

Subject: Food Technology

Script Topic:CC5.Food and Nutrition,

Unit 6 Nutritional labeling (part 1)

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1. Introduction:

. The food production in our country is the most promising sector which is the cause for white revolution and green revolution. India ranks first in the world in production of cereals and milk and second largest producers of fruits and vegetables. India stands second in inland fish production. It is second largest exporter office and so on. In order to have quality evaluation of the food products and to safeguard the interests of the consumers, Food Laws and Regulations have come into force by the Government. In a broader sense, Food Laws and Regulations cover all the related acts with reference to food manufacture, packaging, labeling, marketing, food additives used, dietary supplements, the mode of food evaluation, the enforcement of management practices such as Good Manufacturing Practice (GMP), Hazard Analysis and Critical Control Point (HACCP), Federal Laws and Regulations, Factory Inspections, Import-Export Inspections, Licensing, Certification and not the least the Penalty and Punishment Clause. Each country has their own regulations based on their agricultural practices, products manufacture and distribution.

This episode deals with the following five important limbs of food labelling

1. National Food Laws and Regulatory Systems
2. Compulsory Legislations
3. Voluntary Standards
4. Labelling Requirements

1. National Food Laws and Regulatory Systems

In our country, to begin with statewise regulations were in force. Subsequently, to make it more uniform, practical, Central legislation was advised by the Central Advisory Board of Health. Thus, National Food Laws and Regulatory system was framed under which various orders and acts cum rules came into force. National Laws & Regulatory Systems fall into two categories. Compulsory legislations which are formulated by various ministries while voluntary standards are framed by the organizations with the main criteria of serving the country.

The details of acts, their mode of operation, regulations with special features are tabulated in **Table 1**.

2. Compulsory Legislations:

The Compulsory legislations, as seen are formulated by various ministries. Under that **Prevention of Food Adulteration Act, 1954 (PFA)** is the major law which protects common consumers against impure, unsafe and fraudulently labeled foods. PFA Act and rules apply equally to domestic and imported products and cover various aspects of food processing and distribution and it came into force on 1st June 1955. Subsequently, four amendments of PFA Act during 1964, 1971, 1976 and 1986 were made maintaining the basic norms. The provisions of this act are mandatory and satisfy minimum quality, ensuring safety for consumption of foods. Over the last 50 years, because of advancement in

food applications and new products, nearly 300 amendments in terms of additions have been made with the inclusion of standards of various foods, additives usage, product safety in terms of microbial standards, food packing and labeling upgradation and procedures for working of food inspectors and other regulatory authorities. With reference to safety aspects, microbiological specifications for sea foods and meat products have been included in detail while in fruit and vegetable products specific organisms or mould count limits have been given.

PFA covers the various aspects of food and processing considerations in laying down the food specifications and are briefly as follows:

- i. Definitions and standards of quality for various foods.
- ii. Rules pertaining to the quantity of sample to be sent to the public analyst. It varies from 15g for saffron to 500g of other foods.
- iii. Types of food additives permitted with the specified levels in various foods.
- iv. Specifies the poisonous metals and crop toxicants.
- v. Insecticides and pesticides restriction and residues.
- vi. Irradiation food-dose, restriction and standards.
- vii. Packing and labeling of foods.
- viii. Composition and functions of Central Committee for Food Standards and Central Food Laboratories.
- ix. Appointment and functions of public analysts and food inspectors.
- x. Regulations, prohibitions and conditions of sale and license.

The food additives covered in PFA Act has a long list of preservatives, antioxidants, anti-caking agents, etc., and the permitted levels with special features in brief is tabulated in **Table 2**. The legislation for irradiated foods, infant milk substitutes has come into force during 1990s.

The second main compulsory act is **Essential Commodities Act (1954)** which covers a number of control orders and these operates on the main objectives of regulating manufacture, commerce and distribution. Further, **Standards of Weights and Measures Act (1976) and Rules 1977** covers the packaged commodities. a general act of essential commodities. Fruit Products Order (FPO) is the licensing agency for all fruits products industries.

3. Voluntary Standards:

Bureau of Indian Standards (BIS) for standardization of processed foods mainly is the voluntary organization dealing with more than 800 processed foods. The mode of operation and regulations are included in **Table 1. Bureau of Indian Standards (BIS)** has brought out the specifications on various aspects of foods as follows:

- i. Product specifications - raw materials and final products
- ii. Glossary of terms of certain materials for industrial use
- iii. Hygienic codes applicable to most of the food industries
- iv. Microbiological methods specifications
- v. Sensory evaluation method
- vi. Grading standards for cereals and vegetable oils
- vii. Methodologies booklets
- viii. Packaging materials specifications
- ix. Specifications for food additives
- x. Labeling and advertising specifications

BIS under Food and Agriculture Division (FAD) has covered almost all the commodities. Food additive specifications have been widely covered under Food Grade Category. BIS is the certifying authority for the products. Over the years, the mandatory regulations have also encompassed the compliance of the procedures to meet the standards which is a preventive action for the successful achievement. In 1990's, BIS has introduced the Quality Management Systems (QMS). In the beginning, the guidelines for Accreditation of Laboratories, Inspection Bodies, Certification Bodies and Systems of Certification were released. Further, guidelines for statistical techniques and handling of data, quality control procedures, quality assurance in production, providing service, inspection, auditing were added. The harmonisation process with the **International Standards Organisation (ISO)** was one of major steps of activity by adopting ISO Quality Management Systems (ISO 9000 series) which clearly states the hygiene requirements, performance improvements, quality plans, management of projects, documentation, training, utilization of services of consultants, auditing and certification. The compliance of ISO 9000 series with BIS 14000 series has brought out better clarity in understanding and adopting the procedures. The BIS-14000 series standards refer to the industry management in terms of hygiene, safety, quality control with documentation as the emphasized feature. Many of the industries, research laboratories are streamlining, systematizing in their work action profile through the system of ISO 9000:2001 a generic certification and the recent upgradation to ISO 9000:2008 certification has further improved the procedures and documentation.

The next voluntary standard refers to **Agricultural Produce Grading and Marking Act (AGMARK) (1937)** which is the oldest act comprises the rules for grading and marking of all the agricultural products covering cereals, pulses and their products, fruits and vegetables, spices, oils and fats and a few miscellaneous items. The modality of specifications drawn by this organization is based on:

- i. Commodity and their grades on quality
- ii. Special as well as general characteristics of the commodity

- iii. Based on size and weight of the commodity
- iv. Based on the features of the commodity
- v. Based on the soundness of the commodity

In addition, the **Agricultural and Processed Food Products Export Development Authority Act (1985)** for the promotion of food exports and **The Agricultural and Processed Food Products Export Cess Act (1985)** for levying cess and custom duty collection for exports are in force.

The quality control of foods is managed in the Defence under the act of Army Service Corps (ASC) Specifications. It pertains mainly to the products procured by the Army personnel operating through Directorate General of Supplies and Transport (DGST). Since one of the major requirements of Services is the long shelf life for which suitable alterations in the product processing and packaging need to be looked into. Secondly, the long distance transportation and a very few quality control laboratories call for more authoritative approach. In general, the specifications are relatively more stringent than other statutory bodies working in the country. The quality awareness and cost effectiveness are given equal priorities in judging and procurement of the products. AGMARK emphasizes the various grades and refractions as special features, while BIS prefers the mode of sampling, hectoliter weight determination besides the refractions. Thus, based on their angle of priority, the quality check line is drawn. However, it measures and refers to the total quality of the product.

4. Labeling Requirements

Labeling is an integral part of packaged food system. The license for food manufacture, declaration of label has to be followed as per the regulations. Packing and labeling are the limbs of food presentation to the consumers. Over the years, labeling has become mandatory and

what constitutes labeling has improved in recent years. The history of labeling records the batch number, date of manufacture followed by the list of ingredients used in the product in descending order of their composition, flavours declaration and animal/plant origin ingredients. Further compulsory on animal/plant food mark, followed by shelf life, nutritional labeling giving composition of nutrients as well as the strength of the product in terms of minor nutrients such as vitamins, calcium etc. health supporting components such as dietary fibre, HDL, LDL cholesterol, polyunsaturated fatty acids etc. and awareness regarding the nutrient requirements by providing percent daily value. The above information regarding the product have become mandatory along with the declaration of the license number.

Conclusion:

Food processing sector has a great potential which covers a wide spectrum of products encompassing agriculture, horticulture, plantation, animal husbandry and fisheries. Each country has their regulations based on their agricultural practices, products manufacture and distribution. Compulsory legislations which are formulated by various ministries while voluntary standards are framed by the organizations with the main criteria of serving the country. Food Laws and Regulatory system was framed under which various orders and acts cum rules came into force. Prevention of Food Adulteration Act, 1954 (PFA) is the major law which protects common consumers against impure, unsafe and fraudulently labeled foods. The **Essential Commodities Act (1954)** covers a number of control orders and they regulates manufacture, commerce and distribution. Standards of Weights and Measures Act (1976) and Rules 1977 covers the packaged commodities. Fruit Products Order (FPO) is the licensing agency for all fruits products industries. BIS under Food and Agriculture Division (FAD) covers almost all the commodities. Further, BIS introduced the Quality Management Systems (QMS). The harmonisation process with the **International Standards Organisation (ISO)** was adopted as ISO Quality Management Systems (ISO 9000). Labeling is an integral part of packaged food system. The license for food manufacture, declaration of label has to be followed as per the regulations.

Table I: National standardization systems

Act /Order	Mode of Operation	Regulation	Special Features
I Compulsory legislation :			
I. Prevention of Food Adulteration Act [1954 (PFA Act)]	Ministry of Health & Family Welfare, Directorate General of Health Services	Makes provision for prevention of adulteration of food. Adulterated, misbranded, and not in accordance with the conditions of license shall be prohibited for selling.	Minimum quality standard. Ensures safety against Harmful impurities, adulteration; Mandatory
	Central Committee for Food Standards	No such food shall be imported. Standards for the commodities have been specified in the rules. Proprietary foods shall specify the ingredients in the product in the descending order of their composition of the label	Non-following of PFA Act leads to fine and imprisonment
IA. Atomic Energy Rules, 1991 (Control of irradiation of food)	Deptt. of Atomic Energy	Regulates the irradiation application in foods . Certification with the dose and purpose is insisted upon	Certificate of irradiation indicating the dose & the purpose shall be provided by the competent authority

Act /Order	Mode of Operation	Regulation	Special Features
I B. The infant milk substitutes. feeding bottles and infant foods (Regulation , production , supply and distribution) Act, 1992	Ministry of Health and Family Welfare, Directorate General of Health Services, Central Committee for Food Standards	Regulate the production , supply and distribution of infant products	
2. Essential Commodity Act, 1954	Ministry of Food Processing Industries	Regulate the commodities manufacture, commerce and distribution	Formulations of other suborders for easy implementation
2.1. Fruit Products Order, (FPO) 1955	Ministry of Food Processing Industries. Central Fruit Products Advisory Committee	Regulates the manufacture and distribution of all fruits and vegetable products. Exempted from the provisions of the order to product prepared by Drug Control Act and Educational Institution s for training purposes. Quantity shall not exceed 10 kgs. Licence shall be issued after the satisfaction of quality of product. sanitations, personnel, machinery. equipment and work area	Licensing authority 'FPO ', mark shall be imprinted on the products

Act /Order	Mode of Operation	Regulation	Special Features
		requirements as per the schedule specified	
2.2. Solvent Extracted Oils. Deoiled meal and Edible Flour Control Order. 1967	Ministry of Civil Supplies	Regulates the production and distribution of solvent extracted oil, deoiled meal, edible flours. Specification ; of the products provided	
2.3. Vegetable Oil Products (Regulation) Order, 1998	Ministry of food and Consumer Affairs	Regulates the production and distribution of all the edible oils. Specifications of the products provided.	Supersedes the Vegetable Oil Products (Control) Order. 1947 & Vegetable Oil products (Standards of quality) Order, 1975. BTS Certification for the tin plates used for vanaspati packing is deleted
2.5.Sugar (Control) Order, 1966	Ministry of Agriculture and Irrigation , Department of Sugar	Regulates the manufacture. Quality and sale of sugar	
2.6.Milk & Milk Products Order, 1992	Ministry of Agriculture Department of Animal Husbandry, Dairying and Fisheries	Regulates the sanitary requirements for dairies, machinery & premises	Includes quality control, certification, packing, marking and labeling standards

Act /Order	Mode of Operation	Regulation	Special Features
2.7. Livestock Importation Act. 1998	Ministry of Agriculture, Directorate of Marketing & Inspection	Regulates the import of Meat products, eggs. egg powder and. milk products	Risk analysis to be carried out considering disease situation of both countries
2.8. Standards on Weights and Measures Act. 1976	Ministry of Food & Civil Supplies Directorate of Weights, and Measures	Pre scribed the conditions for packed product s with respect to quantity declaration, manufacturing date and sale price	Providing relief to the weaker sections of society & protecting the consumer in general by guaranteeing the quantity for the amount paid
2.9 . Standards of Weights and Measures (Packaged commodities) Rules, 1 977	Ministry of Agriculture, Directorate of Marketing & Inspection	Governs sale of packaged commodities. Specific commodities to be packed and sold in standard packages	Mandatory registration of all packaged products.
2 . 10 The Consumer Protection Act , 1986	Ministry of Food and Civil Supplies	Provision made for the establishment of consumer councils and other authorities for the settlement of consumer disputes	Protection of the interest of consumer.
2.11 Export (Quality Control & Inspection) Act. 1963	Ministry of Commerce, Export Inspection Council, 5 Regional Ex port Inspection Agencies,	Regulates compulsory, pre-shipment inspection . Exportable Commodities list	AGMARK has been recognized as an agent for inspection and quality control

Act /Order	Mode of Operation	Regulation	Special Features
	Network of 50 Offices	has been notified for pre-shipment inspection. Quality control of various export products is monitored.	of certain items. Voluntary inspection at the request of foreign buyers and advice of Export. Inspection Council also carry out AGMARK certification
II. Voluntary Standards I . Agricultural Produce (Grading &Marking) Act. 1937	Directorate of Marketing and Inspection	Grade Standards are prescribed for Agricultural and Allied Commodities Grading, sorting as per quality attributes and inspection are included	Activity of DMI is based on marketing and producer level grading, internal grading, Export level grading. Non-following of rules leads to fine and imprisonment. AGMARK Certificate System available
2. The Agriculture and Processed Food Products. Export Development Authority Act, 1985	Directorate of Marketing and Inspection	Concerned for the development and promotion of exports of certain agricultural products. Registration of exporters against the scheduled products	Certification system followed
3.The Agriculture and Processed Food Products	Directorate of Marketing &	Concerned with the cess levy and collection of custom duty	Revenue generation

Act /Order	Mode of Operation	Regulation	Special Features
Export Cess Act, 1985	Inspection	on the exports of certain agricultural products	
Bureau of Indian Standards, 1956	Indian Standards Institution	Prescribing of Grade Standards: Formulation of standard specification for foods; prescribing standards for limits of toxic compounds as applicable. Implementation of regulations by promotion through its voluntary and third party certification system: Specifying of packaging & labeling requirements.	General cover on hygienic conditions of manufacture , raw material quality and safety are given . Quality & safety oriented standard. Enforces certification system,
5. Certification Marks Scheme BIS Act, 1986 (Rules & Regulations)	Bureau of Indian Standards	Regulates the certification scheme for various processed food products , ingredients, and packing containers.	Ensures the quality to the consumer by certification

Table 2: List of additives / foods covered under PFA Act (1954)

Additives	Permitted levels	Special feature
Food colours. Natural (11)	No limits	Natural source colour or synthetically produced may be used
Food colours artificial (8)	Min. 100 ppm, Max. 200 ppm in canned foods.	To use in only specified foods.
Preservatives Class I (8) Class II (10)	Depends on the class of foods	More than one Class II usage is prohibited. Nitrate (Class II) is not allowed in infant foods. Natamycin is allowed in hard cheese for surface treatment.
Antioxidants (11)	0.01 to 0.05% depending on the foods	Lecithin, ascorbic acid and tocopherol shall be added to specified foods.
Emulsifying and stabilizing agents (40)	0.2% in bakery products and chocolates	Permitted to use in specific foods, flavouring agents, fruit products, frozen desserts also included.
Anticaking agents (6)	Max. 2%	To use in specified foods.
Antifoaming agents (1)	Max. 10 ppm	Oils and fats and confectioneries.
Flavouring agents	Max. 1%	Monosodium glutamate not allowed in infant food. List of prohibited flavouring agents (11) are provided.
Sequestering and Buffering agents (15)	Depends on the food.	Restricted use in certain foods.
Irradiation (13)	0.06 to 10 KGy depending on the food.	Very specific about the irradiation facility and it shall be as per the atomic energy rules.
Poisonous metals (10)	Max. limits (ppm) Pb 0.5 to 10, Cu 1.5 to 150, As. 0.1 to 5. Sn 5 to 250, Zn 5 to 50, Cd 0.1 to 1.5. Hg 0.5 to 1. CH ₂ Hg 0.25, Ni 1.5 Chromium 20 ppm	Foods are mentioned and the quantity depends on the type of the food.
Crop contaminants Aflatoxin	0.03 ppm	-----
Insecticides and pesticides (121)	Tolerance limit depends on the food	Foods & the compounds for use are mentioned & rules to use are as per
Solvent in extracted oil/ flour	5-10 ppm	Insecticide Act. 1968.

