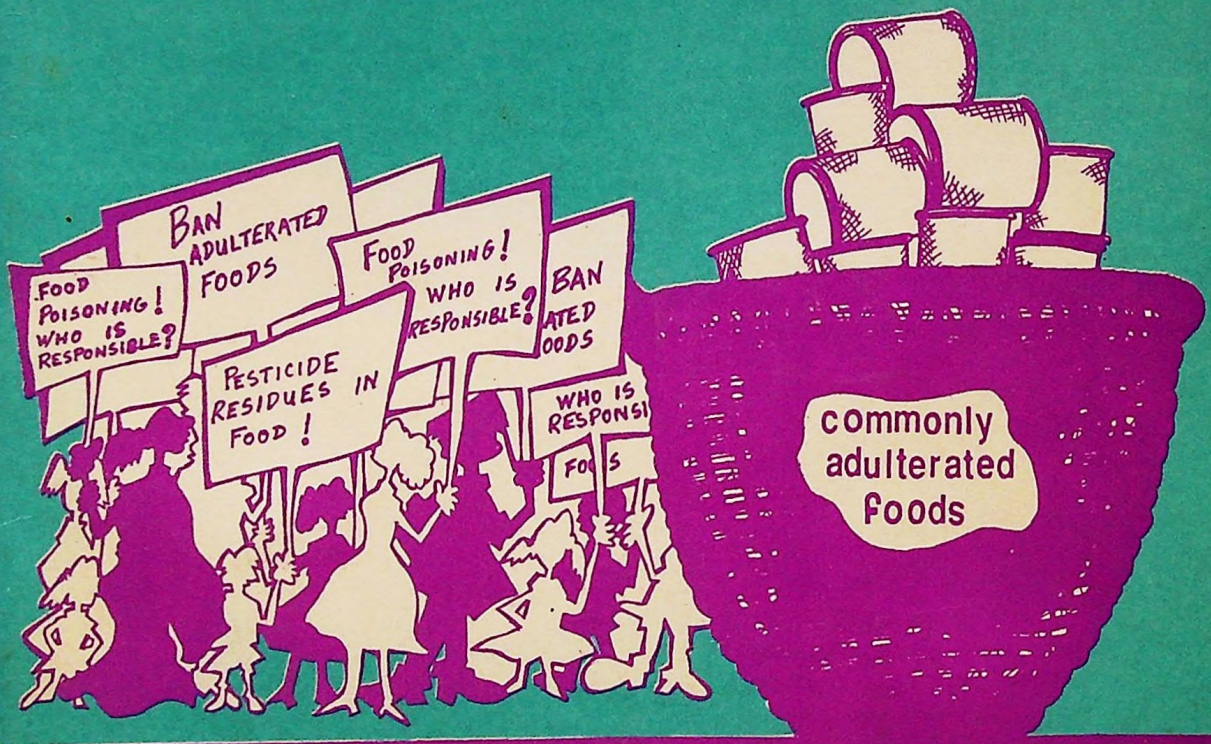
health action series-6

FOOD ADULTERATION NEED FOR CONSUMER ACTION



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Food Adulteration

Need for Consumer Action

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New Delhi
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Preface

For the past decade we (in the Public Policy Division) have been addressing the issues of rational drug use, commerciogenic diseases linked to baby food, pesticide, tobacco, liquor etc. It has not merely been a question of overuse and misuse of these products but the very use of some of these products which are known to be hazardous to health and have no business to be in the market.

The concern about food adulteration is a serious and a growing one, mainly because of the absence of consumer awareness. The fact that there are no facilities for food testing or mechanisms for warning the public even if adulterated food has been identified raises an important issue of accountability of producers to the consumer, absense of mechanism for withdrawl of known adulterated products, ease with which money can buy false results. In addition the absence of any system of paying compensation even when disability and death occurs results in difficulty in assigning accountability.

Increasing chemicalization of food, basically means 'more processing of food' which obviously results in the use of preservatives, colouring and flavouring agents for fruits, vegetables fish and meat. These foods are often laced with pesticides and 'economic gains' are made at the cost of 'nutrition loss'. Increasing use of hormones and antibiotics in some of the dairy animals, as is the pattern in the west is being advocated for dairy farmers and poultry. While the objective may be to improve the animal's health, the implications of this are known to be determined for human health and this must be made aware to the consumer.

Dipping of ladies fingers and other vegetables in 'MALACHITE GREEN', 'COPPER SULPHATE' to give them the bright green colour which is very pleasing to the eyes of the vegetable buyer, is a practice that must be discouraged because of the health hazards associated with consumption of these toxic chemicals. Such practices can be stopped only if consumers are made aware of health hazards and they put adequate pressure through various forums to prevent these hazardous practices.

This booklet on food adulteration is a step in helping strengthen the hands of the consumer since it provides basic information regarding adulterants and the health hazards associated with them. However information alone is insufficient and here, the Consumer Protection Act of 1986 can be used when needed to warn and check irrational use of agro-chemicals by Food Processing manufacturers. Finding ways of using every possible way of protecting public health and resisting exploitation of public health has to go on side by side with consumer action. The need for coordinated Consumer Action and Health Action is becoming more and more urgent for dealing appropriately with the problems of prevention of food adulteration. In the future Consumer Groups have to give high priority to the interface between health, education and consumer awareness activities in view of increasing consumerism.

The consumers have a "RIGHT TO KNOW" and must use their "RIGHT TO SAY NO" not merely for health reasons but because of conscious choice of living sustainable lifestyles.

Mr. Alok Mukhopadhyay
Executive Director

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Introduction

Food is one of the basic necessities for ensuring health of a population. While there has been an increase in food production in the country over the last few decades, much remains desired in terms of its distribution across different segments of society. Additionally the sharp rise in prices of essential commodities like of cereals, pulses and oils covered in the last few months has resulted in a sneeze on the purchasing power of the people. Apart from the question of availability of food, the issue of food safety has also come to the fore. A number of consumer groups have pointed out that essential commodities are adulterated with either substances of inferior quality, excess amounts of chemical additives or have pesticide residues which produce toxic effects and are therefore detrimental to the health of the people.

A food particle is said to be adulterated if its quality is lowered or adversely affected by the presence of ingredients which are injurious to health or by removal of nutritious components of the food. In India many crude methods of adulteration still prevail. So it is no surprise when one finds the milk vendor sureptitiously adding water of dubious quality to milk. Tea & sugar have been known to be adulterated with iron filings, and of course fine sand, grit, starch, chalk powder and stones are a welcome standby.

Inspite of sophistication and all-round improvement in production, processing and packaging, more poisons seem to entering our food chain now than ever before. There are thousands of food additives such as flavouring, colouring agents, preservatives, emulsifiers and sweeteners present in the processed food which are marketed today. The man made chemicals add nothing to the nutritive value of the food but deteriorate our health. The increased incidence of diseases like cancer only seems to underline the basic truth that if we add hormones to animal feed, give antibiotics to keep them healthy and quick maturity, if we keep on adding pesticides to our crops and fertilizer to the suffering soil then definitely our health could be seriously jeopardized.

The ill effects of these chemical additives can range from a minor gastro-intenstinal disturbance to cancer, damage to organs such as kidney and liver and various other disorders. It has been proved now that food additives can lead to serious behavioural problems in children, possible rebeliousness, anti-social behaviours and even deliquency. (Jacob Thankamma, Poison in our food).

There is no such thing as a safe dose – even a small amount of a carcinogen, for example, can initiate malignancy. In fact, small regular doses may be more dangerous than just one large dose, not large enough to kill of course. It is to be emphasised therefore that once contaminants enter food, the consuequences could be grave because they will inevitably end up in our tissues and be harmful to our internal organs.

It must also be noted with concern that many of the chemicals and food adulterants being consumed today are new, neither their existence nor their health hazards is known to majority of the health professionals. In absence of this the consumers themselves remain unaware.

The increasing trend towards more and more food processing at distant places and a trend towards making quick money with many more actors involved in the production, processing and distributions of food—there is little accountability as there is little awareness. Safe and adequate food is essential for good health and food adulteration is not merely unethical but a crime.

The main areas in need of improvement include implementation of food quality control measures in terms of both manpower and resources. Programming and planning of food quality control at central and state levels call for a coherent and coordinated system of agencies to initiate and implement a concerted plan of action. This is lacking in our country today.

The lack of consumer awareness today about food and food-related matters point to an immediate vital need to inform and educate the public in vital areas of nutrition, safety, health and existing commercial practices. Needless to say, government, trade, industry and NGOs must join hands to and approach the problems earnestly in order to arrive at long-term solution.

In this booklet we propose to look at the common adulterants in variety of food stuff and their effect on health, simple tests to detect these adulterants, action initiated by some groups to check adulteration of food and the legal provisions to prevent food adulteration.

In the following section we present some salient features of the Prevention of Food Adulteration Act, 1954 which provides the legal framework for checking as well as initiating action against persons who manufacture and deal with adulterated foods.

SALIENT FEATURES OF FOOD ADULTERATION ACT, 1954 (Act 37 of 1954)

(i) "adulterant" means any material which is or could be employed for the purpose of adulteration.

(ia) "adulterated" - an article of food shall be deemed to be adulterated:

- (a) if the article sold by a vendor is not of the nature, substance or quality demanded by the purchaser and is to his prejudice, or is not of the nature, substance or quality which it purports or is represented to be;
- (b) if the article contains any other substance which affects, or if the article is so processed as to affect injuriously the nature, substance or quality thereof;
- (c) if any inferior or cheaper substance has been substituted wholly or in part for the article, so as to affect injuriously the nature, substance or quality thereof;
- (d) if any constituent of the article has been wholly or in part abstracted so as to affect injuriously the nature, substance or quality thereof;
- (e) if the article has been prepared, packed or kept under insanitary conditions whereby it has become contaminated or injurious to health;
- (f) if the article consists wholly or in part of any filthy, putrid, rotten, decomposed or diseased animal or vegetable substance or is insect infested or is otherwise unfit for human consumption;
- (g) if the article is obtained from a diseased animal;
- (h) if the article contains any poisonous or other ingredient which renders it injurious to health;
- (i) if the container of the article is composed, whether wholly or in part, of any poisonous or deleterious substance which renders its contents injurious to health;
- (j) if any colouring matter other than that prescribed in respect thereof is present in the article, or if the amounts of the prescribed colouring matter which is present in the article are not within the prescribed limits of variability;
- (k) if the article contains any prohibited preservative or permitted preservative in excess of the prescribed limits;
- (l) if the quality or purity of the article falls below the prescribed standard or its constituents are present in quantities not within the prescribed limits of variability, which renders it injurious to health;

(m) if the quality or purity of the article fails below the prescribed standard or its constituents are present in quantities not within the prescribed limits of variability but which does not render it injurious to health;

(ix) "misbranded" - an article of food shall be deemed to be misbranded:

(a) if it is an imitation of, or is a substitute for, or resembles in a manner likely to deceive, another article of food under the name of which it is sold, and is not plainly and conspicuously labelled so as to indicate its true character;

(b) if it is falsely stated to be the product of any place or country;

(c) if it is sold by a name which belongs to another article of food;

(d) if it is so coloured, flavoured or coated, powdered or polished that the fact that the article is damaged is concealed or if the article is made to appear better or of greater value than it really is;

(e) if false claims are made for it upon the label or otherwise;

(f) if when sold in packages which have been sealed or prepared by or at the instance of the manufacturer or producer and which bear his name and address, the contents of each package are not conspicuously and correctly stated on the outside thereof within the limits of variability prescribed under this Act;

(g) if the package containing it, or the label on the package bears any statement, design or device regarding the ingredients or the substances contained therein, which is false or misleading in any material particular; or if the package is otherwise deceptive with respect to its contents;

(h) if the package containing it or the label on the package bears the name of a fictitious individual or company as the manufacturer or producer of the article;

(i) if it purports to be, or is represented as being, for special dietary uses, unless its label bears such information as may be prescribed concerning its vitamin, mineral, or other dietary properties in order sufficiently to inform its purchaser as to its value for such uses;

(j) if it contains any artificial flavouring, artificial colouring or chemical preservative, without a declaratory lable stating the fact, or in contravention of the requirements of this Act of rules made thereunder;

(k) if it is not labelled in accordance with the requirements of this Act or Rules made thereunder;

(x) "package" - means a box, bottle, casket, tin, barrel, case, receptacle, sack, bag, wrapper, or other thing in which an article of food is placed or packed;

(xi) "premises" - include any shop, stall; or place where any article of food is sold or manufactured or stored for sale;

(xii) "prescribed" - means by rules made under this Act;

(xiia) "primary food" - means any article of food, being a produce of agriculture or horticulture in its natural form;

(xiii) "sale" with its grammatical variations and cognate expressions, means the sale of any article of food, whether for cash or on credit or by way of exchange and whether by wholesale or retail, for human consumption or use, or for analysis, and includes an agreement for sale, an offer for sale, the exposing for sale or having in possession for sale of any such article, and includes also an attempt to sell any such article;

(xiv) "sample" - means a sample of any article of food taken under the provisions of this Act or of any rules made thereunder;

(xv) the words "unwholesome" and "noxious" when used in relation to an article of food mean respectively that the article is harmful to health or repugnant to human use.

ANALYSIS OF FOOD

8. **Public Analysis**:- The Central Government or the State Government may, by notification in the official Gazette, appoint such persons as it thinks fit, having the prescribed qualifications to be public analysts for such local areas as may be assigned to them by the Central Government or the State Government, as the case may be;

Provided that no person who has any financial interest in manufacture, import or sale of any article of food shall be appointed to be a public analyst under this section.

Provided further that different public analysts may be appointed for different articles of food.

9. **Food Inspectors**:- (1) The Central Government or the State Government may, by notification in the official Gazette, appoint such persons as it thinks fit, having the prescribed qualifications to be food inspectors for such local areas as may be assigned to them by the Central Government or the State Government, as the case may be :
Provided that no person who has any financial interest in the manufacture, import or sale of any article of food shall be appointed to be a food inspector under this section.

(2) Every food inspector shall be deemed to be a public servant within the meaning of section 21 of the Indian Penal Code (45 of 1860) and shall be officially subordinate to such authority as the Government appointing him, may specify in this behalf.

10. **Power of Food Inspectors**:- (1) A food inspector shall have power:

(a) to take samples of any article of food from:
  (i) any person selling such article;
  (ii) any person who is in the course of conveying, delivering or preparing to deliver article to a purchaser or consignee;
  (iii) a consignee after delivery of any such article to him; and

(b) to send such sample for analysis to the public analyst for the local area within which such sample has been taken;

(c) with the previous approval of the Local (Health) Authority having jurisdiction in the local area concerned, or with the previous approval of the Food (Health) Authority, to prohibit the sale of any article of food in the interest of public health.
(Explanation:- For the purposes of sub-clause (iii) of clause (a), "consignee" does not include a person who purchases or receives any article of food for his own consumption).

(2) Any food inspector may enter and inspect any place where any article of food is manufactured, or stored for sale, or stored for the manufacture of any other article of food for sale, or exposed or exhibited for sale or where any adulterant is manufactured or kept, and take samples of such article of food or adulterant for analysis;
Provided that no sample of any article of food, being primary food, shall be taken under this sub-section if it is not intended for sale as such food.

(3) Where any sample is taken under clause(a) of sub-section (1) or sub-section (2), its cost calculated at the rate at which the article is usually sold to the public shall be paid to the person from whom it is taken.

(4) If any article intended for food appears to any food inspector to be adulterated or misbranded, he may seize and carry away or keep in the safe custody of the vendor such article in order that it may be dealt with as hereinafter provided, (and he shall, in either

case, take sample of such article and submit the same for analysis to a public analyst).
(Provided that where the food inspector keeps such article in the safe custody of the vendor he may require the vendor to execute a bond for a sum of money equal to the value of such article with one or more sureties as the inspector deems fit and the vendor shall execute the bond accordingly).

(4A) Where any article of food seized under sub-section (4) is of a perishable nature and the Local (Health) Authority is satisfied that such article of food is so deteriorated that it is unfit for human consumption, the said Authority may, after giving notice in writing to the vendor, cause the same to be destroyed.

(5) The power conferred by this section includes power to break open any package in which any article of food may be contained or to break open the door of any premises where any article of food may be kept for sale;
(Provided that the power to break open the package or door shall be exercised only after the owner or any other person in charge of the package or, as the case may be, in occupation of the premises, if he is present therein, refuses to open the package or door on being called upon to do so, and in either case after recording the reasons for doing so).
Provided further that the food inspector shall, in exercising the powers of entry upon, and inspection of any place under this section follow, as far as may be, the provisions of the [Code of Criminal Procedure, 1973] (2 of 1974) relating to the search or inspection of a place by a police officer executing a search warrant issued under that Code).

(6) (Any adulterant found in the possession of a manufacturer or distributor of, or dealer in, any article of food or in any of the premises occupied by him as such) and for the possession of which he is unable to account to the satisfaction of the food inspector, (and any books of account or other documents found in his possession or control and which would be useful for, or relevant to, any investigation or proceeding under this Act, may be seized by the food inspector) and (a sample of such adulterant) submitted for analysis to a public analyst:
(Provided that no such books of account or other documents shall be seized by the food inspector except with the previous approval of the authority to which he is officially subordinate).

(7) Where the food inspector takes any action under clause (a) of sub-section (1), sub-section (2), sub-section (4), or sub-section (6), he shall (call one or more persons to be present at the time when such action is taken and take his or their signatures).

(7A) Where any books of account or other documents are seized under sub-section (6), the food inspector shall, within a period not exceeding thirty days from the date of seizure, return the same to the person from whom they were seized after copies thereof or extracts therefrom as certified by that person in such manner as may be prescribed have been taken).
Provided that where such person refuses to certify, and a prosecution has been instituted against him under this Act, such books of account or other documents shall be returned to him only after copies thereof or extracts therefrom as certified by the court have been taken.

(7B) When any adulterant is seized under sub-section (6) the burden of providing that such adulterant is not meant for purposes of adulteration shall be on the person from whose possession such adulterant was seized).

(8) Any food inspector may exercise the powers of a police officer [under section 42 of the Code of Criminal Procedure, 1973] (2 of 1974) for the purpose of ascertaining the true

name and residence of the person from whom a sample is taken or an article of food is seized.

(9) Any food inspector exercising power under this Act or under the rules made thereunder who:

(a) vexatiously and without any reasonable grounds of suspicion seizes any article of food (or adulterant); or

(b) commits any other act to the injury of any person without having reason to believe that such act is necessary for the execution of his duty;

shall be guilty of an offence under this Act and shall be punishable for such offence (with fine which shall not be less than five hundred rupees but which may extend to one thousand rupees)

The following table gives us an idea of the working of the Prevention of Food Adulteration, 1954 (Table I). It is interesting to note that from 1981-90, there has actually been a decline in the number of prosecutions. The number of convictions of registered cases has also registered a decline between 1981-90. At the same time, the number of cases pending in the court has increased during this period. Senior officials who are incharge of implementing the PFA often cite the cumbersome and prolonged legal procedure as an important drawback in the implementation of this Act.

TABLE I - WORKING OF THE PREVENTION OF FOOD ADULTERATION ACT 1954, IN INDIA, 1981-1990

Year	*No. of Samples examined*	*No. of Samples found adultera-ted*	*Percentage of adulteration*	*No. of prosecutions launched*	*No. of Convictions*	*No. of cases acquitted discharged*	*No. of cases pending in the Courts of Law*
1	2	3	4	5	6	7	8
1981	1,33,242	19,050	14.2	15,801	4,588	4,326	28,364
1982	1,29,595	16,765	12.9	15,006	3,617	5,483	36,781
1983	1,29,062	17,965	13.9	15,581	5,294	4,818	40,715
1984	1,22,296	14,990	12.2	13,334	4,530	4,577	43,761
1985	1,28,511	14,677	11.4	11,783	4,702	3,947	44,610
1986	1,21,969	13,730	11.2	10,445	3,864	3,391	44,389
1987	1,31,391	14,091	10.7	9,597	3,347	5,016	47,637
1988	1,30,390	15,365	11.78	9,599	2,576	3,251	50,931
1989	1,22,599	11,549	9.42	8,197	1,990	2,743	53,595
1990	1,18,580	11,124	9.38	7,970	2,464	2,316	54,700

Note : Information is based on the available reports from the States/Union Territories.
Source : Prevention of Food Adulteration Cell, Ministry of Health, New Delhi, 1992.

COMMONS ADULTERANTS AND HOW CAN THEY BE DETECTED

What are the means by which foods can be adulterated?

Foods can be adulterated by the addition of certain substances which can be injurious to health. These substances can be through the addition of sand or chalkpowderto sugar or gur; excess use of chemical as additives and preservatives, dyes as colouring agents, residue of pesticides in cereals, fruits, vegetables, fish and meat.

In order to approach the issue of food adulteration, all of us require certain basic information on what are the commonly adulterated foods, what are the adulterants, what are the simple tests to check these adulterants and the legal measures available to check traders from adulterating foods.

The following table gives us an idea of the common adulterants in spices, milk products, oils and cereals (Table II).

TABLE II
COMMON ADULTERANTS IN FOOD PRODUCTS

Food Product	*Common Adulterants*
01. Zeera	Foreign seeds in Cumin seeds.
02. Shah Zeera	Stalky and woody matter.
03. Pepper	Dried seeds of Papaya.
04. Hing	Sand, chalk, foreign resins.
05. Haldi	Excessive lead or lead chromate and coaltar dyes.
06. Gur	Sand and dirt.
07. Coffee powder	Waste products, date, tamrind husk, black gram husk.
08. Tea leaves	Foreign leaves, excessive woody stalks.
09. Coriander	Sand, saw dust, starchy matter.
10. Milk Products	Excessive moisture, deficiency of milk-fat, admixture with animal body fat, vanaspati etc. addition of preservatives, coaltar colours and foreign vegetable colours. Absence of annatto colour in table butter.
11. Edible Oils	Rancid stuff, cheaper oils, added oil soluble dyes, mineral oils (castor oils).
12. Atta-Maida	Excess sand and dirt, excess bran, admixture with foreign starch, soapstone, powdered chalk, etc. Besides, sale of insect-infested and deteriorated stuff is common.
13. Besan	Excess sand and dirty, coaltar dyes.
14. Vanaspati	Excessive hydrogenation and higher melting point products, Rancid stuff, animal body fat, Sesame oil deficiency, foreign flavour particularly the flavour of ghee, added colours.
15. Mustard Seeds	Foreign seeds particularly argemone seeds which are toxic. Deteriorated and insect-infested seeds.

The following table gives us an idea of the principal poison in foods and their health effects (Table III)

TABLE III
PRINCIPAL POISONS IN FOOD AND THEIR HEALTH EFFECTS

Poisons	*Foods Commonly Involved*	*Disease or Health Effects*
International Adulteration		
Argemone seeds	Mustard seeds	Epidemic dropsy.
Argemone oil	Edible oils and fats	Glucoma, cardiac arrest.
Mineral oil (white oil, petroleum fractions).	Edible oils and fats, black pepper	Cancer.
Orthotricresyl phosphate	Edible oils and fats	Flaccid paralysis.
Lathyrus sativus	Khesari dal alone or mixed in other pulses.	Lathyrism (Crippling spastic paraplegia).
Lead chromate	Turmeric whole and powdered, mixed spices	Anaemia, abortion, paralysis, brain damage.
Methanol	Alcoholic liquors	Blurred vision, blindness, death.
Metallic contamination		
Arsenic	Fruits such as apples sprayed over with lead arsenate (pesticide).	Dizziness, chills, cramps, paralysis, death.
Barium	Foods contaminated by rat poison (barium carbonate).	Violent peristalisis, arterial hypertension, muscular twitching, convulsions, cardiac disturbances.
Cadmium	Fruit juices, soft drinks, etc. in contact with cadmium-plated vessels, or equipment; cadmium-contaminated water and shell- fish.	'Itai-itai (ouch-ouch) disease increased salivation, acute gastritis, liver and kidney damage, prostate cancer.
Cobalt	Water, alcoholic liquors	Cardiac insufficiency and myocardial failure.
Copper	Acid foods in contact with tarnished copperware.	Vomiting, diarrhoea, astringent taste in mouth, abdominal pain.
Lead	Water, some nature as well as processed foods.	Lead poisoning (foot-drop, insomnia, anaemia, constipation, mental retardation, brain damage).
Mercury	Mercury fungicide-treated seed grains or mercury-contaminated fish.	Brain damage, paralysis, death.
Tin	Canned foods	Colic, vomiting, diarrhoea, chest congestion, metallic taste in mouth, headache, retention of urine, photophobia.
Zinc	Foods, especially acid foods stored or cooked in galvanised ironware.	Dizziness, vomiting, diarrhoea.
Biological Contamination		
(a) Bacterial		
Bacillus cereus	Cereal products, custards, puddings, sauces.	Food infection (nausea, vomiting, abdominal pain, diarrhoea).
Clostridium botulinum toxins A, B, E or F.	Defectively canned low or medium-acid foods, meats, sausages, smoked vacuum-packed fish, fermented food.	Botulism (double vision, muscular paralysis, death due to respiratory failure).
C.pertringers (welchii) type A	Milk, improperly processed or canned meats, fish and gravy stocks.	Nausea, abdominal pains, diarrhoea, gas formation.
Salmonella	Meat and meat products, raw vegetables, salads, shell-fish eggs and egg products, warmed up leftovers.	Salmonellosis (food infection usually with fever and chills). Acute inflation of digestion tract.

Shigella sonnei	Milk, potato, beans, poultry, tuna, shrimp, moist mixed foods.	Shigellosis (bacillary dysentery).
Staphylococcus aureus	Dairy products, baked foods especially custard or cream-filled foods, meat and meat products, low-acid frozen foods, cream sauces, etc.	Increased salivation, Nausea, vomiting, abdominal cramp, diarrhoea, severe thirst, cold sweats prostration.
Botulism	Improperly canned foods mushrooms spinach, figs, fermented foods.	Nausea, vomiting, diarrhoea, loss of reflex to light, dry mouth, weakness, constipation, respiratory paralysis.
Streptococcus pyogenes	Milk, eggs and their products	Scarlet fever, septic sore throat.
Vibrio parahaemolyticus	Raw or semi-cooked sea-fish or sea water	Gastro-intestinal disturbances with stomach pain and fever.
(b) Fungal :		
Aflatoxins	Aspergillus flavus-contaminated foods such as groundnuts, cottonseed, etc.	Liver damage and cancer.
Ergot alkaloids from Claviceps purpurea: toxic alkaloids-ergotamine, ergotoxin and ergometrine groups.	Ergot-infested bajra, rye meal or bread, wheat.	Ergotism (St. Athony's fire-burning sensation in extremities, itching of skin, peripheral gangrene or gastro intestinal disturbances).
Toxins from Fusarium sporotrichiodes.	Grains like millet, wheat, oats, rye, etc.	Alimetary toxic aleukia (ATA) Epidemic panmyelotoxicosis.
Toxins from Fusarium sporotrichiella.	Moist grains	Urov disease (kaschin-Beck disease).
Toxins from Fusarium graminearum (roseum).	Grain, bread	'Drunken bread' poisoning.
Toxins from Penicillium islandicum, P.atrinum, P.citreovirede, Fusarium, Rhizopus, Aspergillus.	Yellow rice	Toxic mouldy rice disease.
Sterigmatocystin from Aspergillus versicolour, Aspergillus nidulans and bipolaris.	Food grains	Hepatitis.
(c) Parasitic		
Trichinella spiralis	Raw pork or pork products	Trichinosis (nausea, vomiting, diarrhoea, sweating, colic and later muscular pains).
Ascaris lumbricoides	Any raw food or water contaminated by human faeces containing eggs of the parasite.	Ascariasis.
Entamoeba histolytica	Raw vegetables and fruits	Amoebic dysentery.
(d) Viral		
Virus of infectious hepatitis (Virus A).	Shell-fish, milk, unheated foods contaminated with faeces, urine and blood of infected humans.	Infectious hepatitis.
Machupo virus	Food contaminated with rodents' urine, such as cereals.	Bolivian haemorrhagic fever.
Natural and Adventitious contamination		
Fluoride	Drinking water, sea food, tea, etc.	Excess fluoride causes fluorosis: mottling of teeth, skeletal and neurological disorders.

Oxalic acid	Spinach, amaranth, chenopod, etc.	Renal calculi, cramps, failure of blood to clot.
Gossypol	Cottonseed flour and cake	Cancer.
Gyanogenic compounds	Bitter almonds, apple seeds, cassava, some beans, etc.	Gastro-intestinal disturbances.
Paralytic shell-fish poison (Saxitoxin).	Contaminated shell-fish (mussel, clam)	Paralysis of muscles of extremities, in severe cases paralysis of respiratory muscles and death.
Polycyclic aromatic hydrocarbons (PAH)	Smoked fish, meat, mineral oil-contaminated water, oils, fats and fish, especially shell-fish.	Cancer.
Polychlorinated biphenyls (PCBs).	Fatty foods contaminated with PCBs from packaging or processing.	Severe acne, eye discharge, skin darkening, liver damage, reproductive abnormalities.
Phalloidine (alkaloid)	Toxic mushrooms	Mushroom poisoning (hypoglycemia, convulsions, profuse watery stool, severe necrosis of liver leading to hepatic failure and death).
Solanine	Potatoes	Solanine poisoning (vomiting, abdominal pain, diarrhoea).
Nitrates and nitrites	Drinking water, spinach, rhubarb, asparagus, etc. and meat products.	Methaemoglobinemia, especially in infants; cancer, and tumours of the liver, kidney, trachea, oesophagus and lungs. The liver is the initial site but afterwards tumours appear in other organs.
Asbestos	Polished rice, pulses, processed foods containing anti-caking agents, etc.	Absorption in particulate form by the body may produce cancer.
Nitroso dimethylamine (Nitrosamine)	Water and foodstuffs containing nitrates or nitrites (meat, fish and their products).	Cancer.
Toxic food additives (in general).	Processed foods	Cancer or mutagenesis or teratogenesis.
Pesticide residues	All types of food	Acute or chronic poisoning with damage to nerves, and vital organs like lever, kidney, etc. Heavy dose may lead to cancer.
Diethyl stilbestrol	Used in medicine and cosmetics, may contaminate food, especially meats of stilbestrol-fed animals.	Teratogenesis (when given to pregnant women, causes high incidence of vaginal adeno carcinomas in their daughters), carcinogenesis.
Antibiotics	Meats from antibiotic-fed animals	Multiple drug resistance, hardening of arteries, heart diseases.

Sources: Jacob, Thankamma, 'Food Adulteration' 1976; Bryan, 1971; Joint FAO/WHO Expert Committee on Zoonoses, 1967; Riemann, 1969; Sedlack and Rische, 1961; WHO Expert Committee on the Microbiological Aspects of Food Hygiene, 1968; Wogan, 1964; WHO, Health Hazards of the Human Environment.

Table IV gives us an idea of the additives that need to be used with care, what type of foods they are commonly used in and what are the adverse effects of these additives.

TABLE IV
ADDITIVES TO BE USED WITH CARE

Additive	*Use*	*Remarks*
Coaltar dyes	To colour foods like vegetable and fruit products, soft drinks, candy, desserts, pastry, sausage, baked food, ice creams, hot dogs, hamburgers, sweetmeats, snacks, confectionery, alcoholic and other beverages.	May cause allergic and other adverse reactions in people, including cancer and pathological lesions in vital organs.
Butylated hydroxy toluene (BHT)	Antioxidant in cereals, chewing gum, potato chips, edible oils, etc.	May cause cancer; stored in body fat; can cause allergic reactions.
Butylated hydroxy anisole	"	Appears to be safer than BHT but needs more testing.
Caffeine	Stimulant, added to soft drinks	Causes insomnia and other adverse effects at high levels. Not recommended for children and pregnant mothers.
Saccharin	Noncalorie sweetener, used in diet products also as an adulterant.	Causes bladder cancer in animals. Not recommended for normal people (not suffering from diabetes, obesity)
Sodium nitrite and nitrate	Preservative and colouring for bacon, ham, meat, smoked fish, corned beef.	Prevents growth of bacteria (Gl. botulinum) but can cause formation of small amounts of cancer-producing nitrosamines.
Artificial flavourings	Soft drinks, candy, breakfast cereals, baked foods, vegetable and fruit products, icecream, custards, desserts, alcoholic beverages.	May cause hyperactivity in some children; not adequately tested for safety.
Monosodium glutamate	Flavour enhancer, used in soup, poultry, meat preparations, sauces, stews and cheese.	Damages brain cells in infant mice, so not recommended for children, can cause headache, tightness in head, neck and arms in sensitive adults (Chinese Restaurant Syndrome).
Sulphur dioxide and bisulphites.	Preservative and bleach, used in sliced fruits, wine, grape juice, dried potatoes, dried fruit, vegetable and fruit products etc.	Can destroy Vitamin B1, but otherwise safe at prescribed levels.
Phosphoric acid, phosphates	Acidifier, chelating agent, buffer, emulsifier, nutrient, discolouration inhibitor used in baked goods, cheese, curd, meat, soft drinks, dried potatoes.	Useful but widespread use creates dietary imbalances that may cause bone thinning (osteoporosis).
Anti-caking agents (talc, kaolin).	to make dry powdry foods free-flowing and as dusting agents for rice, confectionery, chewing gum.	May be absorbed and deposited in vital organs: if asbestos is present, can cause cancer.

USE OF FOOD COLOURS

Colouring of foods is common in sweets, ice creams and even spices like haldi. As a consumer it is important to be aware that there are certain dyes which have been banned because they are carcinogenic. Table V gives us details regarding the prohibited dyes and their possible health hazards.

TABLE V - HEALTH HAZARDS OF PROHIBITED DYES

Name of Dye	*Possible Health Hazards*
(a) Orange II	Pathological lesions in vital organs like kidney,
(b) Auramine	spleen and/or liver; (a) to (d) are carcinogenic;
(c) Rhodamine B	(e) causes increasing in the incidence of
(d) Blue VRS	tumours of lung, breast, ovary and liver and
(e) Malachite Green	teratogenic abnormalities of eyes, bone skin
(f) Sudan III	and lungs.
(g) Citrus Red II	Marked increase in morbidity, mortality and unceptibility to subcutaneous infections culminating in malignant growths.
(h) Congo Red	Lesions in the brain and/or kidney, glaucoma.
(i) Metanil yellow	Degeneration of reproductive organs, sterility, stomach trouble, cancer.
(j) Lead chromate	Anaemia, paralysis, brain damage, especially in children.

Apart from dyes, there are also certain additives that are prohibited in foods. The following table (Table VI) gives us details regarding the prohibited additives.

TABLE VI
ADDITIVES PROHIBITED IN FOODS

Brominated Vegetable Oil (BVO)
Calamus and its derivatives
Cobalt salts and their derivatives
Coumarin and Dihydrocoumarin
Cyclamate and its derivatives
Dithylpyrocarbonate (DEPC)
Dulcin
Monochloroacetic acid
Nordihydroguaiaretic acid (NDGA)
Safrole
Thiourea
Chlorofluoro carbon propellants
Colourants:
Red FB
Red 6B
Acid Magenta II
Blue VRS
Brilliant Black

Source: Code of US Federal Regulations (1979): PFS Rules (India)

As mentioned earlier, there are some industrial contaminants of foods. Table VII provides us information regarding the major contaminants, the foods in which such contaminants are found, the long term health effects it has and the maximum permissible limits in food.

TABLE VII - MAJOR INDUSTRIAL CONTAMINANTS OF FOOD

Contaminants	*Food involved*	*Health Effects*	*Max.permissible limits*
1. Polychlorinated Biphenyls(PCBs)	Fish, milk including human milk poultry, eggs, meat, processed and packaged food.	Eye discharges, eye inflammation, severe, acne, darkening of skin, hair loss, reproductive problems, liver tumours, liver damage, may cause cancer, make sterility, hyperkinensis, learning problems, and other abnormalities in children when mothers are exposed to PCBs.	1.5 ppm in milk and dairy products (fat basis) 3 ppm in poultry (fat basis). 0.3 ppm in eggs 5 ppm in fish 2 ppm in infant/baby foods.
2. Mercury	Fresh water fish from polluted waters (not salt water fish), seeds treated with mercury fungicides, plants, foodstuffs grown close to polluted waters, milk from cattle grazing on contaminated plants.	Acute: Severe abdominal paints with nausea, vomitting, diarrhoea accompanied in some cases by severe damage to kidneys and liver. Cumulative: Damage to brain and the central nervous system, manifested as mental and emotional disturbances loss of concentration, memory, general weakness, tremors in the extremities of limbs, loss of vision, hearing, paralysis, insanity.	0.5 ppm-1.0 ppm for fish. Total mercury in food consumed 0.005 mg/kg body weight per week or 0.0033 mg/kg of methyl mercury per week.
3. Cadmium	Shell fish, aquatic plants and animals, liver and kidneys of mammals, foodstuffs from soil where sewage sludge and industrial wastes are dumped or treated with phosphate fertilisers, processed food, cigarettes (1 cigarette may have 2 micrograms of cadmium 10 percent of which may be inhaled as smoke).	Kidney stones, increased urinary excretion of calcium and aminoacids (from proteins) kidney damage, osteomalacia, multiple fractures.	0.01 mg/litre of drinking water, 0.4-0.5 mg per week per adult or 0.0067 to 0.0083 mg/kg body weight per week in the total diet.
4. Lead	Water, liver and kidney of animals, agricultural produce from orchards treated with lead arsenate or from places close to roads with heavy traffic, canned food, especially acidic food, canned milk and milk products and infant foods.	Nausea, insomnia, constipation, fatigue, abdominal pain, anaemia, abortions, stillbirths, neonatal deaths, irreversible changes in the kidneys and brain, paralysis, convulsions, mental disorders and permanent retardation in children.	3 mg per adult or 0.5 mg/kg body weight per week (not applicable to infants and children) 0.05 mg/litre for drinking water.
5. Arsenic	Fruits, vegetables, processed foods, etc.	Highly poisonous	can cause brain damage & even death.

Apart from industrial contaminants, there are also a variety of contaminants which are of bacterial, fungal and natural plant origin. Both bacterial as well as fungal contaminants are a major cause of food poisoning which results in severe vomiting, diarrhoea, dehydration and can in some cases even lead to death. Bacterial and fungal contaminations occurs in improperly processed foods, specially ready to eat foods. Several cases of food poisoning have been reported from some parts of the country due to adulteration of oils as well as in the case of school children getting poor quality mid day meal snacks as well as milk. Table VIII shows some reported cases of food poisoning from different cities of our country.

TABLE VIII—FEW REPORTED CASES OF FOOD POISONING—1990-93

Place	*Nature of Problem*	*Age Group & Numbers*	*Date*
Basti, U.P.	Pesticide in foodstuff	More than 150 people died and over 200 people fell ill.	17 April, '90
Bombay	Bread	70 children	Jan.-Feb. '91
Delhi	Soyabean milk	Over 200 children	5 March, '91
Bombay	Bread supplied by Modern Food Industries to school	150 primary school children.	11 March, '91
Midnapore	Pesticide in the foodstuff	8 persons died and 200 others fell ill.	25 Sept. '91
Bihar	Adulterated Mustard oil	2 adults killed 100 persons hospitalised.	Oct. '91
Chandigarh	Bakeman's Biscuits a part of the mid-day meal under food & nutrition programme.	450 Students were hospitalised. (10-very serious).	10 Nov. '91
New Delhi	Rice, Dal, Chapati and and Shimla Mirch-Potato mixed vegetable.	32 children	8 May '92
New Delhi	Kulfi-faluda	12 people	13 May '92
Chamu Town Near Jaipur	Adulterated Mustard Oil	278 persons	16 August '92
Hyderabad	Putrid Biscuits	160 children	8 Sept. '92
Guwahati	Prasad	200 persons including 40 children.	10 Sept. '92
New Delhi	Vitasoy food and Meghray Biscuits	49 primary school children.	11 Sept. '92
Kochi	Marriage feast	250 people	15 Jan. '93

Source : Compiled from various news reports, 1990-93.

"As many as 10,301 people were affected by food poisoning in the country during the last one year. According to an official document, Tamil Nadu tops the list with 3,153 cases of food poisoning followed by Maharashtra with 2,866, Gujarat with 1,215 and Haryana with 1,109." (Assam Tribune, 6th August, 1991).

For every case of food poisoning that is reported, several cases go unreported. The reported ten thousand cases of food poisoning during 1990 in the country would therefore be an underestimate.

Simple Tests for Adulterants

Given the fairly widespread adulteration of foods and food products, there are simple tests for common adulterants which can be undertaken both at home as well as by consumer groups. Apart from these simple tests, there are low cost kits available. Table IX gives simple tests for common adulterants.

TABLE IX - SIMPLE TESTS FOR COMMON ADULTERANTS IN FOOD

Foodstuff	*Adulterant*	*Test*
1. Milk, curd, khoa, ghee butter	Starch	Add a drop of tincture iodine in a little of the sample. Blue colour shows added starch in any Form. (Iodine solution may be prepared by dissolving 2.5 g of iodide crystals and 3 g of potassium iodide in sufficient water to make the volume 100 ml.
2. Milk or curd	Cane Sugar	Add 0.1 g resorcin and 1 ml concentrated hydrochloric acid to 10 ml of the sample and boil. A rose red colour shows sugar.
3. Butter	coaltar dye	Melt the butter in a test tube kept in a hot water bath and continue heating until the fat and water layers completely separate out. Decant of the butter fat from the top into a clean dry test tube. In another test tube, dissolve about 2 ml of clear fat in ether, add to it 1 to 2 ml of 50% hydrochloric acid, shake and allow to settle. Formation of a pink to wine red colour in the lower acid shows coal tar dye.
4. Ghee or butter	Vanaspati	Dissolve a pinch of cane sugar in 10 ml concentrate hydrochloric acid taken in a glass-stoppered test tube. Add 10 ml of the melted ghee, stopper the bottle and shake vigorously for two minutes. Let stand till 2 layers separate. If the lower layer turns pink or red, the ghee contains vanaspati.
5. Edible Oils	Argemone oil	Shake up 5 ml of the filtered oil with 2 ml of concentrated hydrochloric acid in a test tube and warm with mixture for 5 minutes in a water bath with occasional shaking. Decant off the oil from the top and add to the remaining acid layer 1 ml of 10% ferric chloride solution, gently. Rotate the tube between the palms of the hands to mix the solutions and heat in the mixture in a boiling water bath for 15 minutes, add 10 ml water. Any turbidity shows mineral oil.
	Mineral oil	Mix 2 ml oil with 2 ml of 3% alcoholic potassium hydroxide, heat in boiling water bath for 15 minutes, add 10 ml water. Any turbidity shows mineral oil.
	Castor Oil	Dissolve oil in petroleum ether in a test tube and cool the test tube in ice-salt mixture. Turbidity within 5 minutes shows castor oil.
6. Aerated water	mineral acid other than phosphoric acid	Soak a strip of filter paper in a dilute (0.1%) water solution of metanil yellow and then dry. Dip one end of the paper into the aerated water. The wetted portion turns violet.

	(b) Fine white sand, dirt, semolina(suji), chalk powder	Stir one tea spoon of the sugar in a glass of clear water. Only the sugar will dissolve, leaving a residue of the sand, dirt, semolina or chalk.
7. Coffee powder	(a) Starch (toasted bread crumbs, rye, wheat, peas etc.)	Make a decoction of the coffee, decolourise it by adding acidified potassium permanganate and then add a drop of iodine solution. Blue colour shows starch.
	(b) Roasted dates and tamarind seeds	Shake powder with 2% sodium hydroxide (or washing soda) solution. Formation of a reddish colour shows tamarind seeds.
8. Tea (dust/leaves)	(a) Artificially coloured foreign matter or exhausted tea leaves	Sprinkle the tea on a sheet of wet white paper. Pink or red spots appearing on the paper show added colour.
	(b) Iron filings	Draw a magnet through tea. Iron filings will cling to the magnet.
9. Cane sugar	(a) Iron filings	Pass a magnet through the sugar. Iron filings will cling to the magnet.
	(b) Fine white sand, dirt, semolina (suji), chalk powder	Stir one tea spoon of the sugar into a glass of clear water. Only the sugar will dissolve, leaving a residue of the sand, dirt, semolina or chalk.
10. Gur (Jaggery)	(a) Sand, dirt, chalk	Boil a portion with excess water, Gur will dissolve but sand and dirt will not.
	(b) Metanil Yellow (coal tar dye)	Dissolve a little gur in water. Filter and dilute the solution and then add a drop of concentrated hydrochloric acid. A magenta red colour shows the presence of metanil yellow.
	(c) Washing Soda	Add some hydrochloric acid. Bubbling gas shows washing soda.
11. Honey	Commercial invert sugar (mixture of glucose and fructose)	Fische's Test: Mix about 5 g of the honey with 10 ml of ether in a mortar, using a pestle. Decant off the ether extract into a china dish. Repeat twice with more ether and collect all the extract in the same dish. Allow the ether to evaporate off at room temperature. To the remaining residues in the dish, add a large drop of a 1% solution of freshly sublimed resorcinol in concentrated hydrochloric acid. Immediate appearance of a cherry red colour indicates commercial sugar.
12. Sweetmeats	Aluminium foil for decoration (instead of silver)	Treat the foil with a little warm dilute hydrochloric acid. Bubbles of hydrogen gas will be evolved from the foil (silver foil does not react)
Sweetmeats, Ice cream, sherbet etc.	Metanil yellow	Shake with warm water and add to separated water, conc. hydrochloric acid. Red colour indicates the presence of the forbidden dye.
13. Foodgrains and nuts (e.g.ground nuts)	Mould	The grains and nuts will appear discoloured and shrunken and will usually have an off taste and float on water.
14. Wheat, bajra and other foodgrains	Ergot (a poisonous fungus).	Long irregular black grains show ergot. Treat with 20% salt solution. Ergot will float and sound grains will sink.
	Datura seeds	Brown black seeds resembling chilli seeds which can be easily identified.

15. Foodgrains and pulses (whole and ground)	Insect, larvae	Visual examination. Excessive infestation results in unpleasant odour and taste and the grains will float on water.
16. Wheat flour, semolina (suji) Bengal gram flour (Besan)	Sand, grit	To a little of the sample add 5 ml. of carbon tetra chloride in a dry test tube and shake well. Sand and grit will settle at the bottom, leaving flour on top.
	Iron filings	Pass a magnet through material. Iron will cling to magnet.
	Chalk powder	Treat sample with hot hydrochloric acid. Bubbling of gas shows carbon dioxide gas from chalk or other carbonates.
Wheat flour	Resultant atta from which maida, suji have already been extracted	More water needed to make dough-chapatis blow out and are insipid.
17. Whole black masoor and Bengal gram	Kesari pulse (whole)	Visual examination (wedge-like shape). Also gives brown colour with hydrochloric acid in 15 to 30 minutes.
18. Split and dehusked pulses	(a) Kesari dal	Visual examination (usually present in arhar dal and Bengal gram).
	(b) Metanil Yellow	Shake a portion with cold or warm water. The water becomes yellowish and on treatment with hydrochloric acid turns magenta red.
19. Common salt	Sand, dirt, chalk	Stir a little of the sample with excess water; sand and dirt will sink but the salt will dissolve- chalk will float giving a whitish solution.
20. Red chilli whole	Polished with red dye	Soak some cotton in mineral oil (liquid paraffin) and rub outside of the red chilly with the cotton. If the cotton becomes red, the sample has added colour.
21. Turmeric (whole and powdered) and Mixed spices (powdered)	Metanil yellow	Shake up with some water. Dilute till it is almost colourless and then add a few drops of conc. hydrochloric acid. Magenta red colour shows artificial colouring with metanil yellow.
22. Powdered spices (turmeric, chilli, coriander, garam masala, curry powder, etc.)	Sand, grit, talc	Shake up a little of the sample with about 5 ml. carbon tetrachloride in a dry test tube. Allow to settle. Sand, talc and grit will sink to the bottom, leaving spice on top.
23. Saffron	Dyed tendrils of maize cob	Shake with water several times, pouring away the water each time. Only pure saffron gives colour as long as it lasts; also does not break easily like the artificial.
24. Cinnamon (dalchini)	Cassia bark (chini dal)	Thick bark with less aroma than pure cinnamon (thin bark) shows adulteration.
25. Cardamom, cloves	Exhausted (already extracted) spice	If dry, shrunken in appearance. If not dried well, soggy, with fungus infestation. In either case, deficiency of aromatic taste.
26. Mustard and Rai seeds	Argemone seeds	Small seeds resembling mustard but blacker, more rough and not uniformly smooth and round. Can be seen under a magnifying glass.
27. Mustard, Rai, Cumin seeds, Khus-khus, etc.	Stones and foreign matter	Visual examination.

Note : Adulteration detected as above needs to be confirmed by analysis in a recognised food testing laboratory; the tests in no way replace the prescribed laboratory tests.

Some consumer groups across the country have taken up activities relating to food adulteration. Questionnaires were sent to twenty five consumer organisations from different parts of the country regarding the type of activities undertaken, the target group covered, type of foods tested for adulteration, organisations for food testing, sources for food testing kits and other relevant material for consumer education. The following table provides information on the activities of select consumer groups relating to Food Adulteration (Table X).

TABLE X
ACTIVITIES OF SELECT CONSUMER GROUPS RELATING TO FOOD ADULTERATION

Name of Organisation	*Type of Activities*	*Target Group*	*Adulterated Foods covered*	*Organisations for Food Testing*	*Educational Materials/Testing Kits*
1. Consumer Education & Research Centre, Bhavnagar, Gujarat	Testing, prevention of manufacture of food items. Testing quality of fast foods	Students Women	Masalas Dals, Oils, Bread, Atta, Vanaspati	1.Testing Kit, Laboratory, Baroda 2. Food Testing Laboratory, Bhuj	Consumer Guidance Society, Bombay. 2. Journal for Testing Household items, Lady Irwin College, New Delhi.
2. Consumer Resistance Group, Anand, Gujarat	Check on sale of old stocks of food items	House-wives	N.A.	Consumer Guidance Society of Jamshedpur, 21, Circuit House Area, East, Jamshedpur	Pamphlets on Food Testing food Adulterants (CGSJ), Jamshedpur Local
3. Baroda City Consumers Council, Shram Sadhana, Raopura, Gujarat	1. Action against adulterated food manufactures. 2. Registering cases under PFA Act, 1954 in Baroda Court	Students House-wives	Masalas, Dals, oil	Public Health Laboratory of state government	Health Authority of Baroda, Municipal Corporation, Khauderao Market, Baroda.
4. Consumer Action Group (CAG) 44, Venkatakrishna Road, Mandavelli, Madras	Action leading to seizure of hazardous chemical compounds which are being used as sugar substitutes	Students House-wives	Oil Dal Milk	CAG has been given authority to inspect food products with AGMARK Label within a specified jurisdiction in Madras city.	—
5. Visakha Consumers Council (VCC) D. No. 13-28-6/4 KGH, UP Road Visakhapatnam	–	College Students & Women's Organisa-tions	Dals Oil	–	Food Adulteration Test kits from Consumer Guidance Society of India, Flutment J. Mahapalika Marg Bombay.

6.	The Citizens Consumer Council Achampet, Mohboobnagar Andhra Pradesh	–	Rural persons	Dr Is Oils	–	Consumer Awareness and Research Society, P.O. Box No. 3 Khairtabad, Hyderabad.
7.	Gujarat State Consumers Protection Centre, Ashok Nagar, Nadiad, -387 001, Gujarat	1. Withdrawl of adulterated food item. 2. Publishing material on adulterated food, drugs, use of insecticides. 3. Conducting Surveys related to food habits in rural areas. 4. Have instituted an Award for the corporate sector which safeguards and protects consumer safety and hygiene.	Women in both rural and urban areas	Oil, Milk, Haldi	–	Published a Booklet on 'How to detect adulteration - How to file a complaint."
8.	Consumer Education Centre, No. 4, Sesha Vilas, 3-6-293, First Floor, Hyderguda Hyderabad-500 029	Providing Educational Material to other Consumer Groups	General Public/ Consumer Groups	NA	NA	Food Safety and the consumers - Special Report I from - Deptt. of Post Graduate Studies and Research, SNDT women's university, Juhu Road Bombay-49.
9.	Consumer Guidance Society of India, Hutment 'J', Mahapalika Marg Bombay-400 001	1, Providing Educational Material 2. Networking with consumer groups	1. Women 2. Students 3. Low Income	Ghee Haldi Tea Sweets		1. Developed Home Kit For Detecting common Adulterants 2. Audio visual on 'consumer awareness' 3. Safety at Home 4. Edible Oils (consumer guide)
10.	Consumer Unity & Trust Society 3-B, Camac Street Calcutta - 700016	1. Action against adulterated food manufacturers. 2. Withdrawl of food items. 3. Litigation	Consumers Rural and Urban school children	N.A.		All about GATT publications.

Who is responsible for ensuring food safety?

Private traders as well as industry also have a responsibility to ensure safe food standards.

'Every person is obliged to respect the human rights to life and liberty, and those who are in the business of food marketing have an even more serious responsibility to respect these rights.

Merely relying on the government to check food adulteration is clearly inadequate. What is needed is an active involvement of consumer organisations as well as other organisations working in the field of health to network and create public pressure and awareness on this issue.

Consumer and other Health Action Groups should address the following issues :

— The hygienic quality of food should be established by the wide use of statutory and mandatory standards.
— The modification of food by the addition of non-nutritive substances should never be allowed unless what has been done is clearly unequivocally declared.
— The work of ensuring that permitted food additives have received adequate technological clearance and been proved technologically necessary should be speeded up.
— Necessary Legal measures like the PFA, 1954 should be activated and the authorities should maintain and in some areas increase their programmes of monitoring for the levels of contaminants and additives in the diet of the population.
— A concerted effort should be made by all of us to find ways of describing foods so that people really do know the true nature of what they are buying and we avoid over-detailed compositional requirements for each and every food.
— All pre-packed food should be obligatory marked with a date-either expiry date or production plus shelflife after while it is likely to have deteriorated either microbiologically or in nutritional quality or in flavour.
— National codes of hygienic practice should be applied not only to production but also to distribution within borders and for export and at the point of sale.
— Above all, there must be numerically adequate and sensible remunerated inspectorate, backed up by analytical staff and equipment, to enforce the country's food laws effectively and fearlessly.
— To make that amount of progress, it really shouldn't take another country.

Annexure I gives some guidelines as prescribed by the Director General of Health Services (Food Section) to Consumers to check adulterations.

ANNEXURE I

TIPS TO CONSUMERS

A. While Shopping

(1) Read table before purchase –
   (a) Name, trade name or description of food;
   (b) Names of ingredients used in the products;
   (c) Name and address of the manufacturer/vendor/packer of food;
   (d) Net weight, number of measure;
   (e) Batch number of Code or Lot number;
   (f) The date of manufacture/packing;
   (g) If the product is infant food, see date by which it is to be consumed;
   (h) If the product is claimed to be enriched with nutrients, see the quantities of minerals, proteins of vitamins on the label;
   (i) Synthetic product shall not depict picture of fruit. The word "Synthetic" shall appear in capital letters. The word "Fruit" shall not be used in describing the products.

(2) Purchase food articles from licensed vendors and insist on Bill or Cash Memo.

(3) Prefer foods sold in packed containers even if you have to pay more.

(4) Prefer food certified by Government agencies like (a) Agmark in case of spices, edible oils, ghee, butter, honey, atta etc., (b) I.S. Certification Mark in case of Milk powder, Condensed milk, Infant milk food, Infant formula, Milk, cereal based weaning food, Food colours, confectionery, biscuits, vanaspati (I.S. Certification is must).
   (c) F.P.O. in case of processed fruit products like jam, jellies, ketchup, pickles, chutney, soft drinks or fruit beverages.

   ***There are some exemption in case of specific packages, consult Prevention of Food Adulteration Rules for details.**

(5) Prefer use of iodised salt in place of common salt.

(6) Avoid coloured foods especially sweetmeats/sharbets/ice-candy.

(7) Avoid silver leaves or other decoratives on food.

(8) Buy food articles from reputed firms.

(9) Buy whole masala or certified masala packs.

(10) Do not buy cut/exposed fruits/vegetables.

(11) Do not use container or packages used for insecticide, chemicals or non-edible oils.

(12) Report to Health Officer/Director (PFA)/Food & Drugs Administration in case of any complaint regarding food adulteration.

B. While preparation/serving food

To protect your family follow these simple tips:

(1) Wash your hands with soap and water before you start preparing food and after every interruption.

(2) Cover cuts in hand by bandage.

(3) Cut your nails short and keep them clean.

(4) Cover your head with hair net/band.

(5) Wear clean over clothes.

(6) Keep all kitchen surface meticulously clean.

(7) Wash food grains/vegetables, fruits, eggs, fish, meat thoroughly before cooking/eating/storing in refrigerator.

(8) Avoid contact between raw foods and cooked food, specially, raw meat/fish/poultry meat.

(9) Cook food thoroughly at boiling temperature.

(10) Serve cooked hot food immediately.

(11) Store cooked food carefully, preferably below 10 deg. C or above 60 deg. C.

(12) Do not store cooked food in danger zone, i.e., between 10 deg. C to 60 deg. C, specially perishable food articles.

(13) Protect foods from flies, insects, rodents and other animals.
(14) Wash your hands with soap and water before starting eating.
(15) Do not prepare/cook food several hours before eating.
(16) Re-heat cooked food thoroughly to make all parts of food above 70 deg. C.
(17) Keep the refrigerator door closed, defrost/clean your refrigerator every week.
(18) Do not consume stored prepared food if having off (rancid) flavour/smell or food in which froth has set in.
(19) Use pure and clean water preferably potable water in preparation of food.

BABY-CARE

(20) Remember mother's milk is best for your baby. Continue feeding breast milk as long as you can.
(21) After 4 months of age, baby needs solid food. Start giving home-made weaning food instead of expensive tinned food.
(22) Do not give left over food to your baby.

Issued by :
Directorate General of Health Services (Food Section).

FOOD AND HEALTH QUESTIONNAIRE

1. NAME OF ORGANISATION : _____

   POSTAL ADDRESS : _____

   _____

   _____ PIN : _____

2. MAJOR ACTIVITIES RELATED TO FOOD ADULTERATION/CONSUMER PROTECTION: (PLEASE TICK RELEVANT ITEMS BELOW AS : ☐ YES, ☐ NO

i) Facilities for food testing : ☐ Own ☐ Other sources

ii) Consumer action against adulterated food manufacturers :

☐ Yes ☐ No. If Yes, please specify below:

☐ Withdrawal of food items :

_____

☐ Prevention of manufacture of food items

_____

☐ Propagation of alternatives

_____

☐ Others : (Kindly specify)

_____

iii) Educational campaigns : ☐ Yes ☐ No

If Yes, specify : Target group : _____

Field : _____ Region : _____

iv) Research Studies : ☐ Yes ☐ No
(If Yes, kindly specify)

☐ Food surveys

☐ Adulterated food items : (vendors, manufacturers, etc.)

☐ Consumption patterns among :

☐ School aged children ☐ Urban poor ☐ Rural poor

☐ Case studies : _____

☐ Field Trials : _____

☐ Others : _____

v) Networking Activities (Give details) :

_____

_____

vi) Any other : (Please Specify)

_____

_____

3. If Yes to 2(i) or (iv) please answer this question, if not go to 4.

(a) Specify the adulterated food items covered as listed below :

(i)	☐	Masalas	☐	Haldi	☐	Salt	
(ii)	☐	Dals					
(iii)	☐	Oil	☐	Vanaspati	☐	Ghee	
(iv)	☐	Bread	☐	Biscuits	☐	Snacks	
(v)	☐	Atta	☐	Rice Flour	☐	Sooji	☐ Raw
(vi)	☐	Milk	☐	Powder Milk	☐	Soya Milk	
(vii)	☐	Supari					
(viii)	☐	Icecream					

(ix) Any other (specify) : _____

(b) Specify Food Testing methods for adulterated items used 2(i) :

_____

_____

Name & address of useful organisation for this purpose :

_____

_____

4. List any resource/studies/educational materials developed by your own organisation or by any other group/individual that you have found useful :

Title	Available from :
_____	_____
_____	_____
_____	_____
_____	_____

Thank you for answering our questionnaire, we are preparing an update of available information for the Indian consumer. On hearing from you we will send you a FREE COPY for every questionnaire received!

Kindly send in your filled in questionnaire by November 30, 1992 addressed to :

"FOOD & HEALTH PROGRAMME"
Public Policy Unit,
Voluntary Health Association of India
40, Institutional Area
South of IIT, New Delhi -110 016.

Voluntary Health Association of India (VHAI) is a non-profit registered society formed by the federation of Voluntary Health Associations organised at the level of States and Union Territories. VHAI links over 3000 grassroot-level organisations and community health programmes spread across the country.

VHAI's primary objectives are to promote community health, social justice and human rights related to the provision and distribution of health services in India.

VHAI fulfils these objectives through campaigning, policy research, and press and parliament advocacy; through need-based training and provision of information and documentation services; and through production and distribution of innovative health education materials and packages, in the form of print and audiovisuals, for a wide spectrum of users — both urban and rural.

VHAI tries to ensure that a people-oriented health policy is formulated and effectively implemented. It also endeavours to sensitise the larger public towards a scientific attitude to health, without ignoring India's natural traditions and resources.

VOLUNTARY HEALTH ASSOCIATION OF INDIA

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New Delhi 110 016 INDIA
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