

## STANDARDS FOR FOOD CONTAMINANTS

C. D. R. A. JAYAWARDENE

*Deputy Director General, Sri Lanka Standards Institute.*

*Member, Food Advisory Committee, Food Authority.*

### INTRODUCTION

Standardization is considered as one of the most important infrastructure facilities available for the planned economic development of a country. For over 20 years, the Sri Lanka Standards Institution (SLSI) has been playing a vital role in the standardization movement in our country. Its activities include formulation of National Standards and promoting their use by governmental agencies, Industry and Trade.

A 'Standard' is defined by the International Organization for Standardization (ISO) as a technical document prescribing a set of conditions to be fulfilled by a product or a process, drawn up with the consensus or general approval of all interested parties affected by it. It is based on the consolidated results of science and technology and experience and is aimed at the promotion of optimum community benefits. It should be approved by a recognized standardising body.

SLSI which is the National Standards Organization of the country was first incorporated by the Bureau of Ceylon Standards (BCS) Act No. 38 of 1964 under the then Ministry of Industries. The powers, duties and the functions of the earlier B.C.S. were widened with the establishment of the new Act, namely the Sri Lanka Standards Institution Act No. 6 of 1984, to enable the institution to better achieve the objectives for which it was originally established.

The general objectives of the institution are:

- (a) to prepare standards on National and International basis related to structures, commodities, products, materials, practices and operations and from time to time revise alter and amend the same and promote the general adoption of such standards;
- (b) to promote standardization and quality control in industry and commerce;
- (c) to establish and maintain Laboratories, Libraries and provide relevant facilities for the purpose of furthering the practicing of standardization and quality control in Sri Lanka.
- (d) to make arrangements or provide facilities for the examination and testing of products, commodities and materials, including food and drugs, locally manufactured or imported in order to determine whether they comply with the Code of Intellectual Property Act No. 52 of 1979, or otherwise as well as the examination of processes and practices used in the manufacture of locally produced products, commodities and materials.
- (e) to make arrangements or provide facilities for the testing and calibration of precision instruments gauges and scientific apparatus, and for the issue of certificates in regard thereto so as to comply with the required standards;
- (f) to provide or arrange facilities for undertaking research in connection with standardization and quality control;

- (g) to operate a certification marks scheme in accordance with the relevant provision of these Acts;
- (h) to certify the quality of commodities, materials, produce products and other things whether for local consumption or export;
- (i) to encourage and promote standardization and quality control by educational, consultancy and other means;
- (j) to provide for co-operation with any person, association or organization outside Sri Lanka, having objectives similar to those for which the Institution is established;
- (k) to co-ordinate the efforts of producers and users for the improvement of commodities, materials, products, appliances, processes and methods.

The Institution has already formulated more than 750 National Standards. These standards can be broadly classified in to the following fields.

|                                                       |     |
|-------------------------------------------------------|-----|
| Agricultural and Food standards                       | 201 |
| Chemical Standards                                    | 218 |
| Textiles Standards                                    | 133 |
| Engineering Standards (Civil, Electrical, Mechanical) | 262 |

The implementation programme of the SLSI consists of regular monitoring of the quality of consumer and Industrial products to assess whether the manufacturers and importers comply with the relevant standards.

The institution also take steps to promote the use of standards among manufacturers, traders and consumers by organising conferences and seminars to explain the contents of the standards and the benefits that would accrue to them by using these standards. These conferences are also useful to get a feed-back from the users of standards so that these standards could be made more acceptable and up to date. The institution adopts the following strategies to protect the local consumers and to safeguard the image of Sri Lanka produce in international markets.

- (a) Compulsory pre-export quality Inspection scheme,
- (b) Certification Marking Scheme,
- (c) Compulsory Import Inspection Scheme.

The mandatory Pre-export Certification Scheme launched in 1974 assumes great significance as a part of the implementation strategy. This scheme precludes the export of designated commodities without a certificate of quality issued by the SLSI. This scheme commenced with the inspection of spices such as Cloves, Nutmeg, Cardamoms, Pepper and later extended to Sesame seeds and Cashew Kernels and Coffee Beans. Over the past 12 years export of these commodities have gained a good reputation in the overseas markets and the number of trade complaints have been reduced considerably.

The Sri Lanka Standards Institution also launched a Certification Marking Scheme on a voluntary basis in 1980, where licences are issued to manufacturers who have proved capability to adhere to the relevant Sri Lanka Standards to use the SLS Quality Symbol on their products. Since the issue of the first Mark in July 1980, 149 permits covering 23 different products and 25 manufacturing units have been issued.

Poor response for voluntary Certification and the absence of a firm commitment from the manufacturers to produce quality goods necessitated the Institution to commence a movement for greater product safety.

Even though the Sri Lanka Standards Institution Act No. 6 of 1984 provided wider powers to cover products under compulsory certification, the powers under this Act were not recommended due to various reasons. However, the Import Control Act and the Consumer Protection Act have been used to prevent the importation and sale of 8 designated products which do not conform to the Sri Lanka Standards with effect from 1986-06-01. Since the commencement of this scheme 342 import notifications were studied. With respect to canned fish, 89 consignments were subjected to sampling out of which 8 samples did not meet the requirements of the Standard. Eight consignments failed on drained mass, 8 on marking and 6 on microbiological requirements. 133 import notifications were received for electrical items and 109 consignments have been examined out of which only 2 failed to conform to the Sri Lanka Standard.

Statistics of the Import Inspection Scheme for the Period 86-06-01 to 86-11-01

|                     | Import Notifica-<br>tions Studied | No. of Consign-<br>ments Inspected | No. of<br>Rejected |
|---------------------|-----------------------------------|------------------------------------|--------------------|
| Food Products       |                                   |                                    |                    |
| 1. Canned Fish      | 206                               | 89                                 | 08                 |
| 2. Condensed Milk   | —                                 | —                                  | —                  |
| 3. Cordials         | 03                                | 03                                 | —                  |
| Electrical Products | 133                               | 109                                | 02                 |
| Total               | 342                               | 201                                | 10                 |

### Standardization in the Field of Food Products

From the inception of the SLSI, standardization in the field of food and agricultural products received the highest attention of the Institute. In spite of the fact of there being a separate authority responsible for food standards and for food control activities in the country, the SLSI thought it necessary to prepare standards for Food products and promote them in Industry and Trade for the following reasons.

The standards prepared under the Food Act were minimum standards mainly intended to safeguard the health and safety aspects of the consumer. Those standards do not specify the type of test methods to be used or the sampling procedures. The analysts very often used their discretion in selecting the test methods and interpreting the results. On the other hand standards prepared by the SLSI will have more stringent quality requirements in addition to the minimum standards specified under the Food Act. Detailed sampling procedures, test methods, are also laid down for the purpose of comparison of test results between laboratories and for arbitration purposes.

The procedures adopted for formulation of standards is also different in both cases. Under the Food Act, standards are prepared by members of the Food Advisory Committee comprising of government officials who are experts in the field of Food Science and Technology. Hardly any

representation is made by the Food Industry, Trade or the consumer when establishing these standards. SLSI on the other hand invites the participation of all interested parties when standards for different items are prepared. The drafting committee consisting of manufacturers, consumers, traders, scientists and technologists and regulatory bodies, first studies various aspects of the standards under formulation before they are circulated for public comments for a period of one month. After the public circulation stage the draft standard is once again reviewed by the committee in the light of the comments received and it is then submitted to the Agricultural and Food products Divisional Committee for their approval. The Divisional Committee comprises of senior officials of both public and private sector who are knowledgeable in the field of food science and technology. The draft approved by the divisional committee is then placed before the council of the SLSI for its ratification as a national standard. These standards prepared by the SLSI are always subject to review and revision and they could be changed without much inconvenience to the users. On the contrary some of the standards prepared under the 1947 Food Act are still in use. However, these are now being reviewed by the Food Advisory Committee under the new Food Law. The recently concluded National workshop on Food control activities in Sri Lanka attended by nearly 200 delegates from various government and private sector organizations has decided that the food law in the future

# SOME COMMON CONTAMINANTS SPECIFIED IN SRI LANKA STANDARDS

| Standard                             | Acid insoluble ash | As     | Pb     | Fl      | Zn      | Sn       | Hg     | Cu      | dirt, grit or foreign matter | Cd     | Fe      |
|--------------------------------------|--------------------|--------|--------|---------|---------|----------|--------|---------|------------------------------|--------|---------|
| 1. Baking Powder                     |                    | 1.0ppm | 2.0ppm | 15.0ppm |         |          |        |         |                              |        |         |
| 2. Canned Fish                       |                    | 1.0ppm | 5.0ppm |         | 50.0ppm | 250.0ppm | 0.5ppm |         |                              |        |         |
| 3. Mango Chutney                     | 0.5% m/m           | 1.0ppm | 2.0ppm |         | 50.0ppm | 250.0ppm |        |         | should be free               |        |         |
| 4. Beer                              |                    | 0.5ppm | 0.2ppm |         |         | 250.0ppm |        | 2.0ppm  |                              |        |         |
| 5. Cocoa Powder                      | 0.5% m/m           | 1.0ppm | 5.0ppm |         | 50.0ppm |          |        | 70.0ppm |                              | 0.1ppm |         |
| 6. Ice Cream                         |                    | 0.5ppm | 1.0ppm |         | 10.0ppm |          |        | 20.0ppm |                              | 0.1ppm |         |
| 7. Margarine                         |                    | 0.1ppm | 0.1ppm |         |         |          |        | 0.1ppm  |                              | 0.1ppm | 1.5ppm  |
| 8. Vinegar                           |                    | 1.0ppm | 1.0ppm |         | 10.0ppm |          |        | 10.0ppm |                              |        | 30.0ppm |
| 9. Chocolate                         |                    | 1.0ppm | 2.0ppm |         | 20.0ppm |          |        | 10.0ppm |                              | 0.1ppm |         |
| 10. Jams, Jellies, Marmalades        |                    | 1.0ppm | 2.0ppm |         | 20.0ppm | 250.0ppm |        | 20.0ppm |                              | 0.1ppm |         |
| 11. Squashes, Cordials, Fruit Syrups |                    | 1.0ppm | 2.0ppm |         |         | 250.0ppm |        | 20.0ppm |                              |        |         |
| 12. Tomato Juice                     |                    | 0.2ppm | 0.5ppm |         | 5.0ppm  | 250.0ppm |        | 5.0ppm  |                              | 0.1ppm |         |
| 13. Fruit Juice                      |                    | 1.0ppm | 2.0ppm |         | 20.0ppm | 250.0ppm |        | 30.0ppm |                              | 0.1ppm |         |
| 14. Synthetic Syrups & Cordials      |                    | 1.0ppm | 2.0ppm |         | 20.0ppm | 250.0ppm |        | 20.0ppm | should be free               | 0.1ppm |         |
| 15. Tomato Sauce                     |                    | 1.0ppm | 2.0ppm |         | 20.0ppm | 250.0ppm |        | 20.0ppm |                              | 0.1ppm |         |
| 16. Pickles                          |                    | 1.0ppm | 2.0    |         | 50.0    | 250.0    |        | 20.0    |                              |        |         |
| 17. Canned Mango                     |                    | 1.0%   | 2.0%   |         | 20.0%   | 250.0%   |        | 20.0%   |                              | 0.1%   |         |
| 18. Papadam                          | 0.5%               |        |        |         |         |          |        |         |                              |        |         |
| 19. Jaggery                          | 0.5%               | 0.5    | 1.0    |         |         |          |        | 5.0     |                              |        |         |
| 20. Lozenges                         | 0.2%               | 1.0    | 2.0    |         | 5.0     |          |        | 5.0     |                              |        |         |

should as far as possible refer to the standards prepared by the SLSI, instead of drawing up separate standards.

This will not only reduce the burden on the food advisory committee with respect to preparation of food standards but also will avoid duplication of efforts by both agencies and eliminate dual standards for food products in the country.

#### Standards for Food Contaminants

The following are some of the Food Contaminants specified in the SLSI standards.

1. Acid Insoluble Ash,
2. Admixture,
3. Foreign matter,
4. Residual Antibiotics,
5. Pesticide residues,
6. Metallic Contaminants

Arsenic,  
Lead,

Copper,  
Zinc,  
Tin,  
Cadmium,  
Mercury.

When specifying standards for contaminants the SLSI adopts the following procedures:

- (a) They should meet the minimum standards stipulated in the Food Law.
- (b) If it is an item meant for export, the specifications in major buying countries are taken into consideration.
- (c) In the absence of (a) and (b) the limits specified in the recognised International Standards such as codex standards are taken into consideration.
- (d) When specifying limits for contaminants which are non-hazardous but only contribute towards the poor quality of the products, the SLSI gives consideration to the process capability of local industries and the limits are based on the level of technological development of the Industries.