

(VCI /CVE/KBT-I)

# VETERINARY COUNCIL OF INDIA

(Statutory body of Government of India established under Indian Veterinary Council Act, 1984)



Continuing Veterinary Education (CVE) Programmes

## Training Module On Introduction to Food Safety Standards

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## Preface

Consequent upon the decision of the Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India to implement the Continuing Veterinary Education (CVE) programmes, an activity of Professional Efficiency Development Scheme, through Veterinary Council of India as its nodal agency in the country, the Council has been implementing these programmes through conducting skill based trainings on identified topics since December, 2007. The primary objective of these trainings is to upgrade the knowledge and skills of the registered Veterinary practitioners aimed at improving quality of Veterinary services in all its spheres.

Food safety of animal products has emerged as an important global concern with the ever increasing demand for food of animal origin. Today, prevention of contamination of food of animal origin is a constant challenge. Ensuring of food safety through public health and processing technology related activities being a professional obligation, a Veterinarian must have the knowledge of the latest standards/regulations, the different national and international agencies involved in the process and the quarantine measures.

This Module for a three-day training programme developed and finalized by the experts in the subject emphasizes on the importance of food safety standards, national and international standards/regulations governing food safety, agencies involved in ensuring food safety, and the quarantine measures.

The contents of this Module are also available on the website [www.vci-india.in](http://www.vci-india.in).

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## **INTRODUCTION TO FOOD SAFETY STANDARDS**

Food safety of animal products is receiving greater attention in the past two year period and the requirement and emphasis to assure food safety has consequently grown throughout the food supply chain. The triple effects of population increase, income growth and urbanization will fuel the growth in demand for animal products which would further demand increased emphasis on food safety issues. The role of animal products in ensuring nutrition and food security is important in Indian situation in view of the marginally deficient diets being consumed as well as dependence of many small, marginal and weaker section of the society on animal production related activities.

Food safety is concerned with preventing animal products, not fit for human consumption, reaching consumers. As food can become contaminated with biological and non-biological contaminants at several steps in the production, processing and utilization, controlling these contaminants is a constant challenge. Food safety concerns pertain to pesticide and veterinary drug residues, antibiotic resistance, chemical residues, heavy metals, mycotoxins and hormonally active substances, adulterants, food borne-pathogens, emerging pathogens, reemerging old pathogens, risks from irradiation of foods and genetically modified foods. In India an integrated food safety act in the form of Indian Food safety Act, 2006 has been promulgated for implementation by Ministry of Health, Government of India for ensuring availability of safe and wholesome food for human consumption. International organizations concerned with food safety are FAO, WHO, OIE, IPPC and Codex. A number of National standards and regulations such as of USA Code of Federal Regulations (CFR 9: Animals and Animal Products), Australian, European and Canadian play an important role in International food trade and need to be understood. Food safety is ensured through quality control programmes which are in plant as well as regulated by approved agencies. Several approaches are employed in ensuring food safety. Some of these include TQM, HACCP, GMP, GAP, ISO etc. Production aspects have major implications to food safety particularly with regard to pesticide and veterinary drug residues and introduction of pathogens and food spoilage organisms. Observing proper withdrawal times for drugs and chemicals, good animal feeding practices, good environment management practices, practice of hygiene in production, products processing and distribution and effective monitoring and control programmes developed with active participation of stake holders would ensure to a large extent production and consumption of wholesome animal products.

The per capita use of chemicals and pesticides in Indian agriculture is quite lower compared to other developed countries and hence the chance of finding residues in meat and eggs above the permitted levels may not be prevailing. However in the absence of an acceptable monitoring plan to demonstrate status of contaminants a full advantage may not be realized.

## IMPORTANCE OF FOOD SAFETY STANDARDS

### Risk analysis

A number of newer approaches have emerged in the understanding and assessment of risk to ensure food safety. A number of risk analysis terms related to food safety have been used in food standards: hazard, risk, risk assessment, hazard identification, hazard characterization, exposure assessment, risk characterization, risk management, risk communication, dose-response assessment, scenario set. **Hazard Analysis Critical Control Point** (HACCP) is a risk management tool that provides a more structured approach to the control of processing or manufacturing products than that achievable by traditional inspection and quality control.

Rather than by testing the end product for failure it functions to prevent failure by systematically controlling the process. It anticipates potential problems or failures and does not depend only on final inspection. HACCP can also yield potential cost savings in product wastage, re-processing, or recall should problems occur. The *Codex Alimentarius* Commission has promulgated the concept of HACCP by adopting Guidelines for the application of the HACCP system during its 20<sup>th</sup> Session.

### Animal Products Safety – Indian Scenario

Indian situation is unique in that it is production by masses rather than mass production observed in western countries. While production, processing and utilization is on small scale but monitoring quality and safety aspects and following international trade requirements has been a problem of multi dimension.

A number of constraints are observed in assuring food safety in the Indian situation:

1. Small scale production with multimillion units distributed over a range of agro-climatic and economic zones resulting sampling problems.
2. Inadequate means for adopting quality control aspects by primary producers.
3. Unreasonable economics of quality control programmes. Inability to demonstrate that investments on quality aspects would fetch beneficial returns.
4. Lack of modernization in production and processing.
5. Inadequate and poor quality infrastructure for monitoring food safety aspects, particularly microbes and residues.
6. Processing and consumption pattern
7. Low per capita consumption and lack of awareness
8. Lack of risk demonstration
9. Diverse feed resources and climatic condition
10. Indiscriminate use of chemicals and pesticides
11. Unorganized production and processing units
12. Constraints of potable water supply affecting hygiene
13. Lack of appropriate sampling plans
14. Natural calamities and consequences
15. Lack of cold chain facilities
16. Fast changing and diverse life styles.

Awareness programmes on food safety aspects have an important role to play in Indian situation and extension programmes with appropriate audio-visual aids and distribution of literature among stakeholders would immensely contribute for achieving cost effective food safety goals.

Every day, people face many dangers or hazards, including hazards related to the food they consume. Hazards associated with food can and do result in injury and harm to human health. Millions of people worldwide suffer from some sort of food poisoning each year. Uncontrolled and abusive application of agricultural chemicals, environmental contamination, use of unauthorized additives, improper food quality control and handling practices during food processing and other abuses of food along the food chain can all contribute to the introduction of hazards or the failure to reduce hazards related to food. The effects on human health of hazards associated with food, the increasing importance and rapid growth of world food trade and the demand by consumers for a safe food supply make the analysis of the risks associated with food more important today than ever before.

Consumers have expressed concern about the safety of food additives, agricultural and veterinary chemical residues, biological, chemical and physical contaminants, radionuclide contamination and uncontrolled and unacceptable food handling practices and processing which can result in the introduction of hazards to food at all stages along the food chain, from primary production to the consumer. These concerns have been voiced most often by consumers in developed countries, but improvements in global communication have heightened the interest of consumers throughout the world regarding these matters.

Food hazards can be classified into three categories: physical, chemical and biological. Physical hazards (e.g. stones in rice or beans; bone pieces in meat) are most likely to be understood by people. Far more complex and less understood is the nature of the impact of chemical and biological hazards on human health because of the complexities of the interaction between the hazard and human biochemistry and the absence of empirical data to confirm the theories.

One means by which risks related to food are reduced or minimized to acceptable safe levels is through the establishment of food quality and safety standards. Establishing these standards for food has been the role of the Joint FAO/WHO Food Standards Programme, through the *Codex Alimentarius* Commission, since its beginning in 1962. Since that time, science has contributed considerable information to the scientific evaluation of hazards and the assessment of the associated risks. The *Codex Alimentarius* Commission has used this scientific information in setting quality and safety standards for food in international trade. These standards, along with the many codes of practice, guidelines and other recommendations prepared by the commission, also serve national governments as guides and models for national food standards. However, there is a continuing need to update this guidance as new information is being developed constantly in this field.

### **ROLE OF VETERINARIANS IN FOOD SAFETY**

Veterinarians have a major responsibility of epidemiological surveillance of animal diseases and ensuring the safety and suitability of meat. They are uniquely equipped to play a central role in ensuring food safety, especially the safety of foods of animal origin. Food safety and quality are best assured by an integrated, multidisciplinary approach, considering the whole of the food chain. Eliminating or controlling food hazards at source, i.e., a preventive approach is more effective in reducing or eliminating the risk of unwanted health effects than relying on control of the final product, traditionally applied via a final quality check approach. Approaches to food safety have evolved in recent decades, from traditional controls based on good practices (Good Agricultural Practice, Good Hygiene Practice, etc.), via more targeted food safety systems based on Hazard Analysis and Critical Control Points (HACCP) to risk-based approaches using food safety risk analysis.

The traditional approach, whereby food operators were primarily held responsible for food quality while regulatory agencies were charged with assuring food safety, has been replaced by more sophisticated systems that give food operators primary responsibility for both the quality and the safety of the foods they place on the market. The role of the supervisory authorities is to analyze scientific information as a basis to develop appropriate food safety standards (both processing and end product standards) and monitoring to ensure that the control systems used by food operators are appropriate, validated and operated in such a way that the standards are met. In the event of non compliance, regulatory agencies are responsible to ensure that appropriate sanctions are applied.

Veterinarians play an essential role in the application of the risk analysis process and the implementation of risk based recommendations for regulatory systems, including the extent and nature of veterinary involvement in food safety activities throughout the food chain. Each country should establish its health protection objectives, for animal health and public health, through consultation with stakeholders (especially livestock producers, processors and consumers) in accordance with the social, economic, cultural religious and political contexts of the country. These objectives should be put into effect through national legislation and steps taken to raise awareness, both within the country and to trading partners.

Veterinarians contribute with the direct performance of some veterinary tasks and through the auditing of animal and public health activities conducted by other government agencies, private sector veterinarians and other stakeholders. In addition to veterinarians, several other professional groups are involved in ensuring food safety throughout the food chain, including analysts, epidemiologists, food technologists, human and environmental health professionals, microbiologists and toxicologists. Irrespective of the roles assigned to the different professional groups and stakeholders by the administrative system in the country, close cooperation and effective communication between all involved is imperative to achieve the best results from the combined resources. The veterinary authority retains the final responsibility for satisfactory performance of delegated activities.

Veterinarians play a key role in ensuring that animals are kept under hygienic conditions and in the early detection, surveillance and treatment of animal diseases, including conditions of public health significance. The Veterinary services may also provide livestock producers with information, advice and training on how to avoid, eliminate or control food safety hazards (eg. Drug and pesticide residues, mycotoxins and environmental contaminants) in primary production, including through animal feed.

Producers' organizations, particularly those with veterinary advisors, are in a good position to provide awareness and training as they are regularly in contact with farmers and are well placed to understand their priorities. Technical support from the Veterinary Services is important and both private veterinarians and employees of the Veterinary authority can assist. The veterinary services play a central role in ensuring the responsible and prudent use of biological products and veterinary drugs, including antimicrobials, in animal husbandry. This helps to minimize the risk of developing antimicrobial resistance and unsafe levels of veterinary drug residues in foods of animal origin.

Inspection of live animals (antemortem) and carcass (post mortem) plays a key role in both the surveillance network for animal diseases and zoonoses and ensuring the safety and suitability of meat and by products for their intended uses. Control and/or reduction of biological hazards of animal and public health importance by ante and post mortem meat inspection is a core responsibility of the veterinary services and they should have primary responsibility for the development of relevant inspection programmes.

Wherever practicable, inspection procedures should be risk based. Management systems should reflect international norms and address the significant hazards to both human

and animal health in the livestock being slaughtered. The *Codex Alimentarius* Code of Hygienic Practice for Meat (CHPM) constitutes the primary International Standard for meat hygiene and incorporates a risk based approach to application of sanitary measures throughout the meat production chain. Section 3.10 of the OIE Terrestrial Code contains guidelines for the control of biological hazards of animal health and public health importance through ante and post mortem meat inspection, which complement the CHPM.

The Veterinary authority should provide for flexibility in the delivery of meat inspection service. Countries may adopt different administrative models, involving degrees of delegation to officially recognized competent bodies operating under the supervision and control of the Veterinary authority. Animal identification and animal traceability systems should be integrated in order to be able to trace slaughtered animals back to their place of origin, and products derived from them forward in the meat production chain.

Another important role of the Veterinary services is to provide health certification to international trading partners attesting that exported products meet both animal health and food safety standards. Certification in relation to animal diseases, including zoonoses, and meat hygiene should be the responsibility of the Veterinary Authority. Certification may be provided by other professions (a sanitary certificate) in connection with food processing and hygiene (eg. Pasteurization of dairy products) and conformance with product quality standards.

### **Other Responsibilities**

Most reported outbreaks of food borne disease are due to contamination of foods with zoonotic agents, often during primary production. The Veterinary services play a key role in the investigation of such outbreaks all the way back to the farm and in formulating the implementing remedial measures once the source of the outbreak has been identified. This work should be carried out in close collaboration with human and environmental health professionals, analysts, epidemiologists, food producers, processors and traders and others involved.

Veterinarians are well equipped to assume important roles in ensuring food safety in other parts of food chain, for example through the application of HACCP based controls and other quality assurance systems during food processing and distribution. The Veterinary services also play an important role in raising the awareness of food producers, processors and other stakeholders of the measures required to assure food safety. In order for Veterinary Services to make the best possible contribution to food safety, it is important that the education and training of veterinarians in the roles outlined in this paper meets high standards and that there are national programmes for ongoing professional development.

There should be a clear and well documented assignment of responsibilities and chain of command within the Veterinary Services. The national competent authority should provide an appropriate institutional environment to allow the Veterinary services to develop and implement the necessary policies and standards and adequate resources for them to carry out their tasks in a sustainable manner. In developing and implementing policies and programmes for food safety, the Veterinary Authority should collaborate with other responsible agencies to ensure that food safety risks are addressed in a coordinated manner.

Veterinarians are the guardians of the nation's food supply. Veterinarians should take greater responsibility for the animal food supply system, one of the founding duties of the profession. Veterinarians should take the responsibility to be the guardians of human health, by ensuring animals are safe and wholesome sources of food and fiber, and to have a complete spectrum of knowledge and skills to protect animal welfare. Veterinarians have an indispensable role to play in food safety by working with the producer to keep animals healthy.

Thus the role of veterinarians is pivotal in Indian situation to provide food security (animal derived foods), nutrition, health and livelihood.

## **NATIONAL REGULATIONS**

### **Constitutional provisions and Slaughter regulations:**

Slaughter of animals is a State subject and State legislatures have exclusive power to legislate as per Entry 15 of List II in the Seventh Schedule of the Constitution which reads as under:

Preservation, Protection and Improvement of Livestock and Prevention of animal diseases, veterinary training and practice.

States have to apply Directive Principles which are fundamental in the governance of the country while making laws. Relevant articles concerned with this subject are:

**ARTICLE 47:** *"Duty of the State to raise the level of nutrition and the standards of living and to improve public health-*

**ARTICLE 48** *"Organisation of Agriculture & Animal Husbandry. The State shall endeavour to organise agriculture and animal husbandry on modern and scientific lines and shall, in particular, take steps for preserving and improving the breeds and prohibiting the slaughter, of cows and calves and other milch and draught cattle"*

**ARTICLE 51 A(g) FUNDAMENTAL DUTIES** *"It shall be the duty of every citizen of to protect and improve the natural environment including forest, lakes, rivers and wild life, and to have compassion for living creatures."*

Articles 47, 48 and 51 A(g) under the Directive Principles of the Constitution concern with level of nutrition, standard of living, public health, agriculture and animal husbandry and protection of natural environment. Slaughter of animals is a state subject. Powers to legislate as per entry 15 of List II in the seventh schedule of the Constitution is regulated under state Animal Preservation Acts and rules made there under. Slaughter houses are regulated by local bodies and private slaughter houses are to be authorized by local bodies. Clearances from Pollution Control Board, Airport Authority and Defence Department are required for establishing slaughter houses. Meat hygiene is regulated as per bye-laws of the local body and meat as food is also covered under the Prevention of Food Adulteration Act, 1954.

### **State Animal Preservation Acts**

Slaughter of animals is regulated as per State Animal Preservation Acts and Rules made there under in different States. Cow slaughter is banned largely in the country except in West Bengal and Assam where slaughter of cows is restricted to animals over 14 years of age and unfit for work or breeding, or the animal is permanently incapacitated from work or breeding due to age, infertility, deformity or any incurable disease. The States of Arunachal Pradesh, Meghalaya, Mizoram, Nagaland and Tripura and Union Territory of Lakshadweep Islands do not have any legislation on slaughter of cows. In case of Kerala, the Panchayat Act permits slaughter of cows over 10 years of age. Bull and bullock slaughter is largely permitted with restrictions on age from 14 years onwards and incapacitated for work or breeding. Slaughter of bull and bullock is also banned in the States of Delhi, Gujarat, Himachal Pradesh, Jammu and Kashmir and Uttar Pradesh. Some States have made laws restricting slaughter of buffalo calves and productive buffaloes. Buffalo calves sacrifice is not permitted in the States of Bihar and Andhra Pradesh. (Tables 1 & 2)

**Table 1: Status of legislation on cow slaughter**

**A. States/UT's enacted legislation for banning cow slaughter and restricted slaughter of bull/ bullock.**

**States:**

- |                    |                    |                      |                     |
|--------------------|--------------------|----------------------|---------------------|
| 1. Andhra Pradesh  | 2. Manipur         | 3. Bihar             | 4. Goa              |
| 5. Gujarat*        | 6. Haryana         | 7. Himachal Pradesh* | 8. Jammu & Kashmir* |
| 9. Karnataka       | 10. Madhya Pradesh | 11. Maharashtra      | 12. Orissa          |
| 13. Punjab         | 14. Rajasthan      | 15. Sikkim           | 16. Tamil Nadu      |
| 17. Uttar Pradesh* |                    |                      |                     |

**Union Territories:**

- |                              |  |
|------------------------------|--|
| 1. Andaman & Nicobar Islands | 2. National Capital Territory of Delhi * |
| 3. Chandigarh                | 4. Dadra and Nagar Haveli                |
| 5. Daman-Diu                 | 6. Pondicherry                           |

**\* Total ban on slaughter of cow and progeny.**

**B. States/UT's where Cow slaughter is not banned but restricted or no legislation made:**

- |                |                |             |                      |
|----------------|----------------|-------------|----------------------|
| 1. Kerala      | 2. West-Bengal | 3. Assam    | 4. Arunachal Pradesh |
| 5. Meghalaya   | 6. Mizoram     | 7. Nagaland | 8. Tripura           |
| 9. Lakshadweep |                |             |                      |

Cow slaughter is permitted with/without restriction in these States/ UTs.

**Table 2: Status of legislation on slaughter of buffaloes**

<b>Status of Slaughter</b>	<b>Buffalo calves</b>	<b>Adult buffaloes</b>
Banned	Andhra Pradesh, Bihar Jammu & Kashmir Karnataka, Madhya Pradesh	Jammu & Kashmir
Not banned, But Restrictions Imposed	Assam, Gujarat, Goa Maharashtra, Dadra & Nagar Haveli, West Bengal	Andhra Pradesh, Assam Gujrat, Goa, Karnataka Maharashtra, Madhya Pradesh Sikkim, Bihar, West Bengal Dadra & Nagar Haveli
Not banned No restrictions Imposed	Delhi, Himachal Pradesh Haryana, Punjab, Orissa Pondicherry, Sikkim, Tamil Nadu, Rajasthan, Kerala Uttar Pradesh, Arunachal Pradesh, Pradesh, Manipur, Mizoram, Tripura, Nagaland Meghalaya, Andaman & Nicobar Island, Chandigarh, Daman & Diu	Delhi, Himachal Pradesh Haryana, Punjab, Orissa Pondicherry, Tamil Nadu Rajasthan, Kerala, Uttar Arunachal Pradesh Manipur, Mizoram, Tripura, Nagaland, Meghalaya, Andaman & Nicobar Island Chandigarh, Daman & Diu

Meat food products in the country is also regulated by –

- Water (Prevention and Control of Pollution) Act, 1974;
- Air (Prevention and Control of Pollution) Act, 1981 and Environment (Protection) Act, 1986 stipulate requirements for abattoirs.
- Motor Vehicles Transport Act and The Prevention of Cruelty to Animals Act, 1960
- Meat Food Products Order, 1973 regulates.
- Meat export is regulated as per Export (Quality Control And Inspection) Act, 1963 and the Export (Quality Control and Inspection) Rules, 1964. Export of fresh and frozen meat is regulated as per Raw Meat (chilled/frozen) (Quality Control and Inspection) Rules 1992 and meat products under Processed Meat (Quality control and Inspection) Rules, 1995. Export of animal casings is regulated as per Plant Registration and Animal Casings Rules, 1995.

The fact that economic utility contributes to sustain production with appropriate policy interventions, a pragmatic approach is necessary with respect to slaughter and utilization of livestock so as to sustain their production and prevent depletion.

#### **List of Indian Regulations on Livestock Products:**

- The Prevention of Cruelty To Animals Act, 1960.
- The Prevention of Food Adulteration Act, 1954.
- Meat food products order, 1973.
- Water (Prevention and Control of Pollution) Act, 1974.
- Air (prevention and control of pollution) act, 1981.
- Environment (Protection) act, 1986.
- Export (Quality Control and Inspection) Act, 1963.
- Export (Quality Control And Inspection) Rules, 1964.
- Export of Raw meat (chilled/Frozen) (Quality Control and Inspection) Rules, 1992.
- Export of Processed meat (Quality Control and Inspection) Rules, 1995.
- Foreign Trade (Development & Regulation) Act, 1992.
- Food Safety and Standards Act, 2006(Act No. 34 of 2006).
- The promulgation of Food safety and Standards Act, 2006 repeals the Prevention of Food Adulteration Act, 1954 and the following orders mentioned in the Second Schedule to the Act.
  - ✓ The Fruit Products Order, 1955
  - ✓ The Meat Food Products Order, 1973
  - ✓ The Vegetable Oil Products (Control) Order, 1998
  - ✓ The Solvent Extracted Oil, De-oiled Meal and Edible Flour (Control) Order, 1967
  - ✓ The Milk and Milk Products Order,1992 ( this order has been deemed by section 99 of the Act to have been issued by the Food Authority under the Act from the date of commencement of the Act), and
  - ✓ Any other order issued under the Essential Commodities Act, 1955 (10 of 1955) relating to food. (Section 97(1) of the Act).
- Food safety is also regulated under other state acts such as –
  - ✓ The Andhra Pradesh (Andhra Area) Public Health Act, 1939;
  - ✓ The Punjab Municipal Act, 1911;
  - ✓ The Bihar and Orissa Municipal Act, 1922 etc.

#### **Food Safety and Standards Act, 2006**

An Act to consolidate the laws relating to food and to establish the Food Safety and Standards Authority of India for laying down science based standards for articles of food and

to regulate their manufacture, storage, distribution, sale and import, to ensure availability of safe and wholesome food for human consumption and for matters connected therewith or incidental thereto. The Act is described under 101 sections with 12 chapters and two schedules. The various chapters under the Act are –

- Preliminary
- Food Safety and Standards Authority of India
- General Principles of Food Safety;
- General provisions as to Articles of Food;
- Provisions relating to import;
- Special responsibilities as to Food Safety;
- Enforcement of the Act;
- Analysis of Food;
- Offences and Penalties;
- Adjudication and Food Safety Appellate Tribunal;
- Finance, Accounts, Audit and reports;
- Miscellaneous, The First schedule and The Second Schedule.

### ***Food Safety and Standards Authority of India***

The Central Government shall, by notification, establish a body to be known as the **Food Safety and Standards Authority of India** to exercise the powers conferred on, and to perform the functions assigned to, it under this Act. The head office of the Food Authority shall be at Delhi. The Chief Executive Officer appointed by the Central Government shall be the member secretary of the Food Authority and shall be the legal representative of the Food Authority and shall be responsible for-

- the day to day administration of the Food Authority;
- drawing up of proposal for the Food Authority's work programmes in consultation with the Central Advisory Committee;
- implementing the work programmes and the decisions adopted by the Food Authority;
- ensuring the provision of appropriate scientific, technical and administrative support for the Scientific Committee and the Scientific Panel;
- ensuring that the Food Authority carries out its tasks in accordance with the requirement of its users, in particular with regard to the adequacy of the services provided and the time taken;
- the preparation of the statement of revenue and expenditure and the execution of the budget of the Food Authority; and
- developing and maintaining contract with the Central Government and for ensuring a regular dialogue with its relevant committees.

### ***Central Advisory Committee***

The Food Authority shall, by notification, establish a Committee to be known as the **Central Advisory Committee** and will have the following functions:

- performance of its duties under this section and in particular in drawing up of a proposal for the Food Authority's work programme.
- On the prioritization of work.
- Identifying potential risks;
- Pooling of knowledge; and
- Such other functions as may be specified by regulation.

### **Scientific Panels:**

The Food Authority shall establish scientific panels which shall consist of **Independent Scientific Experts** in the following subjects:

- food additives, flavourings, processing aids and materials in contact with food;
- pesticides and antibiotics residues;
- genetically modified organisms and foods;
- functional foods, nutraceuticals, dietetic products and other similar products;
- biological hazards;
- contaminants in the food chain;
- labeling; and
- method of sampling and analysis.

### **Scientific Committee:**

- The Food Authority shall constitute Scientific Committee which shall consist of the chairpersons of the Scientific Panels and six independent scientific experts not belonging or affiliated to any of the Scientific Panels.
- The Scientific Committee shall be responsible for providing the scientific opinions to the Food Authority, and shall have the powers, where necessary, of organizing public hearings.
- The Scientific Committee shall be responsible for the general co-ordination necessary to ensure consistency of the scientific opinion procedure and in particular with regard to the adoption of working procedures and harmonization of working methods of Scientific Panels.
- The Scientific Committee shall provide opinions on multi-sectoral issues falling within the competence of more than one Scientific Panel, and on issues which do not fall within the competence of any of the Scientific Panel.
- Wherever necessary, and particularly in the case of subjects, which do not fall within the competence of any of the Scientific Panel, the Scientific Committee shall set up working groups in such cases, it shall draw on the expertise of those working groups when establishing scientific opinions.

### **Bureau of Indian Standards**

During the pre independence period, standardization activity was sporadic and confined mainly to a few Government purchasing organization. However, immediately after independence, economic development through coordinated utilization of resources was called for and the government recognized the role for standardization in gearing industry to competitive efficiency and quality production. The Indian Standards Institution (ISI) was, therefore, set up in 1947 as a registered society, under a Government of India resolution.

The Indian Standards Institution gave the nation the standards it needed for nationalization, orderly industrial and commercial growth, quality production and competitive efficiency. However, in 1986 the government recognized the need for strengthening this National Standards Body due to fast changing socio-economic scenario and according it a statutory status. Thus came the Bureau of Indian Standards (BIS) Act 1986 and on 1 April 1987, newly formed BIS took over staff assets, liabilities and functions of erstwhile ISI. Through this change over, the Government envisaged building of the climate of quality culture and consciousness and greater participation of consumers in formulation and implementation of National Standards. **The Bureau is a Body Corporate consisting of 25 members representing both Central and State governments, Members of Parliament, industry, scientific and research institutions, consumer organizations and professional bodies with Union Minister of Consumer Affairs, Food and Public Distribution as its President and with Minister of State for Consumer Affairs, Food and Public Distribution as its Vice-President.**

**Objectives:**

- Harmonious development of standardization, marking and quality certification
- To provide new thrust to standardization and quality control
- To evolve a national strategy for according recognition to standards and integrating them with growth and development of production and exports

BIS is engaged in formulation of Indian Standards for the different sectors including food and agricultural sectors. Each of these sectors has division council to oversee and supervise the work. Food and Agriculture Division Council oversee and supervise Standardization in the field of food and agriculture including food processing, agricultural inputs and agricultural machinery.

Apart from formulation, emphasis is also laid on regular review of the standards to keep them in line with modern technological developments, as also to harmonise them with international standards or their equivalents. A well orchestrated plan has been drawn up for improved adoption of Indian Standards by industry, large scale purchasing organisations, statutory bodies and universities.

In order to ensure a coordinated mechanism for standardization and quality and shaping the standards formulation activity in line with the national priorities, the Ministry of Food & Consumer Affairs had identified a coordination mechanism for a unified single standards approach in six sectors namely food, power, steel, automotives, and textile and information technologies. This approach document was considered and endorsed by the Committee of Secretaries who desired that Ministry of Food & Consumer Affairs should coordinate the work of these sectoral committees. Accordingly the six sectoral coordination committees are functioning. The Food Sectoral Coordination Committee is bestowed with the following scopes:

- Demarcation of clear-cut areas to be dealt by different organizations in the area of food;
- Humanization of standards laid down by the various organizations at the national level in this field; and
- Rationalization of the procedures of the standards formulation, certification and quality assurance of various organisations.

**Their Services:**

- ✓ Formulation of National Standards
- ✓ Certification Schemes:
- ✓ Product Certification
  - Scheme for Domestic Manufacturers
  - Scheme for Foreign Manufacturers
  - Scheme for Indian Importers
  - ECO Mark Scheme
  - IECEE-CB Scheme (International Electrotechnical Commission Electrical Equipment and Components Certification Scheme)
  - IECQ Scheme (International Electrotechnical Commission Quality Assessment Scheme for Electronics Components)
  - Hallmarking of Gold and Silver jewellery & artifacts
  - IEC Ex Scheme International Electrotechnical Commission Scheme for Certification of Electrical Equipments for use in explosives environment)
- ✓ Management Systems Certification
  - Quality Management Systems (QMS)
  - Environmental Management Systems (EMS)
  - Occupational Health & Safety Management Systems (OHSMS)
  - Hazard Analysis and Critical Control Point (HACCP) Scheme
  - Food Safety Management Systems (FSMS)
  - Information Security Management Systems (ISMS)
  - Service Quality Management Systems (SQMS)

- ✓ Training Services:
  - Open Programmes
  - In-house Programmes

Apart from Indian Standards, BIS is also working with international organizations. BIS as a founder member of **International Organization for Standardization (ISO)** continue to take part in international standardization activities. BIS as a member of ISO participates in its policy making bodies like –

- ✓ Committee on Developing Country Matters (DEVCO),
- ✓ Committee on Conformity Assessment (CASCO),
- ✓ Committee on Information (INFCO) and
- ✓ Committee on Consumer Policy (COPOLCO)
- ✓ Also a member for the Council which comprises of 18 members besides the ISO office bearers - Director General, BIS has been nominated Regional Liaison Officer for South and Central Asia for the period 1998-2000.
- ✓ BIS is also actively involved in the activities of the **International Electrotechnical Commission (IEC)** and has participation status in 34 Technical Committees. Director General BIS has been elected as a member of Council Board for IEC which advises Council on various policy decisions.

**Product Certification Schemes:**

- ✓ The **Product Certification Scheme of BIS** aims at providing Third Party Guarantee of quality, safety and reliability of products to the ultimate customer.
- ✓ Presence of ISI certification mark known as **Standard Mark** on a product is an assurance of conformity to the specifications.
- ✓ The conformity is ensured by regular surveillance of the licensee's performance by surprise inspections and testing of samples, drawn both from the market and factory. The Bureau of Indian Standards, empowered through a legislative Act of the Indian Parliament, known as the **Bureau of Indian Standards Act, 1986**, operates a product certification scheme, and has till date granted more than 30 000 licenses to manufacturers covering practically every industrial discipline from Agriculture to Textiles to Electronics.
- ✓ The certification allows the licensees to use the popular **ISI Mark**, which has become synonymous with Quality products for the Indian and neighbouring markets over the past 50 years.
- ✓ The Bureau's predecessor, the Indian Standards Institution began operating the product certification Scheme in 1955. Presently more than 19000 licences are in operation covering about 1000 products.

The BIS standards for various meat and meat related products are given below. Other food related standards are available on the website [www.bis.org.in](http://www.bis.org.in)

## Hazard Analysis Critical Control Point (HACCP) Certification

BIS offers two Certification schemes to the food industry.

- i) HACCP Stand-alone Certification against IS 15000:1998
- ii) HACCP based Quality System Certification provides for two Certification through one audit Certification of Quality System against IS/ISO 9000 and Certification of HACCP against IS 15000:1998

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## APEDA

The **Agricultural and Processed Food Products Export Development Authority (APEDA)** was established by the Government of India under the Agricultural and Processed Food Products Export Development Authority Act passed by the Parliament in December, 1985. The Act (2 of 1986) came into effect from 13th February, 1986 by a notification issued in the Gazette of India: Extraordinary: Part-II [Sec. 3(ii): 13.2.1986). The Authority replaced the Processed Food Export Promotion Council (PFEPC).

**Functions:** In accordance with the Agricultural and Processed Food Products Export Development Authority Act, 1985, (2 of 1986) the following functions have been assigned to the Authority.

- o Development of industries relating to the scheduled products for export by way of providing financial assistance or otherwise for undertaking surveys and feasibility studies, participation in enquiry capital through joint ventures and other reliefs and subsidy schemes;
- o Registration of persons as exporters of the scheduled products on payment of such fees as may be prescribed;
- o Fixing of standards and specifications for the scheduled products for the purpose of exports;
- o Carrying out inspection of meat and meat products in slaughter houses, processing plants, storage premises, conveyances or other places where such products are kept or handled for the purpose of ensuring the quality of such products;
- o Improving of packaging of the Scheduled products;
- o Improving of marketing of the Scheduled products outside India;
- o Promotion of export oriented production and development of the Scheduled products;
- o Collection of statistics from the owners of factories or establishments engaged in the production, processing, packaging, marketing or export of the scheduled products or from such other persons as may be prescribed on any matter relating to the scheduled products and publication of the statistics so collected or of any portions thereof or extracts therefrom;
- o Training in various aspects of the industries connected with the scheduled products; Such other matters as may be prescribed.

APEDA is mandated with the responsibility of export promotion and development of the following scheduled products:

- Fruits, Vegetables and their Products.
- Meat and Meat Products.
- Poultry and Poultry Products.
- Dairy Products.
- Confectionery, Biscuits and Bakery Products.
- Honey, Jaggery and Sugar Products.
- Cocoa and its products, chocolates of all kinds.
- Alcoholic and Non-Alcoholic Beverages.
- Cereal Cereal Products.
- Groundnuts, Peanuts and Walnuts.
- Pickles, Papads and Chutneys.
- Guar Gum.
- Floriculture and Floriculture Products
- Herbal and Medicinal Plants
- Rice (Non-Basmati).

In addition to this, APEDA has been entrusted with the responsibility to monitor exports of some non-scheduled items such as Basmati Rice, Wheat, and Coarse Grains and also import of sugar. APEDA has head quarters at New Delhi and regional offices at Bombay, Bangalore, Kolkata, Hyderabad and Guwahati.

## **MPEDA**

The **Marine Products Export Development Authority (MPEDA)** was constituted in 1972 under the Marine Products Export Development Authority Act 1972 (No.13 of 1972). The role envisaged for the MPEDA under the statute is comprehensive - covering fisheries of all kinds, increasing exports, specifying standards, processing, marketing, extension and training in various aspects of the industry

MPEDA functions under the Ministry of Commerce, Government of India and acts as a co-ordinating agency with different Central and State Government establishments engaged in fishery production and allied activities.

The plan schemes of the Authority are implemented under four major heads:

- ✓ Export production - Capture Fisheries
- ✓ Export production - Culture Fisheries
- ✓ Induction of New Technology and Modernisation of Processing Facilities.
- ✓ Market Promotion
- ✓ Registration of infrastructural facilities for seafood Export trade
- ✓ Collection and dissemination of trade information
- ✓ Projection of Indian marine products in overseas markets by participation in overseas fairs and organising international seafood fairs in India.
- ✓ Implementation of development measures vital to the industry like distribution of insulated fish boxes, putting up fish landing platforms, improvement of peeling sheds, modernisation of industry such as upgradation of plate freezers, installation of IQF machinery, generator sets, ice making machineries, quality control laboratory etc.
- ✓ Promotion of brackish water aquaculture for production of prawn for export.
- ✓ Promotion of deep sea fishing projects through test fishing, joint venture and equity participation.

## NFDB

**National Fisheries Development Board (NFDB)** was established on 9<sup>th</sup> September 2006 under Department of Animal Husbandry Dairying and Fisheries, Ministry of Agriculture, Govt. of India to realize the full potentials of Indian fisheries through coordination of different agencies and public – private partnerships.

### **Objectives:**

- ✓ To bring major activities relating to fisheries and aquaculture for focused attention and professional management.
- ✓ To coordinate activities pertaining to fisheries under taken by different Ministries/ Departments in the Central Government and also coordinate with the state / union Territory Governments.
- ✓ To improve production, processing, storage, transport and marketing of the products of capture and culture fisheries.
- ✓ To achieve sustainable management and conservation of natural aquatic resources including the fish stocks.
- ✓ To apply modern tools of research and development including biotechnology for optimizing production and productivity from fisheries.
- ✓ To provide modern infrastructure mechanisms for fisheries and ensure their effective management and optimum utilization
- ✓ To generate substantial employment
- ✓ To train and empower women in the fisheries sector
- ✓ To enhance contribute of fish towards food and nutritional security.

## INTERNATIONAL REGULATIONS

The International regulations include WTO, OIE, Codex, EU regulations and many other individual country regulations such as USDA regulations, Australian, Canadian etc regulations. All these regulations are important in the international trade in food products and ensuring food safety.

### **WTO, OIE and Codex**

Harmonization of food standards is generally viewed as a prerequisite to the protection of consumer health as well as allowing the fullest possible facilitation of international trade. Agreement on the application of sanitary and phytosanitary measures (SPS Agreement) and Technical Barriers to Trade (TBT) Agreement of WTO recognizes international standards, guidelines and recommendations, including the *Codex Alimentarius* as reference points for facilitating international trade and resolving trade disputes in international law. The *Codex Alimentarius* Commission (CAC) shall be responsible for making proposals to, and shall be consulted by FAO and WHO on all matters pertaining to the implementation of the joint FAO/WHO Food Standards Programme. FAO and WHO compliment the CAC's activities significantly in a number of practical ways. The WHO is a joint sponsor of the CAS with FAO. To adopt Codex standards, countries require an adequate

food law as well as a technical and administrative infrastructure with the capacity to implement it and ensure compliance. WTO under SPS Agreement recognizes for food safety, the standards, guidelines and recommendations established by the Codex relating to food additives, veterinary drug and pesticide residues, contaminants, methods of analysis and sampling, and codes and guidelines of hygienic practice; for animal health and zoonoses, the standards, guidelines and recommendations developed under the auspices of the International Office of Epizootics (OIE); for plant health, the international standards, guidelines and recommendations developed under the auspices of the International Plant Protection Convention (IPPC) and for matters not covered by the above organizations, appropriate standards, guidelines and recommendations promulgated by other relevant international organizations open for Membership to all members, as identified by the Committee.

### **Hazard Analysis and Critical Control Points (HACCP)**

Hazard Analysis and Critical Control Points (HACCP) is a systematic preventive approach to food safety that addresses physical, chemical, and biological hazards as a means of prevention rather than finished product inspection. HACCP is a tool to assess hazards and establish control systems that focus on prevention rather than relying mainly on end product testing. Any HACCP system is capable of accommodating changes such as advances in equipment design, processing procedures or technological developments. Concept of HACCP was developed in 1960s when National Aeronautics and Space Administration (NASA) asked Pillsbury to design and manufacture the first foods for space flights. Since then HACCP concept was used for different processes across the world and especially in food industry. HACCP can be applied throughout the food chain from primary production to final consumption and its implementation should be guided by scientific evidence of risks to human health.

In India, quality control approaches in meat production and processing are followed by export meat sector. Very little emphasis on quality control approaches are given in municipal slaughter houses and meat processing units located across the country under unorganized sector. Understanding the guiding principles of HACCP by the personnels involved in meat industry and its implementation is the need of the hour. This will ensure the safety of consumer, can fetch higher returns to producers and will also help in boosting the export of meat especially to developed countries.

**HACCP team:** First step in implementing HACCP in meat plant is to constitute a HACCP team. Ideally team must consist of personnel specialized in different areas like microbiology, processing, engineering, hygiene etc according to the particular study. Team must take a holistic view of the process involved, prepare a flow chart, develop a plan and assist in implementation of the plan. The application of HACCP is compatible with the implementation of quality management systems, such as the ISO 9000 series and is the system of choice in the management of food safety with in such systems

**Principles of HACCP:** HACCP concept is based on following seven principles,

**Principle 1: Conduct a hazard analysis:** A hazard is any biological, chemical, or physical property that may cause a food to be unsafe for human consumption. In meat production and processing first step to be done is identification of hazards which may enter the meat and meat products during processing. In meat industry major hazards are microbes entering the product from the unclean handler, contaminated water, utensils, surface and environment. Common hazards in meat are Coliforms, Salmonella etc,

**Principle 2: Identify critical control points.** A Critical Control Point (CCP) is a point, step, or procedure in a food process at which control can be applied and, as a result, a food safety

hazard can be prevented, eliminated, or reduced to an acceptable level. Once the hazards are identified steps at which chances of contamination of product with identified hazards should be identified. Most important step at which control is essential must be noted. Eg: In slaughter and dressing of meat washing and cooling of carcass have been identified as critical control points by different workers.

**Principle 3: Establish critical limits for each critical control point.** A critical limit is the maximum or minimum value to which a physical, biological, or chemical hazard must be controlled at a critical control point to prevent, eliminate, or reduce to an acceptable level. Eg: Count of coliform up to which is acceptable after washing of carcass.

**Principle 4: Establish critical control point monitoring requirements.** Monitoring activities are necessary to ensure that the process is under control at each critical control point. Once the critical control points are established, necessary monitoring requirements are to be made for ensuring that identified hazard is within the acceptable level.

**Principle 5: Establish corrective actions.** These are actions to be taken when monitoring indicates a deviation from an established critical limit. The final rule requires a plant's HACCP plan to identify the corrective actions to be taken if a critical limit is not met.

**Principle 6: Establish record keeping procedures.** The HACCP regulation requires that all plants maintain certain documents, including its hazard analysis and written HACCP plan, and records documenting the monitoring of critical control points, critical limits, verification activities, and the handling of processing deviations.

**Principle 7: Establish procedures for ensuring the HACCP system is working as intended.** Validation ensures that the plants do what they were designed to do; that is, they are successful in ensuring the production of safe product. Plants will be required to validate their own HACCP plans.

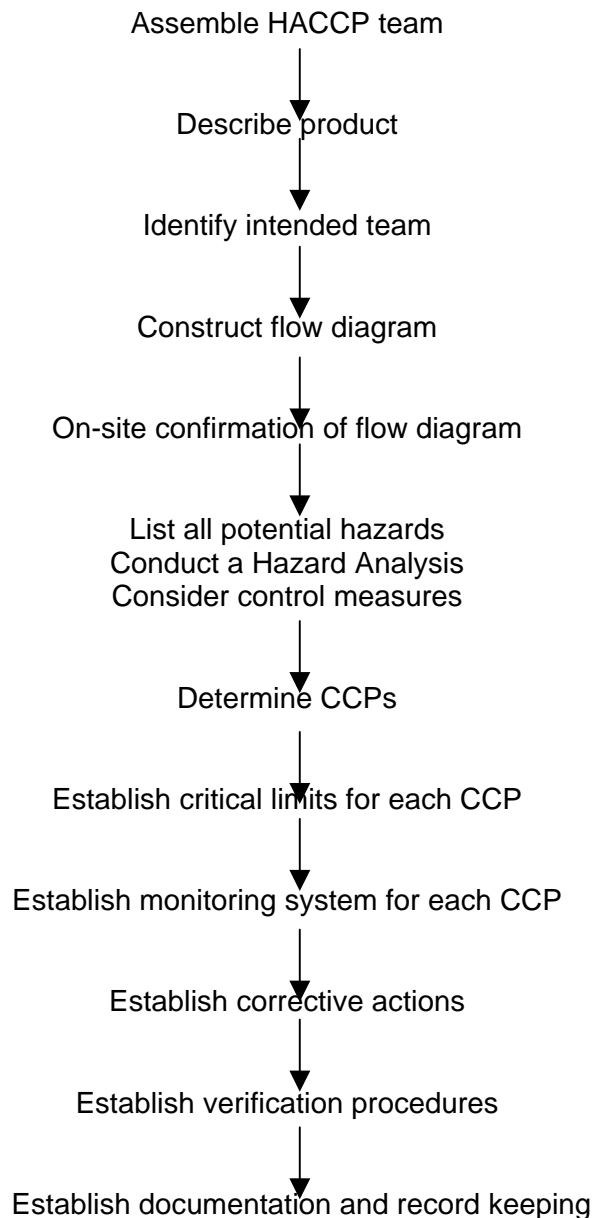
Maintaining records (Principle 6) and verification methods (Principle 7) are difficult to follow in Indian meat processing because most of the people involved in this sector are illiterate and uneducated. Hence, APEDA is requesting WTO relax compliance to these two principles under the SPS agreement. An example of critical control points in meat production is given in Flow chart 1. Certifying agencies will go through the HACCP plan, records maintained and the corrective measures followed. HACCP certificate will be given if the methodology followed and quality of the final product is as per the set standards. Although HACCP involves additional cost, it is expected to give better returns in the long run.

### **Some prerequisites for implementing HACCP in meat industry**

Concept of sanitation and hygiene should be incorporated in construction of building itself. Roofs should be leak proof and walls suitable for cleaning. Sanitation facilities must be of high quality.

1. Insect and pest control should be complete
2. Storage: Appropriate temperature and humidity should be operative in cold rooms
3. Water supply must be of potable quality
4. Equipments must be checked regularly to ensure smooth running of the process
5. Personal hygiene: Personnel must maintain high standard of hygiene.
6. Training: All the personnel must be given appropriate training so that they can understand and follow the quality control approaches.

### Diagram 1: Logical sequence for application of HACCP



### Benefits of following HACCP approach:

Some of the benefits of following HACCP approach in meat industry are,

1. Protection of public health by enhancing food safety
2. Helps to build consumers confidence, reputation and brand value
3. Reduces cost of final product testing
4. End product will be of higher quality
5. Creation of export opportunities by increasing evidence in food safety
6. Will help in meeting the statutory standards and can aid inspection by regulatory authorities.

### Diagram 2: Example of HACCP worksheet

1. Describe product

2. Diagram process flow

3. List

Step	Hazards	Control Measures	CCPs	Critical limits	Monitoring procedures	Corrective actions	Records
1							
2							
3							

4. Verification

## ISO Standards

ISO is the world largest standards developing NON-GOVERNMENTAL organization. ISO was born from the union of two organizations - the ISA (International Federation of the National Standardizing Associations), established in New York in 1926, and the UNSCC (United Nations Standards Coordinating Committee), established in 1944. In October 1946, delegates from 25 countries, meeting at the Institute of Civil Engineers in London, decided to create a new international organization, of which the object would be "to facilitate the international coordination and unification of industrial standards". The new organization, ISO, officially began operations on 23 February 1947. The basic idea of international standardization was to derive International Standards from those already developed nationally, and then to re-implement them nationally. The International Standards developed by ISO are of high value to developing countries. They offer indeed practical solutions to a variety of issues related to international trade and technology transfer because they represent a reservoir of technological know-how and of product, performance, quality, safety and environmental specifications.

ISO grasped an opportunity of the so-called GATT Standards Code (introduced in 1979 aims at ensuring that regulations, standards, testing and certification procedures do not create unnecessary obstacles to trade) and actively promoted the value of ISO's International Standards to be used worldwide as instruments facilitating the elimination of unnecessary barriers to trade, and, whenever needed, as a suitable basis for technical regulations as per WTO agreement.

ISO standards are voluntary and does not regulate or legislate. But is market driven as has happened in the case of ISO 9001 quality management systems. The tremendous impact on organizational practices and on trade has stimulated the development of other ISO standards and deliverables that adapt the generic management system to specific sectors or aspects.

- Food safety
- Information security
- Supply chain security
- Medical devices
- Local government
- Education

International Standards that represent an international consensus on the state of the art are an important source of **technological know-how**. By defining the characteristics that products and services will be expected to meet on export markets, International Standards give developing countries a basis for making **the right decisions** when investing their scarce resources and thus avoid squandering them.

### ***How and who decides to develop a standard?***

ISO launches the development of new standards in response to the sectors that express a clearly established need for them. An industry or business sector communicates its

requirement for a standard to one of ISO's national members. ISO standards are developed by technical committees comprising experts from the industrial, technical and business sectors which have asked for the standards, and which subsequently put them to use.

### ***ISO's International partners***

ISO collaborates with its partners in international standardization, the International Electrotechnical Commission (IEC) and International Telecommunication Union (ITU). The three organizations, all based in Geneva, Switzerland, have formed the **World Standards Cooperation** (WSC) to act as a strategic focus for collaboration and the promotion of international standardization. ISO has a close relationship with the World Trade Organization (WTO) which particularly appreciates the contribution of ISO's standards to reducing technical barriers to trade.

### ***The Standards***

ISO has developed over 17000 International Standards on a variety of subjects and 1100 new ISO standards are published every year. A brief description of ISO standards related to food safety is given below:

67.120.1 Meat, meat products and other animal produce including frozen products.

67.120.10.1 Meat and meat products

65.120 Animal feeding stuffs Microbiology of animal feeding stuffs.

### ***ISO 9000 and ISO 14000 importance***

The **ISO 9000** family addresses "**quality management**". This means what the organization does to fulfill:

- the customer's quality requirements, and
- applicable regulatory requirements, while aiming to
- enhance customer satisfaction, and
- achieve continual improvement of its performance in pursuit of these objectives.

The **ISO 14000** family addresses "**environmental management**". This means what the organization does to:

- minimize harmful effects on the environment caused by its activities, and to
- achieve continual improvement of its environmental performance

## WTO

World Trade Organization (WTO) is the international organization dealing with the global rules of trade between nations. It is the successor to General Agreement on Trade and Tariffs (GATT) and came into being in 1995. The WTO has more than 130 members.

The organizational structure of WTO consists of The Ministerial Conference of WTO consisting of Trade Ministers of all the members which is the highest policy making body of the WTO (required to meet once every two years); the General Council consisting of the representatives of all the members (functions of Ministerial Conference of WTO are carried out in the interregnum period); three sectoral councils to assist the General Council in its work (the Council for Trade in Goods), the Council for Trade in Services and the Council for Trade Related Aspects of Intellectual Property Rights-TRIPS) and a large number of Committees, Working Group / Parties and other bodies dealing with specific agreements or subjects. All these bodies are serviced by Secretariat head by the Director General of the WTO. The General Council also acts as the Dispute Settlement Body (DSB) in addition to such functions as may be assigned to it.

*The mandate of WTO covers trade in goods, trade in services, trade-related investment measures and trade related intellectual property rights.* WTO is committed to establish an open and liberal global environment free from any barriers or restrictions encouraging participation of both developed and developing countries.

Safeguard measures to protect the domestic industry have been provided through the *Agreement on Safeguards* which permits restrictions on import for a temporary period by either increasing tariffs or imposing QRs ( Quantitative Restrictions). Safeguard action can be taken only when it is established by properly conducted investigation that there is a sudden increase in imports of any particular goods/item (both absolute and relative to domestic production) which has caused or threatens to cause serious injury to the domestic industry. Safeguard measures are designed basically to give preparatory time to domestic industry to adjust and to prepare for increased competition impending removal of such temporary restrictions on import of a particular product.

Among several WTO agreements, those that are relevant to agricultural products including livestock sector, dairying and animal products are:

- Agreement on Agriculture (AOA)
- Sanitary and Phytosanitary (SPS) Agreement
- Technical Barriers to Trade(TBT) agreement

Some of the important provisions of these agreements are:

- Quantitative restriction on imports should be eliminated
- Imported products and domestically produced products should be treated alike
- Minimum access opportunity for imports should be 3% of average consumption in 1986-88 increasing to 5% by the end of the implementation period(2004-05 for developing countries).
- All tariff rates are bound and can not be raised without the agreement of trading partners
- To use international standards, guidelines and codes such as those of Codex, as reference points for global trade and for resolving trade disputes.
- Reaffirms right to countries to set their own health and safety standards, higher than those of international ones, provided they are justified on scientific grounds

**Domestic support measures have been categorized into three categories:**

- Amber box measures or Aggregate Measures of Support (AMS) include market price support, non-exempt direct payments and other subsidies not exempted from reduction commitments. Among the countries heavily subsidizing their agriculture, the

- developed countries were required to reduce the total AMS by 20% over 6 years (retaining 80% of subsidies) and the developing countries by 13.3% over 10 years.
- Blue box measures are exempted from any reduction and include 'production limiting measures' such as livestock production payments based on a fixed number of heads, payments based on fixed areas and yields.
  - Green box measures which are also exempt from reduction commitment include government expenditure on research, pest disease control, training, extension and advisory services, inspection services, marketing services and infrastructure services and government assistance to private storage of products as part of food safety programme.

### **Tariffs and Bound Rates on Meat & Poultry**

Sl. No. Item description	Basic Customs Duty (%) (As on 01.01.2006)	Bound Duty (%) (As on 01.03.2006)
<b>Dairy Products</b>		
1. Fresh Milk and cream	30	100
2. Butter and melted butter (ghee)	40	40
3. Cheese	30	40
4. Milk Powder	60	60
5. Yoghurt	30	150
<b>Meat &amp; Poultry</b>		
1. Chicken sausages	100	150
2. Chicken leg (processed)	100	150
3. Meat of poultry, not cut in pieces, fresh or chilled	30	100
4. Raw hams, pig fat; meat of bovine animals	30	100
5. Other meat and offal	30	100
6. Processed hams	30	55
7. Fish	30	Unbound

India needs to ensure that the developed countries effectively reduce the subsidies and make efforts for protecting the interests of Indian livestock sector under Blue box and Green box measures. While the incentives are negative or negligible that is provided to Indian farmers, huge subsidies in different forms are available to the fewer number of farmers in developed countries. Livestock products are subsidized to the extent of 40-60% in the developed countries. As suggested by experts (Dr. M.S.Swaminathan) a "livelihood box" is to be included in the renegotiated world trade agreement, which will permit developing countries to impose quantitative restrictions on the import of agricultural commodities when such imports are likely to destroy livelihood opportunities for resource poor farming families and landless agricultural labour. In order to assess the impact and implications of WTO on livestock sector and animal products it is necessary to understand the advantages and disadvantages of the agreements with reference to Indian livestock sector and initiate developmental and policy measures including renegotiations on WTO agreements.

## Sanitary and Phytosanitary (SPS) Agreement

Agreement on the application of sanitary and phytosanitary measures have the following main features:

- ✓ **Reaffirming** that no Member should be prevented from adopting or enforcing measures necessary to protect human, animal or plant life or health, subject to the requirement that these measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between Members where the same conditions prevail or a disguised restriction on international trade;
- ✓ **Desiring** to improve the human health, animal health and phytosanitary situation in all Members;
- ✓ **Noting** that sanitary and phytosanitary measures are often applied on the basis of bilateral agreements or protocols;
- ✓ **Desiring** the establishment of a multilateral frame work of rules and disciplines to guide the development, adoption and the enforcement of sanitary and phytosanitary measures in order to minimize their negative effects on trade;
- ✓ **Recognizing** the important contribution that international standards, guidelines and recommendations can make in this regard.

There are 14 articles with elaborations on the following aspects:

- ✓ General provisions;
- ✓ Basic rights and obligations;
- ✓ Harmonization;
- ✓ Equivalence;
- ✓ Assessment of risk and determination of the appropriate level of sanitary and phytosanitary protection;
- ✓ Adaptation to regional conditions, including pest- or disease-free areas and areas of low pest or disease prevalence;
- ✓ Transparency;
- ✓ Control, Inspection and Approval procedures;
- ✓ Technical assistance;
- ✓ Special and differential treatment;
- ✓ Consultations and dispute settlement;
- ✓ Administration;
- ✓ Implementation; and
- ✓ Final provisions.
- ✓ There are also 3 annexures under the articles:
  - Annex A- Definitions;
  - Annex B- Transparency of sanitary and phytosanitary regulations and
  - Annex C- Control, Inspection and Approval Procedures.

A sound knowledge of these provisions is required among different stake holders in order to defend their interests by adopting appropriate level of SPS measures and safeguarding from the adverse effects.

### **Equivalence of sanitary measures**

In order to facilitate trade with mutual benefit it is desirable to consider the effectiveness of sanitary measures of the exporting country in achieving the appropriate level of sanitary protection of the importing country, consistent with the principle of equivalence as provided for in the WTO, SPS agreement (Article 2.3).

Importing countries should avoid the application of unnecessary measures when they have already been carried out by the exporting country. For the purpose of determining equivalence Codex developed **'Guidelines on the judgement of equivalence of sanitary measures associated with food inspection and certification systems.'** Equivalence is the state wherein sanitary measures applied in an exporting country, though different from the measures applied in an importing country, achieve, as determined by the exporting country, the importing country's appropriate level of sanitary protection. Judgement of equivalence by the importing country should be based on a transparent analytical process that is objective and consistent, and includes consultation with all interested parties to the extent practicable and reasonable.

**Traceability:** In the identification of risk in food trade traceability has become important but associated with difficulties particularly in developing countries due to a large number of small holders. Animal products, which are processed and packaged, could be identified to the country and processing plant but not to the raw material stage as keeping records and sample identity are not feasible. Newer approaches to identify the source of risk are a challenge.

**Precautionary principle:** The principle states that potential environmental risks should be dealt with even in the absence of scientific certainty. It has long been advocated by environmentalists, who see it as a more effective way of managing hazards than traditional scientific risk assessments, which call for numbers and hard proof as prerequisites for action (Nature, 2000, 407:551).

## OIE

**Office International des Epizooties (OIE- World Organization for Animal Health)** was founded in 1924 in Paris with 28 founding members as a response to Rinderpest outbreak in Europe arising from cattle undergoing international shipment. The organization provides a vehicle for rapid disease information exchange between countries, which continue to promote and coordinate international research efforts into infectious diseases and which sets international animal health standards for trade in animals and animal products and for diagnostic laboratory tests and vaccines. As on May 2004 it has 167 member countries and the OIE operates under an International Committee composed of Delegates of member countries under the leadership of an elected President. The Central Bureau, located at OIE Headquarters in Paris, implements decisions of the International Committee and of various Commissions.

### **Objectives:**

1. To ensure transparency in the animal health situation throughout the world.
2. To collect, analyse and disseminate scientific veterinary information.
3. To contribute expertise and encourage international solidarity in the control and eradication of animal diseases.
4. Within its mandate under SPS and WTO Agreement, to safeguard world trade by publishing health standards for international trade in animals and animal products.
5. To improve the legal framework and resources of Veterinary Services.
6. Assist the international community in the development of guiding principles for animal welfare.

The activities of the OIE are supported by four specialist commissions and a number of working groups, made up of international experts in the relevant fields. OIE operates on a

basis of consensus between the member countries, and in particular through resolutions passed by the International Committee of member country delegates (Chief veterinary officers or their representatives at the general session held annually in May every year. The International Committee appoints the Director General of the Organization and the members of the OIE Commissions. OIE comprises an Administrative Commission, five regional commissions (Africa, Americas, Asia/Far east/ Ocenia, Europe and Middle east) and four specialist commissions for International animal health code, standards, foot and mouth disease and other epizootics and fish diseases. While the fish diseases commission deals separately, the other three specialist commissions work closely together to provide an internationally coordinated approach to the prevention and control of infectious diseases of animals.

The Code commission develops the OIE International Animal Health Code which sets out animal health conditions for trade, including definitions of the criteria by which individual animals, herds or areas may be considered free from a particular disease. The health code frequently refers to OIE Manual of Standards for diagnostic tests and vaccines for the purpose of laboratory diagnostic tests and vaccines. The FMD and other epizootics commission supports international efforts to control major epizootic diseases by developing appropriate strategies and by collaborating with other international organizations in regional programmes for disease control. The regional commissions identify animal health issues which are of concern to countries in the particular region and also organize regional conferences focussed on technical items and on regional cooperation for animal disease control. Regional programmes for surveillance and control of major diseases are also developed by regional commissions.

The OIE Commissions are assisted by Working Groups on biotechnology, wildlife diseases, informatics and epidemiology and by ad-hoc groups which are formed to address specific issues when required. With the establishment of WTO the work of the OIE has assumed a new prominence through recognition of its role in providing standards, guidelines and recommendations for animal health and zoonoses within the Sanitary and Phytosanitary Agreement (SPS) of the WTO.

### **Codex and Codex standards**

The term Codex Alimentarius is taken from Latin and means food code- a code of food standards for all nations. It was established in 1962 when the FAO and WHO of the United Nations recognized the need for international standards to guide the World's growing food industry and to protect the health of consumers.

One of the principal purposes of the Codex Commission is the preparation of food standards and their publication in the Codex Alimentarius. Codex develops *commodity standards* which are product specific and *general standards* which have across the board application to all foods and are not product specific. A number of codex standards have dealt with safety aspects of animal products. Some important standards with a brief mention of scope and content are as follows:

#### **List of some codex standards**

- ✓ General principles of food hygiene (CAC/RCP 1-1969, Rev. 4-20031)
- ✓ Code of Hygienic Practice for Meat (CAC/RCP 58-2005)
- ✓ Codex Standard for Luncheon Meat (CODEX STAN 89-1981)
- ✓ Codex Standard for Cooked Cured Chopped Meat (CODEX STAN 98-1981)
- ✓ Recommended International Code of Hygienic Practice for Processed Meat and Poultry Products (CAC/RCP 13-1976, Rev 1 (1985)
- ✓ Code of practice on good animal feeding (CAC/RCP 54-2000)

- ✓ Principles for the establishment and application of microbiological criteria for foods (CAC/GL 21-1997)
- ✓ Principles and guidelines for the conduct of microbiological risk assessment (CAC/GL- 30(1999))
- ✓ General principles for the use of food additives 1 (CAC/ MISC I-1972)
- ✓ Code of practice for source directed measures to reduce contamination of food with chemicals (CAC/RCP 49-2001)
- ✓ Recommended international code of practice for control of the use of veterinary drugs (CAC/RCP 38-1993)
- ✓ Guidelines on the judgement of equivalence of sanitary measures associated with food inspection and certification systems<sup>1</sup> (CAC/GL 53-2003)
- ✓ Guidelines on good laboratory practice in pesticide residue analysis (CAC/GL 401)
- ✓ Codex general standard for contaminants and toxins in food (Codex Stan 193-1995 (Rev.1-1997))

## Hygiene standards

Effective hygiene control is considered vital to avoid the adverse human health and economic consequences of food borne illness, food borne injury, and food spoilage. Codex developed a general standard '**Recommended international code of practice general principles of food hygiene**'. These general principles should be used in conjunction with each specific code of hygienic practice, where appropriate and the guidelines on microbiological criteria.

### Code of Hygienic practice for meat ( CAC/RCP 58-2005):

Meat has traditionally been viewed as a vehicle for a significant proportion of human food borne diseases. A contemporary risk-based approach to meat hygiene requires that hygiene measures should be applied at those points in the food chain where they will be of greatest value in reducing food borne risks to consumers. The scope of this code covers hygiene provisions for meat from the time of live animal production upto the point of retail sale. Meat hygiene is by nature a complex activity and this code refers to standards, texts, and other recommendations developed elsewhere in the Codex system where linkages are appropriate.

### Code of hygienic practice for processed meat and poultry products

The code applies to processed meat and poultry products and contains the minimum requirements of hygiene in the production, handling, packaging, storing and transportation of processed meat products to assure a healthful and wholesome supply of such products. HACCP system has been applied to the code and a number of other codes have been considered in preparing the code.

### Contaminants and toxins in foods

The standard '**Codex general standard for contaminants and toxins in foods**' contains the main principles and procedures which are used and recommended by the Codex Alimentarius in dealing with contaminants and toxins in food and feeds, and lists the maximum levels of contaminants and natural toxicants in foods and feeds which are recommended by the CAC to be applied to commodities moving in international trade.

### Reduction of source directed food contamination with chemicals

Codex has formulated '**Code of practice for source directed measures to reduce contamination of food with chemicals**' with the main objective to increase awareness of sources of chemical contamination of food and feed, and of source directed measures to prevent such contamination. This means that measures recommended in the document may lie outside the direct responsibility of the food control authorities and Codex. Essentially, these approaches consist of a) measures to eliminate or control the source of contamination, b) processing to reduce contaminant levels and c) measures to identify and separate contaminated food from food fit for human consumption.

### Good Laboratory Practice in pesticide residue analysis

Codex developed 'Guidelines on good laboratory practice in pesticide residue analysis' and the components of the code covering the analyst, basic resources (the laboratory and equipment and supplies) and the analysis comprising avoidance of contamination, reception and storage of samples, standard operating procedures (SOPs), validation of methods, maintenance of overall analytical performance, confirmatory tests, the concept of lower practical levels for the determination of residues of pesticides and expression of results.

### Control of the use of veterinary drugs

The Code '**Recommended international code of practice for control of the use of veterinary drugs**' set out guidelines on the prescription, application, distribution and control of drugs used for treating animals, preserving animal health or improving animal production. Good practice in the use of veterinary drugs (GPVD), as defined by the CCRVDF, is the official recommended or authorized usage including withdrawal periods, approved by national authorities. To avoid the presence of unacceptable residues in meat or other by-products of animal origin, it is essential that the livestock owner adheres to the withdrawal period laid down for each product and dose regime or to a suitably lengthy withdrawal period, prescribed by a veterinarian, where none is specified. If animals are sold before the end of the withdrawal period, the buyer must be informed. Regular feed-back or information to veterinarians and manufacturers on suspected adverse reactions should be encouraged.

### Good Animal feeding

Codex has recommended '**Code of practice on good animal feeding**' with the objective to help ensure the safety of food for human consumption through adherence to good animal feeding practice at the farm level and good manufacturing practices (GMPs) during the procurement, handling, storage, processing and distribution of animal feed and feed ingredients for food producing animals. All feed and feed ingredients should meet minimum safety standards. Codex Maximum Residue limits and Extraneous Maximum Residue Levels set for feed should be applied. MRLs for food set by Codex may be useful in determining minimum safety standards for feed. The presence of undesirable substances should be identified, controlled and minimized.

### Food additives

**'General principles for the use of food additives'** were adopted by the Ninth Session of Codex Alimentarius Commission as an advisory text. All food additives, should have been or should be subjected to appropriate technological

testing and evaluation. This evaluation should take into account among other things any cumulative, synergistic or potentiating effects of their use. Only those food additives should be endorsed which so far as can be judged on the evidence presently available, present no hazard to the health of the consumer at the levels of use proposed. Use of food additives is justified only where they serve one or more of the following purposes: to preserve the nutritional quality of the food, to provide necessary ingredients or constituents for foods manufactured for groups of consumers having special dietary needs, to enhance the keeping quality or stability of a food or to improve its organoleptic properties ( but does not deceive the consumer) and to provide aids in the manufacture, processing, preparation, treatment, packing, transport or storage of food not to disguise the effects of the use of faulty raw materials or undesirable practices or techniques during the course of any of these activities.

### Microbiological criteria for foods

Codex recommended 'Principles for the establishment and application of microbiological criteria for foods' to give guidance on the establishment and application of microbiological criteria for foods at any point in the food chain from primary production to final consumption. A microbiological criterion for food defines the acceptability of a product or a food lot, based on the absence or presence, or number of microorganisms including parasites, and or quantity of their toxins/metabolites, per unit(s) of mass, volume, area or lot. A microbiological criterion should be established and applied only where there is a definite need and where its application is practical. The criterion should be technically attainable by applying Good Manufacturing Practices. To fulfill the purposes of a microbiological criterion, consideration should be given to: the evidence of actual or potential hazards to health; the microbiological status of the raw material(s); the effect of processing on the microbiological status of the food; the likelihood and consequences of microbiological contamination and/or growth during subsequent handling, storage and use; the category(s) of consumers concerned; the cost benefit ratio associated with the application of the criterion; and the intended use of the food.

The microorganisms included in a criterion should be widely accepted as relevant –as pathogens, as indicator organisms or as spoilage organisms- to the particular food and technology. Organisms whose significance in the specified food is doubtful should not be included in a criterion. Where pathogens can be detected directly and reliably consideration should be given to testing for them in preference to testing for indicator organisms. Whenever possible, only methods for which the reliability (accuracy, reproducibility, inter-and intra laboratory variation) has been statistically established in comparative or collaborative laboratories should be used. Limits used in criteria should be based on microbiological data gathered at various production establishments operating under Good Hygiene Practices (GHPs) and applying the HACCP system. A well designed sampling plan defines the probability of detecting microorganisms in a lot, but it should be borne in mind that no sampling plan can ensure the absence of a particular organism. The test report shall give the information needed for complete identification of the sample, the sampling plan, the test method, the results and if, appropriate, their interpretation.

### **Microbiological risk assessment**

Risk assessment of microbiological hazards in food are described in the code "Principles and guidelines for the conduct of microbiological risk assessment". Microbiological Risk Analysis is a process consisting of three components- risk assessment, risk management and risk communication, which has the overall objective of to ensure public health protection. There should be a functional separation

between risk assessment and risk management for an unbiased process. Risk assessment should be conducted according to structured approach that includes hazard identification, hazard characterization, exposure assessment, and risk characterization. Microbial pathogen levels can be dynamic and while they may be kept low, for example, by proper time/temperature controls during food processing, they can substantially increase with abuse conditions. Surveillance programs can provide an ongoing opportunity to reassess the public health risks associated with pathogens in foods as new and relevant data become available and a microbiological risk assessment may need to be revised.

### **Ethics for International trade in foods**

The 'Code of Ethics for International Trade in Food' was developed in the light of the consideration that many countries – particularly developing countries do not yet have adequate food control infrastructures to protect consumers against possible health hazards in food and against fraud. Specific requirements of the code include: Food standards, Food Hygiene, Labeling, Food additives, Pesticide residues, Microbiological contaminants, Other contaminants, Irradiated food, Foods for infants, children and other vulnerable groups, and Nutritional aspects concerning in particular vulnerable groups and regions where malnutrition exists.

### **Food import control systems**

The code 'Guidelines for food import control systems' provides a frame work for the development and operation of an import control system to protect consumers and facilitate fair practices in food trade while ensuring unjustified technical barriers to trade are not introduced. Appropriate level of protection (ALOP) has been defined as the level of protection deemed appropriate by the country establishing a sanitary measure to protect human life within its territory (This concept may otherwise be referred to as the 'acceptable level of risk'). Food import control systems should have the following main characteristics:

- requirements for imported food that are consistent with requirements for domestic foods
- clearly defined responsibilities for the competent authority
- clearly defined and transparent legislation and operating procedures
- precedence to the protection of consumers
- provision of the importing country for recognition of the food control system applied by an exporting country's competent authority
- uniform nationwide implementation
- Implementation that ensures the levels of protection achieved are consistent with those for domestic food.

### **European Union (EU) regulations**

The main goal of the EU is the progressive integration of Member States' economic and political systems and the establishment of a single market based on the free movement of goods, people, money and services. The EU laws (regulations, directives and decisions) take precedence over national law and are binding on national authorities. The EU also issues non-binding instruments, such as recommendations and opinions, as well as rules governing how EU institutions and programmes work, etc.

The European Food Safety Authority (EFSA) is an independent European agency funded by the EU budget that operates separately from the European Commission, European Parliament and EU Member States.

Regulations are the most direct form of EU law - as soon as they are passed, they have binding legal force throughout every Member State, on a par with national laws. National governments do not have to take action themselves to implement EU regulations. They are different from **directives**, which are addressed to national authorities, who must then take action to make them part of national law, and **decisions**, which apply in specific cases only, involving particular authorities or individuals. Regulations are passed either jointly by the EU Council and European Parliament, and by the Commission alone.

EU directives lay down certain end results that must be achieved in every Member State. National authorities have to adapt their laws to meet these goals, but are free to decide how to do so. Directives may concern one or more Member States, or all of them. Each directive specifies the date by which the national laws must be adapted - giving national authorities the room for manoeuvre within the deadlines necessary to take account of differing national situations. Directives are used to bring different national laws into line with each other, and are particularly common in matters affecting the operation of the single market (e.g. product safety standards). Decisions are EU laws relating to specific cases. They can come from the EU Council (sometimes jointly with the European Parliament) or the Commission. They can require authorities and individuals in Member States either do something or stop doing something, and can also confer rights on them.

The European Food Safety Authority (EFSA) was set up in January 2002, following a series of food crises in the late 1990s, as an independent source of scientific advice and communication on risks associated with the food chain. EFSA was created as part of a comprehensive programme to improve EU food safety, ensure a high level of consumer protection and restore and maintain confidence in the EU food supply.

In the European food safety system, risk assessment is done independently from risk management. As the risk assessor, EFSA produces scientific opinions and advice to provide a sound foundation for European policies and legislation and to support the European Commission, European Parliament and EU Member States in taking effective and timely risk management decisions.

## **USDA Regulations**

In the US Department of Agriculture implements regulations related to Animal products safety through Food safety and Inspection Service (FSIS). In 1862, President Abraham Lincoln founded the U.S. Department of Agriculture. In 1865, USDA Secretary Isaac Newton urged Congress to enact legislation providing for the quarantine of imported animals. Several acts and regulations were made from time to time depending on the developments and requirements of animal products industry. On March 14, 1977 the Food Safety and Quality Service was established and was assigned the responsibility of meat and poultry products inspection from APHIS. On June 17, 1981, the Food Safety and Quality Service (FSQS) was redesignated as the Food Safety and Inspection Service (FSIS). FSIS stepped up its research studies to apply the Hazard Analysis and Critical Control Point (HACCP) system to meat and poultry inspection, setting the stage for the most significant change in regulatory

philosophy in the history of the inspection programs. On July 25, 1996, FSIS issued its landmark rule, Pathogen Reduction/Hazard Analysis and Critical Control Point (HACCP) Systems. The rule focuses on the prevention and reduction of microbial pathogens on raw products that can cause illness. HACCP clarifies the respective roles of government and industry. Industry is accountable for producing safe food. Government is responsible for setting appropriate food safety standards, maintaining vigorous inspection oversight to ensure those standards are met, and maintaining a strong enforcement program to deal with plants that do not meet regulatory standards. Implementation of HACCP began on January 27, 1997, and it was completed by January 25, 2000. Assuring food safety is a continuous programme backed by policies and developmental programmes.

### Quarantine measures

Animal quarantine applies to all kinds of animals and animal products including insects, reptiles, birds and mammals. Animals coming into India must spend prescribed time determined by Quarantine Officer for necessary tests and examinations at specially equipped quarantine stations to ensure they are free of disease before being released.

The primary purpose of quarantine of imported animals is to prevent the introduction and spread of animal diseases by these animals. This is necessary to safeguard the animal population in India. Although all animals imported into India have to be certified as healthy and free from infectious and contagious diseases by the Veterinary Authority in the exporting country, at the time of export, quarantine measures are still necessary. This is to ensure that any animal incubating a disease, and therefore not showing any signs of the disease, is examined further during the quarantine period.

Animal Quarantine & Certification Services (AQIS) is under the direct control of Department of Animal Husbandry and Dairying, Ministry of Agriculture, Govt. of India. There are four quarantine stations located at Delhi, Kolkata, Mumbai and Chennai.

Species	Accommodation capacity of animals (in nos.)			
	Delhi	Kolkata	Mumbai	Chennai
Cattle	96	44	40	48
Sheep & goats	300	250	100	270
Dogs / Cats	12	6	16	10
Horses	20	44	20	20
Poultry	250		320	100
Pigs	100	300	100	60
Laboratory animals	500			400
Misc. animals (elephants, camels etc.)	One shed with open space		Open yard	

The address of the four quarantine stations are appended.

**Before arrival of animals:**

- ✓ On receipt of application for import of live animals, all the sheds and feed stores are thoroughly cleaned, disinfected with suitable disinfectants and also fumigated.
- ✓ All animals are transported by a suitable animal carrier as per the standards and requirements for different species of animals
- ✓ The animal carrier is properly disinfected one day prior to the scheduled date of arrival of animals.
- ✓ All the arrangements are made for collection of necessary samples

**On arrival at the point of entry:**

- ✓ On the day of arrival and time fixed with the importer, the Regional / Quarantine Officer and other staff reach the Airport / Sea port.
- ✓ The animals or the products are thoroughly examined physically.
- ✓ The Veterinary certificate accompanying the animals or products is checked thoroughly to ascertain the specified health requirements.
- ✓ After ensuring that the animals are clinically healthy and the health certificates accompanying the consignment are in order, a provisional quarantine clearance certificate (import) or Veterinary health certificate (import) is issued depending on the case to the importing agency for customs clearance.

**During quarantine period**

- ✓ Maintain health record of the animal(s)
- ✓ Collect the necessary samples and arrange for testing in the specified Laboratory.
- ✓ Carryout hematological / urine / faecal examination as and when required and take appropriate follow up action.
- ✓ Examine the animals for infestation of ecto parasite and take appropriate follow up action including disinfection of the premises
- ✓ The vaccination status is checked and if required, the necessary immunization is carried out at the quarantine station.
- ✓ For maintaining proper hygienic conditions during the period of quarantine, the animal sheds are cleaned, disinfected daily and the garbage is disposed as per the laid down procedures.
- ✓ Release of animals after satisfying quarantine requirements and issue Quarantine clearance certificate (import)

## Sampling and monitoring plans

Sampling is the process of drawing or selecting containers or sample units from a lot or production. As a result of sampling, information is obtained by which an estimate can be made to accept, reject or negotiate the merchandise in question. Sampling procedures which contain both sample size and acceptance criteria are commonly referred to as "acceptance sampling".

Laboratory sampling of imported meat products is an important aspect of import meat inspection. This is required to assure food safety and compliance. Laboratory examinations are necessary to detect chemical residue substances, microorganisms, and to verify compliance to compositional standards. Laboratory results can be provided on request to the importer or Operator who provided the sample

The proposed monitoring plan which is appropriate for Indian situation serves the following purpose -

- ✓ to increase awareness on the use and consumption of harmful substances and thereby initiate measures for minimizing / preventing such harmful substances in animal products.
- ✓ to ensure livestock producers to develop self regulation in producing animal products free from unauthorized substances
- ✓ to combat illegal use of harmful substances
- ✓ to facilitate increased trade including export trade.

The objective of the proposed monitoring plan is to establish a surveillance system for monitoring the contaminating substances and residues given in **Annexure – I** in the following animal products:

- i) Meat and meat products (buffalo and poultry meat)
- ii) Milk and milk products (milk and skim milk powder)
- iii) Egg and egg products
- iv) Animal casings

Maximum residue limits for meat, milk and eggs have been set under Prevention of Food Adulteration Rules, 1955 in respect of some of the substances. However, under the proposed monitoring plan the maximum residue limits set by regulation 90/2377/EEC will be followed. Norms as approved by Codex Alimentarius Commission will also be considered. Where no codex limits exist for a particular substance, the National Reference Laboratory will give its expert opinion on maximum permissible residue levels for the substance, based on the scientific data / studies available.

### Substances to be investigated

**Group A:** Substances having anabolic effect and unauthorized substances viz., i) Stilbenes and its derivatives / salts ii) Anti-thyroid agents iii) Steroids iv) Resorcylic acid lactones (including Zerenol) and v) Beta agonists These substances are not being used in India and hence are not being included in the investigation and monitoring plan.

**Group B:** Of the compounds of this group, as mentioned in Annex – IV to 2377/90 of EEC regulation, Chloramphenicol is the only product that is relevant in the Indian context, and residue of this item will be monitored.

**Group C:** Antibacterial substances i) Oxytetracyclines ii) Tetracyclines iii) Benzyl penicillin iv) Sulphonamide

**Group D:** Other Veterinary Drugs i) Anthelmintics ii) Anticoccidials including nitroimidazoles iii) Carbamates and pyrethroids iv) Sedatives – not in common use and hence not considered for monitoring. V) Non steroidal anti inflammatory drugs (NSAID) vi) Other pharmacological substances – no substance under this has been considered.

**Group E** Other substances and environmental contaminants i) Organochlorine compounds including HCB ii) Organophosphorus compounds iii) Chemical elements (lead and cadmium) iv) Mycotoxins v) Dyes.

Since some of the substances under Groups C, D, and E are being used though to a varying extent in different parts of the country, samples are tested for these substances.

### **Methods of analysis**

Internationally recognized methods shall be followed. AOAC methods where available shall be followed. Methods recommended by FAO / WHO Expert Committee on Food Additives and methods published in Codex standards shall be considered. For pesticide residues the methods laid down in “Test Modules on Analysis of Food and Agri Products for Pesticide Residues” shall be followed. National Reference Laboratory shall stipulate the method of analysis to be followed by different laboratories.

### **Sampling procedures.**

National laboratories and State Animal husbandry Departments shall collect the samples as per the stipulations of National Reference Laboratory as to the type of sample, method of collection and handling and the designated number of samples. The general principles of Codex recommendations on sampling should be followed. All stages in the collection and the preparation of the sample including sampling, transport, and storage and processing should be considered in an assessment of the sources of error. For sample storage, vessels of inert material must be used to avoid contamination.

### **Sampling levels and frequency**

**Bovine animals:** Buffaloes: Sampling shall be at slaughterhouses covering domestic and export abattoirs. Sampling level shall be 0.15% of the total number of buffaloes slaughtered during one year period. 10% of the samples collected shall be used for checking Group A 6 substances (chloromphenicol). 30% of samples must be checked for Group B 1 substances. 30% of samples must be checked for Group B2 substances. 10% of samples must be checked for Group B3 substances. About 200g muscle free of tendons, one kidney; fat about 200g and liver 300g would be required.

- Poultry:** Sampling shall be of spent (culled) hens and broilers. A minimum of 50 samples under each of spent hens and broilers would be required. 10% of the samples collected shall be used for checking Group A 6 substances. 30% of samples must be checked for Group B 1 substances. 30% of samples must be checked for Group B2 substances. 10% of samples must be checked for Group B3 substances
- Milk and Milk products:** 0.4% of total product produced. Raw milk and milk for the manufacture of milk – based products: about 200ml in a 250 ml plastic bottle. Pasteurized milk: a package of one liter. Butter and milk powder - 500g preferably in retail packages or packed in plastic bags.
- Eggs and Egg products:** 0.4% of total production. National Reference Laboratory draws up the detailed sampling instructions for the whole of the country. Samples are taken from the production farms, packing and whole sale centres and egg products processing plants. One egg sample consists of 12 eggs and the amount of one egg product sample is 200g.
- Animal casings:** a minimum of 100 samples for all the types of casings with due weightage for the quantity of production and as stipulated by National Reference Laboratory for the Group B3 substances – Organochlorine compounds.

Number of samples to be analysed by different laboratories shall be assessed by the National Reference Laboratory.

### **Sampling Report**

In the sampling report all current information on the identification of the samples should be clearly stated. In the sampling report following details has to be given.

Heading: Samples for Residue analyses

- i) Name and address of the sampling authority
- ii) Name of person drawing sample
- iii) Name and address of the production holding
- iv) Description of the sample
- v) Date of slaughter / production
- vi) Quantity of sample
- vii) Place and date of sampling
- viii) Counter sample taken Yes / No
- ix) Signature of the sampling person
- x) Signature of owner / person in charge

### **Measures in case of Positive sample**

In the event of the results showing detection of residues and other substances in excess of the permissible limits, the concerned laboratory / monitoring agency will inform the Government of the State in which the sample originated for taking

necessary measures to identify the sources of such residues and initiate control measures to eliminate the source of contamination. In the case of export processing plants regulatory agencies will be informed to take appropriate measures for preventing export of products having residues higher than the permissible limits and disposal of the products.

### **Monitoring report**

The results of the tests of the samples from different approved laboratories shall be sent to the National Reference Laboratory for compilation at National level. Compiled report shall be sent to the monitoring organization for preparation of Annual Monitoring plan report to be sent to EC or other relevant agencies.

**ANNEXURE – 1****Residue limits in fresh meat**

	Group of substances	Compounds	Meat	Milk & Milk products	Poultry meat	Egg & Egg products
A	Compounds included in Annex IV to 2377/90	Chloromphenicol	1µg/kg	0.15µg/kg	1µg/kg	0.1 µg
B1	<b>B1 Antibacterial substances</b>	Oxytetracycline	100 µg/kg	100 µg/kg	100 µg/kg	200 µg/kg
		Tetracycline	100 µg/kg	-	-	-
		Benzyle penicillin	50 µg/kg	4 µg/p/d	-	-
		Sulphonamide		25 µg/p/d	-	-
B2	<b>Other Vety drugs</b>					
	<b>a) Anthelmintics</b>	Closantel	1000 µg/kg			
		Doramectin	10 µg/kg			
		Ivermectin	100 µg/kg			
		-do-	40 µg/kg			
		Moxidectin	20 µg/kg			
		Thiabendazole	100 µg/kg			
	<b>b) Anticoccidials</b>	Amprolium				Positive detection
	<b>c) Carbamates and pyrethroides</b>	Deltamethrin			0.01 mg/kg	
B3	<b>Organochlorine compounds</b>	Aldrin & Dieldrin	0.05 µg/kg	-	0.2 mg/kg	-
		Lindane	1 mg/kg (fat)	-	-	-
		HCB	0.005 µg/kg (fat)	-	-	20 µg/kg
	<b>Chemical elements</b>	Lead	5 µg/kg			
		Cadmium	0.5 µg/kg			

Document Number	Standard Title	Status
<a href="#">IS 1743 : 1973</a>	Specification for Mutton and Goat Meat Canned in Brine	Active
<a href="#">IS 1982 :</a>	Code of practice for ante-mortem and post-mortem	Active

<a href="#">1971</a>	inspection of meat animals	
<a href="#">IS 2536 : 1995</a>	Meat and Meat Products - Mutton and Goat Meat (Chevon) - Fresh, Chilled and Frozen - Technical Requirements	Active
<a href="#">IS 2537 : 1995</a>	Meat and Meat Products - Beef and Buffalo Meat - Fresh, Chilled and Frozen - Technical Requirements	Active
<a href="#">IS 3044 : 1973</a>	Specification for Mutton and Goat Meat, Curried and Canned	Active
<a href="#">IS 3545 : 1982</a>	Specification for Meat Choppers	Active
<a href="#">IS 4352 : 1967</a>	Specification for Pork Luncheon Meat, Canned	Active
<a href="#">IS 5065 : 1986</a>	Specification for Meat Meal as Livestock Feed Ingredient	Active
<a href="#">IS 5960 : Part 1 : 1996</a>	Methods of test for meat and meat products: Part 1 Determination of nitrogen content	Active
<a href="#">IS 5960 : Part 2 : 2000</a>	Meat and Meat Products - Methods of Test - Part 2 : Determination of Total Ash	Active
<a href="#">IS 5960 : Part 3 : 1970</a>	Methods of test for meat and meat products: Part 3 Determination of total fat content	Active
<a href="#">IS 5960 : Part 4 : 1997</a>	Meat and meat products - Method of test : Part 4 Determination of free fat content	Active
<a href="#">IS 5960 : Part 5 : 2001</a>	Meat and Meat Products - Methods of Test - Part 5 : Determination of Moisture Content (Reference Method)	Active
<a href="#">IS 5960 : Part 6 : Sec 1 : 1997</a>	Meat and meat products - Method of test Part 6 Determination of chloride content Section 1 Volhard method	Active
<a href="#">IS 5960 : Part 6 : Sec 2 : 1997</a>	Meat and meat products - Method of Test Part 6 Determination of Chloride content Section 2 Potentiometric method	Active
<a href="#">IS 5960 : Part 7 : 1996</a>	Methods of test for meat and meat products : Part 7 Determination of nitrite content	Active
<a href="#">IS 5960 : Part 8 : 1996</a>	Methods of test for meat and meat products: Part 8 Determination of nitrate content	Active
<a href="#">IS 5960 : Part 9 : 1988</a>	Meat and Meat Products - Methods of Test - Part 9 : Determination of Total Phosphorus Content	Active
<a href="#">IS 5960 : Part 10 : 2001</a>	Meat and Meat Products - Methods of Test - Part 10 : Measurement of pH - Reference Method	Active
<a href="#">IS 5960 : Part 11 : 1988</a>	Method of test for meat and meat products : Part 11 Determination of glucone-delta-lactone content	Active
<a href="#">IS 5960 : Part 12 : 2001</a>	Meat and Meat Products - Methods of Test - Part 12 : Determination of L-(+)-Glutamic Acid Content - Reference Method	Active
<a href="#">IS 5960 : Part 13 : 1988</a>	Methods of test for meat and meat products : Part 13 Determination of polyphosphates	Active

<a href="#">IS 5960 : Part 14 : 1988</a>	Methods of Test for Meat and Meat Products - Part 14 : Determination of Starch Content	Active
<a href="#">IS 5960 : Part 15 : 2000</a>	Meat and Meat Products - Methods of Test - Part 15 : Determination of L (-) Hydroxyproline Content	Active
<a href="#">IS 5960 : Part 16 : 2004</a>	Meat and Meat Products - Methods of Test - Part 16 : Determination of Total Phosphorus Content - Spectrometric Method	Active
<a href="#">IS 5960 : Part 17 : 2004</a>	Meat and Meat Products - Methods of Test - Part 17 : Determination of Starch and Glucose Content - Enzymatic Method	Active
<a href="#">IS 6851 : 1973</a>	Specification for Meat Extract, Microbiological Grade	Active
<a href="#">IS 7053 : 1996</a>	Meat and Meat Products - Basic Requirements for a Stall for Sale of Meat of Small and Large Animals	Active
<a href="#">IS 7143 : 1973</a>	Specification for Crab Meat Canned in Brine	Active
<a href="#">IS 7582 : 1975</a>	Specification for Crab Meat, Solid Packed	Active
<a href="#">IS 7802 : 1975</a>	Code of hygienic conditions for sweetmeat shop	Active
<a href="#">IS 8182 : 1976</a>	Code for hygienic conditions for processed meat products	Active
<a href="#">IS 8539 : Part 1 : 1977</a>	Terminology of meat products and meat animals: Part 1 Poultry	Active
<a href="#">IS 8700 : 1977</a>	Basic requirements for a stall for sale of meat of large animals	Withdrawn
<a href="#">IS 9800 : 1993</a>	Meat and Meat Products - Day-Old Chicks (layers and broilers) Basic Requirements	Active
<a href="#">IS 10380 : 1982</a>	Methods of test for printing ink permeation of paper (castor oil test)	Active
<a href="#">IS 10726 : 1983</a>	Specification for Knife, Meatal Skin Incision	Active
<a href="#">IS 10763 : 1983</a>	Specification for Frozen Minced Fish Meat	Active
<a href="#">IS 10974 : Part 3 : 1984</a>	Code for hygienic condition for production, transport, storage and ditribution of indigenous milk products: Part 3 Coagulated products CHHANA and CHHANA based sweetmeats	Active
<a href="#">IS 11748 : 1986</a>	Specification for Meat Extract (Beef), Food Grade	Active
<a href="#">IS 12486 : 1988</a>	Specification for Meat Inspection Table	Active
<a href="#">IS 12541 : 1988</a>	Meat and Meat Products - Poultry - Chicken Curry, Canned - Specification	Active
<a href="#">IS 12542 :</a>	Meat and Meat Products - Canned Ham. Minced -	Active

<a href="#">1988</a>	Specification	
<a href="#">IS 12543 : 1988</a>	Meat and Meat Products - Poultry Products - Canned Egg Curry - Specification	Active
<a href="#">IS 13059 : 1991</a>	Meat and meat products - enumeration of micro-organisms colony count technique at 30°C (reference method)	Withdrawn
<a href="#">IS 13060 : 1991</a>	Meat and meat products - detection and enumeration of presumptive coliform bacteria and presumptive Escherichia coli (reference method)	Withdrawn
<a href="#">IS 13061 : 1991</a>	Meat and meat products - detection of salmonellae (reference method)	Withdrawn
<a href="#">IS 13165 : 1991</a>	Meat and Meat Products - Mutton Biryani (Canned) - Specification	Active
<a href="#">IS 13400 : 1992</a>	Meat and Meat Products - Chicken Sausages - Specification	Active
<a href="#">IS 13401 : 1992</a>	Meat and Meat Products - Determination of Thiobarbituric Acid Value in Meat - Test Method	Active
<a href="#">IS 14514 : 1998</a>	Clam Meat - Frozen - Specification	Active
<a href="#">IS 14843 : 2000</a>	Meat and Meat Products - Enumeration of Pseudomonas Spp.	Active
<a href="#">IS 14844 : 2000</a>	Meat and Meat Products - Enumeration of Lactic Acid Bacteria - Colony-Count Technique at 30C	Active
<a href="#">IS 14920 : 2001</a>	Meat and Meat Products - Enumeration of Yeasts and Moulds - Colony-count Technique	Active
<a href="#">IS 15463 : 2004</a>	Meat and Meat Products - Enumeration of Escherichia Coli - Colony-Count Technique at 44°C Using Membranes	Active
<a href="#">IS 15478 : Part 2 : 2004</a>	Meat and Meat Products - Sampling and Preparation of Test Samples - Part 2 : Preparation of Test Samples for Microbiological Examination	Active
<a href="#">IS/ISO 3100-1 : 1991</a>	Meat and Meat Products - Method of Sampling	Active
<a href="#">IS 8700 : 1977</a>	Basic requirements for a stall for sale of meat of large animals	Withdrawn
<a href="#">IS 8539 : Part 1 : 1977</a>	Terminology of meat products and meat animals: Part 1 Poultry	Active
<a href="#">IS 7053 : 1996</a>	Meat and Meat Products - Basic Requirements for a Stall for Sale of Meat of Small and Large Animals	Active
<a href="#">IS 14988 : Part 2 : 2002</a>	Microbiology of Food and Animal Feeding Stuffs - Horizontal Method for the Detection and Enumeration of Listeria monocytogenes - Part 2 : Enumeration Method	Active
<a href="#">IS 7909 : 1993</a>	Slaughter House Equipment - Electrical Stunning Tongs for Pigs - Specification	Active
<a href="#">IS 8895 : 1978</a>	Guidelines for handling, storage and transport of slaughter house by-products	Active

## Appendix I (b)

ISO codes for meat and meat products are given below. Other related codes are available at the website [www: iso.org](http://www.iso.org)

S.No.	Code	Details
1	ISo 936:1998	Determination of total ash
2	ISO 937: 1978	Determination of nitrogen content
3	ISO 1442: 1997	Determination of moisture content
4	ISO 1443: 1973	Determination of total fat content
5	ISO 1444: 1996	Determination of free fat content
6	ISo 1841-1: 1996	Determination of chloride content – Part 1: Volhard method
7	ISO 1841-2: 1996	Determination of chloride content – Part 2: Potentiometric method
8	ISO 2294: 1974	Determination of total phosphorus content
9	ISO 2917:1999	Measurement of pH
10	ISO 2918:1975	Determination of nitrite content
11	ISO 3091:1975	Determination of nitrite content
12	ISO 3496: 1994	Determination of hydroxyproline content
13	ISO 4134: 1999	Determination of L- (+) glutamic acid content
14	ISO 5553:1980	Detection of polyphosphates
15	ISO 5554: 1978	Determination of starch content
16	ISO 13493: 1998	Determination of chloramphenicol content- method using liquid chromatography
17	ISO 13496:2000	Detection of colouring agents – Method using thin layer chromatography
18	ISO / CD 13720	Enumeration of Pseudomonas spp.
19	ISO 13730: 1996	Determination of total phosphorus content – spectrometric method
20	ISO 13965: 1998	Determination of starch and glucose contents – enzymatic method

1. Agricultural and Processed Food Products Export Development Authority (APEDA) NCUI Building, 3rd&4th Floor, 3, Siri Institutional Area, August Kranti Marg Opp. Asiad Village, New Delhi-11016  
Tel.: +91-11-26513204, 26514572, 26534186, 26513219, 26526198  
Fax: +91-11-26534870 Email: headq@apeda.com website:www.apeda.com
2. *The MPEDA (Head Office)*  
*3, Thoufeeq Complex, Ravipuram,*  
*M.G.Road, Cochin-682 016.*  
*Tel : +91 484 350562 / 350518*  
*Telex : 0885 6657. MPDA IN*  
*Cable : MARINEAUTHORITY*
3. National Fisheries Development Board  
Department of Animal Husbandry, Dairying & Fisheries  
Ministry of Agriculture, Government of India  
Blocks 401-402, Maitri Vihar, HUDA Commercial Complex, Ameerpet,  
Hyderabad-500038 Tel: +91-40-23737207 Fax: +91-40-23737208  
Website: www.nfdb.org.in
4. **ISO General Secretariat**  
*International Organization for Standardization (ISO)*  
*1, ch. de la Voie-Creuse,*  
*Case postale 56*  
*CH-1211 Geneva 20, Switzerland*  
*Telephone +41 22 749 01 11*  
*Fax +41 22 733 34 30*
5. **Addresses of these four quarantine stations**  
  
**Delhi:** Regional Officer (NR), Animal Quarantine and Certification Service Station, Government of India, Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries, Kapashera (crossing), New Delhi – 110 001. Gram: ANIQUAR NEW DELHI Tel: 011 – 25063272 FAX: 011 25060647  
  
**Kolkata** Regional Officer (ER), Animal Quarantine and Certification Service Station, Government of India, Ministry of Agriculture, Department of Animal Husbandry and Dairying, Vill: Narayanpur, P.O. R-Gopalpur, Dist: North 24 Parganas, West Bengal – 743 5  
Gram: ANIQUARCER – Cal – 700 052 Telefax: 033 25739777  
  
Airport Office: CALTEX Building, NSC Bose International Airport, Kolkata – 700 052, West Bengal: Tel 033 25119418; Fax: 033 25119418  
  
**Mumbai:** Quarantine Officer (WR), Animal Quarantine and Certification Service Station, Government of India, Ministry of Agriculture, Department of Animal Husbandry and Dairying, Kopar Khairane, Sector – 11, Navi Mumbai – 400 709 Tel: 022 27630021 Fax: 022 27630021

Airport Office: Cargo Terminal Building, Phase I, Chatrapati Shivaji International Airport, Sahar, Mumbai – 400 099; Gram: QUARCERT, MUMBAI – 99 Tel: 022 26828194

**Chennai** Quarantine Officer (SR), Animal Quarantine and Certification Service Station, Government of India, Ministry of Agriculture, Department of Animal Husbandry & Dairying, Valachery Main Road, Pallikaranai, Chennai – 601302. Gram: ANIQUAR, CHENNAI, Tel: 044 – 22460659, Fax: 044 22460659