establish an initiative in the nature of a five year National Mission to explore the bio-diversity sources of India through a nationwide R & D network to search for eco-friendly pesticides. The CSIR can be an appropriate agency to mount and lead such a mission, acting in co-operation with the Ministry of Agriculture, Ministry of Science & Technology, Ministry of Environment & Forests and their agencies, State Government institutions, relevant academic institutions and private business houses.**

3. **In order to avoid panic reactions to revelations of the recent type, the Committee suggest that a national conference may be held annually to discuss results of annual formal and non-formal surveys . A status report/white paper on food standards and safety should be made available to the public every year. Government may identify a suitable agency which could be entrusted with this task, acting in co-operation with all stakeholders, both government and non-government.**

4. **There must be a code of conduct for disseminating the results of an investigation either from an NGO or from a laboratory or anyone else. Today for example if a survey is done or a study conducted, or an analysis with respect to spurious food item is suddenly taken up, there is no code of conduct for reporting it in an orderly fashion. In order to avoid such a situation, the Committee recommend that the results must be validated so as to ensure transparency.**

5. **The code of conduct should include a process of self-regulation in the industry in terms of their in-house analysis at regular intervals in accordance with the standarized parameters. This may include in the current context pesticides, heavy metals, chemical toxicants, pathogens and synthetic additives. The manufacturers have to be absolutely responsible for maintaining standards. Any deviation from the set standards for beverages, fruit juices and other related products must be dealt with strictly after verifying the records, with an immediate disclosure of the Processing Centre. It must also be ensured at the same time that the verification is fool-proof, unambiguous and transparent.**

6. **A mandatory Food Recall System should be established and companies should be made accountable for selling sub-standard and harmful products in the market which must be destroyed in the presence of authorities. Withdrawal notices must be issued in media to inform citizens so that they should be made aware about the unsafe products. In order to check adulteration in the food items, the Government should not hesitate in taking help of NGOs. The Government must also improve surveillance and monitoring the quality of the food.**

7. **Building confidence measures are equally important for the consumer. It is therefore essential that the product must have a logo on it displaying that the product is safe. It is this logo that the consumer, whether literate or illiterate, must look for on the product. Consumers need not be aware of the AGMARK, PFA, BIS etc. Such a logo must be obligatory on all food packages either processed or fresh as a guarantee from the supplier or the manufacturers. This should be applied to the imported food products as well. In case it is not there, the local distributor or supplier must put the same and take the responsibility. In case these requirements are flouted by putting a wrong information regarding the safety of the product, the concerned manufacturing unit should be closed immediately and the sale of that product should be banned. If necessary provisions in the relevant Act need to be incorporated to this effect, the same must be done without further loss of time. It is also important that the information regarding the Batch Number, Date of Manufacture, Expiry Date etc. must be indicated on the label and not on the container as is the present practice, as the container can be thrown after use, whereas the label can be preserved and digitized. In the case of proprietary food products, the detailed label declaration about the ingredients including the nutritional information should be made mandatory, so that sensitive consumer groups which may include allergic people, diabetic, children, etc. can take their own decision for consumption of the food items.**

8. **The Committee also desire that there should be 50% representation from the Central and State levels in various R&D policy making bodies and the remaining 50% should be equally divided among the representatives of the farmers' cooperatives, consumer bodies, industrial bodies particularly small scale industries as they are the main stakeholders.**

9. **The Committee have observed that there is no proper enforcement mechanism for regulating food laws. The number of samples drawn as well as the Inspectors are almost negligible as it has been reported that on an average in each State 10 to 20 samples are drawn per month and the number of Inspectors likewise on an average ranges between 20 to 50 per State. This needs to be suitably augmented. The information with regard to the samples lifted by the Inspectors along with the results must be available in each State on the website on monthly basis.**

10. **Clause 43 of PFA stipulates that there shall be no advertisement of any food which is misleading or contravening the provisions of PFA Act, 1955 or the rules made there-under. Despite the detection of pesticides in the samples of soft drinks by CSE, CFTRI and CFL, Kolkata, Cola Companies have been giving wide publicity in the electronic media stating that their products do not contain any pesticides and are fully safe for human consumption. The Committee feel that claims made by the Cola companies in their advertisement tantamount to misleading the public as their products do contain pesticides which have ill effect on human health in the long run.**

4.79 The Ministry of Health & Family Welfare have expressed their inability to restrict the advertisement by Cola companies on the plea that MRL for pesticides have not been prescribed for carbonated beverages under PFA Rules, 1955 and in the absence of which there is no provision to restrict the advertisement from these products. The Committee feel that it is the responsibility of the Ministry of Health to ensure that no misinformation is spread by any company with regard to their products. The Ministry of Health & Family Welfare should have invoked the relevant provisions of the Prevention of Food Adulteration Act, 1954, in this regard.

NEW DELHI;
January 27, 2004
Magha 7, 1925 *(Saka)*

SHARAD PAWAR,
Chairman,
Joint Committee on Pesticide Residues in and Safety Standards for Soft Drinks, Fruit Juice and other Beverages.

OBSERVATIONS/CONCLUSIONS/RECOMMENDATIONS

Sl.No.	Para No.	Observations/Conclusions/Recommendations
1	2	3
1.	1.89	As regards the first terms of reference of the Committee, the Committee would like to divide it in two components, the first one is the qualitative (detection and identification) aspect and the second is the quantitative one (estimation and confirmation). So far as qualitative aspect is concerned, the Committee are of the view that CSE findings are correct on the presence of pesticide residues in carbonated water in respect of three samples each of 12 brand products of Pepsico and Coca-cola analyzed by them. CSE tested 36 samples for 16 organochlorine pesticides, 12 organo phosphorus pesticides and 4 synthetic pyethroids, which together constitute a list of 32 most commonly used pesticides in India. CSE detected the gamma isomer (Lindane) in all the 36 samples and three other isomers of hexachlorocyclohexane (commonly called HCH or BHC) in some of the samples at varying levels. DDT and its metabolites were detected in 29 out of 36 samples. Among the organo phosphorus ones, chlorpyrifos was detected in all the 36 samples in varying concentrations and malathion in 35 out of the 36 samples at different levels. None of the four synthetic pyrethroids was found in any of the 36 samples.
2.	1.90	The Committee have however, noted that 19 of the 36 samples came from one bottling unit in Jaipur, 15 from one bottling unit in Hapur Tehsil in Ghaziabad, one from a bottling unit in Jodhpur and one from bottling unit in Mathura.
3.	1.91	CFL-CFTRI (Central Food Laboratory at Central Food Technological Research Institute, Mysore) and CFL, Kolkata (Central Food Laboratory, Kolkata) analyzed independently samples of the same 12 brands collected and sent to them by Directorate General of Health Services. Both laboratories also detected the presence of organochlorine and organophosphorus pesticide residues. The presence of pesticide residues, therefore, is a common scientific finding of all the three laboratories. The Committee would, therefore, conclude that CSE stands corroborated on its finding pesticide residues in the carbonated water. So far as non-detection of malathion by the two laboratories is concerned, the Committee attribute the same to the variations in different batch numbers, manufacturing locations and also the dates of collection and analysis. The absence of malathion in the Mysore and Kolkata analysis have been scientifically explained by CFTRI. GCMS method

1	2	3
		has been applied to confirm the absence of malathion, reinforced by spiking samples and analysis. The Committee also note that the presence of malathion was also reported by the laboratory under the Central Pollution Control Board and Shriram laboratory (Bangalore) and hence out of the five laboratories three had detected malathion in the samples tested by them.
4.	1.92	With regard to the quantitative aspect, the results of CSE on the one hand and CFL-CFTRI and CFL, Kolkata on the other vary widely. The Committee have no hesitation in admitting that as explained by different experts who deposed before the Committee, variations in an analytical research is a well known factor. It can arise due to host of other factors such as differences in (a) the manufacturing locations, (b) date of manufacture, (c) batch number of products, (d) temperature conditions of storage at the stocking place/retail end, (e) the laboratories due to the differences in the analytical techniques/procedures, (f) structural stability and (g) characteristics of the chemical molecule in question etc. In the instant case, there have undoubtedly been variations in the samples which had different batch numbers and also were manufactured at different locations. Though all the three laboratories have employed the same analytical procedure namely US Environmental Protection Agency Method 8081A for organochlorine and 8141A for organophosphorus pesticide, differences have been noticed in the way the procedure was performed as enumerated in Annexure X, with the result that the differences could be significant.
5.	1.93	Moreover, CFL of CFTRI was able to apply GC Mass spectrometry combination for confirmation of its results—the importance of which has been highlighted by a number of experts who appeared before the Committee. Besides, though CSE has reported that the concentration level of pesticide identified in carbonated water was far in excess of the limit laid down in EU directives, however, the Committee are of the view that comparing residue level in any article of food on a percentage basis could have been avoided because EU norms were not adopted at that point of time in our country. The results of CFL, Mysore and CFL, Kolkata however come closer to each other in terms of the number of times the total pesticides level exceeded the EU limit, in the specific batches. For the results to be compared in the quantitative terms, all the three laboratories should have adopted the same protocol in the design, conduct and interpretation of results of the study.Besides, CFL-CFTRI and CFL Kolkata are among the four laboratories established under the Prevention of Food Adulteration Act, 1954 with a mandate to carry out the functions entrusted under the PFA Act, as amended and notified on 30 December, 2002. The broad jurisdiction of these four laboratories has been notified under the PFA Rules, 1955. These are therefore approved and authorized laboratories to conduct food

1	2	3
		analysis including beverages and packaged drinking water. In addition CFTRI under which CFL functions has been accredited by NABL for both chemical and biological testing. CFTRI is also an ISO/ 9000:2000 certified organization. On the other hand CSE has not cited any accreditation from NABL or certification from ISO (International Standards Organization) to support its analytical competence. This aspect was highlighted by several organizations in their evidence and presentations before the Committee particularly CII, FICCI, ICMR and CPCB. CFL, Kolkata also does not have accreditation from NABL. Accreditation is a formal recognition of the competence of a testing laboratory and gives credence for data acceptance—a fact which has been recognized internationally also.
6.	1.94	The European Union in fact has a long list of guidelines and directives concerning the performance of analytical methods and interpretation of results. (Council Directive 96/23 EC). The importance of adopting confirmatory methods for arriving at the authenticity of the results is equally important, since as per the EU Directive also confirmatory methods for organic residues or contaminants provide information on the chemical structure of the analyte. Consequently, methods based only on chromatographic analysis without the use of spectometric detection are not suitable on their own for use as confirmatory methods. The fact however remains that such a test was not done by CSE. Moreover, it would have been appropriate if the evaluation of tests was conducted on the same samples by two or more laboratories in accordance with the predetermined conditions. The Committee note that although the pesticide residues were found in all the test reports with quantitative variations, however, while citing EU norms/limits for pesticides, the CSE adopted the USEPA method for analytical purposes. The Committee feel that CSE could have adopted the EU specified methodology to reach a final conclusion of pesticide residues and its follow up.
7.	1.95	Though the results of the Central Pollution Control Board which had conducted an independent testing through their laboratory, come closer to the findings of CFL-CFTRI and CFL, Kolkata, the percentage reported by Shriram laboratory which had tested only one sample each of Coca Cola and Pepsi is quite high. In view of the fact that these laboratories also did not test identical samples and the dates of manufacturing as well as locations are different, the quantitative results reported by them cannot be compared.
8.	1.96	The Committee, however, find that the CSE findings are correct on the presence of pesticide residues in carbonated water strictly in respect of the 36 samples of 12 brand names analyzed by them. The Committee also appreciate the whistle blowing act of CSE in alerting the nation to an issue with major implications to food safety, policy formulation, regulatory framework and human and environmental health.

1	2	3
9.	2.170	The Committee note with deep concern that the soft drink (Carbonated water/Sweetened Aerated water) industry in India with an annual turnover of Rs. 6000 crores is unregulated. It is exempted from Industrial licensing under the Industries (Development and Regulation) Act, 1951 and gets a one time license to operate from the Ministry of Food Processing Industries under the Fruit Products Order (FPO), 1955 and a no objection certificate from the local government and the State Pollution Control Board.
10.	2.171	What further dismays the Committee is the fact that whatever action has been taken recently by the concerned Ministries is only as a result of the findings of an NGO with respect to the presence of pesticides in the soft drinks rather than any systematic approach based on scientific studies. For instance the Ministry of Health and Family Welfare which is a nodal Ministry for laying down standards of safety for all food items suddenly became alive to the entire issue only after Centre for Science and Environment—NGO based in New Delhi published its report on the presence of pesticides in soft drinks on 5th Aug., 2003. It issued a draft notification No. GSR 685 dated 26.8.2003 prescribing the same standards for soft drinks, fruit juices and other beverages as prescribed for packaged drinking water which were notified again after the Report by the same NGO was made public and under which EU norms for individual and total pesticides have been prescribed, without trying to ascertain as to how under the same notification soft drinks could be clubbed with fruit juices particularly when the MRLs fixed in the case of raw fruits and vegetables happen to be much higher under the existing provisions of the PFA Act, 1954. The Ministry did not take the opinion of the Central Committee on Food Standards (CCFS), which is a statutory Committee under the Act for laying down standards for various food items. This step of the Ministry according to their own admission was in a way unprecedented. The plea taken by the Ministry, therefore, that it had issued the said notification under the provisions contained in the bye-laws and section 23 of the PFA Act because the matter was of public importance, is not at all acceptable to the Committee. The Ministry further submitted that Government approved the draft notification on 14.8.2003 and issued the same on 26.8.2003, in between JPC was also constituted to look into the matter. Though normally the time allowed for inviting objections is 90 days but under the aforementioned draft notification only 30 days were allowed, with the result that the JPC had to intervene and take up the matter with the Government, which agreed to extend the date by 31.12.2003. The Draft notification naturally resulted in raising concerns about the feasibility and practicability of implementing these identical standards for soft drinks and fruit juices, from not only the Chambers of Industry representing the manufacturers of the soft drinks, fruit juices and other ready-to-serve beverages but also from the other Govt. Agencies *viz*. Ministry of Food Processing Industries, APEDA and CFTRI etc.

1	2	3
11.	2.172	The Committee therefore, feel that in future the modifications in the standards should not be done in haste but should only be taken after full scientific studies based on proper risk assessment and after holding wide consultations in the CCFS and its sub-committees where the Ministries, experts, scientists, trade and industry, farmers' representatives, consumer organizations as well as the States/UTs are represented. Moreover, keeping in view the vital issue of the health of the population of our country, the revision of standards has to be an ongoing and regular process which should draw the serious attention of all the concerned ministries and particularly of the Ministry of Health and Family Welfare which is at the center-stage for administering food laws and implementation of various health programmes.
12.	2.173	The Committee are of the view that Codex matters are of very serious nature under WTO regime. It is therefore necessary that Indian delegations are not under prepared and should have the required technical qualification and experience to discuss complex technical matters in Codex meetings. The Committee therefore, desire that scientists must head the Codex teams representing India in all Codex meetings and these should not be headed by the bureaucrats from different ministries as is the present practice, since the latter often lack required professional/technical knowledge and do not have expertise and relevant experience. It is also desirable that all position papers on all agenda papers are submitted to the Head of the Govt. Department before the Codex meetings. The technical experts, must submit detailed independent reports to the Government, after attending Codex meetings.
13.	2.174	The Committee note that soft drinks under the PFA Act, "A01.01" are defined as Carbonated Water meaning potable water impregnated with carbon dioxide under pressure and may contain other ingredients such as sugar, liquid glucose, dextrose, invert sugar, fructose, honey, fruit and vegetable extractives and permitted flavouring, colouring matter, preservatives, emulsifying and stabilising agents etc. The major ingredient of soft drinks is water which accounts for 86%-92% of the total soft drink composition. Besides water, soft drinks contains sugar varying from 5 to 10%, carbon dioxide, acids like citric acid, phosphoric acid and malic acid which are added to balance and the concentrate. It is however extremely surprising that though water is the major constituent, so far neither it has been defined properly nor the standards laid down either under PFA, FPO or BIS certification scheme are monitored and enforced effectively. The only stipulation with regard to the water mentioned under FPO in the Second Schedule Part 1 (A) is that the water used in the manufacture shall be potable and if required by the Licensing Officer it shall be got examined chemically and bacteriologically by any recognized laboratory, but the same has not been defined. Further FPO mentions limits of poisonous metals

1	2	3
		(lead, copper, arsenic, tin, Zinc etc.) in fruit products but makes no mention of pesticide residue levels either in the water used in the manufacture of juices or in the beverages. The norms about quality and standard for the potable water that is used by the soft drink manufacturers has not been prescribed. The irony is that only at the time of issuing the license, a certificate from a recognized laboratory is insisted upon. The other condition that is stressed upon is that the premises should be maintained in a hygienic way. Similarly, under the Prevention of Food Adulteration Act, 1954 and Rules 1955, under item A.01.01 of Appendix B, water under the category of carbonated water only mentions that water has to be potable but no quality standards except for the microbiological contaminant standards for the final soft drinks are specified. Like FPO, PFA also does not specify any standards for inorganic and organic chemicals and pesticides for soft drinks.
14.	2.175	Apart from these two mandatory regulations, there is also a voluntary specification of BIS for Carbonated beverages (IS 2346:1992). It specifies the quality of water to be used in the manufacturing of soft drinks which should meet the water quality standard for the processed food industry IS 4251:1967, which in turn specifies standards for bacteriological, physical and chemical tolerances but does not mention pesticides. It is only recently that the Ministry of Health and Family Welfare issued notification No. GSR.554(E) Dated 18.7.2003 prescribing standards of 0.0001mg/litre for individual pesticides and 0.0005 mg/litre for total pesticides for the packaged drinking water which are in conformity with the standards of EU and these norms have already been enforced w.e.f. 1.1.2004. The packaged drinking water has also been brought under the definition of 'Food' in the year 2001. The same norms however, have been prescribed in the notification issued on 26.8.2003 for the soft drinks and other beverages on the plea that water is the main constituent in these. From the depositions made before the Committee by the Coca-Cola, Pepsico, Delhi Jal Board, Indian Bottled Water Manufacturers Association and a few others including the Ministry of Health and Family Welfare, it was made amply clear that it is not difficult to meet the new norms for water since most of the manufacturers have already installed the requisite equipment which is not very costly and they are already meeting the new standards. In fact the Bottled Water Manufacturers Association as well as the Ministry of Health & Family Welfare, had also clarified that the processing charges involved in processing the water are almost negligible. The Committee were also informed by a number of experts that the technology for removing the pesticides from water already exists and these can be removed to any level.
15.	2.176	The Committee are of the view that Carbonated beverages cannot be clubbed with fruit juices, because these are different products with different specifications and the existing law already differentiates

1	2	3
		between these products. Moreover, the soft drinks do not form part of the nutritious diet, and though the present per-capita consumption of the soft drinks is not much in our country as compared to other countries like United States or European countries, but the trend towards more consumption is gradually growing in the entire Asian region and in future can expand to a significant extent in India also. The Committee are therefore, of the considered opinion that the water used in manufacturing the soft drinks should be in conformity with the new norms which have already been notified under notification No. GSR 554(E) dated 18.7.2003 so that the consumers are not deprived of the best standards.
16.	2.177	Though it has been stated by some manufacturers of soft drinks that there is a possibility of pesticides entering into the beverages through sugar, the Committee are not inclined to accept the same and desire that this requires to be investigated in detail. The following may be considered while investigating: According to the Package of Practices provided by Extension Departments, most of the sugarcane farmers are using only three to five types of pesticides. Most of the pesticides in sugarcane cultivation are used at the time of pre-planting stage, planting stage and first six months of crop growth (February to June). In case there is any insect or disease attack on the crop, two or three types of pesticides are used till harvesting. This time gap between spray of pesticide and sugar extraction only results in degradation of pesticides. According to Current Science Vol. 85, No. 10 25th Nov., 2003, under tropical conditions microbial activities in soil are high, hence degradation of pesticides is also faster. According to sugar technologists, the refining process of sugar from sugarcane juice involves boiling, clarification by lime, sulphur dioxide gas, centrifugation of massecuite to remove molasses and sugar crystal. Sugar produced by crystalization is a process, which itself ensures the purity of the product and reduces impurities like dust, dirt and pesticide residues. According to United States Department of Agriculture's Pesticide Data Program (USDA-PDP) supplemented with information from Food and Drug Administration Centre for Food Safety and Applied Nutrition (FDA/CFSAN) on Organophosphorus Chemicals on Food Crops, "a knowledge of highly refined nature of sugar and syrups supported by the limited residues data mentioned above is the basis of assumption that negligible residues of pesticides would be expected to occur in sugar and syrups".
17.	2.178	This indicates that the number of pesticides present in carbonated water and the levels may not be from the sugar source.
18.	2.179	Carbonated water manufacturers have already mentioned before JPC that they have foolproof process to select and treat the sugar and this treatment is uniform worldwide to ensure good quality sugar syrup for the products. These companies are already purifying the

1	2	3
		sugar syrup with Hot Carbon Treatment Process, which is effective in reducing most of the pesticide residues to below detectable level or below 0.1 ppb levels. The Committee feel that sugar, therefore, can not be the only source of pesticide residues.
19.	2.180	If the pesticides could be controlled to a large extent by adopting new water standards for packaged drinking water and also by subjecting sugar syrup through hot carbon process, the only other ingredients through which there is a chance of pesticides entering is either through the concentrate or other acids or flavours and colours etc. which also constitute about 3-4% of all the ingredients used in the manufacture of the soft drinks. So far as concentrate is concerned, it is not subjected to any quality testing by the Government laboratories under PFA.
20.	2.181	So far as other ingredients are concerned, their percentage is not significant. The Committee therefore opine that in case the standards of water are strictly adhered to and the entry of pesticides could be checked to a large extent by prescribing MRLs for all the pesticides which are used in the case of sugarcane, this problem can be tackled to a large extent. The Committee have observed from the oral/written evidence tendered before them that EU and others have formulated their norms keeping in view their environment, agricultural practices, pesticide usage, etc. The Committee have also noted that EU norms are not based on any toxicological criteria or any realistic basis, but are a surrogate for zero. Moreover, these norms are often used as non-tariff barriers by the European countries against the developing nations, to protect their agriculture, trade and industry. For various agro-based products EU standards for produce within the European Union are much liberal compared to products imported from developing countries—for example, the different MRL stadards for cane sugar vs. beet sugar and apple vs. mangoes, etc. The Committee, therefore, recommend that India should formulate its own food standards, which are based on scientific criteria, protects the interest and health of its people and are in keeping with the internationally acceptable norms. The Committee therefore recommend that standards for carbonated beverages, which are best suited for the Indian conditions need to be fixed in the overall perspective of public health. These standards should also be stringent enough. The reason that the other countries have not fixed such limits, should not dissuade our law makers in attempting to do so, particularly when a vulnerable section of our population who are young and constitute a vast national asset are consuming the soft drinks. In Committee's view therefore, it is prudent to seek complete freedom from pesticide residues in sweetened aerated waters . 'Unsafe even if trace' should be the eventual goal.

1	2	3
21.	2.182	The other area of concern to the Committee is the use of ground water by the soft drink manufacturing companies as well as bottled water manufacturing companies. The Committee find that though these companies are extracting huge amount of ground water but they are not being charged anything for using the water. The only charges that they pay is a petty amount as water cess which is being levied by the State Pollution Control Boards under Water (Prevention & Control of Pollution) Cess Act. States also do not seem to have uniform procedure in this regard as in some States, industries located in the industrial development areas are charged for use of ground water at rates decided by the concerned States and in others there is no such practice. Though the Secretary, Ministry of Water Resources tried to put forth the legal position in this regard before the Committee by stating that no charges can be levied on the use of ground water because legally speaking the land and the resources located under it belong to the owner who is free to use his assets in the manner he likes, but in view of the recent judgement delivered by the Hon'ble High Court of Kerala on 16.12.2003 in the case of Plachimada plant of Coca Cola India, the stand taken by the Secretary loses relevance. The Hon'ble High Court has opined in no uncertain terms that the use of water is free only in case the same is used for the domestic or agricultural use by the owner and since ground water belongs to the public, its commercial use has to be adequately restricted and even in the absence of any law governing ground water, the Panchayat and State are bound to protect ground water from excessive exploitation. The Secretary however had assured the Committee that in future perhaps the water if used for commercial and industrial purpose will have to be charged. The Committee, however, note with utter dismay that the Central Ground Water Authority (CGWA) which has been constituted as an authority on the directions of the Hon'ble Supreme Court of India, taking into consideration the urgent need for regulating the indiscriminate boring and withdrawal of ground water in the country, has so far hardly taken any concrete steps to properly regulate or coordinate effectively the extraction of ground water for industrial purposes. Taking into account that the water level in many parts of the country is getting depleted alarmingly, the Committee desire that this requires to be properly regulated so that at least on account of indiscriminate use of water for commercial purposes the level does not go down further. The Central Ground Water Authority must take immediate steps in this regard and also impress upon the State Governments to do so without further loss of time. The Committee note that water being a State subject, the central legislation cannot be enacted unless the concerned state legislatures pass a resolution and only a few states have enacted laws to regulate over-exploitation of ground water. The Committee desire that the Ministry of Water Resources must pursue the matter vigorously with the States and impress upon them

1	2	3
		the need to regulate water particularly for commercial purposes and also fix the price for water after taking into account the price being charged for water which is being used for domestic purposes.
22.	2.183	In India a variety of pesticides have been used for the last several years both in the agriculture as well as health programmes and these include the environmentally persistent organochlorine compounds such as DDT, BHC, Aldrin, Endosulphan etc. There is already published scientific work by the National Institute of Nutrition, Hyderabad and National Institute of Occupational Health which has established that long term consumption of DDT can cause reproduction disorders in women, cause chronic disorders and also cause different types of cancers. Pesticides such as DDT, Endosulphan and Dieldrin have been assigned oestrogenic potencies. Other than the scientific papers published, there have been flood of reports both in the print and electronic media on the harmful effects of pesticides. The most recent media report is on Endosulphan in cashew plantations in Kasargode district of Kerala, which has caused a variety of health problems in a few villages in the area ranging from cerebral palsy to congenital neurological disorders. Besides the harmful effects of pesticides, it has also been alleged by CSE that the other major ingredients of soft drinks namely, carbon dioxide, certified sweetners like aspartame, saccharine, acesulfame-K etc. and flavouring agents such as caffeine and phosphoric acid are also injurious to health.
23.	2.184	At present however no survey has been carried out to establish the daily intake of various food items including water, soft drinks and other beverages, which can be used for deciding the intake rate of pesticides. There is therefore an urgent need to initiate research studies on total exposure. Surveillance studies to identify high risk area, seasons, foods, high risk population groups etc. to pesticide residues especially organochlorines need to be undertaken in different agro-climatic zones of the country. The data needs to be combined with dietary intake studies. Thus exposure assessment from multiple exposure routes needs to be calculated so as to qualify the aggregate exposure. The Committee therefore suggest that in order to achieve this, a co-ordinated research project should be undertaken by the ICMR involving CSIR, Indian Agricultural Research Institute, National Institute of Occupational Health, National Institute of Nutrition, Vector Control Research Center and various other research centres. It is expected that building up of a vast data base on pesticide residues, its occurrence in food and environment, total intake by humans along with the long term effects of pesticides on the health will go a long way in taking appropriate control measures.
24.	2.185	The Committee find that soft drink companies are selling non-caffeinated soft drinks in every country besides the cafeinated ones

1	2	3
		including the United States and all countries in Europe. In India their production of non-caffeinated soft drinks is very little, as only Limca, Sprite and Mazza are stated to be non-caffeinated. Though the soft drink manufacturers have contended that more non-caffeinated products can be made available in India also provided there is a demand from the consumers, the Committee desire that at least option should be made available to the consumers to choose between the two. It is therefore desirable that all brands should include caffeinated and non-caffeinated drinks. They also desire that there should be no difference in the quality of products being marketed in India as compared to those which are being sold in the USA or other European countries.
25.	2.186	The Committee have been informed that Drink and Carbonated Beverages Sectional Committee FAD 14 which is BIS Technical Committee have decided to revise IS 2346-1992 which are standards for carbonated beverages and make it more broad based. In their report, the Technical Committee has advocated for restricting the use of caffeine in carbonated beverages as has already been done by some countries like Australia and China. They have also desired that the label on the caffeinated beverage must include advisory statements to the effect that the beverage contains caffeine and the same is not recommended for children, pregnant or lactating women and individuals sensitive to caffeine. The Committee desire that this recommendation be implemented based on best practices globally regarding caffeine regulations and its effects on human health. However, the Ministry may consider bringing down the present limit of 200 ppm in carbonated beverages as prescribed under PFA.
26.	2.187	The Committee were informed that due to operation of Coca Cola and Pepsico plants at Plachimada in District Palakkad in Kerala, agricultural operations have badly been affected. It has been alleged that operations of these plants have resulted in causing pollution of water, depletion of ground water, reduced yield in crops, skin disorders and other ailments among the inhabitants. The allegations have mainly been made against the Hindustan Coca Cola Beverage Private Ltd. plant at Plachimada. The High Court of Kerala, where a case was filed by the Perumatti Gram Panchayat against the company has delivered the judgement on 16.12.2003 according to which the extraction of ground water even at the admitted amounts has been declared illegal. An expert Committee has also been appointed by the High Court of Kerala on 20th December, 2003 to study the entire matter and file a report. The Committee were however informed that the application of the company regarding alternative source of water as well as power is pending with the State Government for the last more than four years. The Committee strongly recommend that the entire issue should be resolved and the company should also take into account the strong sentiments of the local people and various environmental

1	2	3
		issues positively. The State government must intervene in this regard and take necessary steps to resolve this serious issue. The Committee have been informed that the Hon'ble Supreme Court of India has constituted recently a Monitoring Committee on Hazardous Waste Management. One of the terms of reference of this Committee serviced by the Ministry of Environment and Forests is to oversee the implementation of hazardous waste management and submit a report to the Court on quaterly basis. It has jurisdiction over the entire country. The Committee suggest that implementation of discharge of effluent sludge in Palakkad and Plachimada be also monitored by the above Monitoring Committee.
27.	2.188	The Committee also find that though huge amount of ground water is being extracted by both the Coca Cola and Pepsico plants at Plachimada and Palakkad respectively, but the efforts made in recharging the water are not commensurate enough. While the Hindustan Coca Cola plant is recharging the water to the extent of 50% of the total water used, the position is far from satisfactory in the case of Pepsico plant which is recharging merely 10% of the total water used. Taking into account the importance of preserving our ground water resources which are vitally important for all sections of society, the Committee strongly recommend that provision in this regard needs to be incorporated in the relevant Act making it mandatory for those who use the water for commercial purposes to recharge ground water to the maximum extent possible.
28.	2.189	The Committee note that more than half of the total plants of Coca Cola India and Pepsico India Holding Private Limited are franchisee owned plants. Out of 52 plants of Coca Cola India, 25 are franchisee owned plants. Pepsico India has 21 Franchisee owned plants out of a total of 38 plants in India. They also note that all bottlers of Coca Cola company whether franchisee or company owned have signed Standard International Bottlers Agreement (SIBA) which is uniform across the world and the quality control system for the company owned and franchisee owned plants is the same. However, Pepsico India has not even signed the agreement and have stated that Franchisee bottlers are liable for their business and the company has no responsibility in respect thereof. Thus even though franchisees bottlers are required to adhere to quality control specification and other standards of parent company, they have no legal liability over their action and inaction.
29.	2.190	The Committee consider these explanations tendered by Pepsico and Coca Cola India unsatisfactory in the context of the findings of Pesticide residues in their brand of soft drinks. The Committee feel that the existence of a bottlers agreement can not absolve the producers and marketers of their responsibility towards ensuring freedom from contamination of the beverages sold to the consumers. Whether its own bottling units or a franchisee bottling units, it is the

1	2	3
		absolute responsibility of the brand owner who selects the bottlers, provides the processing technology quality know-how, the concentrate and finally markets the end products, to ensure that consumers get a product which is in conformity with the prescribed norms of quality and safety. The Committee therefore, recommend that onus for maintaining the quality should lie with the parent companies/brand owners and its compliance should be ensured.
30.	2.191	Fruit juice and other Beverages are covered under Clause 2 (d) of the Fruit Products Order, 1955 as fruit products. As per FPO, fruit juices are defined as unconcentrated liquid product extracted from ripe fruit and may contain portions of the pulp and other cellular matter natural to the fruit. FPO specifices that percentage of fruit juice in the final product should not be less than 85% and total soluble solids in the final product by weight should not be less than 10%.
31.	2.192	Other beverages under FPO mentioned as ready-to-serve fruit beverages including aerated water containing fruit juice or pulps, should have a good flavour and be free from objectionable taints and flavours and show no sign of fermentation. FPO specifices that minimum percentage of fruit juice in the final product i.e. ready-to-serve beverages should be 10% and minimum percentage of total soluble solids in the final product (by weight) should be 10%.
32.	2.193	Carbonated water, Sherbat, Fruit drinks and fruit nectar, flavoured milk and lassi are some of examples of ready-to-serve beverages.
33.	2.194	Like soft drinks, the fruit juice and other beverages manufacturing industries are issued license under FPO, 1955 and their quality is enforced through PFA Act, 1954.
34.	2.195	Besides minimum sanitary and hygienic requirements other conditions required for grant of licence under FPO is that water should be potable. BIS has formulated standards for fruit juice, alcoholic and non-alcoholic beverages which are voluntary in nature.
35.	2.196	As already commented earlier Draft Notification No. GSR 685 dated 26.8.03 issued by the Ministry of Health & Family Welfare as a sequel to the detection of pesticides residues in soft drink samples, besides soft drinks prescribes pesticide limit for fruit juice and other beverages also. The Committee are unable to understand the logic behind clubbing of fruit juice and other beverages with soft drinks.
36.	2.197	Fruit juices are multi-component systems where water is an ingredient but not the main ingredient. Ready-to-serve beverages are mainly derived from agriculture products like fruit, tea, coffee, milk for which MRLs for pesticides prescribed in PFA are many times higher. The technology like reverse osmosis, micro filtration ozonation etc. which are used for purifying water cannot be used for fruit juice, milk and milk products. Further more, water in fruit juices derive essentially

1	2	3
		from the fruits and raw horticulture and plantation produce which identifies with the fruit juice. Under PFA 1954, MRLs of pesticide in fruit and vegetable products, which are the raw material for preparation of fruit juice, vary from 0.1-30.0 mg/kg. The Committee have been informed by the representatives of Ministry of Food Processing Industries, All India Food Processor's Association, that it is not technologically feasible to bring down the present level of pesticide residue in fruit and vegetable to 0.0001 ppm as stipulated in draft notification. The Committee are surprised with the argument advanced by the Ministry of Health and Family Welfare that in the process of washing, peeling, cutting and extraction of juice pesticide residues are removed. The above statement of the Ministry of Health & Family Welfare is completely vague and illogical and not based on any scientific assessment. It does not indicate as up to what level the pesticides are removed by the above process. It seems the Ministry of Health & Family Welfare is merely concerned with laying of standards without scientifically assessing as to whether they can be achieved to the desired levels and enforced properly.
37.	2.198	It seems, it is only after Committee's repetitive query to the Ministry of Health and Family Welfare about the rationale of clubbing fruit juice and other beverages with soft drinks that the wisdom seems to have dawned upon the Ministry of Health & Family Welfare as they have now stated in their latest reply that tea and coffee based drinks are not likely to meet the requirements for pesticide residues for packaged drinking water. They had also asked the Bureau of Indian Standards which is in the process of revising standards (IS2346:1992) for carbonated beverages *vide* their letter No. P.15021/ 8/2003-PH(Food) dated 31.12.2003 to make it more broad based and not to include products containing fruit and vegetable juices in the revised standards. This letter has however, been withdrawn recently according to Ministry as it was not approved at the appropriate level in the Ministry.
38.	2.199	Secretary, Ministry of Food Processing Industries, representatives of All India Food Processors Association and others have drawn the attention of the Committee towards non-availability of any technology in the world to reduce pesticide residues to the level of 0.0001ppm from the present levels in fruits and vegetables. The representatives of Ministry of Food Processing Industry in the 49th meeting of CCFS held on 26th Sept., 2003, have also raised objections on laying down of standards for processed food and vegetable products under PFA which, as alleged by them, were not even properly reflected in the minutes of the meeting.
39.	2.200	Fruit juice and other ready-to-serve beverages have nutritional value. Even if some technology is developed to clean them from the pesticide residues, the Committee are not sure whether the nutritional value of the raw products used for extracting juices will be ultimately retained in the fruit juice as well.

1	2	3
40.	2.201	Soft drinks market is dominated by two global giants with access to state-of-the-art technologies and techniques and thus would be expected to show the way to better food safety. Fruit juices and beverages are primarily in the small and medium sectors and are labour intensive. There are millions of fruit and vegetable farmers who provide the raw materials and thus constitute a principal support base to the fruit juices and beverages units. Given the current levels of pesticide residues allowed in raw fruits and vegetables, and given the socio-economic ground realities, the fruit juices and beverages industry needs to be treated differently compared to the carbonated water sector. The same standards cannot apply to them equally. Pesticide residues in food are a phenomena related to agricultural practices as they enter the soil and plant systems and work their way into the food chain. It is not a manufacture related issue and, therefore, it will not be fair or proper to apply the carbonated water and packaged water (pesticide) residue levels to the fruits and vegetable juices and such beverages.
41.	2.202	The Committee, therefore, recommend that standards notified under draft notification for pesticide residue should not be made applicable for fruit juice and other beverages.
42.	2.203	The Committee note that Ministry of Food Processing Industries have sent samples of fruit and vegetable juice and beverages to CFTRI, Mysore for testing the presence of pesticide residue and also asked National Institute of Nutrition, Hyderabad to assess the daily intake and safe limits of these products.
43.	2.204	The Committee desire that on the basis of test results of CFTRI, Mysore and assessment from National Institute of Nutrition, Hyderabad, steps may be taken in consultation with CCFS for fixing residue limits of pesticide residue in fruit juice and beverages based on consumption pattern and safe limits (ADI).
44.	2.205	The Committee also recommend that institutions like ICMR, National Institute of Nutrition, CFTRI etc. should evolve database taking into account our food habits with regard to consumption of processed and non-processed food, level of contaminants, and pesticides in these food products, their conformity with acceptable daily intake, usage of pesticide in agriculture and public health programme and based on their database. Standards for fruit juice and other beverages may be fixed after due deliberations in CCFS. Incidentally, European Directive (97/41/EC) provides for a system to set MRLs in processed products and composite foodstuffs, based on the MRLs fixed for raw agricultural products. Such guidelines may also be consulted.
45.	2.206	The Committee note that Indian consignments of food products being exported from India have many a time been rejected merely on account of defective packaging. Due to high cost of packaging,

1	2	3
		food processing industries, which are mainly in the small scale sector, have not been able to adopt state-of-the art technology. In view of stringent norms for packaging of export products and the inability of our food processing units to adopt state-of-the-art technology for packaging, the Committee recommend that Public Sector Undertakings like Hindustan Machine Tools etc. may be asked to make available cost effective packaging technology for the food products being exported by food processors in small scale units.
46.	2.207	The Committee note that fruit products advisory Committee of the Ministry of Food Processing Industries has proposed amendments to Fruit Products Order, 1955, which, as stated by them are being vetted by the Ministry of Law and Justice. From the details of amendments, the Committee find that they mostly pertain to labeling, microbiological requirements, methods of analysis, sampling defects and contaminants. No mention of pesticide residue in food products and legal definition of potable water has been made in the proposed amendments. In view of the need for setting of pesticide residue limit in fruits, vegetables and other food products on a scientific basis and setting quality standards for potable water, the Committee desire that necessary provisions for defining potable water and setting of pesticide residue limits in fruits, vegetables/juices may also be incorporated in the proposed amendments, in consultation with CCFS.
47.	3.40	The health and environmental problems arising from pesticide use in developing countries have received wide spread recognition. The Food and Agriculture Organisation (FAO) of United Nations has adopted the International Code of Conduct on the Distribution and Use of Pesticides (the FAO Code) to address the issues. The earlier code has been amended to include a section on Prior Informed Consent (PIC) to enable governments to prohibit imports of certain hazardous pesticides. Many of the organochlorine pesticides are included in the Persistent Organic Pollutant (POP) category and are to be phased out gradually.
48.	3.41	Pesticides sustain food production and control vector born diseases. They are vital for crop production and instrumental in continuous increase in food production. The consumption of pesticide in India is one of the lowest in the world. India uses a low amount of 0.5 kg/hectare pesticide compared to 7.0 kg/hectare by USA, 2.5 kg/ hectare by Europe, 12 kg/hectare by Japan and 6.6 kg/hectare by Korea. However, despite the low consumption of pesticides, India has more problem of pesticide residues *vis-a-vis* other countries and these have entered into food products and underground water because of non-prescribed use of chemical pesticides, wrong advice and supply of pesticides to farmers by vested interests, non observance of prescribed waiting period, pre-marketing pesticide treatments during storage and transport, use of sub-standard

1	2	3
		pesticides, effluents from pesticide manufacturing units, continued use of persistent pesticides for public health programmes; lack of awareness and lack of aggressive educational programmes for farmers/consumers.
49.	3.42	Ministry of Agriculture regulates the manufacture, sale, import, export and use of pesticides through the 'Insecticide Act, 1968' and the rules framed thereunder. Central Insecticide Board (CIB) constituted under Section 4 of the Act advises Central and State Government on technical matters. The Registration Committee (RC) constituted under Section 5 of the Act approves the use of pesticides and new formulations to tackle the pest problem in various crops. The monitoring of pesticide residues levels in food comes under the purview of Union Ministry of Health and Family Welfare.
50.	3.43	While the Registration Committee (RC) registers pesticides for their usage, the MRLs in food commodities are prescribed by Ministry of Health and Family Welfare under the PFA (Act), 1954 and rules framed thereunder. The maximum residue limit (MRL) for pesticide is the maximum concentration of a residue (expressed in mg per kg) which is legally permitted in food commodities. MRL is established taking into account the toxicological data of the pesticide as well as that of the residues on crops under Good Agricultural Practices (GAP).
51.	3.44	At present 181 pesticides are registered in the country. The Committee, note with dismay that out of 181 pesticides, MRLs for 71 pesticides only have been fixed under the PFA Act, 1954.
52.	3.45	Out of these thirty-two pesticides are still left for which MRL is yet to be fixed. Of these 32 pesticides, registration data for 24 pesticide is stated to have already been submitted by the Registration Committee to the Ministry of Health & Family Welfare. The Committee desire that MRLs for these 24 pesticides may be fixed without any further delay. As regards 8 pesticides, the Committee take serious note that no data is available and therefore CODEX norms are being adopted for the time being. The Committee, therefore, desire that the Registration Committee should call for the data from manufacturers in due course of time and furnish the same to Ministry of Health & Family Welfare so that MRLs for these can also be fixed without further delay.
53.	3.46	The Committee were anguished to note that pesticides were being registered by the Registration Committee even when no MRLs had been fixed. It is only after the CSE came out with their report on presence of certain pesticides in the bottled water in the month of February, 2003, that a decision was taken by the Ministry of Agriculture in the meeting chaired by Secretary, Agriculture in June 2003 to discontinue this practice. The Committee desire that this should now be strictly enforced. In order to rule out any possibility

1	2	3
		of registering the pesticide by way of notification/rule, the Committee recommend that Insecticide Act 1968 should be suitably amended by inserting a suitable clause in this regard.
54.	3.47	The Committee also desire that a review of existing MRLs of the pesticides may be made at regular intervals, in the light of scientific developments and revision of ADI, if any. There is scope to exceed acceptable daily intake (ADI) if high MRLs have been set because ADI is a safety milestone and should not be allowed to be breached and the basic purpose of setting realistic MRLs is to ensure that we remain well within allocated ADI for that pesticide.
55.	3.48	The pesticides which were being used before 1971 *i.e.* prior to coming into force of the Insecticide Act, 1968 and rules 1971 were included as "deemed as registered pesticides". The Committee note that many of the MRLs of the "deemed registered pesticides" have not been fixed so far. The reasons given by the Ministry of Agriculture, for not fixing MRLs for deemed pesticides, that at that time, their usage data was not complete, is not convincing as the Committee feel that even if this data at that time was not complete or available, Registration Committee should have asked the manufacturers of these pesticides to supply the data and fix their MRLs. Though many of the deemed pesticides are already phased out, the Committee desire that MRLs of deemed pesticides which are still in use may be fixed without any further delay.
56.	3.49	The Committee note that waiting period for deemed pesticides are not mentioned on the leaflets due to non-availability of the residue data on the crops in which the products are applied. To overcome the gap, the Registration Committee has constituted an expert group to examine data available with the pesticide industry and the Registration Committee so as to recommend the waiting period. The Committee desire that in the light of recommendations of expert group regarding waiting period, steps may be taken to ensure that the same is invariably mentioned on the leaflets. Farmers should also be educated to observe the prescribed waiting period.
57.	3.50	The Committee note that residues of certain pesticides like DDT, Lindane, which are totally banned for use in Agriculture and permitted for restricted use in health programmes only, have been found in food and vegetable products. Also due to aerial spray of Endosulphan in Kasargod area in Kerala, the inhabitants suffered health problems. The Committee have been informed that use of Endosulphan has since been banned in that area.
58.	3.51	The Committee also find that neither the Ministry of Agriculture nor Ministry of Health & Family Welfare have any data about the usage of banned pesticides in the States since inception. The Committee wonder as to how the Ministry of Agriculture which have made claims before the Committee towards Integrated Pest Control

1	2	3
		Programme are monitoring the very use of pesticides in the absence of such vital data. It does speak volumes about the apathetic attitude of the various functionaries. The Committee however desire that Ministry of Health and Family Welfare in coordination with the Ministry of Agriculture should impress upon the State Governments the imperative need of strictly adhering to the guidelines for usage of DDT, Lindane and other restricted pesticides for health programmes only. The farmers too need to be educated properly in this regard.
59.	3.52	The Committee desire that strict punishment may be provided to the offenders who are found selling banned/restricted pesticides. It has been noted that steps have already been taken by the Ministry of Agriculture by making provision in the Insecticide Act, 1968. The Committee desire that proposal for the amendment to the Act may be expedited so that the farmers in the country get quality pesticides.
60.	3.53	To educate the farmers about ill-effects of the pesticides, need-based use of chemical pesticides and correct application techniques, an integrated pest management programme has also been started by the Government. Integrated Pest Management (IPM) is an eco-friendly approach for pest management that encompasses cultural, mechanical, biological methods and need based use of chemical pesticides with preference to the use of bio-pesticides, bio-control agents and indigenous innovation potential. Ministry of Agriculture has established 26 Central IPM Centres during VIII plan in states and one UT. Six new IPM centres were established in 6 states during X Plan. These centres are supposed to conduct Farmers Field Schools (FFSs); Season Long Training (SLT) in major crops; provide grants for establishment of State Bio-Control Laboratories (SBCLs); undertake awareness campaign through public media and prepare and distribute IPM Packages of Practices.
61.	3.54	The impact of IPM is reported to have presumably led to reduction in consumption of chemical pesticides from 65,462 MT during 1994-95 to 47,020 MT during 2001-02. There is a marginal increase in the trend towards use of bio-pesticides from 219 MT during 1996-97 to 902 MT during 2001-02.
62.	3.55	As integrated pest management programme cannot replace the use of pesticides, the Ministry of Agriculture through ICAR has also started an All-India Coordinated Research Project on Pesticide Residues in 1984-85. This programme is aimed to develop protocols for safe use of pesticides by recommending good agricultural practices, based on multi-locational supervised field trials. It is supposed to advise on proper waiting period and pre-harvest intervals so that the residues in the food commodities remain well within the prescribed safe limits (MRLs). Another major thrust has been on monitoring pesticide residues in agricultural produce through 17 co-operative centres. As this programme is confined to monitoring

1	2	3
		of pesticide residues in raw agricultural produce only its impact has not been fully forthcoming.
63.	3.56	No agency regularly monitors pesticide residues in market samples or undertakes diet basket surveys to assess actual exposure of consumers from pesticide residues in food or water and project health risk, if any. Such activity comes under the purview of Ministry of Health but no comprehensive regular monitoring programme is being conducted in the country. The Committee feel that such monitoring of food commodities requires to be done extensively and on yearly basis.
64.	3.57	The Committee desire that steps to encourage the use of bio-pesticide, production of bio-control agent and promoting organic farming etc. need to be taken more vigorously.
65.	3.58	The Committee find that the presence of pesticide residues in some cases could have an effect on our exports. The major hurdle which an average farmer faces on this account is firstly that there are inadequate testing facilities which are presently available in the country and secondly the charges for the same are exorbitant ranging from Rs. 4000—Rs. 5000 per sample. The necessity and importance of setting up more laboratories have already been highlighted by the Committee elsewhere in the Report. The Committee however once again reiterate that the existing infrastructure of laboratories may further be strengthened and the services may be offered to the farmers at affordable rates.
66.	4.49	Water is an elixir of life and its importance as an item of food needs hardly to be spelt out. It is however, most disconcerting to note that even after fifty years of the enactment of the Prevention of Food Adulteration Act, 1954, the necessity of including it under the definition of 'Food' has not been felt. This is despite the fact that the recommendation to this effect had been made by no less than a Parliamentary Committee on Subordinate Legislation, way back in 1994. The Ministry cited resource constraint as the main cause for non-implementation of this recommendation. The fact remains that almost a decade has elapsed and the Ministry has still not taken any concrete steps in this regard. This therefore, speaks volumes about the concern that the Ministry of Health has in our country towards the health of the people. It is, therefore, not surprising that no legal standards for monitoring the quality of ordinary drinking water have so far been prescribed under the Act. It is only recently that the wisdom seems to have dawned upon the authorities who have at last realized now that there is a big lacuna in the Act which needs to be remedied by way of amendment which they are contemplating to bring forth. The Committee recommend that section 2(v) of the PFA Act which defines 'Food' should be amended without further loss of time.

1	2	3
67.	4.50	The Committee are equally alarmed to note that though the culture of packaged drinking water came to India in the eighties, the first time that any standards were laid down by the Bureau of Indian standards—a national body for standards, was only in 1998 *i.e.* almost after a decade. During this period no check whatsoever was being exercised on the quality of water being sold by the manufacturers of this water by the authorities. The manufacturers, therefore, took full advantage of such an unregulated regime by charging heavily for the water which, according to the admission of the BIS itself, was being sold after filling the bottles from the municipal water without any processing ! Even in 1998 when the standards were laid down, these were only voluntary in nature. The limits of pesticides prescribed under these were 'below detectible limit' and were not even quantified. It was only in 2001 that the packaged water was brought under the compulsory certification scheme of the BIS and included under the definition of 'Food' *vide* GSR No. 202(E) dated 21 March, 2001. The Committee wonder whether the situation could be more alarming than this.
68.	4.51	It is only recently that when the CSE brought out a report on 4th February, 2003 with respect to the presence of pesticides in some samples of bottled water and highlighted the hazardous effects of such pesticides on human health in their report, that the Technical Committee of BIS thought of convening an urgent meeting and recommended new standards. These standards were ultimately notified by the Ministry of Health and Family Welfare under Notification No. GSR. 554(E) dated 18th July, 2003 and have already been implemented *w.e.f.* 1.1.2004. The limits prescribed for individual pesticides has now been prescribed at 0.0001mg/litre and for total pesticides it is 0.0005 mg/litre.
69.	4.52	The Bureau of Indian Standards, which was given a statutory status by an Act of Parliament, came into existence as a national standards body of India on 1st April 1987 and is mandated to prepare and implement standards, is another body which needs to be strengthened. Though it is supposed to monitor the quality of various food products by getting the same tested, the reality is that it hardly has any laboratories of its own. The Committee note that it has only eight laboratories out of which only one laboratory is equipped to test pesticides. None of these laboratories is equipped with GCMS technology and none of these is accredited by NABL, which is indicative of the type of technical competence which these laboratories have! BIS also has a system of recognizing private laboratories and has nine laboratories under this scheme out of which only six are equipped to test the pesticides. The number of samples drawn by these laboratories are negligible and in no way related to the quantum of production. The Bureau is also saddled with the problem of shortage of technical manpower which in turn has adversely affected its monitoring operations. Non official experts

1	2	3
		are however, not attending the meetings of the Bureau because they do not get allowances. This needs to be looked into. The Committee, also strongly advocate that a thorough review of the working of this organization should be taken up forthwith with a view to removing all the bottlenecks which are hampering its operations and should be headed by an eminent scientist who can infuse dynamism in its working so that it becomes a national standards body in the real sense of the term. The various recommendations made by the Committee which was appointed on 5th August under the Chairmanship of the Additional Secretary, Department of Consumer Affairs, are of important nature which the Committee fully endorse and the same should be implemented fully.
70.	4.53	The Committee also fail to understand as to what is the rationale for BIS to monitor 32 pesticides. Many other pesticides which are otherwise found in the ground water do not appear among these, while those which are unlikely are included. The Committee recommend that this list needs to be reviewed with a view to including all relevant pesticides which are actually found in water sources in the country. There is also an urgent need to establish more state-of-the-art laboratories and suitably increase the number of samples handled by them.
71.	4.54	The Committee find that the drinking water supply is a State subject and, therefore, it is primarily the responsibility of the respective State Governments to provide safe drinking water to the people. The Central Government acts only as a facilitator in this regard. At the Central level there are two agencies which are concerned with the supply of drinking water in the country. It is the Department of Drinking Water Supply under the Ministry of Rural Development in regard to rural areas and Central Public Health and Engineering Organization under the Ministry of Urban Development and Poverty Alleviation for urban areas. Though the norms for quality of water have been laid down by both these agencies, these are only recommendatory in nature. The implementation part vests with the State Governments. Besides these two, there are a host of other agencies which are operating water quality network in the country. These include the Central Ground Water Board/Authority, Central Pollution Control Board, Central Water Commission, Public Health Department, Water Supply Authorities, Industries and Educational Research Institutes. It is, however, noted that all these agencies are working more or less independent of each other and there is hardly any co-ordination among these. The result is that at present there seems to be total confusion as one agency does not know what the other is doing and very often there is a great deal of overlapping. The Committee note that in order to address this problem of multiplicity and with a view to bringing the various agencies on a single interactive platform, an initiative has been taken by the Government by constituting Water Quality Assessment

1	2	3
		Authority on 29th May, 2001. The Committee however, find that though under the notification this Authority has been empowered with a number of functions with regard to the water management including drawing action plans for quality improvement in water bodies and monitoring the implementation of different schemes, so far not much headway has been made as only two meetings of the Authority have been held so far. The Committee have their doubts as to whether the Authority will act as an effective apex body so far as monitoring the quality of water is concerned, since it does not seem to have been empowered to take any legal action against other agencies in case of any type of default. The Committee, therefore, strongly recommend that there should be a single organization at the apex level which should be responsible for enforcement and monitoring the quality standards for the drinking water in the country and the role of all other agencies should be defined clearly so that there is no scope of any ambiguity left so far as their respective functions are concerned. This apex body should be able to effectively exercise control over others so that close co-ordination and uniformity in approach could be achieved.
72.	4.55	Since there is enough scientific data to prove that most of the serious diseases and deaths particularly in rural areas, are caused due to the unsafe drinking water, it is the primary duty of the State to make safe drinking water available to the people. The Committee find that BIS is revising the standards for drinking water and has recommended the same standards for drinking water as are now applicable in the case of packaged drinking water. Though these standards are only voluntary, the Committee wonder as to what is the scientific basis for adopting such standards, particularly when there are hardly any state-of-the-art laboratories of BIS which are presently equipped to test the pesticide residues in water. The Committee are of the considered view that norms for drinking water should be formulated based on scientific studies and should be such which are achievable. It is at the same time very essential that these standards are made legally enforceable. Earnest efforts in this regard must be initiated immediately.
73.	4.56	The Committee take serious note of the fact that in the constitution of the Central Ground Water Board there is no representative of the Central Insecticides Board and likewise in the latter, there is no representative from the Central Ground water Board. In the absence of these, the Committee fail to comprehend as to how the authorities are monitoring the levels of pollution in the water or for that matter even allowing registration of the pesticides. The Committee desire that this lacuna needs to be addressed immediately.
74.	4.57	Finally, the Committee would like to record their displeasure on the weakness of the enforcement system which has resulted in the appearance of spurious brands of packaged drinking water in the market. This menace has to be dealt with on the lines of the sure (none is spared), swift (fast processing of case) and severe (deterrent

1	2	3
		punishment) approach proposed by the Mashelkar Committee to curb the spurious drugs menace in the country. The Prevention of Food Adulteration Act as recommended in the last Chapter of this report should be suitably amended. Surveillance of drinking water quality has to be a continuous exercise.
75.	4.76	The Committee find that there are multiplicity of laws and regulations dealing with the food safety standards in our country, which is evident from the fact that there are about eight ministries which are dealing with the food laws. This has resulted in many standard making bodies like BIS under the BIS Act, CCFS under the PFA Act, The Ministry of Food Processing under the FPO, Ministry of Agriculture under 'AGMARK' etc. The position with regard to the multiplicity of agencies in the case of drinking water has already been highlighted by the Committee in the earlier chapter. What is of deep concern to the Committee is the fact that very often these bodies are working independent of each other and there is hardly any co-ordination among these. Such a situation has obviously resulted in loose administration and enforcement of the various laws, with the result that consumer is the ultimate sufferer. The concern in this respect was rightly expressed by a number of organizations/bodies/experts who deposed before the Committee. The need to converge all the present laws and to have a single regulatory body was also strongly impressed upon by almost each of them.
76.	4.77	The Committee note that the Ministry of Food Processing Industries are already seized with the problem and the entire issue of an integrated food law and a single Authority is being looked into by a Group of Ministers. The Ministry of Food Processing Industries which is serving the Group of Ministers has already drafted a Bill on the Modern Integrated Food Law. The Bill provides a framework for integration of the existing food laws to bring harmony and convergence in their areas of operation. It also provides for the establishment of an independent Food Safety and Standards Authority of India, which shall be responsible for ensuring availability of safe and wholesome food for human consumption by fostering the use of science in the food industry. Though this is a well conceived notion which will help harmonize various existing food laws, the Committee are unhappy to note that so far not much headway has been made in this regard, as the Group has met only twice since it was constituted. They therefore desire that expeditious steps be taken in this regard to finalize the Bill, without further loss of time by giving it top priority, as it concerns public health and food safety in India.
77.	4.78	There are some other related but vital issues which cropped up during the examination of the subject before the Joint Parliamentary Committee and the Committee would not be doing justice if the recommendations relating to these are not made. These are enumerated as under:— 1. The Committee note that at present, neither there are sufficient number of laboratories in the country nor are these adequately

1	2	3
		equipped. There are only four Central Food Laboratories now to cater to the entire country. The Committee therefore, strongly recommend that in a country of the size of India there should be an adequate number of modern, world class food analysis laboratories accessible to aggrieved consumers, at affordable charges. The Committee therefore, urge the Government to constitute a Task Force of experts to assess the present situation and recommend measures to (a) upgrade and strengthen the infrastructure in the existing laboratories under the Central and State Governments, (b) assess the need for new dedicated world-class laboratories, (c) ensure that these laboratories have appropriate recognition/accreditation necessary to be respected in the international fora and in the courts. The Government of India should go for NABL accreditation of all its laboratories responsible for testing of foods for all the parameters specified under various food laws. At least two laboratories which must have international recognition should be set up so that results of foreign laboratories should be cross checked to ensure the quality of foods. It is also important that Indian testing methodologies should not be inferior in any sense in comparison to CODEX, WHO, ISO or AOAC in order to ensure the safety and credibility of Indian products in the market. The laboratories should also have the facilities to test the antibiotic residues, heavy metal contamination and other toxic contaminants in the food items. Testing manuals should be developed for all the parameters and products that are covered under Indian food laws. In case any variation is required in the existing standardized methodologies, this must be specified in the manual itself. The laboratories should also be well equipped with competent qualified personnel in all the States/UTs.
	2.	India is fortunate to have substantial reserves of bio-diversity. While vigorous efforts are on by the CSIR and other institutions to explore them for new therapeutic agents, hardly any attention is being given to scouting for new plant protection substances. Farmers can be weaned away from using banned and polluting synthetic pesticides, if better, safer and affordable alternatives are made available to them. The Committee strongly recommend to the Government to establish an initiative in the nature of a five year National Mission to explore the bio-diversity sources of India through a nationwide R & D network to search for eco-friendly pesticides. The CSIR can be an appropriate agency to mount and lead such a mission, acting in co-operation with the Ministry of Agriculture, Ministry of Science & Technology, Ministry of Environment & Forests and their agencies, State Government institutions, relevant academic institutions and private business houses.

1	2	3

3. In order to avoid panic reactions to revelations of the recent type, the Committee suggest that a national conference may be held annually to discuss results of annual formal and non-formal surveys . A status report/white paper on food standards and safety should be made available to the public every year. Government may identify a suitable agency which could be entrusted with this task, acting in co-operation with all stakeholders, both government and non-government.

4. There must be a code of conduct for disseminating the results of an investigation either from a NGO organised or from a laboratory or anyone else. Today for example if a survey is done or a study conducted, or an analysis with respect to spurious food item is suddenly taken up, there is no code of conduct for reporting it in an orderly fashion. In order to avoid such a situation, the Committee recommend that the results must be validated so as to ensure transparency.

5. The code of conduct should include a process of self-regulation in the industry in terms of their in-house analysis at regular intervals in accordance with the standardized parameters. This may include in the current context pesticides, heavy metals, chemical toxicants, pathogens and synthetic additives. The manufacturers have to be absolutely responsible for maintaining standards. Any deviation from the set standards for beverages, fruit juices and other related products must be dealt with strictly after verifying the records, with an immediate disclosure of the Processing Centre. It must also be ensured at the same time that the verification is fool-proof, unambiguous and transparent.

6. A mandatory Food Recall System should be established and companies should be made accountable for selling sub-standard and harmful products in the market which must be destroyed in the presence of authorities. Withdrawal notices must be issued in media to inform citizens so that they should be made aware about the unsafe products. In order to check adulteration in the food items, the Government should not hesitate in taking help of NGOs. The Government must also improve surveillance and monitoring the quality of the food.

7. Building confidence measures are equally important for the consumer. It is therefore essential that the product must have a logo on it displaying that the product is safe. It is this logo that the consumer, whether literate or illiterate, must look for on the product. Consumers need not be aware of the AGMARK, PFA, BIS etc. Such a logo must be obligatory on all food packages either processed or fresh as a guarantee from the supplier or the manufacturers. This should be applied to the imported food products as well. In case it is not there, the local distributor or supplier must put the same and take the responsibility. In case these requirements are flouted by putting a wrong information regarding the safety of the product, the concerned manufacturing unit should be closed immediately

1	2	3
		and the sale of that product should be banned. If necessary provisions in the relevant Act need to be incorporated to this effect, the same must be done without further loss of time. It is also important that the information regarding the Batch Number, Date of Manufacture, Expiry Date etc. must be indicated on the label and not on the container as is the present practice, as the container can be thrown after use, whereas the label can be preserved and digitized. In the case of proprietary food products, the detailed label declaration about the ingredients including the nutritional information should be made mandatory, so that sensitive consumer groups which may include allergic people, diabetic, children, etc. can take their own decision for consumption of the food items. 8. The Committee also desire that there should be 50% representation from the Central and State levels in various R&D policy making bodies and the remaining 50% should be equally divided among the representatives of the farmers' cooperatives, consumer bodies, industrial bodies particularly small scale industries as they are the main stakeholders. 9. The Committee have observed that there is no proper enforcement mechanism for regulating food laws. The number of samples drawn as well as the Inspectors are almost negligible as it has been reported that on an average in each State 10 to 20 samples are drawn per month and the number of Inspectors likewise on an average ranges between 20 to 50 per State. This needs to be suitably augmented. The information with regard to the samples lifted by the Inspectors along with the results must be available in each State on the website on monthly basis. 10. Clause 43 of PFA stipulates that there shall be no advertisement of any food which is misleading or contravening the provisions of PFA Act, 1955 or the rules made thereunder. Despite the detection of pesticides in the samples of soft drinks by CSE, CFTRI and CFL, Kolkata, Cola Companies have been giving wide publicity in the electronic media stating that their products do not contain any pesticides and are fully safe for human consumption. The Committee feel that claims made by the Cola companies in their advertisement tantamount to misleading the public as their products do contain pesticides which have ill effect on human health in the long run.
78.	4.79	The Ministry of Health & Family Welfare have expressed their inability to restrict the advertisement by Cola companies on the plea that MRL for pesticides have not been prescribed for carbonated beverages under PFA Rules, 1955 and in the absence of which there is no provision to restrict the advertisement from these products. The Committee feel that it is the responsibility of the Ministry of Health to ensure that no misinformation is spread by any company with regard to their products. The Ministry of Health & Family Welfare should have invoked the relevant provisions of the Prevention of Food Adulteration Act, 1954, in this regard.