New insights into consumer-led food product development

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This paper builds upon a review of relevant marketing, consumer science and innovation management literature to introduce the concept of consumer-led new product development and describe its main implementation stages. The potential shortcomings of this concept's application in European food industry are described. Contrary to previous optimistic views, it is put forward that without significant changes taking place in the mindset of the organizations involved in Europe's food R&D, the way forward for consumer-led innovation strategies in the agri-business sector will be long and hard.

Introduction

New product development (NPD) is often recommended as a suitable strategy to build competitive advantage and long-term financial success in today’s global food markets. Product innovation is said to help maintain growth (thereby protecting the interests of investors, employees and food chain actors), spread the market risk, enhance the company’s stock market value and increase competitiveness (Buisson, 1995; Lord, 2000; Meulenberg & Viaene, 1998; Trail & Grunert, 1997; van Trijp & Steenkamp, 1998).

Surprisingly, however, the European food and beverage industry displays much lower research and development (R&D) investments than industries in other sectors and is quite conservative in the type of innovations it introduces to the market. Radically new products are rare (only 2.2% of total product launches), especially when compared to the high number of products (an estimated 77% of total product launches) representing nil or an incremental level of novelty only that is introduced to the market every year (Avermaete et al., 2004; Ernst & Young Global Client Consulting, 1999). This approach to innovation, which keeps R&D costs low and implies a minute technological risk only, does allow the introduction of a relatively high amount of different products in a short time span. The large majority of food products developed in this way cannot, however, be considered truly new. Moreover, with mere technology-based reductions of processes’ and ingredients’ costs being frequently marketed as new, enticing benefits to the consumer, it becomes increasingly harder for buyers to perceive the added-value of ‘slightly new’ food products and thus reward incremental innovation (Galizzi & Venturini, 1996; Grunert, Baadsgaard, Larsen, & Madsen, 1996; Trail & Grunert, 1997).

It is a generally accepted fact that far too many food product introductions fail. Figures vary widely, but even the more conservative estimates, encompassing only truly new products and excluding those that failed before reaching the marketplace, indicate that 40–50% of new product introductions are out of retailers’ shelves within a year (Ernst & Young Global Client Consulting, 1999). This apparently supports those advocating that few resources should be committed to discontinuous innovation in food. It is often said that eating preferences and habits’ slow rate of change, together with the consequent consumer aversion to too much novelty in food, constitutes a barrier to genuine innovation too high to overcome. Nevertheless, consumers’ food consumption behaviour does change, perhaps faster today than ever. It is also not wise to assume that consumers all share the same preferences or degree of risk-aversion concerning innovative products. Given the global character of food markets today, innovation may, therefore, become more of a necessity than an option (Galizzi & Venturini, 1996; Grunert et al., 1996; Trail & Grunert, 1997).

Moreover, being conservative does not seem to be paying off much anymore: me-too products launched in Europe fail
Consumer-led product development was introduced in the early 1990s as a market-oriented innovation concept concerning the use of consumers’ current and future needs and its determinants in the development of new products with true added value (Urban & Hauser, 1993). It has been since repeatedly advocated by several marketing and food technology experts (Lord, 2000; van Trijp & Steenkamp, 1998), but little has been done to consolidate its theoretical foundations and establish concrete methodological guidelines for its practical implementation. To our knowledge, only two applications of consumer-led NPD within the food industry have been described so far (Grunert & Valli, 2002; Jaeger, Rossiter, Wismer, & Harker, 2003), each following its own methodological approach. Additionally, empirical or case-based studies analysing the advantages and disadvantages of this innovation strategy vis-à-vis the conventional NPD practices within the food industry have not yet been reported.

This article builds upon a review of the relevant marketing, consumer science and innovation management literature to describe the economic background and the theoretical foundations that brought about the concept of consumer-led new product development. Next, the key stages of the concept’s practical implementation and the potential shortcomings of its application within the food sector are described. Additionally, an attempt is made to forecast the future of consumer-led food product development in Europe in the current circumstances and to highlight some of the areas in which more research is necessary to ensure its prosperity.

The challenges of today’s global food markets

Socio-economic and technological developments occurring during the last decades in Western society have triggered the need for a shift of the agricultural and food industry sectors’ orientation from production to market. The fact that food markets have become buyer markets rather than seller markets has several explanations (Grunert et al., 1996; Meulenberg & Viaene, 1998). From the economic perspective, the increase of disposable income and the decrease in population growth resulted in the deceleration of the demand for food. Meanwhile, the scientific and technological developments of the last half-century gave rise to global-scale food production and distribution, making an ever-diverse and ever-increasing food supply almost permanently available everywhere. This imbalance between supply and demand decreased the importance of availability and price as determinants of food purchase and increased the relative importance of consumers’ choice criteria (Meulenberg & Viaene, 1998; van Trijp & Steenkamp, 1998). Nowadays, most Western consumers can buy exactly what they want to eat, instead of only what is readily available or affordable, and have, therefore, become the driving element of the food chain.

Due to the significant changes in life-styles and values taken place in the last 50 years, the nature of food choice itself has been transformed. Smaller, higher-educated families, in which both adults work full-time, and single-person or single-parent households have triggered a quiet revolution that is gradually doing away with conventional eating patterns. The growing importance of values such as quality of life, well-being or protect the planet’s environment is also exerting influence on the way consumers perceive and evaluate foods and production systems, thereby increasingly determining choice (Meulenberg & Viaene, 1998). Western consumers are likewise demanding more and better information about the food they eat and how it is produced. They are increasingly aware of the interdependence between food production, food consumption, their own health and that of the environment. This awareness, together with an abundant and diversified supply, has made consumers highly critical of, and demanding about, food products’ quality and safety (Earle, 1997; van Trijp & Steenkamp, 1998). Finally, consumers are more heterogeneous and whimsical than ever, which makes their food choice harder to understand and predict (Grunert et al., 1996; Linnemann, Meerdink, Meulenberg, & Jongen, 1999). To gain a better knowledge of what consumers want, how their needs change and how such changes can be promptly addressed is consequently becoming not only a factor of success for the agri-food businesses, but ultimately also one of mere survival. Companies who are able to uncover (or, better yet, anticipate) demand, deliver against it and communicate this effectively to consumers increase highly their chances of survival and success in the marketplace (Kohli & Jaworski, 1990; Urban & Hauser, 1993). This is particularly true in the context of today’s global food markets, in which manufacturers and distributors seek to produce and sell foods to both familiar and unfamiliar customers in the midst of world-wide competition.

Public health, environmental and sustainability policies may also bring about the need to influence consumer’s food choice. This influence can be exerted either by regulating processes and products (i.e. affecting availability) or by educating consumers about the relation between food consumption, health and the environment (i.e. changing the relative importance of choice criteria). In any case, the food chain will be affected, either directly or indirectly, and the development of an effective means of communication between people and organisations becomes crucial in being able to cope with policy change (Best, 1991; Meulenberg & Viaene, 1998). If consumers cannot grasp the need to adjust their behaviour, as well as the benefits to be gained by such an adjustment, they will not accept change, let alone behave according to the policy-makers’ expectations. Similarly, for innovative
Market-orientation and consumer-led new product development

Agriculture and food enterprises clearly need to develop further their understanding of the markets in which they operate and skillfully apply this knowledge in the creation of competitive advantage. The most adequate way to achieve this is probably through the implementation of the market-orientation concept (Grunert et al., 1996). Market-oriented companies are those which have committed themselves to the continuous generation and internal dissemination of market intelligence relevant to the current and future needs of their customers, as well as to the continuous improvement of their responsiveness to such needs (Kohli & Jaworski, 1990). Although a positive relationship between market-orientation and business performance has been established for several types of industries (Avlonitis & Gouraris, 1997; Han, Kim, & Srivastava, 1998; Slater & Narver, 2000), not much is known about the level of market-orientation of European food companies and how it influences their performance. One could expect the current scenario of high market instability, increasing competitiveness, slowing economy and modest technological development to be rather favourable to a market-oriented approach (Kohli & Jaworski, 1990). Nevertheless, few studies addressing this topic indicate that the generation of consumer intelligence by the food industry, a necessary but not sufficient condition for market-orientation, remains very scarce and mostly accidental. In practice, most food companies, with the probable exception of some large multinationals, rely on retailers to obtain information about their end-users. This leads to the assumption that truly market-oriented food companies are still rare in Europe (Avermaete et al., 2004; Harmsen, 1994; Meulenberg & Viaene, 1998; Trail & Grunert, 1997).

Studies in innovation management have looked closely at the relationship between market-orientation and new product development (NPD), suggesting that these organisational processes could greatly benefit from each other (Grunert et al., 1996; Kok, Hillebrand, & Biemans, 2004; Harmsen, 1994; Meulenberg & Viaene, 1998; Trail & Grunert, 1997). On one hand, it has been sufficiently demonstrated that market-orientation is a critical factor in successful product development and innovation processes (Atuahene-Gima, 1995; Cooper & Kleinschmidt, 1994; Lukas & Ferrel, 2000; Wind & Mahajan, 1997). On the other hand, it is rather straightforward to conclude that the continuous adaptation of a company’s products and services to the market (i.e. NPD) is a pertinent way of formulating the market-orientation concept. NPD can be seen as an organisational process in which information about the market and its actors is gathered, diffused, assimilated and returned in the shape of a new product or service. Consequently, a market-oriented approach to product development implies a sound understanding of:

1. The fact that both technical knowledge and market information are necessary to run effective product development processes;
2. The way market information can be gathered, disseminated and combined with technical knowledge to develop successful products (Grunet et al., 1996).

It is also thought that the implementation of market-orientation in innovation and NPD processes can be a crucial step in leading the remainder of the organisation to a more market-oriented conduct (Kok et al., 2001).

The concept of consumer-led new product development can be viewed as a market-oriented innovation strategy developed specifically for the manufacturers of consumer goods, as it focuses on the share of market intelligence pertaining to the end-users. It is an integrated concept concerning the application of consumers’ current and future needs, and its determinants, in the development of innovative products with true added value (Grunert et al., 1996; Lord, 2000; Urban & Hauser, 1993; van Trijp & Steenkamp, 1998). Its main pillars are:

- Consumer needs should be the starting point of NPD processes;
- NPD should aim at the fulfilment of consumer needs and the realisation of consumer value rather than at the development of products or enabling technologies per se;
- Given that increased sales and satisfactory returns on investment can only be achieved if consumer needs are effectively identified and satisfied, the measure of success of a NPD process should be the degree of fit between the new product and the needs of the targeted consumers.

The key stages in the formulation of the consumer-led NPD concept follow closely a market-oriented approach: need identification, idea development to address the need, product development to substantiate the idea and the product’s market introduction to communicate the fulfilment of a need (Urban & Hauser, 1993) (Fig. 1). An effective ability to translate subjective needs (e.g. healthy or convenient) into objective product specifications is essential for the realisation of the satisfaction of consumer needs through the development of a new product. Concurrently, marketing strategies communicating the existence of a new or improved product which satisfies consumer needs in a distinctive and superior way must be conceived. It is thought that such a consumer-led approach to product development can greatly increase the likelihood of success of innovation processes (Dahan &
If one accepts that the European food industry currently possesses a low degree of market-orientation, the benefits of introducing consumer-led NPD become obvious. Having in mind the socio-economic constraints earlier described, it is relatively simple to conclude that European food production chains must increasingly rely on the industry’s ability to continuously develop innovative and differentiated products with added consumer value. Therefore, any approach that promotes the efficiency and effectiveness of product innovation processes is welcomed (Grunert et al., 1996; Meulenberg & Viaene, 1998; van Trijp & Steenkamp, 1998). Moreover, seeing that consumer-led NPD is a tangible way of putting market-orientation into practice, its implementation should lead to a better financial performance of the agri-business sector as a whole.

**Key stages in a consumer-led NPD process**

Fig. 2 depicts the key stages of a consumer-led NPD process. The opportunity identification stage aims at defining the target markets in which management expects NPD efforts to be profitable and generating product ideas which can successfully compete in these markets. At this stage, supported by a thorough understanding of its own and the competitors’ core competences and unique strengths, companies should conduct a strategic assessment of which technological platforms might provide a solid basis for NPD. If, given the outcome of such an assessment, potentially attractive markets and ideas can be found, the decision to initiate the development process can take place (Dahan & Hauser, 2002; Robinson, 2000; Urban & Hauser, 1993; van Trijp & Steenkamp, 1998).

The design stage seeks to identify the key consumer benefits the new product is to provide, as well as the positioning of these benefits via-a-vis the competition. It is thus at this stage that the development of the physical product, the correspondent marketing strategy and the service policy takes place (Urban & Hauser, 1993; van Trijp & Steenkamp, 1998).

Fig. 3 depicts the main elements of the product design stage. The strategic information about the target consumers collected during the opportunity identification stage serves as primary input for the first design element—opportunity definition. At this point, the potentially rewarding ideas selected earlier are submitted to the target consumers’ evaluation. Such an early evaluation is crucial since it allows for an assessment of the market potential of the selected ideas to take place before any considerable funds are committed to the NPD process. Both qualitative and quantitative consumer research are undertaken at this point.

Qualitative research methods are usually employed first to identify relevant issues which may need further investigation, while quantitative methods are used at a later time to establish the expected benefits and their relative importance in a more precise manner (Urban & Hauser, 1993; van Trijp & Steenkamp, 1998). Next, a list of benefits and their relative importance to consumers is conveyed into a
refinement phase, in which the new product starts to take shape. This is achieved through a careful analysis of the relationships between consumer perceptions, preferences and choices, on one hand, and the product’s technical features on the other. Underlying this analysis is a conceptual model of consumer behaviour in which preferences are formed based on the perceptions of the products’ features and lead, in turn, to choices contingent upon price and availability (Tybout & Hauser, 1981; Urban & Hauser, 1993; van Trijp & Steenkamp, 1998). Finally, if the refinement phase was completed successfully, i.e. if it was possible to design a new product that could potentially fulfil consumer needs in a superior and unique way, an evaluation of the design takes place—opportunity evaluation. This evaluation consists of forecasting sales for the designed product based on the aggregation of the probabilities of individual consumers’ preferences and choices. If the estimated market performance complies with expectations, further development and testing of both the product and its marketing strategy can occur.

Once the testing of the new product and its marketing strategy has been successfully concluded (Fig. 2), the market introduction of the new product takes place. The monitoring of the target consumers’ and the competitors’ reactions to the new product’s introduction, which might lead to adjustments in the product and the marketing strategy, constitutes the final stage of the NPD process, the so-called life-cycle management (Urban & Hauser, 1993).

Limitations to the application of consumer-led NPD in European food industry

There are many reasons why food companies decide to develop and market new products. This decision is often associated with changes occurring in the food chain and/or its environment which are not necessarily related to consumers’ needs (Best, 1991; Fuller, 1994). Upstream changes in the production chain, like supplier, package or ingredient modifications, typically imply product and process reformulations and constitute, thus, a common motive for food companies to initiate product development. But downstream changes such as alterations in the distribution channels, introduction of competing products or internationalisation may also bring about NPD activities. Finally, developments in the chain’s environment, like the availability of new technologies or restrictions imposed by governmental and supra-governmental legislation, can trigger innovation efforts too. All these cases are prototypical of the so-called reactive approach to NPD, in which food companies try to market what was developed through advertising and other marketing efforts rather than developing what consumers wanted in the first place (Buisson, 1995; Urban & Hauser, 1993). On the other hand, it has by now become clear that the continuous collection and assimilation of suitable information about the consumers’ views and needs, since the very beginning of development until the market introduction stage and beyond, is an essential feature of
consumer-led NPD. This feature, along with the fact that the concept itself implies taking consumer needs as the starting point of product innovation efforts, makes of it the quintessential example of a proactive approach to NPD (Urban & Hauser, 1993). It would seem then quite obvious to conclude that, given the current socio-economic background against which the European food industry is set, proactive strategies for product innovation should be more successful than reactive ones. Yet, there is a major downside to this reasoning, which is the fact that there are no published empirical or case-studies demonstrating that proactive strategies are significantly more successful than their reactive counterparts in the context of food industry. Being as it is, the motivation to adopt a proactive approach to food innovation, such as consumer-led NPD, relies solely on management’s strategic vision and a leap of faith. It is, therefore, imperative for researchers in food innovation management to concentrate their efforts on clarifying whether or not (and in which circumstances) consumer-led NPD can lead to products that are more successful in the marketplace than those developed through more conventional innovation strategies.

Understanding consumer needs and reacting effectively to them is believed by many to be one of the most important correlates of product development success (Cooper & Kleinschmidt, 1994; Grunert et al., 1996; Saguy & Moskowitz, 1999; Urban & Hauser, 1993). There are those, however, who question the value of consumer focus in NPD. It has been stated that consumer-led development activities, by following closely consumer needs, encourage incremental innovation in detriment of the development of truly new products. The main argument sustaining this view is that consumers cannot be expected to provide needs about products or technologies which are yet unknown to them (Atuahene-Gima, 1995; Ortt & Schoormans, 1993; van Trijp & Schifferstein, 1995; Wind and Mahajan, 1997). In line with this argument, several methodologies, such as consumer-idealised design (Cicciandelli & Magidson, 1993), problem and lead-users design (Ortt & Schoormans, 1993; von Hippel, 1986), beta-testing (Kaulio, 1998) and information-acceleration (approach which places consumers in future technological scenarios) (Urban & Hauser, 1993), have been developed to overcome this obstacle. More recently, researchers begun to explore the potential of image-based, web-based and virtual reality technologies to obtain better, real-time consumer information and involvement in NPD processes (Dahan & Hauser, 2002; Wind & Mahajan, 1997). It would be advisable also for those active in food innovation research to explore the ability of these technological developments to improve the quality of the consumer intelligence obtained, as well as the cost efficiency of consumer research methods.

One of the major and most obvious gaps in consumer-led food product development is the lack of clear and concrete guidelines for its effective implementation in everyday company practices. This deficiency is felt mostly (but not uniquely) at the early phases of the development process—opportunity identification and opportunity definition—which are simultaneously the less structured and the more determinant for the success of new products (Nijssen & Frambach, 2000; Nijssen & Lieshout, 1995). Quite suitably, these phases have been named the fuzzy-front end of consumer-led NPD (Dahan & Hauser, 2002). It is at this fuzzy-front end that the integration of the appropriate intelligence regarding the market, the competitors and consumers, which is essential for companies to be able to successfully match their core competences with demand, must take place (Cooper & Kleinschmidt, 1994; Grunert et al., 1996; Lord, 2000; Robinson, 2000; Urban & Hauser, 1993). Nevertheless, it was only very recently that efforts to compile and test the applicability and validity of the methods and tools associated with the fuzzy-front end, in the context of consumer-led food product design, have taken place (Costa, 2003; van Klee, van Trijp, & Luning, 2005). Efforts to extend this line of research as to encompass methods and tools associated with the later stages of consumer-led NPD should be envisaged.

Finally, a somewhat sequential (rather than concurrent, overlapping or iterative) nature of consumer-led NPD has been pointed out as a conceptual weakness and a considerable obstacle to its application in the food industry (Buisson, 1995; Fuller, 1994; Stewart-Knox & Mitchell, 2003; van Trijp & Steenkamp, 1998). Nevertheless, attempts have been made to improve the realism and effectiveness of consumer-led NPD, such as with the funnel (Wheelright & Clark, 1992) and the spiral approaches (Casimano & Selby, 1995). Both these approaches start with a broad range of ideas from several sources that are later winnowed to a few high-potential concepts, some of which will, in turn, be ultimately developed and launched. The underlying assumption is that it is less expensive (and more effective) to screen many alternative concepts at an early stage than to modify one product during testing and pre-launch. The latest and most holistic approach has been suggested by Dahan and Hauser (2002)—the end-to-end NPD process—with the aim of developing new product platforms within a pre-specified market environment. This concept combines the advantages of the stage-gate approach (Rudolph, 1995), in which developers must justify their selection of the most promising option at each NPD stage, with those of the funnel approach. The end-to-end approach integrates the different development stages and takes into account environmental influences, such as those related to the supply chain or human resources’ expertise, as well as trade-offs between time-to-market, customer satisfaction and costs. Whether these holistic approaches could also be
The key issue of effective knowledge and effort integration in food innovation

A structural weakness of consumer-led NPD in what concerns its potential application in the food industry is that this concept does not explicitly address the role of chain actors other than consumers in product innovation management. Looking at the markets in which food manufacturers operate today this hardly seems realistic. Several studies point out that European food companies do involve, at least on an informal basis, retailers and suppliers in their product development processes. Furthermore, it is reasonable to expect that the vertical integration of product innovation management will greatly increase the chances of new product success in the marketplace (Ernst & Young Global Client Consulting, 1999; Kristensen, Ostergaard, & Juhl, 1998; Stewart-Knox & Mitchell, 2003; Trail & Grunert, 1997). The establishment of methods for an effective, chain-wide integration of product development activities is, therefore, an area where considerable improvement could be made, not only for the benefit of the implementation of consumer-led strategies but also of food innovation management as a whole.

Unfortunately, difficulties in properly coordinating and integrating activities in food product development are, by no means, limited to operations at the chain level. It is frequently heard among researchers and practitioners of food R&D that there is very little motivation to move away from their technology-driven environment and start paying more attention to consumer needs and proactive innovation strategies. Such issues are frequently seen as more of a marketing concern than anything else. Consequently, marketing and consumer researchers active in the area of food innovation management who openly advocate the benefits of changing to a more market-oriented approach in food R&D are often met with considerable scepticism. What they must also understand is that food science academia and R&D practitioners have not been, so far, often required (or encouraged) to think about how to design and sell an augmented product as the consumer demands it. Perhaps, a wiser approach is to start by taking less extreme views on both sides of the issue and look for ways in which the market-pull and the technology-push can benefit from each other. For instance, a food company can make the decision to commit a share of its resources to the investigation of the market potential of its innovative product ideas, irrespective of where they come from, at the earliest stage possible. Or, instead, decide that consumer research in the context of market opportunity identification must already take the company’s core technological competences sufficiently into account (Kok et al., 2001).

On the other hand, there is also a tendency among marketing scholars and practitioners active in the agri-business area to overlook the ingenuity and innovation potential of many of those specialised in exact sciences or engineering. What cannot be overstated is the fact that those employed in R&D and production are fundamental providers of a company’s enabling technologies and core competences. Given that they are also the ones who will ultimately create the core product, their expertise and buy-in is vital to the success of any market-oriented innovation effort (Urban & Hauser, 1993; van Trijp & Schifferstein, 1995; van Trijp & Steenkamp, 1998). Reinforcing this view is the recent development of computer and web-based interface design tools which, instead of conveying the voice of the consumer from marketing to R&D as in standard NPD practices, enable technical personnel to contact directly with consumers throughout the whole design process (Dahan & Hauser, 2002).

Ultimately, the sustained practice of consumer-led food product development implies that an effective integration of the knowledge and efforts of management, marketing, R&D and production has been achieved. This is a notoriously difficult feat in any type of industrial organisation, but one upon which the success of new products in a global marketplace is crucially dependent (Dahan & Hauser, 2002; Griffin & Hauser, 1996; Urban & Hauser, 1993; van Trijp & Steenkamp, 1998).

Final remarks

Contrary to previous, more optimistic visions, this viewpoint suggests that without significant changes taking place in the mindset of the organizations involved in Europe’s food R&D, the way forward for consumer-led innovation strategies in the agri-business sector will be long and hard. In this context, we have highlighted what we perceive to be the three major obstacles to the implementation of this kind of innovation strategies:

1. The lack of concrete guidelines for the effective implementation of consumer-led food product development in everyday industry practices;
2. The sequential nature of consumer-led NPD, in a clear contrast with the reality experienced by R&D practitioners in their activities;
3. The lack of intra- and inter-organisational coordination or integration of R&D and Marketing’s research activities and know-how.

Nevertheless, the removal of the first two obstacles will be meaningless unless a serious effort is made to break down the barriers to intra- and inter-organisational cooperation within food supply chains. The time has come to do away with the clan mentality prevailing in the European agri-business and food-related research by
encouraging cross-functional communication, multidisciplinary team work and the development of a common language for innovation that truly focuses on consumer needs without neglecting technological know-how. Or otherwise, we might just as well missed the market-orientation boat altogether.

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