

Consumer and Food Product Innovations

Subjects: Economics | Others

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New lifestyles, higher incomes and better consumer awareness are increasing the demand for a year-round supply of innovative food products. In past decades, important developments have been achieved in areas related to food and the food industry. This entry shows that factors influencing performance in new product development (NPD) are dynamic and continuously guiding project development. The data obtained by direct involvement of consumers can impact positively successful product development and enhance the company's financial performance. The study of consumer behaviour and attitudes towards new foods encompasses multiple aspects, such as preference, choice, desire to eat certain foods, buying intentions and frequency of consumption. Additionally, both the consumers' willingness to purchase and the willingness to pay a premium are important in NPD, launching and success.

Keywords: buying intention ; consumer acceptance ; marketing innovation ; price

1. Introduction

Today's manufacturing companies rely much on the success of new products, and this has become critical for a healthy business performance, having in mind the present competitive and fast shifting markets ^{[1][2]}.

Developing appropriate strategies for achieving successful new product development (NPD) has required increasing consideration. Attention has been given to exposing the drivers of successful new product performance while at the same time highlighting the importance of measuring that performance ensuring viable product life-cycle (PLC). Still, it has been observed that the majority (50–75%) of consumer-packaged goods do not achieve desired levels of success, in general, and this is also a reality in the case of the food industry, for which contributes some degree of food neophobia ^{[1][2]}.

Presently, the food sector is considered one of the most important in the current global economy. Nevertheless, food industry or food service companies still face many challenges in managing their products and competing in the market. In fact, the food manufacturing industry has been recognized as an area with high degrees of new product failure ^{[3][4][5]}.

Products aim to fulfil certain needs, which are not constant because of differences among users, constrains, usage scenarios and social values, among others. Hence, in order to meet these differences, manufacturers rely on variety as a way to target different needs and preferences (Figure 1). In this sense, it is important to clarify some concepts: Variety or assortment is defined as a number or collection of different items of a particular class of the same general kind, while variant is an instance of a class that exhibits usually slight differences from the common type. Product variety is beneficial in a way that offers potential to expand markets, with economic benefits by increasing sales' volume and revenues. This market expansion can have two dimensions: on one hand, to reach entirely new customer segments, while on the other, being able to sell to existing customer segments more customized products repositioned as premium options. Nevertheless, this positive result is not automatic, and therefore, it must be evaluated. Variety is not necessarily always good, and more product variants may not be the best for customers when making purchase choices. It has been shown that when consumers have to choose among items in a wide assortment, frequently, they become too confused and cannot really perceive the differences between product variants and product quality. Besides, offering additional products with improved characteristics can bring increased costs from product design to production, inventory, marketing and service. Therefore, a deep evaluation must be done before making decisions about diversification of the present offer ^{[6][7]}.



Figure 1. Industrial food development strategy (author's own work).

Historically, three main research perspectives in new food product development can be pointed out: (1) a technological perspective, according to which technological progress was the main driver of research and innovation in early times. Examples include technologies such as freezing or pasteurization or more recently extrusion, all technologies that were quite innovative in their own time. (2) A market-oriented perspective, according to which, back in the mid-60s, the establishment of marketing and appearance of supermarkets allied to new packaging and increased competition led to innovations in manufacture and marketing of distinguishable foods. (3) A consumer-led product development, which has more recently attracted attention to increase new products' success [9].

These approaches appear relatively independent, with technological aspects and product performance traditionally studied by food scientists and consumer researchers, whereas marketing and promotion of new food products would be in the field of economics, management and marketing. Nevertheless, at present, it is demonstrated that there is a need to integrate marketing, consumer research, food design and food technology to improve new food product performance [9]. Attempts have been made to establish an integrated approach to food product development, combining the different subjects that altogether contribute for the positive appreciation of the product by the final consumers (ex., technology, design, marketing, product benefits, consumer research). These go way back to the early stages of development until the final launch of the product in the market and evaluation [9].

The factors influencing NPD performance are dynamic and continuously influence the project of development, so that changes in those factors must be somewhat anticipated and measured multiple times throughout a product's life. For a new product to be entirely successful, it must achieve excellence in three different areas: (a) reduced NPD cycle time, (b) high level of innovation and (c) reuse of company knowledge resources. To be successful in these three complementary areas, companies must pay attention to the factors that drive innovation: people, knowledge and systems. Product Lifecycle Management (PLM) focuses on the later (systems) and can constitute a key role for innovation and success [9].

2. The Role of Consumer

To assess the ideal fitting of the new product with the needs of the target consumers, there are different methods available for the food industries to rely on, such as collecting data about consumers' needs and preferences [10][11]. A more traditional strategy includes a wide variety of tests designed to gather information about consumers' response to new ideas and concepts of possible food products as well as concrete developed products. These allow a more directly assessment of the level of acceptance by consumers regarding those new products, so important for successful launch [11]. Other types of approach make use of indirect data, which can also be used to determine the optimal degree of fit of the new product with the expectation of consumers (Figure 2). Examples of these include data on current food trends or aggregated data on environmental factors that affect consumers' needs and preferences, such as demographics, economical aspects, social and cultural factors or technological developments [11][12]. While the first, focusing on consumer involvement data collection and corresponding methodologies, have been more studied, the second group, namely study of consumer trends and socio-environmental factors, have been less analysed. Ultimately, data obtained through direct involvement of consumers in NPD, like for example a consumer co-creation, constitute a rich source of product ideas and can have a positive impact on the successful product development and consequently improve the company's financial performance [12][13][14]. Nevertheless, food firms that use food trend and socio-environmental data, which point to future changes in consumers' needs and preferences, can more effectively develop products with longer PLC and in that way make their NPD more profitable [15].

Many studies have focused on consumer involvement data obtained and used only up to the launch of the new products. However, consumers' needs and tastes change over time. Hence, the fitting of the new product with the consumer is dynamic and sometimes obliges food industries to redesign and reformulate their products, even after they had already

been launched to be marketed. Even in this case, a successful redesign or reformulation must be based on knowledge regarding what consumers like, or dislike, about the existing product. Hence, it is also important to understand whether food firms obtain and employ consumer data and analyse the fitness of the new product after its launch and also during the PLC ^[11].

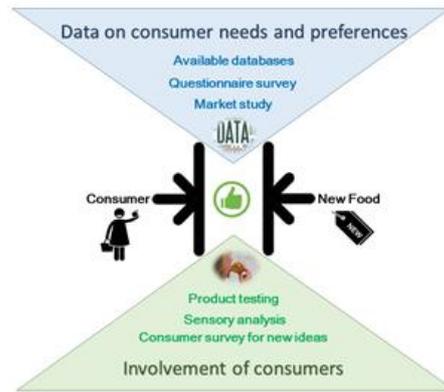


Figure 2. Fitting of the new food product with target consumers (author's own work).

3. New Foods Acceptance

The study of consumer food behaviour has been based on two types of variables, i.e., some related with behavioural aspects and others linked to attitudes. While the first include measures like preference, choice, purchase or consumption, the attitudes include affective measures of the desire to select or eat foods, purchase intent or desired frequency of consumption ^{[16][17]}.

Research and development (R&D) activities in the food sector should be supported by a program of research on sensory analysis and consumer acceptance of foods, and that should be well established in the company for quite some time. The NPD is supported by intrinsic as well as extrinsic factors that impact consumer acceptance, regardless of being towards conventional or novel foods. These include the role of sensorial perceptions, cognitive evaluations and situational variables ^{[18][19]}.

Although the measurements of food preference and acceptance attained through attitudinal judgments can become poor predictors of consumption, owing to their degree of motivational willingness, still these types of measures continue to be used to predict consumer behaviours toward new foods, regardless of being at industrial or academic levels. This is mostly due to the easiness in assessing these measurements, in a rapid and relatively simple way, with a controlled participation of the subjects. Although with an affective nature, these evaluations in response to a tasted food have become fundamental for studying consumer behaviour towards new foods and therefore are used to orient new product development or product improvement while ensuring quality in the food industry ^[16].

At present, innovation practices in the food industry rely very strongly on the voice of the consumer, recognized as vital for success. Hence, strategies to develop a successful new product include an appropriate sensory evaluation allied to an understanding of the consumers' acceptance criteria, which should be as detailed as possible ^[20]. When food scientists design tests intended to truthfully predict consumer behaviour at the point of purchase, they must not forget to include a proper number of variables related to marketing in their experimental design specifications, in order to guarantee that the right consumers will respond suitably to the new products ^{[21][22]} owever, for the assessment of a correct prediction of consumer behaviour, a high number of assessors is needed to evaluate food preferences regarding a specific product, which could represent a constraint.

The role of the sensory analysis for success when launching a new food product is complemented with defining the target consumers. In truth, for success on the market, it is crucial to direct, eventually, the product to the right people, leading to target segmentation. Hence, food products should be market oriented according to consumers' needs and expectations. To target a market segment, different criteria can be adopted (Figure 3): geographic variations; demographic characteristics (like sex or age); psychographic factors (including healthy or sportive lifestyles) or, lastly, behavioural criteria, like consumer's habits and types of purchase ^[23].



Figure 3. Marketing segmentation (author's own work).

When it comes to innovation, the food sector faces higher challenges when compared to other business areas, because people are more protective towards what they eat since, contrarily to other products, foods will enter their bodies and go all the way through the gastrointestinal tract, ending up absorbing many of their components. The concept of food neophobia, which consists in the fear of new foods, shows how this can be problematic. Although this phenomenon has been reported to have particular incidence in children, the truth is that there are people whose food neophobia persists into adulthood and truly determines their decisions when it comes to choosing between new unknown or old fully recognizable foods .

Consumer research and marketing dedicate attention to those segments of market interested in new products, and at the same time, the neophobic consumers shall not be neglected during the new product development process and marketing studies, because, depending on the specific product, they may represent an important share of the target market [24][25]. Some areas in which this is of particular importance include for example irradiation technology or gene mutation biotechnology, much owing to the fear of risks that these may bring for health [26][27][28][29].

The assessment of consumers' perceptions towards foods is of vital importance in the development and marketing of new foods [30]. Therefore, understanding how consumers respond to tests helps develop effective food marketing and communication strategies. Although communication and information do not really change the characteristics of the products, they can shape the attitudes of consumers and influence their choices and behaviours [31].

4. Innovation in Traditional Foods

Traditional food products (TFP) have been playing an important role in European culture, heritage and identity. The growth of this segment in the European food market has been providing a higher variety of food choices for consumers [32]. Moreover, traditional food may be viewed as an opportunity to rethink rural development and sustainability patterns in many countries and to add value to the market [33][34]. There are different definitions of traditional foods in the literature that intend to capture the various dimensions of this food concept [35][36][37][38][39]. Different conceptions to define traditional food contribute to explaining consumers' motivations to purchase traditional foods but may also cause low consumer awareness of TFPs [40]. From the general definitions, it follows that TFPs are characterized by historical, geographical and sociological dimensions. One possible definition of "traditional" related to foods was given by the European Commission as "traditional means proven usage in the community market for a time period showing transmission between generations; this time period should be the one generally ascribed as one human generation, at least 25 years" [41]. In 2007, the EuroFIR FP6 Network of Excellence developed an elaborative definition, which includes statements about traditional ingredients, traditional type of production and/or processing and composition [42][43]. Guerrero et al. [32] introduced in 2009 the perspective of consumers' point of view in traditional food product definition based on a study across six European countries that analysed the data using an ordinary semantic and textual statistical on four main dimensions (habit and natural, origin and locality, processing and elaboration and sensory properties). A traditional food product, from the consumers' perspective, was defined as "a product frequently consumed or associated with specific celebrations and/or seasons, normally transmitted from one generation to another, made accurately in a specific way according to the gastronomic heritage, with little or no processing/manipulation, distinguished and known because of its sensory properties and associated with a certain local area, region or country". Later, in 2010, Guerrero et al. [44] added the dimensions of health, heritage and variety to the definition of traditional foods. Furthermore, the study also notes that Central and Nordic regions tend to associate the term "traditional" primarily with practical issues such as usefulness, convenience and health whereas Southern regions tend to focus on broader concepts such as culture, heritage or history.

Although there are different definitions of TFP available in the literature, the concepts related to these food products are regulated by a European regulatory framework established in 1992 and updated in 2012 [45][46]. Furthermore, as part of its policy on food safety and quality and to boost competitiveness and profitability, the European Union (EU) has promoted a

set of criteria for the registration and recognition of TFPs, namely, PDO (Protected Designation of Origin), PGI (Protected Geographical Indication) and TSG (Traditional Speciality Guaranteed), produced under predefined quality standards (Table 1).

Despite the controversial concept of innovation in the context of traditional foods, innovation can become an important tool to maintain and expand the market share of TFP through the improvement in convenience, safety or healthy products. Innovations in the traditional food sector have also the potential to strengthen and augment the market for traditional food products in accordance with the emerging difficulties, such as poor imitations and changing preferences and eating patterns towards more processed and convenience foods [47]. Other challenges such as the effective communication in the labels, legal protection of collective brands and quality assurance can contribute for the growth of traditional food market. In fact, some TFPs in the EU are protected with designation quality schemes to protect producers and consumers from copycat goods. However, due to the low awareness of consumers and producers about the labels and poor understanding of the differences between them, these labels have little impact on the consumption of these traditional products. In this market, privately owned brand names are often more important quality signals to consumers than designation labels [48][49].

Innovations in traditional food are mainly introduced in the product characteristics or in packaging, which preserve the sensory quality and improve the shelf life (e.g., resealable packaging), but also in size, form and composition or in new ways of using the product but preserving the sensory quality. Given the impact of process on the authentic identity of the product, the innovation in production processes is less common and mainly refers to new technical solutions to improve quality assurance and traceability along the chain network. The organisational and market innovation can be valuable, but it is not yet recognized by all chain members of the traditional food sector and is limited to joint product development and formation of research organisations or networks [50].

Table 1. European Union labels for protected traditional products [46].

Protection scheme	Symbol	Products	Specifications	Label
Protected designation of origin (PDO)		Food, agricultural products and wines.	Every part of the production, processing and preparation process must take place in the specific region. For wines, the grapes have to come exclusively from the geographical area where the wine is made.	Mandatory for food and agricultural products. Optional for wine.
Protected geographical indication (PGI)		Food, agricultural products and wines.	For most products, at least one of the stages of production, processing or preparation takes place in the region. In the case of wine, this means that at least 85% of the grapes used have to come exclusively from the geographical area where the wine is actually made.	Mandatory for food and agricultural products. Optional for wine.
Geographical indication of spirit drinks and aromatised wines (GI)		Spirit drinks and aromatised wines.	For most products, at least one of the stages of distillation or preparation takes place in the region. However, raw products do not need to come from the region.	Optional for all products.
Traditional speciality guaranteed (TSG)		Food and agricultural products.	It highlights the traditional aspects such as the way the product is made or its composition, without being linked to a specific geographical area.	Mandatory for all products.

For the successful introduction of innovations in traditional food products, it is also important to have a good understanding of consumers' perceptions and attitudes towards traditional food products and of consumers' needs and preferences when applying even small innovations to the traditional food products [51][52]. In this sense, consumers' acceptance and improvements of traditional foods are related with product quality, innovations oriented to safer and healthier products that do not compromise their sensory properties, labels with the guarantee of origin and more product variety and convenience-oriented innovations [50]. Innovation in the traditional food sector also aims to further guarantee quality by introducing full traceability along the chain, reinforcing the message of authenticity. The integration of chain partners in the innovation increases the ability to innovate while at the same time diminishes the risks involved in their implementation [53][54].

Globally, any innovation related with TFPs has to be evaluated taking into account the specifications of the product, whose market success largely depends on how consumers perceive the innovation [55].

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