



Relevance of Quality Standards in Global Marketing of Coconut Products

*Sreekumar Poduval**

Quality standards are of great importance in facilitating both national and international trade. Quality standards simplify industrial transactions and improve international trade relations, which in turn creates a proper environment for trade, thus promoting industrial development.

One of the objective of standardization is to facilitate the movement of materials and products through all stages of production in any industrial activity starting from the raw material to the finished products; then to the dealer and finally to the retailers and consumers. Standards make it possible to carry on trade in an economic and efficient manner for they make possible quantitative measurement, physical and chemical analysis and manufacture of products of constant and uniform quality.

The establishment of standards is a long and tedious process. It involves proposing, devising, discussing, adopting, announcing and revising, in consultation with the trade organizations, processors, government regulatory agencies and consumer groups. The government authorities should carefully weigh the need for and the effect of the particular proposed standards or regulations. Question should be asked whether it promotes improved safety of food, whether it enhances availability of food products and whether it is feasible in terms of both industrial production and enforcement. The answers to the questions may vary from country to country due to differences in agricultural, industrial, marketing, economic or regulatory potentials and resources. In general all countries have the main objective to safeguard the well being of their people with effective food and health laws and regulations. Most countries have a Food Administrative Authority, which is widely recognized for its responsibilities and authority in establishing and enforcing standards of identity for food products.

Issues and problems in coconut products quality

Traditional coconut products such as copra, coconut oil and desiccated coconut rely heavily on international markets for their trade. Similarly new value added coconut products like canned, frozen and spray-dried coconut milk, coconut juice etc are also dependent on foreign market. Quality control problems including the aflatoxin levels in copra and copra meal and the presence of microorganisms in other coconut products resulted in numerous complaints from buyers. Some of the major quality control issues in coconut products are follows.

Aflatoxin in Copra

The aflatoxin problem is one of the serious threats to the coconut industry. Poor quality copra resulting from inadequate drying, improper handling and faulty storage usually favors the growth of aflatoxin by fungi. Based on the characteristics of coconut meat and review of different types of drying methods, the international recommended procedures for producing good quality copra would be as follows:

- (1) The nuts for copra making should be mature. (11-12 month old)
- (2) Drying should be started within 4 hrs from splitting to avoid start of microbial action.
- (3) To avoid case hardening, the temperature of drying should not exceed 60° C during the first 10 hrs and should be about 55° C during the next 14 hrs.
- (4) Copra should be stored with 6% moisture level in well-ventilated areas to prevent mould growth and reduce storage losses.

Microbial contamination of coconut milk products

Coconut milk is an excellent medium for many kinds of microorganisms being rich in moisture, neutral in pH and rich in nutrients. On the other hand, canning

of coconut milk results in coagulation of certain constituents. Due to these technical constraints, coconut milk is favored to be preserved by freezing which requires strict sanitation practices for the safety of the product.

Microbial contamination of Desiccated coconut and other Coconut Convenience foods

In the manufacture of desiccated coconut and other coconut convenience foods, the plant workers must receive extensive training in quality control aspects at every stage of processing in order to control microbial contamination. The packaged DC should be stored in well ventilated warehouses and not shipped until microbiological tests are negative for salmonella. In spite of all these provisions, exported DC is sometimes found to be rancid, discolored and clumped due to lapses in handling, processing and distribution of the product. It is therefore important to observe strict quality control in the raw materials, equipment and storage of finished product in order to produce high quality and safe product. The soapy flavor sometimes found in DC is an important defect and this causes concern among buyers. It is attributable to enzymatic hydrolysis of coconut oil, which results in the release of free fatty acids principally lauric acid which is the source of the soapy flavour. The enzymes responsible for this undesirable reaction are derived from microorganism present in the DC. The soapy flavour is readily apparent at a free fatty acid level of around 0.25 %. The occurrence of this problem in the desiccated coconut can be minimized by ensuring that only good coconuts are preserved and (b) efficient blanching of the kernel to reduce any microbial contamination. Bad odour and a "greasy feel" to the desiccated coconut are usually attributable to insufficient care being observed during transit and storage of desiccated coconut bags. In most of the developing countries, there is a lack of adequate awareness on standards in ensuring good quality and safety. The enforcement agencies are deficient and lack adequate physical and human resources in ensuring the prescribed standards.

Quality Improvement through Food Safety Management System (ISO 22000)

The extent of food safety problem in India due to microbial contamination, natural toxicants and plethora of adulterants is compounded by the widespread

consumption of unsafe street foods, especially in urban areas, unhygienic environment in public catering places, and sometimes improper handling in the household. There have been reports of food contamination from industrial pollutants, non-judicious use of agro-chemicals, mainly pesticides, and use of non-permitted food colors.

The problems of food safety in coconut processing industries in India are enormous. The problems posed during transport of raw material, handling, processing, packaging, and waste disposal are considerable. There have been considerable efforts in improving food safety/quality scenario in the country by many Governmental Agencies. These include grading, certification and inspection measures such as those under AGMARK, BIS, FPO, MMPO, EIC, as well as the developmental activities of agencies like APEDA, MPEDA, Ministry of Food Processing Industries and Commodity Boards. While each one of these operates under its own legislative provisions with a clear objective, they do have a positive impact on food safety and quality, which could be further enhanced through better coordination within an integrated system. Export Inspection Council have already moved from inspection mode to quality assurance including HACCP through out the food chain coupled with appropriate monitoring. There has been a sea change in consumer awareness about food safety and consumer protection issues. Consumers seek competent and reliable source of information about their concerns in this area. They want protection measures to be scientifically based and determined in consultation with all the stakeholders. Consumer organizations give a high priority to systemic change in governmental approach through the establishment of a professionally competent and autonomous food control agency. They demand transparency and accountability in the food control system.

At present there are a number of laws, control orders, legislative and administrative directives at the central and state level, which relate to food safety. It is recognized by all the stakeholders that the current status of food control system is far from satisfactory and it has not succeeded in achieving the objectives set for it. BIS has recently launched Food Safety Management Systems (FSMS) Certification IS/ISO 22000:2005 scheme which envisages grant of FSMS Certification licence to organizations according to IS/

ISO 22000.

Food Safety is related to the presence of food borne hazards in food at the point of consumption. Food reaches to consumers via supply chains that may link many different types of organizations. One weak link can result in unsafe food that is dangerous to health. As food safety hazards can occur in the food chain at any stage, adequate control throughout the supply chain is essential. Therefore food safety is a joint responsibility of all organizations with in the food chain including, producers, manufactures, transport and storage operators, sub contractors, retail and food service outlets and service providers.



Highlights of IS/ISO 22000:2005

- Integrates the principles of Hazards Analysis and Critical Control Point (HACCP) system developed by Codex Alimentarius Commission. It combines the HACCP plan with prerequisite programme (PRPs) and operational PRPs.
- Requires that all Hazards that may be reasonably expected to occur in the food chain are identified, assessed and controlled.
- Can be applied independent of other management system standards or can be integrated with existing other management systems.
- Allows even small, tiny scale organizations to implement as externally developed combination of control measures.
- Intended for organizations seeking more focussed, coherent and integrated food safety management systems.
- Emphasis on preventions of food safety hazards of all types.
- Ensures compliance with legislative and regulatory requirements.
- Provides for management of potential emergency situations and accidents that can impact food safety.

Key elements to ensure food safety

The key elements of FSMS for managing and

reducing the risk to health resulting from operations across the food chain to final consumption are:

Interactive Communication, System Management, Prerequisite Programmes and HACCP Principles.

Benefits to Customers

Increased international acceptance of food products, reduces risk of product/service liability claims, satisfies customer contractual requirements, ensures safety of food products, greater health protection, demonstrates conformance to international standards and applicable regulatory requirements, helps to meet applicable food safety related statutory and regulatory requirements and ensures to compete effectively in national and international markets

Comparison of existing quality standards of Indian coconut products with available international standards

Presently only a few coconut products like copra, coconut oil, desiccated coconut and coconut vinegar are covered under the BIS Agmark and FPO standards. In the present scenario there are a series of value added coconut products launched in the Indian market. The products are virgin coconut oil, packed tender coconut water, coconut milk, coconut milk powder, frozen coconut gratings and other coconut convenience foods. A comparison of the available standards of coconut oil and desiccated coconut in India with the International standards is presented in table 1 and 2.

At present there is a wide variation in the quality parameters for copra, coconut oil, desiccated coconut, virgin coconut oil and other coconut products. In India, presently standards have been developed for only a few coconut products like copra, coconut oil, oil cake, desiccated coconut vinegar by BIS/Agmark/PFA. At the international level, Codex standards have been formulated only for Virgin coconut oil, DC and aqueous coconut products-coconut milk and coconut cream. APCC needs to initiate action in evolving appropriate standards for all the coconut based products which should more or less be in harmony with the prevailing national standards available in coconut producing countries.

The following suggestions could boost the trade of coconut products so as to meet the standards of

the importing countries.

1. Generating significant number of well trained scientists with sufficient knowledge in various aspects of food technology, food nutrition, food safety, laws and standards.
2. Co ordination of agencies involved in food quality, quantity and safety to avoid duplication of functions, thus increasing effectiveness.
3. Establishment of standards that should be precisely standardized carefully by those persons involved in the design, manufacture, distribution and use of the product.
4. Information campaign should be carried out so that the concerned agencies could be informed of the standards and they should be willing to enforce the same.
5. Institutions and laboratories, which are engaged in programmes to ensure food safety, should be adequately equipped to carry out necessary analytical techniques using the most modern up-to-date procedures, conforming to the highest international standards.

Table -II - Quality Standards for Desiccated Coconut

Parameters	BIS	Agmark	Thai Industrial Standards	Sri lankan Standards	Codex Standards
Fat	65% min	68% max-Grade 1 64% max- Grade 11 60% max-Grade 111	60% min	65% min	55% min
Moisture	2.5% max	0.25 max	0.20 max	3.0% max	3.0% max
Ash	2.0% max	2.0% max	-	-	2.5% max
Acid insoluble ash	0.1% max	0.1% max	-	-	-
Free fatty acid (as lauric acid)	0.2 max %	0.25% max	0.3 % max	-	0.3% max
Particle size	1.4-1.0 mm-Grade 1 1.7-1.4 mm -Grade 11 > 1.7 mm- Grade 111	-	2.0-2.35 mm-Coarse 1.4-2.0 mm -Medium < 1.0 mm- Fine	-	0.85 mm-Extra fine 1.4 mm-Fine 2.8 mm Medium

6. Intensive programmes of Health/Nutrition education through schools, primary health centers and media should be undertaken in order to promote hygienic habits with regard to preparation, handling, preservation and storage of foods in households to ensure food safety at the home level.
7. Food safety and nutrition should be an integral part of the national policy on food and nutrition security and continue to receive high visibility and high priority.

Table -I

Quality Standards for Coconut Oil

Parameters	BIS	Agmark	Thai Industrial Standards	Sri Lankan Standards Institute
Acid value	0.25 max	0.5 max	0.6 max	0.4 max
Moisture & Volatile matter	0.1 max	0.25 max	0.20 max	0.40 max
Refractive Index	1.448-1.449	1.4481-1.4491	1.448-1.449	1.448-1.449
Iodine value	7.5-10	7.5-10	7-11	7.5-11
Saponification number	250 min	250 min	248-264	255 min
Unsaponifiable matter	0.5% max	0.5% max	0.5% max	-
Insoluble impurities	--	--	0.05 %	-
Sp Gravity	0.915-0.920	0.915-0.920	0.915-0.927	0.92
Poiencke Value	13.0 min	13.0 min	--	-
Peroxide value	--	--	3.0 milli equiv. oxygen/kg	-
Lead	5 mg/kg	-	1.5 mg/kg	-
Arsenic	0.5 mg/kg	-	0.1 mg/kg	-
Cadmium	1.0 mg/kg	-	-	-
Mercury	0.25 mg/kg	-	-	-

8. Launching of a Food Quality Literacy Movement to cover primary producers, secondary food processors, middlemen, traders and consumers.

For this purpose, appropriate networking and alliances among stakeholders and educational institutions should be promoted.

9. Primary responsibility for ensuring food safety lies with the industry. They need to upgrade their quality control systems, apply HACCP and educate consumers. Unsafe products must be withdrawn from the market and the consumer compensated monetarily either on voluntary basis or through legal action.

* Junior Processing Engineer, CDB, Kochi-11