FOOD QUALITY ASSURANCE FOR CHILDREN AND SPECIFIC DIETARY PURPOSES

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Summary

The foods serving specific dietary purposes form a considerable part of food production, among which dietary foods for medical purposes, baby foods, and low calorie and reduced-calorie foods may be mentioned. Starting in the 1980s in Japan, a new term appeared in food science and later in food production—*functional food*. Functional food is food that claims to be actively health-promoting because it contains specific bioactive components. Functional foods are becoming popular with European consumers, too, and their production is growing not only in Japan and the US but also in Europe.

In the case of such products, quality assurance needs a specified control, starting from raw materials through consumption of finished products. Safety and nutrient composition are the main objects of quality control and inspection. General rules included in legislation of foods are also valid for this group of products. However, the regulations concerning nutrient composition, hygiene, and permitted minimal levels of contaminants are stricter. Because of the high diversity of such types of foods, only some types of products are treated here.

1. Introduction

Many segments of the population have special dietary needs, which exist by reason of age (infants, children, the elderly), physical, physiological, pathological, or other conditions, including disease, convalescence, pregnancy, lactation, allergic hypersensitivity to foods, underweight, or overweight. The foods serving specific dietary purposes form a considerable part of food production, among which may be

mentioned primarily dietary foods for special medical purposes, baby foods, and low-calorie or reduced-calorie foods.

As stated above, the term *functional food* began to be used in the 1980s. As a working definition, a food can be said to be *functional* if it is satisfactorily demonstrated to affect beneficially one or more target functions in the body, beyond adequate nutritional effects, in a way that is relevant to either human well-being and health or the reduction of risk of disease.

Put more simply, food that claims to be actively health promoting because it contains bioactive components, with respect to "traditional food," is called "functional food." Although not a legal term, the functional foods concept is also gaining consumer acceptance in the US. Interest in the health benefits of foods in the US has been sparked by several factors, including health care costs, legislative changes that permit claims and associated components, and an aging population. In the European Union, a research program was launched in 1999 that included functional food science.

Foods for specific dietary purposes, because of special requirements concerning quality needs in addition to generally applied quality and safety controls, require more sophisticated regulation. Concerning nutrient loss of food during processing, it can be mentioned that the importance of such loss depends on the nutritional value of a particular food in the diet. Some foods (for example, bread and milk) are important sources of nutrients for large numbers of people.

Vitamin losses are therefore more significant in these foods than in those that either are eaten in small quantities or have a low concentration of nutrients. In industrialized countries the majority of the population achieves an adequate supply of nutrients from the mixture of foods eaten. Losses attributed to the processing of one component of the diet are therefore not as important with regard to the long-term health of an individual in that situation.

However, the situation is quite different for groups with special dietary needs, such as infants, children, and pregnant women, and so on. In these groups there may be either a special need for certain nutrients or a more restricted diet than normal.

Quality assurance in the case of such products needs a specified complex control, starting with raw materials and ending with control of finished goods. Among the requirements to be met, safety and nutritive value are the most important. Concerning the safety of raw materials, the general rules included in legislation are valid also for the ingredients of foods destined for children or special dietary purposes.

However, in addition to the general rules, specific demands should be kept in mind by establishing the Hazard Analysis and Critical Control Point (HACCP) system in production control. In the framework of this chapter, some specific aspects of legislation and quality assurance of products will be treated. Because of the high diversity of products belonging to this group, a full overview is not possible; only some types of products will be treated.

2. General Issues about Special Foods

Foods for special dietary purposes should fulfill all requirements prescribed for common food products. For quality assurance control, appropriate methods included in other chapters dealing with food quality should be used (see *Food Quality and Assurance, Quality Control of Raw Materials*, *In-Process Quality Control*, and *Quality Control of Finished Products*). However, in addition to generally applied quality control, specific requirements are included in regulations and/or standards.

These specific requirements are primarily connected with the essential composition of such types of foods, with safety, and with labeling (information given to the consumer). Concerning nutritional quality, a more detailed regulation is needed for special foods, for example, in addition to the main nutrients (proteins, carbohydrates, and fats), the vitamin and trace element content, the presence of nonnutritive but biologically active ingredients, the origin of protein components, and so on.

The regulations prescribe the minimum level or range of nutrient composition appropriate for the given class of foods for special dietary purposes.

Standards and regulations concerning the safety of this group of foods are generally strict. A stricter selection of raw materials and a high level of sanitation are needed in comparison with production conditions of other foods, e.g., generally processing of other foods in the area of baby food production is not permitted.

Concerning contaminants, lower permitted levels should be prescribed, or total absence should be required of some contaminants, including biological ones. In addition to standard nutritional labeling and other common information (e.g., suggested recipes, storage and cooking instructions and recommendations), the label must contain a description of the dietary properties in a prescribed manner, to inform the purchasers fully as to the product's value.

The label may include statements concerning nutritional and health claims. It is generally agreed that such claims should be demonstrated scientifically. In many countries there are limitations concerning such claims—in the US, the label of a special dietary food is specifically prohibited from:

- any claim that products intended to supplement diets are sufficient in themselves to prevent or treat disease(s)
- any implication that a diet of ordinary food cannot supply adequate nutrients
- all claims that an inadequate or insufficient diet is due to the soil in which food is grown
- nutritional claims for nonnutritive ingredients

The FDA has promulgated specific regulations related to the label statements for hypoallergenic foods, infant foods, foods relating to body weight modification, foods for diabetes, and foods regulating sodium intake.

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Bibliography

Barness, L.A. and McLeish, D. (1991) Feeding the Term Infant. *Clinical Nutrition of the Young Child* **Vol. 2**. New York: Nestec Ltd., Vevey/Raven Press Ltd.

European Community (1999). *EC Directive 21*.British Journal of Nutrition. Functional Food Science in Europe. *British Journal of Nutrition* **80**, Supplement 1, 1–193.

Hu Y.H. (1984). *United States Food Laws, Regulations, and Standards*, Vol. I–II. New York: John Wiley and Sons. [A good review of US food legislation and agencies involved in food control.]

Lásztity R., Pfannhauser W., Sarkadi L. and Tömösközi S., eds. (1999). Functional Foods—A New Challenge for the Food Chemists. Budapest: TU B Publ. [Proceedings of an international conference with papers of internationally known experts related to production, quality control, and regulation of functional foods.]

(US) National Academy of Sciences. (1974). *Proposed Fortification Policy for Cereal-Grain Products*. Washington, DC: National Academy of Sciences.

Biographical Sketch

N. C.-Lásztity is a Ph.D. student at the Hungarian National Institute of Nutrition in the laboratory of Professor Dr. Magda Antal. She received her M.Sc. degree from the University of Belgrade (Faculty of Medicine) in 1990. Dr. Lásztity worked until 1997 in the Pediatric Clinic of Semmelweis University of Medical Sciences in Budapest, and obtained a degree as a specialist in pediatrics. She has published several papers in scientific journals, mainly in the field of nutrition. She has also participated in several national and international scientific events. Her present major interest is enteral and parenteral nutrition.