Novel technologies and collaborative innovation in the food sector (RECAPT)

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RECAPT (Retailer and Consumer Acceptance of Promising Novel Technologies and Collaborative Innovation Management) is a three-year (2011-2014) EU-funded project which aims at supporting closer collaborative management of innovations along the food supply chain. More specifically, the RECAPT project has investigated the role of retailers and caterers in food innovation and how different players collaborate in the innovation process.

The role of retailers and caterers in food innovation

There has been very little recent research on how retailers and caterers make decisions on new products, particularly those based on novel technologies.[1] These technologies can be defined as scientific and technological developments that alter the way food is produced and processed and may (or may not) result in a differentiated product for consumers. These developments may be entirely new discoveries (e.g. in vitro meat), or their application to food may be what is novel (e.g. nanotechnology). For an overview of novel technologies identified in this project see Table 1. The project conducted a series of interviews with retailers, caterers, food manufacturers and suppliers to explore three questions related to the role that retailers and caterers play in innovation, and the findings are summarised below.[2]

How is the buying process organised?

Retail buying is overwhelmingly organised and managed on a product category basis. Increasingly, the search for new products is initiated by the retailer and stimulated following periodic category reviews to identify range “gaps”. These gaps are driven by customer needs, not product-led ideas. 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.

The selection process, especially for private brands, comprises a set of process steps with key decision points where formal approval is needed to pass to the next stage. These steps and gates are clearly defined, with core guidelines and criteria. The use of consumer panels is a notable feature, with customer confirmation sought on taste, packaging and presentation, and pricing. Protection of the retailer/caterer brand is also vitally important. Brand integrity and reputation are sacrosanct, and will not be risked on a new product introduction, a particular concern if the risk is enhanced by involvement of a novel technology. The decision about whether to adopt a new product is ultimately a commercial/trading one – will it make money for the retailer/caterer?

What are retailer’s and caterer’s attitudes to novel technologies?

Both retailers and caterers emphasise that the key issue in selecting the products to place on their shelves is the question of benefits, i.e. identifying and evidencing the customer benefit (or solution) arising from a novel technology, not the technology itself. Overall the focus is on what the technology does not how it does it. However, one respondent commented that novel technologies were often about “solving a problem which doesn’t concern customers”. Furthermore, there may be a difference between what customers understand or believe (e.g. how the technology works) and what they accept (final product on the shelf). Similarly, there is a need to recognise the difference between the perceptions of the shopper (who purchases the product) and the consumer (who eats the product).

As far as novel food technologies are concerned, retailers and caterers unashamedly consider themselves as “fast followers” or looking for “second mover advantages”. These terms refer to the idea of entering the market early but not first, as the pioneers typically face a greater risk of failure. Concerns over reputational risk reinforce this conservatism. The clear preference is for a novel technology to have become mainstreamed by leading brands with greater marketing power before the technology is used for products to be sold under the retailer’s brand. Thus, retailers and caterers tend to stick with what they have or what is well-known.

Despite the generally cautious approach, a number of potential opportunities for novel food technologies are recognised. For example, retailers and caterers seek novel technology to enable the creation of a new market/product category, the reconfiguration of an existing product category, or the expansion of an existing product category.

What are the barriers to acceptance of novel technologies?

The major challenge with novel technologies is felt to be consumer knowledge and understanding of novel technologies, and their subsequent acceptance of that technology within a food context. Consumer knowledge of food production techniques and their scientific literacy in general is believed to be limited. This raises the question - who should educate the consumer? Often companies feel this is not their role.

Communication issues are widely recognised as a barrier. All communication should focus on the benefits (not the features) of the technology. Communication should take place in a simple, non-technical language, emphasise the positives, and if possible avoid raising concerns. This also applies to communications with retailers and caterers, not just end consumers.

A further barrier to the adoption of novel food technologies identified by the retailers and caterers relates to the return on investment. Scaling up costs of production is perceived as being prohibitive. Similarly, the marketing costs involved in shaping or creating a new market are seen as a barrier. It is felt that established brand manufacturers have both the resources and the brand power to cover these risks.

The final potential barrier is the regulatory environment. Governments are called upon to champion technologies, and to be aware of the implications of some regulatory frameworks (such as labelling requirements) on consumer perceptions.

Collaborative innovation management in the food sector

The conservatism and risk-aversion that characterises retailers and caterers may impede the development of radical innovations. An important challenge that food manufacturers face when developing new products based on novel technologies is the focus on cost. The low-price focus often favours incremental innovations, whereas long-term success is mainly gained from radical innovations. Strategies to steer away from this unfortunate situation focus on radical process innovations that save costs along the chain, or on radical product innovations with added consumer and retailer benefits. Collaborative innovation with co-development partners is recommended to implement these strategies effectively and efficiently.

Out-bound innovation is when firms seek additional revenues by allowing others to use their unused knowledge, for example through licensing (granting permission to a licensing party to distribute products under a trademark). In-bound collaborative innovation concerns the acquisition of knowledge and resources from external parties; for example, from universities, machine manufacturers, or retailers. This type of in-bound innovation often saves money and time. Although the anticipated effect of in-bound innovation is likely to be great, an important challenge will be that in many industries and product categories only a limited range of potential partners with deep knowledge of the radical new technology is available. The RECAPT research gives insights into how these issues are dealt with in collaborative radical innovation processes in the food sector.

When and how do collaborations take place in a radical innovation process?

The RECAPT project has identified four categories with 15 promising novel food technologies (see Table 1) that offer financial benefits along the food chain, customer benefits, or both. For each of the four categories, a case study was identified in which a new food product was developed by means of the radical new technology, and multiple interviews were conducted for every case.

Table 1. Overview of promising novel technologies[3]

Texturising methods

- Hydrodynamic pressure technology (shock wave)
- Ultrasonic cutting
- High pressure homogenisation

Electromagnetic methods

- Electromagnetic methods
- Electron beam irradiation
- Ohmic heating
- Cold plasma

Mild processing

- High pressure processing (HPP)
- Infrared heating
- Super critical fluid extraction (SCFX)

Advanced packaging methods

- Intelligent packaging
- Radio-frequency Identification (RFID)
- Edible coatings
- Active packaging
- Biodegradable packaging film

The findings show that in all four case studies, value was provided to the end customer due to an additional benefit; for example, the new technology ensured additive-free products with extended shelf-lives. The end consumer could therefore be charged premium prices. The radical new technologies made these benefits possible, but also allowed machine manufacturers to experiment with new set-ups that could be re-used for different applications.

Two of the cases offered significant cost reductions. In both cases, multiple parties in the chain benefitted. In one case the product manufacturer received a premium for implementing the technology, which reduced costs for the retailer. In the other, a new processing technique offered possibilities for procurement re-negotiations, which reduced costs for the manufacturer.

Innovation models

Firms typically followed the classical phases of experimentation (research), development, manufacturing, and commercialisation, but the boundaries of these phases were not always clear. Concurrent engineering often took place. For example, manufacturing lines were already built while pilot scale set-ups and product recipes were still under development. Furthermore, a lot of learning-by-doing and iterative steps were needed to optimise the radical new technologies. For example, various applications of a new packaging technology lead to improved system configurations.

Timing of the collaboration

Multiple types of intensive collaboration were present at different moments in the collaborative innovation process.

- In-bound innovation through intensive technological knowledge sharing happened both at the exploration and development phases. Product manufacturers collaborated intensively with technological and scientific service and machinery suppliers.
- Commercial knowledge from retail and sales agents was included both in the development and the commercialisation phase.
- Out-bound innovation only took place in the form of licensing, possibly due to the early stage of the chosen technology’s development.

Technological knowledge sharing

Collaborations could often be labelled as intense and long-term, or less intense and timely. For instance, according to a machinery manufacturer, out-bound licensing collaborations can be timely when the licensing partners work with many technologies at the same time, as this unfortunately doesn’t allow them to put a lot of effort into selling the new product. A promising long-term collaboration was arising between the machinery manufacturer and a retailer; as the retailer facilitated product trials and influenced the adoption of the technology by other product manufacturers.

Results of the project will be presented at the joint final conference of EU-funded projects RECAPT and Connect4Action, 29 October 2014.

For more information on the project, please visit the project website: www.recapt.org

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