

FOOD CEMISTRY II- UNIT VI- NEW PRODUCT DEVELOPMENT

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Dear Students, I welcome you all for our lecture series on FOOD TECHNOLOGY. In today's lecture, let's make an attempt to know about '**New Product Development**'.

Introduction

Product development process is one of the major activities of food industries/companies since decades, which have recently evolved as a strategic business area using advanced technology. The need of new products by the consumers drives for development of new products or modifying an existing product to show a difference. Generally food is known as a material that consumed by humans for fulfillment of physiological and psychological needs. However, based on the perspective of the company or the consumer, the meaning changes. The company defines food as being a primary food ingredient which is packaged, priced, branded and advertised as a product whereas the consumer looks at food products as a product with benefits in tangible and intangible aspects based on their need. In terms of the current global market, innovation in food products is a necessity. Development of new products requires skilled staff, extensive research, facilities, and money. The product development is part of the business plan as well as research methods conducted in the food industry.

The following aspects will be covered in this chapter:-

1. Definition and types of new products
2. Need for product development and its importance
3. Steps of product development
4. Product development tools
5. Reasons for failure

1. Definition and types of new products

The food business is one of the largest businesses in the world. In order to be profitable and survive in the field of food product business, companies are constantly seeking new food products. The product and process development is considered as a vital part of the business strategy. New products are designed with an intention to make it a successful product by replacing the old ones. The company in order to be successful needs to use the old products and find new uses for them or design a new product in order to maintain continuous growth and profitability.

Product development is a systematic, commercially oriented research to develop products and processes satisfying an already known or suspected need of a consumer. Product development encompasses the following actions:

- A new product introduced into the marketplace which was not previously manufactured by a company
- The presentation or rebranding of an already existing product by a company in a new form into a market which was not explored previously by the company

Consumer's demands keep changing over time as the food choices and preferences vary. The changes are observed in food related aspects such as improving food safety, shelf life, reducing wastage, foods with improved or specific nutritional value, palatability, and convenience. The whole product development process is driven by the interaction between consumer expectations and demand, capacity of the food producer to comply with the requirements of new product development and emerging knowledge from field of research outputs in food science.

The characteristics of a new food product introduced by a company are as follows:

- ✚ The product has not been manufactured in the company before
- ✚ The product has not been distributed by the company before
- ✚ An old/existing product being introduced into a new area geographically by the company
- ✚ An old product introduced in a new form or package or with a new label
- ✚ An old product introduced into a new market positioned as one with a new function

Now let's learn about the different classes or types of new food products and their characteristics one by one.

Line Extensions—A line extension is a variant of the already existing line of food products. Such products require minimum time during the phase of research for their development. They do not require new raw materials, processing equipment, storage or handling techniques for their production. An example can be new flavors for a snack product such as potato chips and soft drinks.

Repositioned existing products—These are existing products for which a new use has been discovered with an intention to increase sales. Such products give new life to an existing product. Rebranding and extensive marketing promotion may be necessary for such products. Ex: Products containing oat meal positioned as functional foods in reducing cholesterol.

New form or size of existing product—These are products which have taken a new form. The development of these products involves extensive developmental time and expertise, manufacturing process and equipment and change in packaging and distribution system. Ex: Instant coffees, teas, and flavored coffees.

Reformulation of existing product- These are existing products reformulated to improve their characteristics such as color, flavor, stability, appeal and functional characteristics. Such products may contain new ingredients also. Ex: Low calorie (reduced sugar, fat) containing products, fibre biscuits etc.

Repackaging of existing product- These products have new packaging applied with an aim to increase its shelf life, ease of distributing properties.Ex: Squeeze bottles for condiment sauces, sachets, smaller size, tetra packs etc.

Innovative products- These products are produced based on the outcomes of changes made in already existing products other than those described earlier. The degree of innovation decides the time, costs involved and extensive marketing required. Ex: Canned snack food dips.

Creative products- These products will be first of their kind in the market which have not been in existence. These products require extensive development time, marketing, expensive equipment and processes thus are costly and possess high risks of failure. If successful, they result in considerable profits to the company. Ex: Extruded products, Ready to eat snacks etc.

2. Need for product development and its importance

There are two important reasons for the new food product development. Firstly, very few products last forever which needs to be replaced or rebranded into something completely new. Secondly, successful new products contribute enormously to a company's continuing profit. Broadly a company decides to develop new product because of the following reasons-

Consumer demand - The "needs and wants" of the consumers keeps on changing. The consumers today look for products which are healthy, easy to prepare, natural, tasty, safe and cost effective. The companies should respond to these changes through their products and services, which otherwise would lead to loss of the consumers to competitors products.

Technological advancements- Advances in technology in the field of agriculture, processing, handling, storage and nutrition have given rise to techniques for developing foods which are safe and possess extended shelf life. The implementation of such techniques leads to the development of a new product

Product life cycle- The life of a product in market starts from introduction (birth) and ends into withdrawal (death). The product may be at the end of its product life cycle thus the company would intend to introduce new and improved form of these products.

Changes in government policy -The business activities of the companies are influenced by the formulation and implementation of law and regulations by the governments which keep on changing with a view to protect the consumer.

Growth of a company -All companies like to grow and increase their profits by the introduction of new foods or modifications in existing products to satisfy the needs of the consumer. The new product development is required when a company has the following objectives:-

- To increase the product range available to customers or to enter into a new segment in the market
- To enter into a new segment or subsegments
- To increase the profitability
- To increase the customers preferring their products
- To overcome the effects of failure of another product

3. Steps in new product development

Development of a new strategy or plan involves the use of three key elements namely thinking skills, analysis and synthesis. The basic elements of a strategy for a company are the

market, stakeholders, capacity and capability. Factors that influence the strategy are size of the company, management, market type, resources available (financial, technology, skills, human etc), influence of the channels used for distribution, supermarket chains and level of competition for the products. The new food product development can be divided into several stages and sub stages with an attempt to understand the process. The process is divided into the following four major categories as described by Earle (1997).

1. Product strategy and planning
2. Creation, design and development of a product
3. Development of programs for marketing, production, and quality assurance
4. Optimization of production and distribution for the launch and analysis of the post data

The details of each of these stages vary as per the food product but each stage has activities that lead to outcomes based on which decision by the management of the company is made. The process is dependent on the critical 'go or no-go' decisions that must be made by management between two stages.

In the first stage, steps are taken to ensure the connections of the product development process to the company's research development. The inventions and ideas that arise from the researchers' based on scientific interpretations of advances in the field of food science are a separate stage by themselves yet the outcomes are implemented into the business strategy. The research is conducted strategically in this stage. In case of insufficient knowledge about the consumer, market of the intended product, research is conducted. A product development team will take the concept and work on it to convert it into ideas for new products. It is necessary to perform analyses to identify current market trends and available solutions, to understand the behavior and needs of a consumer and to identify areas

of opportunity for development of a new product. Broadly the activities involved are development of business strategy, analysis of the consumer, market and advances in technology as well as marketing and technological requirements. At the end of this stage decision is taken by the top management must about the implementation of the business strategy, the financial aspects and time to be invested in the process.

The second stage of creation, design and development has application of various techniques and coordination of the research. It is an important stage because it decides the uniqueness of the product which is a key element in the product development success. The variations arise due to the development of many quantitative measuring techniques for assessment of the consumer needs and technicality of the product. The use of concepts on engineering from other industries in the food industry has a major impact at this stage. Broadly this stage involves setting up a new project, creation and screening of ideas, engineering and design of the product and design of the process. At the end of this stage the management evaluates the probability of success of the product in the market, the time and costs required for further steps in the project and the harmony of the process with the business strategy developed earlier.

In the third stage there are two activities namely business analysis and marketing of the product. The expenditure in terms of cost increases due to the finance, personnel and time employed. Business analysis is essential for the decision making before launching. When there is lack of control at this stage product failures can occur. This stage defines the measures for success and failure. Broadly this stage involves testing of the product, analysis of hazards and setting up control points, development of management plan for the process, study of market and financial analysis. At the end of this third stage the management gets a clear idea of the feasibility of the production process, the usability of the strategy and other resources required

for the next stage. The management can also predict the returns on the investment and decide whether to go on or to stop at this point to avoid the large expenditure in the next stage.

In the fourth and final stage, the management sets standards against which the decision to judge the launch of the product takes place. This also involves consideration of the reaction of a competitor in planning the strategy. Decisions are also taken with respect to development of future products in the same line or a re-launch with improvements or a reduction in the initial price owing to increasing efficiency of production. Monitoring of the environment, competition, social and economic changes is a necessity. Broadly this stage involves launch of the product, study of quality and efficiency of production process, study of consumer behavior toward the product. Thus the launch of a product is not the end but a beginning of a new process with initiation of successful mechanisms which also requires future planning.

The process discussed above is intended for the development and introduction of a major new product. This process can have variations based on the other types of products such as a line extension or a re-launch where many of the steps may be omitted as the knowledge will already be there with the company.

4. Product development tools

Let's study some of the tools used in managing the process of product development one by one.

5.1 Tools in the product designing such as 3 dimensional modeling software which can describe the exterior and interior of the product in three dimensions; Rapid-prototyping which can test new design concepts by developing them into models using plastic materials; Collaborative design tools which use an intranet or the Internet facilitating the design simultaneously by many people.

5.2 SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) is a structured planning method used to understand the weaknesses, strengths, opportunities and threats for the product thus helping to craft a strategy that can distinguish a company from its competitors.

5.3 Market segmentation, targeting and positioning is a strategic approach used in product development process. This involves identification of slots in market with specific needs, to find new customers and to deliver focused and effective marketing messages. Targeting is the process of identifying the most attractive segments from the segmentation phase usually considering the profitable areas. Positioning is the final process which is business-orientated involving assessment of the competitive advantage and position in the consumer's minds so that the product becomes more attractive.

5.4 Product development charter is a tool used to establish a clear scope of the project, communicating the proposed details of the plan and to allocate resources.

5.5 Product sanity check is a tool used for arriving at a common decision on the product development process starting from market requirements, product requirements, product development checkpoints.

5.6 Product launch checklist is a tool used to organize and standardize the process of overall product launch.

5. Reasons for failure

The risk of failure of a product is high for a food company due to the higher level of competition right from the domestic and global food companies. The risk is generated because their existing products are prone to changing customer needs, shorter product life cycles, new technologies and increased competition.

Making a product successful is a difficult task in spite of the research and capital being used in understanding the consumer. The new product largely depends on the product quality and the marketing tactics of the firm. There are many occasions of product failure even after implementation of the latest technology and quality available because the consumers may not feel the product worthy. The way a consumer values a product determines the success of a new product. The major reasons for product failure are-

Faulty product idea:

A good idea can revolutionize the market but a bad idea may prove bitter to the company and is most often the reason for failure.

Distribution related problems:

The new product fails when the product is unable to meet the requirements of the distribution channel. While developing a product the channel requirements and facilities available should be given adequate importance.

Poor timing of launch:

Timing the launch of a product too early or late into the market is a common cause of failure.

Improper Positioning:

Positioning of a product means putting the product into a predetermined orbit. Improper positioning may affect the success of a product.

Some other reasons for product failure are:

- Lack of differential advantage
- Poor planning
- Technical problems in the product

- Competitors fighting back harder than expected
- Poor market research

Conclusion

Food product development is a crucial process that can dictate the success or failure of a food product as well as the profit and growth of a company. It is a scientific process with step wise of strategic decision points that allow a company to minimize the risks of failure of a product right from the stage of generation of a concept into the post launch stage. This process constantly focuses the consumer as a central point as the design as well as the acceptability of the product is dependent on the need and behavior of consumers thus maximizing success.