JUDGING OF DAIRY PRODUCTS

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Module 1. Sensory evaluation, importance and terminology

Lesson 1
INTRODUCTION, DEFINITION, IMPORTANCE AND APPLICATION OF SENSORY EVALUATION IN RELATION TO CONSUMER ACCEPTABILITY AND ECONOMIC ASPECTS

1.1 Introduction

The sensory quality of food products has been considered an important factor since the beginning of the food industrialization process due to its influence on the overall quality of the product. Quality, in terms of sensory properties, is related to the adequate levels of sensory attributes considering the appearance, aroma, flavor, and texture

Sensory analysis is used to characterize and measure sensory attributes of products. Sensory Analysis is the description and scientific measurement of the attributes of a product perceived by the senses: sight, sound, smell, taste and touch. By understanding sensory data, one can offer food-product development guidelines as to which property should be emphasized when making product-development decisions. This decision process includes processing ingredient and economic considerations. Not merely food "tasting" it can involve describing food color as well as texture, flavor, aftertaste, aroma, tactile response, and even auditory response. Sometimes sensory analysis is used interchangeably with sensory evaluation.

Sensory analysis is a natural science. The measurements of sensory characteristics of foods should be taken carefully. When done properly, sensory information can provide great insight into the world. When measures are undertaken poorly they do more to mislead than to inform. Careful controls must be implemented and followed when conducting sensory analysis, including (1) neutrality in the presentation of samples, (2) elimination of response bias, and (3) use of methods that require panelists to demonstrate their ability rather than relying upon self-reports. Failure to adhere to any of these controls diminishes the value of the resulting sensory data. By contrast, determining appropriate controls and ensuring they are in place will result in reliable and useful information about foods which no instrument can measure i.e. their eating quality.

1.2 Definition

Sensory Evaluation has been defined as "A scientific discipline used to evoke, measure, analyze and interpret reactions to those properties of foods and materials as they are perceived by senses of sight, smell, taste, touch, and hearing." Four variables affect sensory evaluation: the food, the people and the testing environment and test methods used.

1.3 Objectives

Different components which form a foundation for an effective sensory evaluation programme are approved goals and objective, well defined programme strategy, professional staff, suitable test facilities and qualified test subject. The objectives of sensory evaluation are as under:

1. To study the sensory evaluation of dairy products for use of research.

2. To provide useful and timely information and recommendation about sensory evaluation of the dairy products.

3. To develop methods and procedure relating sensory and analytical information for use in research, quality control and quality assurance.

4. To demonstrate the methods used for sensory evaluation of dairy products.

5. To describe correct procedures for sensory evaluation of dairy products.

6. To maintain awareness of new product development in product evaluation and their application.

7. To find out most cost effective and efficient method to obtain most sensory information.

1.4 Importance

The role of sensory evaluation is to provide valid and reliable information to the research department, production and marketing in order for management to make sound business decisions about the perceived sensory properties of the product. Cost saving may be realized by correlating sensory properties with instrumental, physical or chemical analysis. Moreover, following points are equally important in sensory evaluation:

1 Man has well-developed like and dislikes for dairy products depending on their

palatability.

2 Sensory evaluation will become paramount importance with increasing consumer awareness towards nutrition and quality.

3 Sensory evaluation assists in measuring the eating qualities of any food.

4 Optimal information can be obtained only through co-ordination of instrumental and sensory measurements.

5 Where no signal appears our senses may still perceive an odour or taste.

6 Senses give us a total impression of quality.

Sensory evaluation provides unique information that has significant importance/value in the market place. Successfulness of sensory programme will depend on the involvement of individuals, the sensory professionals and their ability to make meaningful contribution to the decision making process.

1.5. Applications

Sensory analysis gives answers to the following three questions

- What does the product taste like?
- What are its sensory characteristics?
- How does a change in production, packaging or storage affect sensory characteristics

Sensory evaluation can be applied in the following areas in dairy industry

- Companies can compare a competitor's product.
- Improve products by modifying or changing the ingredients.
- Check that the specification is being met.
- Monitor quality control by checking regular samples against specification.
- Detect differences between products from different runs or batches.
- Profile the characteristics of new products.
- Describe specific characteristics of the product.

- Demonstrate new products to marketing team.
- Promote new or reformulated products to consumers.

Advantages

- Helps manufacturers, scientists, food technologists etc. to gain a clear perception of what ordinary consumers may experience.
- Measures the overall impression of the product i.e. eating quality when consumed.
- Sensory panel testing can be much more rapid than most non-sensory methods.
- Uses more than one sense, making them more flexible instruments.
- Can be very sensitive and good at detecting minute differences in product characteristics.

Disadvantages

- Sensory panelists can become fatigued with the entire process of testing and assessing descriptive data.
- Assessors may be subject to biases e.g. from loss of interest or from distractions.
- To ensure precision in the analysis and interpretation of the descriptive data and for statistical analysis, several assessors may be required, making it an expensive proposition.
- The entire process of recruiting and training sensory panelists can be a time-consuming and costly process.
- It may not be easy to replace assessors quickly, as the incoming assessor will have to be given intensive training to develop requisite expertise of the job.
- The sensory panel method can be more expensive than some non-sensory methods.
- The panelists may not be good at quantifying perceptions.
- Interpretation of results may get problematic and be open to dispute.

1.6 Sensory Evaluation of Dairy Products

One of the earliest users of sensory analysis was the dairy industry. Dairy product sensory evaluation includes the critical examination and interpretation of important sensory attributes of the given product. In the early 1900s, techniques for judging dairy products

were developed to stimulate interest and educate people in dairy science.

Three different methods are available for tracing causes of sensory defects in dairy foods: (1) chemical procedures; (2) microbiological tests; and (3) sensory evaluation. The simplest, most rapid and direct approach is sensory evaluation. A food technologist trained and experienced in flavor evaluation of dairy products has an ‘‘edge’’ over someone who is competent only in performing chemical and/or microbiological methods of product analysis. Correct diagnosis of the type and cause(s) of sensory defects is a prerequisite to application of remedial measures in production, processing and distribution stages. For dairy processors, the most important requirement of a comprehensive quality assurance program is careful and competent flavor evaluation of all dairy ingredients. Based upon sensory judgments, occasionally some milk, cream or other dairy ingredients may merit rejection. An important truism of the dairy industry is dairy products quality can be only as good as the raw materials from which they are made.

Judging and grading dairy products normally involve assigning quality scores to products by one or two trained “experts”. Attributes scored include appearance, flavor, and texture, based on the presence or absence of predetermined defects. This approach has provided the dairy industry with a body of knowledge on sensory defects and their causes, and although these traditional methods are valuable for rapid product quality assessment in a hectic industrial setting, they are, in general, not useful for product innovation and development of new products that meet consumer acceptance.

Bureau of Indian Standards has specified guidelines for judging & grading of some dairy products. The sensory evaluation of dairy products has become an important research component in the development of new products and process.

1.7 Sensory Attributes of Food Products

Food products are developed, produced, and marketed to appeal to the consumer, who is becoming more and more demanding about quality. The perception of food quality is changing rapidly, which highlights the need for food producers to be innovative as a way to survive. In other words, the success of a product depends on its acceptance by consumers, because they are the ultimate users of the product and thus, the ones who will be willing to purchase the product. Therefore, professionals in various industries are eager to understand consumer perceptions and attitudes toward a new product, a formulation change, or a new process. If a product is not liked by consumers, the research or manufacturing project is considered to be a failure.

The sensory attributes of food products can be either intrinsic or extrinsic. Intrinsic attributes are concrete product characteristics that can be perceived by a consumer and, in many situations, can serve as a quality cue that can be observed, without actual

consumption or use. It is related to the appearance, color, shape, size, and structure, all of them extremely important for milk products. Intrinsic attributes are always related to the physical aspects of the product. Extrinsic quality cues refer to product characteristics that are used to evaluate a product but are not physically part of it, such as price, brand, production and nutritional information packaging design, country of origin, store, and convenience (Table 1.1). Extrinsic cues become more important when products are very similar in appearance. The intrinsic and extrinsic cues are categorized and integrated by consumers to establish the quality attributes of a food product.

Table 1.1 Intrinsic and extrinsic sensory attributes of food products

Intrinsic	**Extrinsic**
Appearance	Price
Color	Brand name and familiarity
Shape	Label (packaging design)
Size	Advertisement
Structure	Nutritional information
Aroma	Production information (environment, organic)
Taste	Origin (country)
	Store name Convenience

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