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2010

[Link to publication](#)

Citation for published version (APA):

Beckeman, M., & Olsson, A. (2010). *The role of packaging suppliers in food innovations in Sweden*. Paper presented at 2nd Nordic Retail and Wholesale Conference, Gothenburg, Sweden.

Total number of authors:

2

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The role of packaging suppliers in food innovations in Sweden

Abstract

This study investigated how selected packaging suppliers viewed innovations in food packaging, their role and the roles of other actors in the chain. Six companies and ten respondents were selected based on suggestions from previous interviews of retailers and food manufacturers. Data collection consisted of responses to specific questions followed by responses to open-ended questions. The results showed that many packaging suppliers are far removed from the end customers/consumers and out of touch with wishes and trends in the market, but that they have been responsible for many innovations in Sweden. This presents an opportunity for supply chain collaboration.

Key words: food manufacturer, retailer, supply chain collaboration

Introduction

The main objective of an innovation is to create value, but according to Burt, 'Value exists only if the consumer perceives it as such, otherwise it is not added value but added expense' (Burt 1989, 29). In the food sector, retailers are the 'gatekeepers' to the consumers (Dobson et al., 2003) and are responsible for the retail store, its products and services. The packaging is what meets the eyes of consumers and influences to a large extent their buying decisions. As pointed out by Rundh, 'Packaging can be considered as an integral part of the product and is the first point of contact with the brand for a consumer product' (Rundh, 2005, 673). Young (2008, 26) simply states, 'The package is the product'. Hence, innovations in packaging and/or packaging systems in the retail sector are intimately connected with the products they contain; success or failure can be due to either or both aspects. And the success rate of food products is low: 80 to 90% of all launched products in the USA fail within the first year (Rudolph, 1995). Similar figures can be found in other countries.

Retailers today control the supply chain from producers to consumers (Fernie and Sparks, 2009), which is a change from the past when the manufacturers were in control and decided what to produce and when. Van Donk (2001) gives three main reasons for this change in the food sector: consumers' wish for differentiation; the restructuring of the supply chain by retailers to cut cost and time; mergers and acquisitions among retailers triggered by low retail margins. This shift in control has increased demands for more flexible production to meet a greater variety of packaging sizes, products, recipes and delivery on demand, without increasing the costs. This results in smaller order sizes and designs (Van Donk, 2001, 2008). Another aspect is the differentiation by retailers of their own branded products. This started in the UK (Burt and Sparks, 2002) and similar trends can be seen in Sweden.

The real breakthrough for packed food in Sweden came with self-service stores in 1947, demanding packaging all over the country, along with the introduction of frozen food in 1945, considered a radical innovation in Sweden (Beckeman, 2006). These changes in the market initiated efficient supply chains, which together with a value chain perspective have become a necessity for the different requirement of the various food products (Fisher, 1997; Gustafsson et al., 2006). Food and beverages on the market range from dry products to liquids and they require distribution/storage temperatures from ambient, via refrigerated to frozen. Hence, demands on packaging will vary.

Since packaging is part of the product, packaging suppliers contribute to the end products and are affected by changes on the market. But the effects differ depending on how close packaging suppliers are to the finalised packaging, as well as on the reactions from customers and consumers as packaging supply chains are usually not in the core food supply chain.

The purpose of this study was to investigate how selected Swedish packaging suppliers today, however different they may be, view innovations in food packaging, their roles and the roles of other actors in the chain. Hence, the following research questions:

- How do innovative Swedish packaging suppliers define innovations and how do they regard their own role in food innovations?
- What is the nature of the collaboration among packaging suppliers and other actors in the supply chain regarding food innovations?

In this paper ‘consumer’ is defined as the end consumer of a food product whereas a ‘customer’ can be a food manufacturer, a retailer or the next one in the packaging supply part of the chain, as packaging suppliers cannot be defined as one homogenous group. They can be material producers, packaging converters, packaging machinery suppliers and other relevant suppliers (Paine, 2002) and work as partners, sub-suppliers and/or competitors with each other, depending on the situation and the demands. In this mixture, some suppliers in Sweden are considered more innovative and successful than others and these companies are the focus of this paper. They were suggested by retailers and food manufacturers, whose opinions and roles in food innovations in Sweden were studied previously (to be published) and who were asked about innovative packaging suppliers.

The paper is organised as follows: It starts by summarising literature on packaging and packaging functions, on innovations in general, and in connection with food and packaging. The methodology is then explained followed by results, analysis, discussion and conclusions.

Packaging and packaging functions

‘Package’ and ‘packaging’ are often used interchangeably but in this paper the latter is defined as follows: ‘Packaging is a coordinated system of preparing goods for safe, efficient and effective handling, transport, distribution, storage, retailing, consumption and recovery, reuse or disposal combined with maximising consumer value, sales and hence profits’ (Saghir, 2002). Packaging can be primary (in food contact), secondary, tertiary, etc., depending on use and function in the supply chain. In food contexts one often talks of a ‘packaging system’, usually referring to the primary packaging and the filling operation as one integrated system.

The functions of packaging in the food retail sector can be summarised under three headings: *logistical* (protect, distribute and provide information), *marketing* (graphic design and format, legislative demands and marketing, consumer requirements/convenience), and *environmental* (recovery/recycling, dematerialisation, one-way vs. reusable, toxicity) (Jönson, 2000). Quite often, though, the demands are conflicting; a compromise between packaging functions is then necessary and needs to be addressed in a systematic way and in a wider perspective (Chan et al., 2006). The trend is to see packaging as part of a larger integrated system involving multiple actors in the supply chain. ‘One of the prime factors that inhibit manufacturing efficiency and productivity is treating packaging activities as an individual task’ (Chan et al., 2006, 1088). They go on to conclude that this requires that the product and the packaging be developed simultaneously. A similar conclusion is reached by Olsson and

Larsson (2009) who advocate that in order to create higher value for consumers, product and packaging innovation processes should be integrated and one should not only focus on product functionality.

A practical example of *logistical* improvement through packaging rationalisation has been presented by Garcia-Arca et al. (2006), building on the three headings of packaging functions listed above and incorporated into the term ‘packaging design’ for frozen food in Spain. They showed that not only could the differentiation quality of the product be improved, but that the logistical costs could also be lowered and still improve quality and service by proper logistics management (Garcia-Arca et al., 2006).

According to Rundh, packaging may influence most variables in the *marketing* mix and increase customer value or lower cost due to: packaging design, ensuring safety, offering possibilities for price differentiation, reducing costs of transport and storage, contributing to innovativeness by new solutions, increasing convenience, supporting communication, and supporting promotion of other products (Rundh, 2005). Hawkes (2010) sees two basic functions for packaging: practical packaging that extends shelf life and makes it easier to transport and display, and marketing. ‘It combines all the “Ps” of marketing: the package contains the *product*, *packages* convey messages about product attributes to consumers as part of *public relations*, and often its *price*, while also carrying *promotions*’. This makes packaging an integral part of the product (Hawkes, 2010, 297). Paine (2002) predicts that, ‘The day is coming when the package will be a more important advertising medium than newspapers and magazines’ (Paine 2002, 171). Löfgren (2006, 11) suggests ‘that the consumption of physical goods and services should not be separated, but integrated into a process with two major steps: the first and the second moments of truth’ (i.e. the moment of purchase and the moment of usage and consumption). These two steps create the perception of quality among consumers according to Löfgren (2006).

The *environmental* function today goes further into sustainable packaging and the combined systems of packaging and the packed product across the whole distribution chain from manufacturer to end consumer and further, including the waste and recovery phases (Svanes et al., 2010). Svanes et al. (2010) have created a holistic methodology to evaluate the whole chain and to use it as a tool in packaging design. They have focussed on packaging optimisation rather than on packaging minimisation and they have set up a number of indicators for evaluation of the packaging design. The aim is not to develop a method that guarantees development of more environmental and resource efficient packaging systems but to show options and in the end, a balance has to be found and marketing aspects may prevail (Svanes et al., 2010).

Innovation

An innovation is the combination of two processes: invention and implementation (Deschamps, 2008) and can be a product, a service or a new way of doing things; it ‘refers to any goods, service, or idea that is perceived by someone as new’ (Kotler referred in Grunert et al., 1997, 4). Innovations are often connected with newness, success and change (Assink, 2006). There are technical innovations that do not directly create visible values for the consumers, as they may change processes, functionality or utility (Assink, 2006).

Innovations range from radical ones – ‘that cause marketing *and* technological discontinuities on *both* a macro *and* microlevel’ – to incremental ones – that ‘occur only at a microlevel and cause either a marketing *or* technological discontinuity but *not* both’ (Garcia and Calantone,

2002, 120). The more radical an innovation, the higher the uncertainty and risk; at the extreme it is disruptive in nature. Radical innovation involves ‘the development or application of significantly new technologies or ideas into markets that are often non-existent’ (McDermott, 1999).

The trend in recent years in innovation research has been to emphasise services and not only products/processes as ‘a service-centred view is inherently customer oriented and relational’ (Vargo and Lusch, 2008, 7). This requires relationships, networks and interactions and trust between partners as it encourages cooperation, more long-term benefits and prevents opportunism (Lindgreen, 2003).

Packaging and food innovations

The food industry is the largest end user of the global packaging industry (Rundh, 2005). As packaging is regarded as an integral part of the product (Rundh, 2005), innovations in the food area may be possible because of the capabilities of packaging. One example is canning where the processing takes place in the package, making a range of shelf-stable products possible. Glass containers were used first in France at the beginning of the 19th century, then went over to tin cans in the UK and recently, retortable cartons have been introduced, Tetra Recart. The last innovation has been described by Deschamps (2008). Naylor (2000) states, ‘Indeed, the canning of food was a decisive moment in the growth of globalisation’, and points at the British success in colonisation and expeditions in the 19th century because they were able to store and transport shelf-stable foods in cans all over the world. Another example of a packaging system driving product development is the aseptic carton system by Tetra Pak, which more or less created the ambient market for orange juice in Europe (Nermark, 2003) in addition to being successfully developed for ambient milk (Stark, 1999; Andersson and Larsson, 1998). Today the system is also used for many other shelf-stable products worldwide.

Primary packaging is in food contact during storage but can also be part of the processing as in the two examples above. New food processing technologies can affect the packaging material on mechanical and barrier properties (Ozen and Floros, 2001). New packaging systems, materials and technologies such as smart/active packaging, nanotechnology, biopolymers, biosensors and less energy requiring processes can offer new opportunities for innovative products (Mahalik and Nambiar, 2010), but have to be tested and evaluated (Fátima Pocas and Hogg, 2007). Among the most interesting new food contact materials are bio-nanocomposites (Sorrentino et al., 2007). Nanotechnology applied to food and packaging has the potential to offer a number of benefits to consumers (Harrington, 2010), but in addition to safety aspects and functionality, cost has to be taken into account. Innovation of new materials and packaging may require efforts from a number of packaging suppliers before a system is ready and accepted. According to Rundh (2009), the goal for a base material supplier is often to become a full-service supplier of packaging. This requires the development of innovative products and total solutions and ‘the continued development of design expertise in partnership with customers’ (Rundh, 2009, 999).

Keys for growth in developed packaged food markets are convenience, functionality and indulgence (Ahmed et al., 2005). ‘The most successful new product developments suggest increasing consumer demand for convenient, portable, easy-to-prepare meal solutions that lessen the hassles of time-starved modern urban life and the inevitable limitations on food preparation and shopping time that distress consumers’ (Ahmed et al., 2005, 760). According to Mascarenhas et al. (2004), the product itself is no longer the basis of value creation, but the

experience by the consumer. Customer satisfaction is not only influenced by past experience but by expected future experiences of consumer delight. This is why food products, which include packaging, have to be co-created with the customer/user, who could be a food manufacturer, a retailer and/or a consumer. Grunert et al. (2008, 591) define user-oriented innovation as ‘a process towards the development of a new product or service in which an integrated analysis and understanding of the users’ wants, needs and preference formation play a key role.’

Understanding the consumers and coming up with the appropriate packaging design is central to the success of a product. Wells et al. (2007) investigated packaging designs for retailers’ own labels, a trend which continues to grow, providing retailers with a means to build store loyalty. They found that over 73% of the interviewed consumers stated that they rely on packaging to aid their purchasing decisions. Wells et al. commented that, ‘Since so many purchase decisions are made at the point of sale, the impact of packaging represents an important issue for food suppliers to consider’ (Wells et al., 2007, 686).

Nancarrow et al. (1998) identified three key issues to be addressed by marketers and packaging designers: ‘taking account of the consumer’s past experience, needs and wants; packaging design and getting customers to notice its message; and evaluating packaging design and labelling for their effectiveness in the communications effort’. (Nancarrow et al., 1998, 117). Ahmed et al. (2005) list four main packaging elements that influence the purchase of a product and divide them into visual elements (i.e. graphics and size/shape of packaging), and informational elements (i.e. information provided and technologies used in the packaging). Silayoi and Speece (2004) build on these four packaging elements and their influence on buying decisions. They consider visual elements, including graphics and colour, to be the major influences to produce an attractive and more sellable package, although what is attractive varies from market to market. On the other hand, the informational elements are becoming increasingly important as they, if appropriately delivered, reduce uncertainty and create product credibility (Silayoi and Speece, 2004).

Young (2008) mentions five principles for packaging new products effectively: shelf visibility (found that new product visibility is at 33% or lower); differentiation; versioning (working effectively within a larger brand family); reassurance (‘less is more’ in the number of arguments on the packaging); product delivery (creating realistic expectations about the product inside).

Methodology

This study of packaging is part of a larger study of the Swedish food sector, which started in 2007/2008. The first phase was an exploratory series of open-ended interviews (Yin 2003) with twelve expert participants, who had long experience in the food sector. The interviewees were a mixture of professors from academia and institutes, professionals active in branch organisations and senior executives with past experience in food R&D or marketing. The purpose was for them to identify issues and important aspects in the Swedish food sector and to elicit their suggestions for suitable interviewees/companies in the different phases of the study, including in the packaging supply field. Participants confirmed their interest in the topic, contributed with aspects and suggested names and companies to approach.

The purpose of this study, which took place in September and October 2009, was to investigate how selected Swedish food packaging suppliers today define and view innovations, their roles and the roles of other actors in the chain; their special assets, trends,

collaboration, etc. Hence, the methodology chosen was qualitative in order to achieve a deeper understanding of the suppliers' views on these topics. Respondents in six companies, suggested to be among the most innovative food packaging companies in Sweden, were interviewed plus four professionals with experience and connections to the industry; in total ten respondents. The selection was based on input from the exploratory study but mainly on input from earlier retailer and food producer interviewees, who were specifically asked to suggest innovative packaging companies for food in Sweden.

The data collection consisted of responses to initial and specified questions about the interviewees' company or work, position, previous experience and educational background. This was followed by open-ended questions on the subject (Yin, 2003). Web sites and articles about the packaging suppliers were also studied before the interviews. The interviews were recorded and transcribed and analysed based on themes identified in the answers and grouped according to purpose and research questions (Miles and Huberman 1994).

A majority of the ten interviewees has past experience in at least one other packaging company and/or food company and some are now involved in creating networks/bridges between different packaging suppliers and to customers. Hence, although the number of companies is small, it was felt that with the accumulated experience of the selected interviewees and previous data from other interviews of actors in the supply chain, that the number of packaging companies would be sufficient to get a good picture of current opinions packaging suppliers had of innovation. In addition, both authors had past experience in the packaging (and food) industry.

The ten interviewees, their background and information about their previous experiences are presented in Table 1. One respondent is included from the exploratory group, having a background in packaging R&D, and is marked with an asterisk.

Table 1: Interviewees in the study of the Swedish packaging industry

Respondent	Present position	Educational background	Previous experiences
A	Vice President	MSc in Business and Economics	Different positions in same multinational packaging company
B	Editor-in-chief		Branch journal for packaging
C	Network coordinator, packaging	MSc in Engineering	Business development and marketing, director in global and national packaging companies
D	Packaging development in a packaging network	Packaging technology and graphic design	Packaging developer in a mainly national food company
E	CEO	MSc in Engineering	Different positions in other companies, incl. other packaging companies
F	R&D director	MSc in Engineering	Different positions in food and pharmaceutical companies, national and international
G	CEO	MSc in Business and Economics	Different management positions in different food and beverage companies
H	CEO	MSc in Business and Economics	Different management positions in food, packaging and other industries
I	Technical director	PhD in Engineering	Academic research and with other packaging supplier
J*	VP; R&D institute	PhD in Engineering	Academic research

* From an early exploratory study as a packaging expert; interviewed in April 2009.

The educational background of the majority of interviewees is technical whereas three have a business and economics background. Two respondents (C, D) represent organisations that specifically exist to facilitate bridge building and matchmaking in the packaging industry and towards customers, indicating something of a need and/or a trend.

Results and analysis

The aim of this study was to illustrate and better understand how different food packaging suppliers in Sweden view innovations. Their activities, suppliers and special assets are first presented in Table 2.

Table 2: The interviewed packaging companies

Company	Main activity	Packaging/other supplier collaboration	Special assets claimed by the company	Comments
1	Cartons; pre-press, print, crease, cut and seal; special filling machines; supplier of one system	With company 6 and other suppliers incl. machinery suppliers	Innovation, service, quality; active sales force; work in defined sector	Want to develop with customers from the start; rather be the best than the cheapest; no. 3 in Europe
2	Systems for aseptic and refrigerated liquids; base plastics in mix & lamination; innovative material on rolls; filling machines	Buy raw materials from different suppliers; tests at institute	Environment (best LCA), cost & convenience; low cost and good functionality; rather inexpensive & small machinery – easy to place	Patents; service contracts; work to add more convenience; introduce something new!
3	System supplier for chilled convenience food; base plastics; supplier of critical components and equipment for the system	With packaging suppliers, machinery suppliers and selected customers	Selling the whole concept; unique system for high quality single portion food, refrigerated	Patents & license; actively involved in packaging, processing and preparation of food
4	Paper and packaging material supplier that takes responsibility for end products in selected value chains	Reach big customers via partners; partner with design firm; partner with company 6 and others	Serve the whole value chain in 3 selected areas; competence in bio-plastics; consumer insight; own sales force	Look for new business models with new/unique offerings without direct competition with their own customers
5	Systems for aseptic, canned and refrigerated liquids/food; carton based, laminated, printed, etc.; filling machines, distribution and processing equipment	Buy raw materials, some specially developed, from suppliers of materials	Strong core values, unique and continuous innovations in processing and packaging; global & strong brand presence	Complete packaging lines; service contracts; strong fill-product competence
6	Lamination of up to 8 layers flexible roll-fed material; work to exchange plastics for formable paper and run in plastics machinery– unique niche	Company 1’s biggest customer; development with no. 4; buy raw materials, some collaboration with previous owner	Close to customer and faster than anybody else; some unique collaborative development; whole company operates as a service organisation	In geographical region with max 24 hours’ delivery time

The companies differ in their offerings, how they work and operate, how they collaborate with other packaging and/or machinery suppliers in the supply chain and how they define their special assets according to the interviewees. Packaging suppliers are not a homogenous group, being differently positioned in the packaging supply chain with different activities

(Paine, 2002; Chan et al., 2006), and to different levels sourcing externally or from one another base- or semi-fabricates. Three companies claim to be system suppliers (2, 3, 5) and one (1) for part of its range. A majority, four of the companies, work with fibre-based material but other components are also added to make the final packaging material. Companies 2 and 3 base their activities on plastics in mixtures. None of the interviewed companies only focus on Sweden as a market and they see expansion much more outside of Sweden and Scandinavia. Many of them are exploiting and building on the traditional strong pulp and paper sector in Sweden in their development but market their products and services anywhere.

In defining their activities and special assets, the company respondents mention some aspects more frequently: working with customers; service with or without contracts; innovation and being unique; selling and access to sales force as an issue. Yet all the six companies are different: from packaging material to systems to serving the whole value chain in selected areas; regional limitations with quick service to global presence; not the cheapest but the best at acceptable cost and good functionality and small and inexpensive machinery, etc. This underlines even more the differences among packaging suppliers (Paine, 2002; Chan et al., 2006).

View of innovation by packaging suppliers in Sweden

The packaging suppliers define innovations as:

- Something consumers identify as new; some height of innovation and causing some changes in the market; something more than what others already have done.
- A unique idea which has been commercialised or has the potential to become successfully commercialised and could be a service, a system, a technology or a new attitude.
- A package with additional value such as an additional function, active packaging or improved logistics.
- An ‘invisible’ change (Assink, 2006) such as increased capacity, cost and/or environmental advantages; not me-too but something pushing the products forward.

Parts of these definitions correspond with the view of Kotler (in Grunert et al., 1997, 4) that an innovation ‘refers to any goods, service, or idea that is perceived by someone as new’ but overall the definitions suggest something additional and based more on facts than perceptions.

In order to find out more about what the respondents really meant by innovation, they were asked to give examples on the market in the food sector (i.e. not specifically packaging or their own development). It turned out that most examples of innovations mentioned were packaging related and are listed in Table 3.

Table 3: Examples of recent innovative packaging mentioned by the respondents

Innovation	Description	Type of innovation	Brand owner	Level of innovation*
Ecolean Packaging system	A totally new packaging system for chilled or aseptic liquid products; material mainly based on chalk and plastics	Unique packaging material, new filling equipment; Market: lower costs, claim more environmental	Ecolean	Targets mainly markets outside Europe; some claim radical innovation but not proven yet
MicVac	Packaging and process; patented	Process in new packaging with special vault and using microwaves	MicVac	Radical? but not proven yet; unique and patented; for refrigerated food and possible to use in existing filling machines for trays

Gooh in MicVac	New high quality chilled products in new package/process/way of selling; new category	MicVac packaging and process; Marketing: shop in shop	Lantmännen	Recipes developed by renown restaurant; now going national
Tetra Recart; Material for Tetra Recart	'New carton cans' that can be run in parts of existing process lines	Packaging system and material innovations; Marketing: old in new and new customers	Tetra Pak	Radical packaging system for existing products, 'redefined cans' and parts of process line (see Dechamps, 2008)
Fibreform; PaperLite	Formable fibre trays	Packaging material	Billerud; Flextrus	Radical? Can be used in existing plastic tray lines
Twin package for patties	Double pack of plastic and outer carton with separate openings	Packaging	Supplier unknown; Atria	Less waste and longer shelf life
Twin cup for Risifrutti and others	Two compartments of plastic in a cup and one opening and mix before consumption	Packaging and products; Marketing: new category	Supplier unknown; Risifrutti (Procordia)	New package on the market and with new products created a new category for 'on the go' convenience
Flexible pouch with a vent	Possible to prepare the product in the package for improved quality	Marketing: improved convenience and quality	Unknown	New packaging that may create a new category
Reclosable plastic packaging	Used for cheese and other products	Marketing: increased convenience; less waste?	Unknown	Used by several dairies in Sweden

* Levels of innovation evaluated by the authors

In addition, some packaging innovations from the past and still valid came up, such as Tetra Pak's aseptic system with continuous filling, bag-in-box and the Ceka can system by Å & R. Some examples can be considered radical (as indicated in Table 3) or have the potential in due time to 'cause marketing *and* technological discontinuities on *both* a macro *and* micro level' (Garcia and Calantone, 2002) and support 'the development or application of significantly new technologies or ideas into markets that are often non-existent' (McDermott, 1999).

Trends in food supply chains affecting innovations

(A letter within brackets refers to an interviewee in Table 1)

On the market, customers are changing and influencing innovations among packaging suppliers. The suppliers notice a much higher interest and involvement from retailers in packaging. Retailers are becoming bigger, stronger and centralise decisions on purchase (G, I). This means smaller order sizes and designs for increased differentiation and pressure on cost and just-in-time (A, E, H). Retailers' main focus is on environment (A) and their own brands. In the UK, retailers deal with packaging via their 'packers' unless something is really unique (H), and this may be also happening in Sweden. Food manufacturers are increasingly concentrating on special assets/core business and developing their brands and may be outsourcing many of their activities, such as packaging (A, H), product permitting. According to the packaging suppliers, customers do not make use of the competence at the packaging supplier (E, H) and most discussions take place between the supplier and the customer purchasing departments, not their marketing or development people.

Hence the most important trends seen by the packaging suppliers are:

- *Environment* or rather *sustainability* that includes corporate social responsibility (E); nobody wants to pay for environment but it is a door opener (G); minimise waste (and cost) by packaging? (H); the highest environmental impact for food originates from the actual food production, not from packaging and transport (G).
- *New attractive packaging* for *differentiation* and *more sales* (E); sustainability will possibly become part of this (I).

- *Shorter order sizes*: a real problem (I, E) technically and cost wise; cost of new investment in machinery is a barrier (I).
- *Lower cost*: goes against some trends but is a strong driver alongside sustainability and more attractive packaging (E).
- *Consumer insight*: of major interest among major material producers (A, D); demand for increased convenience is one example (A).
- *Collaboration*: suppliers and customers are searching for partners for packaging collaboration, which is one of the reasons behind the two organisations (represented by C and D), that act as intermediates or consultants between potential partners.

The trend for differentiation is similar to that in the UK and other markets (Burt and Sparks, 2002; Van Donk, 2001, 2008), involving smaller order sizes and designs and an even stronger pressure on costs. One way to solve this was illustrated by Garcia-Arca (2006), through packaging rationalisation and logistical improvement.

To meet many of the trends and be more competitive, some respondents identified a number of necessary actions of mainly a technical nature, listed in Table 4 and grouped by the authors into packaging issues.

Table 4: Mainly technical issues linked to packaging mentioned by the respondents

Packaging issue	Action and description	Respondent
System	Less material, intact functionality and same or lower cost	A, E
	Value for money, new, interesting, exciting and more cost effective	A
	Add more/new functionality	D
	Bigger packages and smaller easy-opening packages for older people and single households	A
Material	Transfer from plastic to fibre, but plastic bottles still easier to open	A, H
	Less material but stronger	A, D
	Flexo printing increasing for smaller series	D, H
	Variable design to adapt to season	D
	New surface treatment/coating	D
	Better barrier for longer shelf life, but consumers do not want longer shelf life as fresh is a trend	A, H
	Plastic increases and has potential but not for system-sell	A, I
	No pressure on bio plastics but awareness of development and costs which so far are too high	G
	Carbon footprints will come (A, D) and benefit cartons (E)	A, D, E
	Interest for more flashy and expensive packaging at times	E
	More easy-opening packaging	A
Production	Higher efficiency	F
	Lean production	A
	Faster filling machines but also more flexible machines that are usually slower; bottles much faster than cartons	A
	Lower cost and adapt to environment	E
	Faster product changes in the packaging line as nobody wants to store	D
	New openings that allow for stacking	A
	More environmental food processing and packaging	F
	Product & packaging	Local products a trend (D) – why not create a brand and license it? (E)
Other	Climate smart in the whole store	I
	Waste an issue	B, C, G, H
	Shorter series means to identify niches and be the best	H
	New ways of working, new partners	D

	Most actors in the chain too focussed on the European market	G
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Some of the issues and actions can lead to innovations, some of which are ‘invisible’ to customers and consumers.

The trends and issues identified are many of the functions attributed to packaging in the literature: logistical, marketing and environmental (Jönson, 2000), but often with conflicting demands (Chan et al., 2006). Hawkes (2010) sees two basic functions: the practical and the marketing function and Svanes et al. (2010) look at the whole chain and packaging optimisation rather than minimisation and to balance different functions with sustainability in mind. The interest for new or different packaging material is also reflected and is and will be an area for innovative products (Mahalik et al., 2010). In addition, respondents mentioned that it is much more important to communicate by means of the packaging rather than via traditional advertising in newspapers, magazines, on TV, etc. One company has created a partnership with a design firm.

In the literature the consumer aspects are very much emphasised (Nancarrow et al., 1998), driven by convenience, functionality and indulgence (Ahmed et al., 2005) and how to package new products more effectively (Young, 2008), as packaging is essential in the purchasing decision by the consumers (Rundh, 2005; Wells et al., 2007). The perception of quality is created by ‘the two moments of truth’, attractiveness/purchase and usage/consumption according to Löfgren (2006) and supported partly by Mascarenhas et al. (2004). Some of the above mentioned trends and actions address those consumer aspects.

But Mascarenhas et al. (2004) suggest that the product itself is no longer the basis of value creation, but the past and expected future experience by the consumer. Hence products have to be created with the customers/consumers and this also applies to packaging, since it is part of the product. This requires collaboration with many actors in the supply chain and to develop product and packaging simultaneously (Chan et al., 2006; Olsson and Larsson, 2009).

Collaboration in innovations and development in the food chain

In the food packaging business very few if any companies, to our knowledge, have integrated both backwards and forwards to master the whole chain of packaging. Hence all the interviewed companies rely more or less on other suppliers of raw material, semi-fabricates, machinery for filling, distribution, etc., in a vertical or sometimes even horizontal relationship in the packaging supply chain, as is evident from Table 2. Due to the dependence on each other and the need to find suitable partners, organisations like those represented by C and D aim to fill this gap by assisting different suppliers and customers in finding the right packaging/packaging system and/or the right service. System suppliers are usually closer to the customer but still need to collaborate to source some raw materials, machinery, etc.

Co-packing in order to test new packaging for acceptance and functionality in different environments and on consumers is often desired by customers. Some companies can arrange this with other customers or with professional co-packers, unless they have their own pilot plants. This can lead to even wider collaboration and result in customers further outsourcing activities that are not essential to a company such as packaging, as suggested by two respondents (A, H).

Most companies work in special projects with customers and other potential partners like universities (J) and packaging networks or intermediates (respondents C and D in Table 1).

When suppliers run development projects with customers, costs are often shared. One company collaborates in partnership/ownership with a design firm and with distributors in selected geographical areas and in a selected value chain.

Customer service is of major importance and two companies (2, 5) have service contracts with the customers, whereas one (6) claims that the whole organisation is a service organisation. The other companies are involved on different levels and depending on how unique their offering is. Keeping customers is very important (6) but in order to find new ones most companies participate in selected exhibitions and conferences. Many ideas originate together with customers who sometimes arrange design and other similar competitions. Companies in the forefront with new ideas (claimed by companies 3 and 4) cultivate their images as innovative companies and feel that this works like rings on water; they are automatically approached by interested customers, entrepreneurs and others with new ideas for development.

Discussion

Packaging suppliers are very diverse as shown in this study and the selected ones do not cover all activities in the packaging field. For instance, no design firm or supplier dealing solely with packaging material has been interviewed. The selection of the respondents and companies was mainly based on recommendations from customers of the packaging suppliers, retailers and food manufacturers, in order to interview the ones considered the most innovative. Consequently, the results are rather dispersed and many references are made to individual respondents. Many packaging suppliers are global actors and find their customers all over the world. The limiting factor for expansion seems to be availability of their offerings at competitive costs and thus packaging material production often has to be established close to the customers. It is surprising, then, that so much of the development is still taking place in Sweden. But how aware are Swedish food manufacturers and retailers of this? And how do they make use of this competence? Not to any great extent, according to the respondents.

Rundh (2009) claims that the goal for a material supplier is to become a full-service supplier of packaging. This is not entirely confirmed by these suppliers, although limited in number. Rather, they appear to look at and define their own niches, although some are system suppliers and one is actively working to serve the whole chain in selected areas. One limiting factor, if aiming to become a full-service or system supplier, can be to gain access to a sales force with sufficient competence to meet the customers. Company 4 realised this and set up a special sales force for one of their selected areas.

From cost and customer acceptance points of view, it is interesting to note that the new MicVac system uses existing filling machines, Tetra Recart can be run in parts of existing canning lines, and the Fibreform/PaperLite trays can be used in existing plastic tray lines. Investments in new packaging or processing lines are costly and the acceptance of a new product/packaging very often has to be tested before investing. Co-packing is one alternative, although difficult for many food products with intricate formulations and processing. But for some products with no or limited processing, outsourcing of the packaging process must be tempting as suggested by two respondents (A, H) and could be an opportunity for the packaging industry or specialised packers.

Collaboration does exist among packaging suppliers and with their immediate customers (i.e. another packaging supplier or those further down the supply chain) but apparently not involving consumers. So how will the different packaging suppliers approach the present and

future needs of consumers? The general opinion is that food manufacturers and retailers should know what consumers want and convey this to the packaging suppliers, and that they should keep the manufacturers, and increasingly the retailers, informed about their offerings. In the UK, leading the retailing development, most retailer packaging contacts go via the packer unless the packaging company has something new and unique to offer, and a similar situation might come in Sweden. In addition, the retailers decide where and often how packed products should be exposed in the stores, which influences consumers' purchasing (respondent D; Wells et al., 2007; Young, 2008). The way packaging attracts consumers and gets them to purchase a product is of major importance (Nancarrow et al., 1998; Rundh, 2005; Ahmed et al., 2005; Young, 2008). Brand retailers or manufacturers decide design, printing, colour, etc., whereas shapes, sizes, barriers, openings, etc., seem to be developed by the system supplier or the supplier of the final packaging in joint agreement with the customer. The step to go into partnership with a design firm, as company 4 has done, is thus a very interesting attempt to come closer to customers and consumers.

The environmental trend, going further into sustainable packaging across the whole supply chain and into waste and recovery (Svanes et al., 2010), should favour collaboration in the entire chain. This trend is behind many packaging issues and carbon footprints on the packages will come, according to several respondents, and this will involve the whole chain. One respondent stated that the greatest environmental impact comes from the actual food production and this is probably true in many cases. Hence, collaboration in the whole supply chain should be of particular interest to the packaging suppliers to put the debate on packaging waste into proportion. Another reason for collaboration is the trend to emphasise services and not only products/processes (Vargo and Lusch, 2008; Löfgren, 2006), which requires relationships, networks, interactions and trust between partners (Lindgreen, 2003) and favours development of products and packaging together (Chan et al., 2006; Olsson and Larsson, 2009).

Conclusions

Packaging suppliers are not a homogenous group and have different roles in the packaging supply chain and differ in distance to end customers and consumers. The role of packaging suppliers in food innovations is, as could be expected, primarily to serve their customers and provide support with the most applicable packaging system, packaging or packaging material. To do this successfully encompasses serving customers and defined areas of the food product range and being competitive, whatever that means: most attractive, flexible, best, cheapest, best value, fastest, most environmental, etc. Most packaging suppliers do not appear very interested in finding out for themselves the trends and developments in the market, particularly regarding food development, that might indicate future consumer needs. The prevailing attitude among some of the packaging suppliers seems to be that the food manufacturers and retailers should know and communicate what they as customers and what the consumers want.

Existing trends on the market such as differentiation, sustainability and shorter order sizes drive the packaging suppliers to spend much effort on 'invisible' innovations to meet the cost issue while investigating new opportunities in packaging materials, production, etc., and often in collaboration with other packaging suppliers. The interviewed packaging suppliers still do much of their innovation and development in Sweden even though many of them are global suppliers, working with global retailers and food manufacturers. The packaging suppliers complain that their customers in Sweden do not utilise their knowledge enough. This is an opportunity for manufacturers and retailers in Sweden to take advantage of being so close to

so much packaging competence in the country and this should encourage collaboration to innovate and develop together. Retailers view packaging as a means for differentiation, whereas the food manufacturers should look at packaging as a possibility to drive product development, like cans and aseptic systems did in the past. Even if Sweden is a small country, it could serve as a test market. This requires in-depth collaboration between suppliers and food manufacturers. But packaging suppliers must then take a stronger interest in the trends and developments in the food area, become more involved and gain more consumer insight.

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