

Retailers and technology-driven innovation in the food sector: caretakers of consumer interests or barriers to innovation?

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Abstract

Purpose – The purpose of this paper is to investigate the role that retailers play in innovation in the food sector.

Design/methodology/approach – Analysis is based on interviews with retailers and food suppliers from Belgium, Denmark and the United Kingdom.

Findings – The findings show that in different ways retailers act both as caretakers of consumer interests and as barriers to innovation. Retailers are not interested in new technologies per se, but whether new technologies and the products made using them provide clearly identifiable benefits to consumers. These products must carry minimum risk for the retailer and there is a clear need for benefits to be communicated in commercial rather than technological terms to both retailers and consumers.

Research limitations/implications – The main limitation is that the study is based on interviews with retailers and suppliers in three countries.

Practical implications – Food suppliers developing new products based on novel technologies need to identify and communicate clear benefits to consumers if their products are to be adopted by grocery retailers.

Originality/value – This paper extends our understanding of the important role that retailers play in the diffusion of new innovative food products, services and technologies to consumers.

Keywords Buyer-seller relationships, Consumer benefits, Diffusion of innovation, Food industry, New technology, Retailer adoption decision-making,

Paper type Research paper

1. Introduction

The development of new products and production processes in the food sector is often a technology-driven process. In the past, innovation in technologies such as fertilizers, pesticides, sterilisation and pasteurisation have all contributed to the production of ever-larger volumes of food, thereby ensuring that the food sector has been extremely successful in reacting to Malthusian predictions about food shortages. Today, food manufacturers in developed markets face increasingly fragmented and dynamic consumer demands for good value for money food products that are simultaneously high quality, convenient, healthy, authentic and sustainably produced. On a global scale, the food industry also has to ensure the long-term availability of sustainably produced, high quality, nutritious and safe foods in sufficient quantities to feed a growing population. The convergence of insights across food science, ICT, human physiology, biology, and nanotechnologies is considered a driver for the development of a broad range of new technologies and their applications that can contribute to meeting these challenges (Roco and Bainbridge, 2003). New technologies within fields such as electromagnetic processing, texturizing techniques, mild processing and advanced packaging can help meet these challenges by facilitating processing, logistics, storage and preparation methods through which existing product attributes, such as safety, quality and taste, are preserved. Furthermore, these technologies can also result in lower wastage along the food chain from initial production to consumption, whilst allowing new products and assortments to be developed, for example by ensuring that perishable goods stay fresh for longer or can be marketed outside refrigerated areas.

Competitive forces within the retail sector, coupled with growing organizational scale and power within the distribution channel, alongside more discrete (and at times individualized) information on consumer trends and preferences have changed the traditional food industry-retail industry interface. Retailers are increasingly important gatekeepers between the food industry and final consumers (Burt and Sparks, 2003; Caizza and Volpe, 2013). Retailers frame the choice sets within which consumers make their individual choices (Esbjerg and Bech-Larsen, 2009). The day-to-day interactions of retailers with consumers allows them to identify emerging consumer demands and respond accordingly by instigating the development of innovative food products and services in collaboration with their suppliers. Retailers, through their ownership of stores and shelf-space, are also central to the diffusion of new food products, services and technologies to consumers, as they control access to consumer markets (Hirschman & Stampfl, 1980; Rogers, 2003). Retailers thus play an important bridging function, identifying consumer demands and linking them to food producers and food scientists who possess the know-how for the development and production of innovative food products. Yet, without acceptance by retailers innovative food products will find it difficult, if not impossible, to gain full access to consumer markets. For the vast majority of food products retailers are the actors who, through stores (and shelf space) and alternative channels, make products available and accessible to consumer market, consequently their role in providing access, promoting and diffusing new technology-based food products to the consumer market should not be underestimated.

New products and technologies often diffuse at a rate that disappoints the innovators or technologists behind them (Rogers, 2003). In the food sector, grocery retailers are often cast as barriers to innovation, especially radical innovation, as they are alleged to focus too much on price and short-term sales performance, not giving new products a fair chance on supermarket shelves before delisting them or replacing them with a copycat product. This is not how retailers see themselves, however. Rather they see themselves as the caretakers of consumer interests. They deal with thousands of customers on a daily basis and their sustainability is dependent upon generating and maintaining high levels of customer satisfaction and repeat business. Their sophisticated information systems and other forms of customer engagement allow them to track, monitor and ideally pre-empt changes in consumer wants, desires and behaviours. Based on this information and their interactions with customers they seek to provide the products and services that customers want (Day and Moorman, 2010). Despite this there has been relatively little recent research on the retail buying process and assortment decisions.

The objective of this paper is to investigate the role that retailers play in innovation in the food chain, and whether it is the notion of caretaker of consumer interests or barrier to innovation that best describes their behaviours. More specifically, this paper explores:

1. retailer awareness of novel food processing technologies;
2. retailer attitudes towards the product and service opportunities presented by novel food technologies; and
3. perceived challenges to the adoption of new food products based on novel technologies.

These considerations are important because the role of retailers in innovation in the food and drink industry remains vastly under-researched given that they play a pivotal role as gatekeepers to consumer markets in the food value chain.

2. Retailers and product assortments

The traditional role of retailers was to serve as an intermediary between suppliers and consumers. This involved the creation of product assortments, bulk breaking and offering a range of services. Academic research into product assortment decisions therefore focused on identifying the tasks and roles within the buying process (e.g., Nilsson, 1977; Johnston and Bonoma, 1981; Ghingold and Wilson, 1998) and categorising the decision-making criteria used (e.g., Nilsson and Høst, 1987; Banting and Blenkhorn, 1988). As product selection and product development underpin the core activities of the retail buying task, a number of studies also sought to identify the selection criteria used by buyers when making buying decisions in a number of different contexts (e.g., McGoldrick and Douglas, 1983; Shipley, 1985; McLaughlin and Rao, 1991; Swindley, 1992; Thomas and Marr, 1993; Skytte and Blunch, 2001, 2005; Skytte and Bove, 2004).

The relevance of the traditional approach to retail buying to the realities of modern grocery retailing has been questioned (e.g., Hansen and Skytte, 1998; Johansson, 2001, 2002). As retailing has become more market oriented in its approach, with a move towards a demand (pull) chain rather than a supply (push) chain ethos, retailers have moved away from their traditional role. Rather than

simply selecting from the product portfolios of food manufacturers and focusing their operational efforts on assortment bundles, pricing and availability, retailers in search of differentiation from competitors have now taken a more active interest in other distribution channel activities that were previously the domain of the manufacturing and wholesale industries (Swindley, 1992; Varley, 2003; Collins and Burt, 2003, 2006). As a result, there have been significant changes in the scope, organisation and implementation of the retail buying function within an increasingly dynamic, relationship based environment. Similarly, the decision criteria used by buyers have also evolved, with a greater emphasis on consumer-driven market-related aspects entailing more elaborate (beyond simple transaction-based attributes) relationships with suppliers. Retailer interest in product development, product innovation, packaging design and functionality, and supply chain activities has thus grown. Some of this involvement has intensified with the growing (and changing) market share of private brand ranges, which have evolved from relatively simple 'me-too' products to segmented, differentiated and (sometimes) innovative products (Burt and Davies, 2010; Burt and Sparks, 2002).

The growing importance of private brands in retail assortments also means that retailers have become more involved in innovation in the food sector. The limited research conducted indicates that the extent of retailer involvement in innovation differs between countries (Johansson and Burt, 2004). One study found that although Swedish retailers see themselves as driving food innovations through differentiation, this is often via packaging and the development of private branded products by food manufacturers in or outside Sweden (Beckeman and Olsson, 2011). Informants expressed a wish for genuinely new products from brand manufacturers, but also stated that any new product should not be too advanced as consumers might reject them. The development of new products based on novel technologies was primarily seen to be the responsibility of manufacturers, although the study also found that trust between retailers and manufacturers was limited, as retailers often squeeze suppliers on price.

In contrast, a study of British food retailers found a more proactive approach. Those retailers that sought to influence food innovation all had large food technology departments (Omar, 1995). The degree to which retailers could influence food innovation relied on the number of technological staff employed, the size of the technological departments and the accumulated knowledge within those departments. Whilst the technological capabilities of British food retailers were employed to ensure that retailer branded products met consumer requirements and legal obligations in collaboration with their suppliers, they also influenced the method of private brand procurement and the choice of suppliers.

3. Methodology

To fill the gaps in our knowledge of the role that retailers play in food innovation, we have interviewed key informants from 10 retailers in Belgium, Denmark and the United Kingdom, as well as representatives from five food suppliers. The retail organisations involved were major retail chains within their respective markets, together accounting for circa 22.6% (Belgium), 84% (Denmark) and 61.1% (UK) of the national grocery markets. The supplier sample represented companies supplying these and other major retail chains in Europe. The informants were all senior managers engaged in the buying and selling of food products into the retail

sector. All had responsibility for a specific category (both retailer and supplier) or held wider roles within their organisations with responsibility for activities such as technical services, product research, food policy and standards, and business development. All informants had current experience of the buying process for both national and private brand products.

An interview guide was used to structure the initial discussion and was provided in advance to participants, but the interviews were open-ended to facilitate free discussion (Arksey and Knight, 1999; King and Horrocks, 2010). The interviews covered the retailer decision-making processes in relation to new food product innovations based upon novel technologies, focusing upon four inter-related themes: (1) the organisation and management of the buying process when selecting new products; (2) retailer awareness of novel food processing technologies; (3) retailer attitudes to novel food technologies and potential areas for growth; and (4) the potential barriers to acceptance. The interviews were intended to ascertain how retailers make adoption decisions about new products, especially when novel processing or packaging technologies were involved

During the interviews, extensive notes were taken and in some cases, when permitted, the interviews were recorded. Notes were written up shortly after each interview to provide a summary of the issues discussed. Interviews typically lasted between one and two hours, and firms participated on the understanding that their comments and views would not be directly attributed to them.

4. Findings

The presentation of our findings focuses on the objectives of the research, namely to establish the awareness of and attitudes towards product innovation based on novel food technologies by those involved in product adoption decisions within retail chains, and then to identify and assess any potential barriers to adoption of these products by retailers. First a few words on the organisation of the buying process, as this has implications for the adoption of new products based on novel food technologies.

4.1 Organisation of the retail buying process

Our findings suggest that retail buying is overwhelmingly organised and managed on a product category basis. Combined with the prevalence of private brand ranges and the growth of limited line discount chains, this poses a very basic challenge for new product introductions as there are fewer 'slots' available for new products within prevailing assortments and brand architectures. A food product category typically comprises the leading manufacturer brand, a price-fighting manufacturer brand and a range of segmented private brand options. In this scenario the opportunities for the selection of new products become constrained into a specific role in the category assortment. Within this category framework, the retail informants claimed that the search for new products is increasingly initiated by themselves, stimulated by periodic category reviews to identify range 'gaps.' All informants stated that these gaps are driven by the retailers' understandings of customer needs, not product or technology-led ideas *per se*.

The modern retail buying process was also described as being quite rigid: new products have to pass a number of hurdles in order to get selected. Most retailers

have formal processes for new product introductions comprising a series of internally documented steps with key decision points or 'gates' through which any proposed new product must pass. One consequence of this approach is that a wider range of internal stakeholders, and expertise, is involved in the decision making process. Both retail and supplier informants acknowledged that the hurdles for the acceptance of a new food product are high, particularly if the benefit provided by the new product is perceived as marginal or carries a potential brand risk. Any new product in grocery retailing can be copied relatively easily and any additional benefit eroded quite quickly, therefore decision making processes were rigorous.

4.2 Retailer awareness of novel technologies

Informants exhibited a good awareness of emerging novel technologies in the food sector and the different forms that technology based innovation might take, whether via 'new' ingredients, production processes or packaging. Technology awareness was typically couched in terms of the ensuing benefits for customer groups rather than in the 'science' of the technology.

The view was universally expressed that radical product innovations are rare in the food area. Most 'new' products are effectively different versions of existing products, e.g., recipe variations or imitated features of competing products and brands. Consequently, food product innovation was characterised by "small steps not big evolutionary steps," and was in effect 'product churn,' driven by category management decisions, often entailing changes in brand architecture, rather than major shifts within a product category.

Retailers, however, see innovation as taking multiple forms, and the informants did not distinguish between the future potential of developments in respect of ingredients, processes or packaging. All potentially had value. Retailers approached suppliers seeking packaging and display solutions as much as product or process solutions. Although retailers frequently described themselves as innovative, when explored further this was often with respect to the store format and store/shopping processes, rather than in terms of product innovation. Many of the potential areas for future innovation suggested by informants were concerned with changes, or solutions, that might enhance the shopping process. Specifically, the rapid growth of on-line shopping and ideas that might help with fulfilment related issues such as how to keep food safe and chilled during a consumer's absence were given as examples of current concerns by retailers.

For suppliers, innovation was also about efficiency in the production process and supply chain, especially anything that shortened the supply chain and extended shelf life. Suppliers commented that retailers were interested in enhancements to brand value, shelf life and service quality but without any compromise on product quality or safety. Process innovations that improve efficiency and reduce costs were always of interest because efficiency gains drive profit margins. Such gains, however, might be delivered by new processes and systems which were unseen by customers such as machinery cleaning efficiencies, reduced waste, energy savings etc. However, any efficiency gains through process mechanisms (e.g., extended shelf life) needed to be in line with other consumer values, needs and desires.

Various areas for product development and innovation linked to novel technologies were identified through our interviews as they were believed to have the potential to deliver consumer benefits. Examples of benefits-driven issues of interest to retailers include the growing consumer interest in health, wellness and nutrition issues; the consumer desire for natural ingredients, freshness and authenticity; traceability and transparency in food products; convenience in all its forms, and finally smarter packaging that makes products more easily accessible and/or preserves the quality of the products. During the discussions around these themes, it was consistently reiterated by informants that key to any past game changing developments had been the identification of a consumer need/gap in the product category - and then technology had assisted rather than driven change. Variety and the offer of a range of options or solutions was a common characteristic of successful product innovation in most product categories. In some categories, private brands increasingly provide variety through clearly defined (branded) product hierarchies linked to specific customer desires.

4.3 Retailer attitudes to novel technologies

Another theme explored in our interviews was the attitudes of retailers towards novel technologies in the food sector. Risk, or perceived risk, to the existing business and brand reputation was an important recurring theme behind attitudes to new product adoption. It was evident that technology awareness was high among the companies covered by our study, but it was also clear that as far as novel technologies in food are concerned, retailers unashamedly regarded themselves as followers rather than leaders. One retail informant categorised grocery retailers as 'fast followers' looking for 'second mover advantages' as far as novel food technologies are concerned.

Retail informants admitted that they were unlikely to adopt a new manufacturing technology or ingredient unless it was proven and mainstream. As a pre-requisite, the technology must have government approval and any technology or supplier must be legally compliant and meet all legislative requirements. It was very clear that retail informants felt that it was not the role of the retail sector to champion a new technology to legal acceptance. Some informants also commented that often an innovation or technology is accepted in a specific cultural context (e.g., GM in the US) and may not easily be transferred to another settings. Regulations in one market may be more stringent or prohibitive, e.g., requiring further scientific evidence or more detailed consumer information/labelling of manufacturing processes or ingredients, than in another.

Food safety was the starting point in the assessment of any novel technology, ingredient or process, and most retailers had some form of a health and food safety forum which would typically consider safety issues but also wider issues of consumer attitudes and perceptions of the innovation (i.e., the commercial dimension) and brand risk. There was evidence of a greater willingness to lead with novel technology via a food manufacturer brand, but retailers were far less likely to do so with a private brand because of their attitudes to brand risk. Many retailers had an internal policy list against which any new product based on a novel technology is evaluated. An example was provided by one retailer, which had GM products in its stores, via manufacturer brands, but a strict policy not to use GM ingredients in its own private brand products.

The suppliers interviewed also believed that retailers were risk adverse with respect to novel technologies. They claimed that retailers talk about being innovative and say they are looking for new products, but are usually unwilling to invest in unproven ideas or take big risks if there was no clear commercial advantage or a threat to existing sales. The comment was made that as retailers usually have to remove an existing product from the shelf to replace it with a new product, they needed to be confident that the new product will sell. The view amongst the informants was that retailers tend to stick with what they have or what works and are more inclined to accept variations on a (successful) theme rather than risk losing sales. One supplier commented that retailers were more willing to be first with packaging innovation, but not with ingredient or process technology, as they wanted to gauge market reaction first. If a supplier has an innovative ingredient or process technology they usually have to carry all the costs and risks themselves, including consumer testing and providing evidence to the retailer that there is a market. There were however some examples of collaboration and joint investments, e.g., where a retailer and manufacturer worked together to invest in wood burning ovens to improve the taste and authenticity of pizzas.

The market position sought by the retail company also influenced attitudes towards innovation. It was suggested that those with specific 'niche' positions, appealing to a particular consumer socio-demographic group or trading on a specific customer attribute (e.g., organic) were under more pressure to innovate or continually renew their product ranges. One mainstream retailer observed that if a store was only offering circa 1500-2000 lines then it often had to be seen (or perceived) to be innovating/renewing, compared to one offering many more lines. In the latter case innovation was less instantly visible – and may go unnoticed because it was absorbed into a large category – so there was less immediate pressure to renew the range, especially with higher risk new products.

Despite the generally risk adverse attitude to novel food technologies, there was a widespread understanding of their potential amongst informants, possibly reflecting their roles and remits within their respective organisations. However, retailers tended to reiterate the view that it was easier to see the advantages of technology-driven innovations around sales, rather than around products. Informants identified a number of novel technologies as having potential, but in most cases issues of customer acceptance were also highlighted. Consumer understanding and acceptance, and the associated risk, of the technology and associated process was seen to be a key issue. For example, terminology for certain technologies was identified as a problem as they have negative connotations (e.g., high pressure processing or shockwave tenderising of meat) and might be associated with 'Frankenstein foods.' In contrast the terminology associated with some other technologies provided much more positive connotations for consumers. The ultra-filtration of milk was provided as an example. This process provided clear consumer benefits (longer shelf life) and sounded like a 'positive' technology, i.e., an additional filtration process to make a 'purer' product. The consumer perception was that impurities and 'bad things' had been taken out to make a better product. Despite recognition of the potential of novel technologies in the food chain, those interviewed raised a number of caveats

concerning possible barriers to their adoption by the retail sector. The comments of one supplier provide a useful overall summary:

What is important to understand is the unity between the suppliers and producers of new technologies, the retailers and the consumer. How these three go hand in hand. So the retailer will not put something on the shelves that the consumer does not want and the consumers have a very difficult time explaining what they really want. What they say in an interview, what they think is cool to have in the fridge, might not be what they actually buy. It is understanding who the ultimate decision maker is. Is it the consumer? Or is it that technology is being kept away by retailers being risk adverse?

4.4 Challenges to the adoption of products based on novel technologies

Informants discussed a number of challenges to the adoption of novel technologies in the food sector. The major barriers or challenges to the acceptance of innovative products based on novel technologies were identified as difficulties of scaling up, lack of consumer benefits, consumer understanding of novel technologies and communication-related issues.

One issue identified was whether ‘scaling up’ production from the laboratory/small-scale proof of concept stage to industrial scale production was always possible and economically viable. According to our informants, moving from the proof of concept stage to industry scale production was often expensive and required significant investment. There is a high capital cost associated with many novel technologies – high pressure processing was cited as an example – and the costs involved in moving to the commercialisation stage may erode any marginal benefits. The costs required to scale up to the trial stage may also inhibit new innovations.

Scale was also seen as an important driver in terms of shaping (and potentially creating) a market for an innovative new food product. One retailer stated that it would not commit large resources to the launch of any novel technology, as there is a lot of ‘noise’ in a large retail store so it is not easy for new products to get noticed. Promotional support and communication at an industry-wide level is preferable, and major manufacturer brands were best placed to lead this as they have the marketing resources and perhaps more importantly brand power and existing consumer franchise to develop a market for the product. Retail communication tends to focus around price or in store offers, not technology-related benefits.

The main challenge to novel technology adoption was, unsurprisingly, felt to be customer (shopper) acceptance and thereby retailer acceptance. It was suggested that in general retail customers are not usually pushing for innovation (in products and ingredients), as they are themselves risk averse. One retail informant commented that often a new technology was about ‘solving a problem which doesn’t concern customers.’ Any novel technologies in food should solve customer problems without giving them a reason to worry. As one supplier also commented:

Usually the retailers don’t care about the technology; they just want a good product. If the technology is really something that gives uniqueness to the product that also the consumer can see a value in, it is different.

Informants felt that consumer knowledge about food production was very limited, and consumers needed to understand product compromises. Technology could often provide solutions that lead to apparent contradictions in and tensions between consumer desires. The difficulty for many novel technologies is that they appear to be in conflict with the general desire for more natural and wholesome products. An example given was that, on the one hand consumers want long life and functionality for products, but at the same time want to remove additives and simplify products – ‘less salt but more taste.’

Sometimes informants felt that it was difficult to know what to communicate to consumers in order to remain transparent but without raising unnecessary concerns for consumers who might not fully understand the terminology. One retailer stated that if ingredients or processes need to be labelled but did not ‘sound nice’ it was sometimes easier not to use them rather than create customer concerns. An example provided was the use of pulsed electric fields in fruit juices. The process extends shelf life without compromising sensory characteristics, but there was concern that if the process was named on the pack it would sound ‘unnatural’ and consumers would react negatively.

A number of retailers now routinely test the information and ingredient listings provided on packs with customers, as well as the product itself. These forums provide the opportunity to test phrases and language acceptable to customers. A supplier also commented that that marketing the benefits of the technology to the consumer was key:

If consumers are convinced there is nothing to be concerned about, then the buyers will also see that there is a demand and will work with it.

Informants felt that communication can be too technology focussed. The ability to communicate the benefits of technology – simply and clearly - was fundamental. The communication issue was felt, however, to be internal as well as external. Internal communication was seen as the responsibility of the technologist supporting the commercial team. Internal communication, and the potential benefits, need to be expressed in terms that the listener will appreciate, e.g.: ‘commercial teams tend to only be interested in a new process when it will save money.’ Translating the science into a benefit is also important. As one supplier commented:

With new technologies it is most important to explain what the outcome is, not so much how the technology works. The retailers want to know what the advantage is for the consumer, how our products differ from other products on the market.

It was universally felt that there is a real need to blend ‘pure’ technologists with others who can explain the technology in commercial terms. Getting commercial colleagues to understand the technology was a challenge, which should not be underestimated. The retailer needed to understand the technology, not just so commercial colleagues understand what they are selecting and buying, but because ultimately they have to explain it to customers:

It is always interesting for us to understand how it is done, because we have to be able to explain that to the end users as well. If there is a new container or wrapping, we need to be able to explain that it is still just as good as the old one, or it is even better because it has a longer shelf life for example. So we need to

understand the technology behind it and what does it mean for the customer as well. What are the benefits? Are there drawbacks involved? If the customer is asking about it we need to be able to explain all the details involved.

Irrespective of customer acceptance, a novel food technology may simply not fit with the corporate vision or ethos. This may be reinforced by private brand range policy and guidelines. For example, one retailer had decided not to use any products that had undergone irradiation, as it was felt that customers would deem this to be an 'unnatural' process and a declaration on the pack would restrict purchases. Whilst irradiation was seen as a valuable process with several benefits, the retailer concerned felt that customers needed to be educated as to what it is about, but that was the role of the government and scientific community not the retailer. A number of informants commented that ultimately the decision to adopt comes down to a straightforward cost/benefit analysis. If there is a potential public relations risk to reputation then adoption was unlikely. Brand reputation is sacrosanct to retailers and cannot be risked.

Finally, comment was made that channel alignment is crucial to the adoption of a novel technology. If an innovative idea develops around a novel technology all channel members and activities must be aligned, and supplier relationships are an important contributor to this process. An example given was if a feedstuff provider claims that a foodstuff additive will provide tastier protein, the supplier has to be persuaded, and then the supplier has to convince the retailer and the customer. All stakeholders in the food chain need to be in agreement about the benefits.

5. Discussion and management implications

Retailers, through their ownership and control of shelf space, are key gatekeepers in the food sector. For most suppliers offering innovative new or established products, their primary access to consumer markets is via established retail chains. The expansion of store floorspace, the introduction of new store formats, the provision of associated retail services, the enactment of loyalty schemes and the development of the retailer as a product, store and corporate brand have been some of the mechanisms through which retailers seek to attract and retain customers and take a larger share of customer spend. The capture of customer information and, via centralised management systems, the management of information and product flows within the supply chain, have enabled retailers to leverage their information and market power to become the pivotal actor in the food chain.

The move to retailer (or consumer) led food chains experienced in most markets has practical managerial implications for the way suppliers approach and deal with retailers. Retailers have moved away from a simple trading-based buying function to encompass a broader, more holistic approach to the commercialisation and marketing of any new product. It is no longer the case of a retail buyer selecting a product/manufacturer and negotiating a deal, but consideration of marketing and commercialisation activities are taken into account at all stages in the product selection and adoption process. Suppliers need to be aware of the commercialisation activities relating to their products, and to communicate in these terms in their dealings with retailers.

Whilst, novel food technologies have the potential for radical, disruptive innovation that changes how goods are defined, most of the new products that are introduced represent incremental improvements that have as much to do with process as product innovation (Abernathy and Utterback, 1978). Competition in the retail sector and the commercial pressures upon retail organisations to maintain sales growth and profits ensures that retailers are generally cautious about radical innovation, especially if the innovation is based upon novel food technologies of which consumers may have limited understanding.

Our findings suggest that retailers can play two contrasting roles in relation to technology based innovation in the food chain. On the one hand, retailers can be seen as the caretakers of consumer interests. They are not interested in the new technology as such, but in what benefits it offers to consumers (and themselves). Their focus is on the customer: what the customer wants, what the customer understands and what the customer accepts – as the final link in the supply chain for the retailer such a focus is imperative. Retailers have a clear view of emerging consumer desires, attitudes and behavioural trends and they seek out products that provide ‘solutions’ for customers and which ‘fit’ these trends. The implication is that when a supplier approaches a retailer with a new product idea, they should be very clear about what consumer need it satisfies (or perhaps creates); provide evidence including a risk-benefit analysis to support the product; and communicate to the retailer in commercial, as much as technological, terms. Although certain technologies may offer the potential to deliver benefits to consumers, if the technology itself and the associated consumer understanding of the technology raises concerns and suggests potential reputational damage from marketing products based on these technologies, then the risks of adoption are likely to be perceived as too high by retailers.

On the other hand, retailers can be regarded as a barrier when it comes to technology based food innovation: they are, quite unashamedly, followers who prefer to move incrementally rather than in big evolutionary leaps. It is therefore easier for suppliers to have line extensions or tweaks on existing products accepted by retailers than radically new products. Retailers are particularly risk averse when it comes to their private brands: they will not take risks that may damage their brand reputation, and their formal processes seek to minimise the risk of product and brand failure. As they have developed as corporate brands in their own right, retailers have articulated a clear vision and ethos, with associated values, to which any new product must conform. Ultimately, any new product had to fit with the market position or core values underpinning the retail brand. As retailers seek to differentiate themselves from each other, product innovations acceptable to one retailer may not be acceptable to another. If a supplier has a novel innovation, certain types of retailers, i.e., those with a niche position or a less income constrained customer demographic, may be more receptive if the product fits their vision. From these perspectives, retailers are indeed roadblocks to innovation, maintainers of the status quo, and cautious innovators. This is not surprising, however, as the potential advantages of imitative innovation have long been recognised (Levitt, 1966).

The key driver to the adoption by retailers of new innovative food products based upon novel technology is the identification and communication of the consumer benefits or consumer solutions enabled by the technology, not the features of the

technology itself. Retailers are ultimately looking for ‘solutions’ for customers, not technology or innovation per se, and they feel that food producers sometimes lose sight of the consumer benefit, as they are blinded by the scientific promise of a particular technology. The potential for novel technologies to contribute to meeting consumer desires for health, wellness and nutrition, natural ingredients, freshness and authenticity, food education, traceability, convenience and packaging is recognised, but any resulting innovation needs to be clearly framed in terms of these consumer benefits.

The articulation of customer benefits has a number of dimensions, not least being clear about what consumers understand and what they will accept. Understanding and managing perceptions, or perhaps more accurately misconceptions, is important. The benefits of any novel food technology to consumers have to be clear, not the specifics of the technology itself. Customer knowledge of how food products are produced is limited. Although certain technologies might deliver some benefits to consumers, issues relating to the technology itself and the associated consumer understanding of the technology raises doubts and the potential reputational damage from marketing products based on these technologies might be perceived as too great a risk by retailers.

Suppliers (and retailers) therefore need to recognise that communication is a core issue in the adoption of innovative food products based upon novel technologies both internally (within the organisation) and externally (within the market). It is necessary to recognise that consumers’ scientific literacy varies and concerns are likely around certain technologies and associated processes associated with food. Consequently, messages need to be clear and straightforward and it is important to speak the same language as the target group – whether to explain commercial benefits or consumer benefits. The science can be too complex and, as is clear from our findings, is not the most important consideration. Technologists may be great food scientists, but are not necessarily the best at understanding or explaining what a technology does in terms of delivering customer benefits. One implication of this is that retailers must clearly understand the technology themselves, not just so they know what they are adopting (buying) but also how to communicate its benefits in the marketplace (selling). Ultimately, the ‘story’ around any novel technology – to both consumers and retailers – has to have a clear customer focus and be relatively straightforward. The more complex and different the novel technology, the more important it is to provide a clear explanation. Innovations should be intuitive and logical and not require too much information or explanation – this encourages small incremental steps and accepted or established innovations, e.g., flavour, low fat or less salt, rather than any radical steps.

Finally, there is always a risk with any new innovative food product, particularly if based on a novel technology, so suppliers need to feel secure enough to invest in product development. Scaling up a technology to industrial production levels, and achieving governmental and customer endorsement can be a costly exercise. Longer-term relationships help with the innovation pipeline and the willingness to develop and trial a new idea.

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