

Consumer research: creating a solid base for innovative strategies

Howard Moskowitz^{a,*}
and Johannes Hartmann^b

^aMoskowitz Jacobs Inc., White Plains, NY, USA
(Tel.: +914 421 7400; fax: 914 428 8364;
e-mails: mjihrm@sprynet.com, Johannes.Hartmann@unilever.com)

^bVP Consumer Insight Foods, Unilever NV, Weena,
Rotterdam, Netherlands

The paper deals with the issue of innovation from the viewpoint of applied product development, as motivated by experimental design of both concepts and products. We begin with the limitations in the food and beverage industries (the nature of the product world and the nature of the customer being served). We move on to a discussion of the corporate structure involved with consumers (sensory analysis, market research), review methods currently in use, and then finish with one area that has worked well, systematic variation of ideas and products. We conclude with a discussion of the limits to the innovation process.

Introduction – Food product development in the world of innovation

Innovation is today's business mantra. Pundits proclaim daily that the only hope for business survival is the ability to continue innovating. Anything less and the company will find itself in mortal danger because every other form of competitive advantage is simply too temporary (Bacon & Butler, 1998). Most industries create technological advances and occasionally breakthroughs that manifest

themselves in new products and services. We need only look at each generation of the PC, of the Internet, of consumer electronics for entertainment to get a sense of the vast sea of innovation, both in new technology and in recombination of old technologies.

This type of thinking makes a great deal of sense in many industries, especially those in high technology. Just think of the number of electronic gadgets lying around, disused, bearing on their bodies the archaeological history of the business, written at processor speed, with different bells and whistles. There, as in more serious electronics such as computers, performance is a driving force. Miss incorporating the 'right chip' and you might as well forget about the product line.

Unfortunately, the food industry is not subject to this type of innovation pressure. There are 'state of the art' potato chip (food form), production processes, nutritional characteristics, each of which demand some innovation. The world's food industry tends to be a steady, relatively boring, slow-moving behemoth, not particularly jogged by those technical innovations which themselves turbocharge business innovation. What occurs, therefore, is that the mind-set of the business person in the food and drink industry is sharp, a *sine qua non* of industrial competition, but the focus migrates from product itself to relying on innovations/expertise in marketing, packaging, distribution, and line extensions (Earle, Earle, & Anderson, 2001; Zind, 2000).

The slow-moving nature of the food industry in part can be traced to the conservatism in food habits (Rozin & Vollmecke, 1986) and to the tendency to dislike new foods (so-called neophobia, Pliner & Salvy, 2006). Furthermore, at the consumer level there may be an emergent distrust of the 'new', further dampening the acceptance of innovative products (Backstrom, Pirttilä-Backman, & Tuorila, 2003; Huotilainen, Pirttilä-Backman, & Tuorila, 2006). We don't see such conservatism in other verticals, such as electronics and financial services. If the consumer is not pushing hard for changes, and doesn't really respond strongly to 'new and quite different', then the underlying bedrock of innovation simply doesn't exist. There is really no economic incentive to spend money on truly new products if the adoption of such products is unlikely, except with heavy marketing. It's better to wait for the demand to emerge, however slowly, and then respond to that demand. So in a sense innovation may occur, but on a very long time scale.

* Corresponding author.

There are of course, general trends in the food industry that drive changes, and force innovation. Some of these are the push to reduce calories, to reduce salt, to eliminate trans-fats, all on an ingredient level. Another set of trends driving some innovation is the goal to market more healthful, 'good-for-you' foods, and the recognition that obesity is a looming problem worldwide due to 'over-nutrition'. Beyond these general trends are three others that force innovation. One is the realization that food can 'drive' health, producing the world of nutraceuticals, or nutrition as pharmaceutical. Another is the push for variety, with the goal that people want to try new products, new cuisines. A third is the growth of up-scale and high-end in the food and beverage industries, so that brand, typicity (origin), and product 'legend' become important. In the main, people's attitudes have changed dramatically in the past 50 years, with the food and beverage industries trying to catch up, but generally lagging these attitude changes.

Innovation in the food industry – Structural issues and business perspectives

In the food world innovations are increasingly difficult to come by – true innovations, that is. Of course, there are always the mammoth innovations to be discovered, such as microwaving. But read the literature in food science and technology, and you will be struck by a different type of innovation. The stories in the food and beverage trade magazines, a good source of information on innovation, focus on new ingredients substituting for old ingredients; of lower calorie ingredients substituting for higher calorie ingredients. One gets the sense of rearranging components in the same old boxes, to extract a slight 'edge' *versus* the same product a year ago, or *versus* competition (e.g., Anonymous, 2005; Holleran, 2005). There are no major stories, week after week, of technologies that open up new vistas for foods and beverages.

There is always the issue of consumer safety which 'hamstrings' innovation. There can be no truly new product or component of a product that has not gone through extensive testing for safety. So, even at the 'get-go', the food industry is hampered; not enough technologies make it through the gate, either for lack of performance, or more often for lack of a definite market at the end of the testing cycle due to interfering but necessary legal regulation.

There's no generation after generation of a food product, the latter lapping at the heels of the former, as there is for electronics, unless the generation is almost 'trivial', such as the *n*th flavor of a cookie or still fruit beverage. In such a world of limited development, excessive testing and regulations, innovation is stifled, if not at the core of the business than certainly at its place of execution – the company's R&D laboratory. At the merchandiser's shelf 'innovation' efforts occupy increasingly valuable store real estate that must be paid for with onerous and discouraging 'slotting fees' (really rent for shelf-space).

How the consumer focus drives a company's innovation and innovativeness

For decades now, we have heard again and again that 90% of new products fail. If this number is true (right now it is not particularly well substantiated), then we ought to ask ourselves *why* this massive failure rate when companies across the board in food and beverage, in packaging, packaged goods and food service proclaim that the 'customer is king'. What's going on?

Today's innovation practices and literature are filled with the recognition that the voice of the consumer is paramount (e.g., Jaeger, Rossiter, Wismer, & Harker, 2003; Stewart-Knox & Mitchell, 2003). If truth be known, however, the voice of the consumer is only one of many considerations. Other considerations in the company are sourcing (can we get the raw materials in a cost-efficient, stable way), technological capabilities (can we process the raw materials to produce the products in a way that produces a cost-effective, quality-stable way), and competitive threats (are we insulated from competition, or can any other company copy our product, reducing the impact and value of our efforts and our marketing). The list of other considerations can be lengthened, of course. Yet the consumer is still paramount, no matter what, because for most products purchasing the company's offering is generally discretionary.

One consequence of consumer focus is an enormous literature on this so-called voice of the consumer, either as a discipline itself, or as part of the stages and gates for new product development (Cooper, 1993). Some points of view hold that innovation means incorporating the consumer needs and wants into products. And yet, at the same time, there is a counter-current of viewpoints stressing that the consumer really doesn't know what is wanted, reacts to what current 'is', and therefore the strategy of creating today's needs/wants stifles true innovation. This second point of view is not often published, is politically incorrect, but nonetheless stridently proclaimed by 'creatives' whose job it is to know the consumer's tastes before the consumers do. Of course, all too often pundits neither tell the developer or the marketer what exactly to create, nor how to position it.

The notion of marketplace success by listening to the consumer is not necessarily proven. First, consumers typically know what is 'today', and don't know what will be tomorrow. They can evaluate, but this presupposes that the developer has already created something. Second, are macro-trends in the environment such as health. Third, there is the micro-economic climate of the company and competitive activity – are other companies marketing similar products? (e.g., United Soybean Board, 2004–2005). All influence product success.

All of the above point to the strong possibility that innovation based on the voice of the consumer may limit what the developer can do. Yet, because food is so much a matter of personal preferences, the developer cannot leave out the

consumer either, and proceed willy-nilly towards innovative and unique ideas, just because they provide something that no competitor currently provides. The tolerance of individuals for newness may be great for electronics, say, but it certainly is not for foods. We come wired in as babies with some level of fear of new things (neophobia) that manifests itself greatly in the rejection of new foods. As we get older, we keep some, if not all of these food aversions (Ganchrow & Mennella, 2003). Research in taste and smell shows that the same set of sweet and salt stimuli may be accepted by some individuals yet strongly rejected by others (Pangborn, 1970). No other sensory inputs show this type of systematically polarized, often intense segmentation, where individual differences abound in the same culture.

The practical consequence of sensory segmentation is paralysis in the face of polarized acceptance/rejection. It's likely that during the innovation process there will emerge changes in the chemosensory profile of products. These changes in sensory profile may engender just as much rejection among some prospective customers as they engender acceptance among others. In sum, then, relying on the voice of the consumer will probably lead to some innovation, but not much, just because built-in, polarized preference patterns may limit acceptance of the 'new'. Moskowitz and Gofman (2007) recount the practical business issues that emerge when a food product that polarizes due to taste or smell (e.g., Maxwell House coffee, Prego pasta sauce) is the candidate for innovation. The ordinary tendency in the food and beverage business is to avoid changing the product, and to accept lower acceptance overall, instead of recognizing the polarization and opting to create a far superior product, but yet consciously targeted to a much smaller segment.

Consumer-orientation in food product development could nonetheless substitute for (or complement) technological drive. Pragmatically, it is still relatively easy to modify the existing products, create new flavors, new package forms, new graphics, and then 'flag' these on the package as being new (e.g., Naes & Nyvold, 2004). It certainly is cheaper than moving towards high level product innovation, such as changes in processing to produce new textures, or even the creation of whole new food categories. We don't see very many technology-led initiatives leading to big breakthroughs, suggesting that *de facto*, focus on the consumer has substituted for the strong technological drive. The trade magazines are filled with stories of small advances, of new ingredients that give the same sensory experience as older, more costly, or caloric or less stable ingredients. The focus in those stories is that consumer acceptance is the same, perhaps even slightly enhanced.

The roles and contributions of corporate functions – Market research and sensory analysis

Today's food industry is well catered by consultants who watch trends, and who provide reports on what people eat.

Both Nielsen and IRI are well known for their ongoing tracking of what people buy in stores (e.g., Nielsen, 2005). There is certainly no lack there in the information available to the marketer or developer. In fact, it might be said that there is too much information available at the granular level – so much so that an entire industry has sprung up to deal with the this data, so that the astute marketer can identify the levers of marketplace success. These are the so-called marketing mix models, which show the effect of advertising, promotion, etc. Surprisingly, most models do not incorporate the acceptance of the product, nor do they incorporate any of the features of the products into a measure of product uniqueness (see Blair & Kuse, 2004). Most of them deal, instead, with advertising and promotion expenditures, albeit at a local level.

The nature of market research today has evolved from problem solving into the continuing reportage of market performance, consumer awareness tracking, and the like. This information does not necessarily produce insights and direction for the product developer and marketer. For the developer the hope is that somewhere within the 'story' hides a nugget that can be used, a trend that is just emerging and which might be useful for a new line of products. Unfortunately, those nuggets are rare and disappointing because of their superficiality. At a more profound level, the fun reading about 'trends' masks the lack of a deeper involvement with consumers, at least for quantitative research. Unfortunately, company after company has commoditized the consumer research process, turning the process into 'insights', and then formalizing these 'insights' as a series of standardized reports, rather than as solutions to problems. This commoditization of research does not help the innovation process.

Another area of consumer knowledge is the discipline known as sensory analysis. Sensory analysis began a half century ago with so-called 'taste tests'. In the late 1960s, sensory analysis began a long-term, occasionally tempestuous relation with psychophysics, which is the branch of psychology that studies the relation between physical stimulus and sensory perception. Psychophysics deals with how the sensory systems transform physical stimuli and their mixtures to responses. Even in its early days, psychophysics was an appropriate area of interest for product developers, as numerous papers suggest (see Moskowitz, 1983). However, sensory analysis took a different turn, moving decisively towards its heritage of expert panels, extensive training, and 'profiling' products for their sensory signature (Cairncross & Sjostrom, 1950; Stone, Sidel, Oliver, Woolsey, & Singleton, 1974). This turn to expert panels, very popular among R&D directors who had hoped for innovation breakthroughs, did not lead to new product innovations because many product developers did not really understand what to do with the reams of profile charts produced by sensory for different products. The implementation of specific, concrete actions to the product using the product's sensory profile was often

unclear, and left to the intuitive interpretation of the product developer. Furthermore, the extensive focus on statistics, whether inferential or mapping, rarely led to actionable insights or concrete direction that generated products. That is, there was no operational path that could be clearly demonstrated showing how the output from sensory research would drive a specific change in the product formulation.

Perhaps the one area of statistics applied by sensory professionals that did lead to specific *prescriptive*, testable and verifiable changes for the product formulation was response surface analysis or RSM (see Box, Hunter, & Hunter, 1978). RSM produced equations that let the product developer understand the specific formulation profile corresponding to a sensory profile. This type of actionable sensory research was known by the rubrics of product optimization and reverse engineering (Moskowitz, 1994). More of that later in this paper.

There were some psychophysicists such as Harry Lawless of Cornell, who maintained the psychophysical tradition, and in some cases merged descriptive analysis with psychophysical methods (Heymann & Lawless, 1997), and over time psychophysicists drifted in and out of the world of sensory analysis. Yet for the most part sensory analysis in general does not seem to have grasped the full potential of what psychophysics had to offer it, perhaps with the exception of some academic sensory researchers. Certainly much of business did not.

Rethinking innovation from the viewpoint of people, rather than method

Last but not least let's not forget that innovation is '*people work*': The very nature of the foregoing situation has an effect on those people leading innovation processes in food companies. The eternal, political struggle between development and marketers, marketers and consumer research, and all together against their bosses determine the agendas of people in big fast moving consumer good companies. Reduced quality of interdependency between people has become a main constraint to effective innovation. The insecurity of teams comes with the pressure to decide high investments for real new innovations on the one hand whilst the risk aversion on the other – being grounded on the very nature of food innovation success rates in general – are not helping a company to become broader in their innovation leadership.

The other people aspect is related to *object-focus* in innovation processes. A project very often becomes an issue by itself, because project management is not able to remain holistic. The consequence is little, often irrelevant successes that become the focus, so that one might point to one's own success and legacy in the process. There is little else to leave or to show. This focus on the 'small and now' affects adversely the willingness to honestly collaborate and to include broader audiences into the development process. Human nature being what it is, once an idea

has been established it will be pushed to its end, good or poor, to avoid a better or broader idea coming from somebody else.

Tools (1) – Design and development based on experimental design of ideas and products

Having dealt with the structure and some of the issues, let us now proceed to methods that have worked. These are the tools of the different professions involved in innovation. There are at least three key areas in quantitative research that the developer can use to link innovation to consumer needs. The first is experimental design of product ideas to fit end-uses (so-called First Principles) The second is experimental design of product ideas, including both 'close-in' ideas (line extensions), but also potential '*frank-enfood ideas*' (combinations of features from disparate worlds, with the goal to 'mix' ideas from disparate realms). The third is experimental design of actual product features (response surface modeling), and its extension to unrelated foods in the same category (category appraisal).

Experimental design of ideas to fit end-uses (first principles)

The researcher develops an architecture of a product concept, with features corresponding to appearance, aroma, taste/texture, packaging, etc. Each feature comprises, in turn, several options. The computer mixes/matches these options into new combinations. The respondent rates the 'fit of the combinations' to a specific end-use. The end-use 'drives' the elements that are deemed appropriate (see Moskowitz, Porretta, & Silcher, 2005).

Experimental design of product ideas to generate new-to-the-world products

Consumer-driven innovation can work within a limited world such as that provided by food, provided that the developer accept that much of the innovation will be through recombination of existing ideas or parts of ideas into new 'wholes', i.e., new ideas. To the degree that these components represent close-in sensory changes (e.g., modest changes in appearance, flavor/taste, texture) the products will become line extensions. To the degree that the elements are components from different products that have been mashed together into new wholes, the mixing exercise may well generate stronger, more impactful innovations. Moskowitz and Gofman (2007) discussed this approach in consumer electronics. A more detailed approach appears in Moskowitz (2007), which showed the strategy as a systematized sequence of steps, beginning with the architecture of a product, the evaluation of different products by experimental design of ideas (RDE or rule developing experimentation), identification of winning elements or product features from the separate products, and then the 'mash-up' of these ideas into new-to-the-world products based upon the reactions of consumers to systematic recombinant ideas. The approach, currently enabled by

web technology (Moskowitz & Gofman, 2007) provides one way out of the dilemma of innovation in a constrained world.

The product model – Ranges of formulation

At the outset we need to understand that for the most part the food industry has relied on an incomplete knowledge of consumer preferences. Very few companies, if any systematically explore their own products to understand how changes in the product formulation drive consumer responses. Yet, such systematic variation brings a discipline that works quite well, and actually drives innovation. The systematic variation, also known in some circles as response surface methods (Box *et al.*, 1978; Myers & Montgomery, 1995), can produce innovation, although not if used in close-in projects where one or two or even three variables are modified to understand how processing changes or ingredient changes ‘affect standard or identity’ or consumer acceptance. When the response surface methods are exploded out to 5, 6 or even 10+ ingredients, and process conditions, the result is a set of products that was hitherto not considered by marketing or product development. Testing these products with clearly defined sensory differences generates a database of consumer responses to different sensory experiences ‘playing off the same basic product’ (Bech, Hansen, & Wienberg, 1997). Moskowitz and Gofman (2007) reported how such ‘rule developing experimentation’ generated better coffees for Maxwell House, as well as innovated many of the Prego pasta sauce products for Campbell Soup, and lines of pickles for Vlasic. Such response surface methods were also responsible for the creation of Tropicana’s Grove-stand® Orange Juice, because the exploration of many variables showed that pulp was a key driver of a new product perception.

Category appraisal and models using in-market products

The notion of experimental design and product models has been further generalized by working with unconnected products in the same product category. The approach, called category appraisal, allows response surface methods to be applied, not to ingredients, but to factor scores derived from sensory attributes. The result is an ability to identify new products, combining existing sensory properties in combinations not possessed by current in-market products (Jaeger, Wakeling, & MacFie, 2000; McEwan, 1996; Meullenet, Lovely, Threlfall, Morns, & Striegler, 2008; Moskowitz, Beckley, & Resurreccion, 2006; chp 3; Moskowitz & Jacobs, 1989).

Tools (2) – Theories, methods and IT tools available to help innovation

In most growing disciplines, there is a body of information that leads to theories, which in turn lead to predictions. Food preferences are no different. Fifty years ago we had

the very well accepted food preference survey funded by the US Army for feeding soldiers, but then adopted widely (Meiselman & Schutz, 2003). Today’s world of theories, methods and technology has gone beyond those early days, beginning with the store scan of what is being sold. The reader might wish to look at extensive analyses of issues and tools in the food industry that have been considered as aids to innovation (e.g., van Kleef, van Trijp, & Lunging, 2005; Viaene & Januszewska, 1999). They provide a longer analysis of the thinking and approaches, primarily focusing on issues and methods, rather than the way this paper is put together, with business issues and problems *per se* playing the key role.

A lot of what the food industry relies on comes from the reports of store movement, rather than from primary research. With the increasing *WalMartization* (trade-governance) of the food industry on the one hand, and the rapidly growing ‘quality’ products from the trade (store brands), there is a dearth of funding to better understand the way consumers make decisions about food, and thus relatively little in the way of seed ideas to spark innovation. There are, of course, various disciplines dealing with the very large field of ‘consumer behavior’, but those disciplines tend to focus on the gross decision rules, rather than the specifics for innovation. A researcher in consumer behavior would, for instance, focus on the decision rules for buying some fast moving goods such as spaghetti sauce. Is it brand first, then variety, or variety first then brand? In such research, or parallel studies on marketing, merchandising and branding, there is relatively little that the product developer can use directly (e.g., Broniarczyk, Wayne, & McAlister, 1998; Hoch, Bradlow, & Wansink, 1999). Occasionally the research might incorporate taste, but usually just to find out the relative importance of taste, rather than the direction to take when formulating a product (e.g., Vickers, 1993).

For innovation, all is not lost, however. Market researchers, ever resourceful and dealing with the issue of ‘how to predict new’, have come up with various schemes to help innovation. Few are systematic; most set up the opportunities for ideas to emerge. Almost none except the latest web-based technologies are actually implemented on the Internet, and scalable worldwide.

a. *Ideation sessions.* These are the most traditional. You bring 5–40 or more people into one working space and then start squeezing ideas out of the brains of participants. Ernst and Young have established a very effective process called ASE. It is integrated into an open space environment, where ideas are immediately sketched by designers to visualize the function of the new ideas. In the process new additional knowledge is fed in lateral streams, so that ideas can be broadened and re-worked. In less sophisticated ideation sessions, quantity is the guiding principle. The more ideas can be combined, re-defined, etc., the better. Editing and

using the output of these processes can be very frustrating in hindsight. Although the generation of many ideas leaves one with a feeling of immediate gratification, there is no check for relevance and size of the ideas during the process itself. Even afterwards it often shows to be difficult because raw product ideas (sometimes just based on technology knowledge) cannot be tested — as is — with consumers. A second issue lies in the fact that the corporate hierarchy often intrudes, preventing an honest prioritization of developed ideas in favor of selection by corporate rank. A third issue is true ‘actionability’ of the ideation work-product. Namiranian and Ishmael (2005) reported that ‘out of the box’ or ‘blue sky’ thinking actually produced fewer actionable ideas than disciplined, ‘in the box’ thinking. It’s easy to imagine that thinking broadly will result in wide-ranging ideas, but often these ideas are irrelevant and less actionable, and they may only skim the surface of an issue and thus are shallow rather than innovative. Paradoxically, the way to generate a large number of highly innovative ideas is to focus narrowly, and dig very deep. In other words, the most effective way of being creative is to stay ‘inside the box’. Or, build an even narrower box than relevance demands, and plumb the depths of that box before building another box whose depths can be mined for great ideas.

- b. *Insighting*. This approach has proven to be quite effective particularly when several competing country teams are involved. The process starts with a deeper analysis of the category/consumer/technology background. Based on this knowledge, the participating group (around 5–10 people) write connecting statements, sentences that try to reach out for the mind of a consumer before the factual product story is told. The reasoning is based on the notion that a concept first has to resonate emotionally with the prospect before the factual story is told to persuade. The process works in iterative steps with the help of an independent facilitator, who continuously strives to open the group for new ideas, integrate those in the overall thinking process and transcending them into more holistic ideas. In between, batteries of statements are presented to consumer groups for evaluation. The aim is to understand “how” statements resonate and not whether the consumer likes the statement or not. Once a strong connector has been identified, the process starts to look for adequate descriptions to determine product identity and benefit/reason to believe stories (persuaders). As the group moves through the process, the ultimate outcome becomes a group effort. This can obviously be very supportive for the overall alignment process of the team. Everyone is invited to participate with his/her ideas. At the end there is no hobby-horse being checked, no single individual’s vision being discussed by an unwilling group (Hartmann & Moskowitz, 2007).
- c. *Collaborative filtering*. The approach works with experts who presumably have monitored the environment. The experts build on each other’s ideas. Recently, a number of market research specialists have developed web-enabled methods by which one individual can look at the ideas of another, vote on them, and then give ideas of his own. The method cascades ideas quickly, with some ideas staying and others dying. Flores (2005) has called these ‘weak signals’ using the metaphor of Ansoff (1975), and has provided one of the web-tools, ‘brandDelphi’. The tool shows success in generating, refining, and screening winning ideas in a matter of a few hours, with consumers working on the Internet.
- d. *Gifted creatives and simulated markets of ideas*. This method promoted by BrainJuicer® (Kearon, 2006) uses their online Creativity Test to identify naturally gifted creatives in the population and to engage them online to produce and rate large numbers of innovative ideas against specific briefs. BrainJuicer® then tests the top 15–20 ideas using a method they call, Predictive Markets which has shown that a large random group of 500 buying and selling ‘shares’ in ideas can be as accurate at sorting the ‘wheat from the chaff’ and spotting the strongest ideas. Decision Analyst, Inc. also uses a panel of creatives screened from thousands of consumers, in ‘virtual, time-extended, multiple-day sessions’ conducted with an online bulletin-board. The output is taken as idea inputs. The company works together with clients, innovation experts, and writers to develop the concepts that resonate with the business objectives (Namiranian & Ishmael, 2005).
- e. *Lead user observation*. Consumers fall along a distribution, with leaders who grab the product and actually modify it ahead of the manufacturer, all the way to laggards who are the last ones to use the product, if ever (Urban & von Hippel, 1988). Lead user research presumes that the natural proclivity of the leaders is to take hold of a food product and use it in new ways. Such hoped-for-sources of innovation occasionally occur when the consumer uses the product as part of another dish.
- f. *In-context research*. Research among consumers ‘in-context’ generate observations which can lead to new ideas. In-context research increases the respondent’s ease by creating a casual setting that makes people feel more comfortable. As a consequence, the researcher sets up an environment that helps unearth the consumer needs and wants by creating a setting that stimulates memory and allows participants to re-experience evocative situations that they might otherwise not recall (Moskowitz *et al.*, 2006, chp 3).
- g. *Ethnography*. One of the tools of anthropologists is to observe people in their own culture. Ethnography has been welcome for product innovation because it is

presumed to observe people their natural habitat, and may provide an avenue for future product development (Mariampolski, 2006). As Mariampolski wrote to the authors, the actual work consists of “going around to people’s homes to watch them during meal preparation and use their ingredients, processes, tools, beliefs, concepts, ideas and cooked items served in their cultural context as input for new product and communications concepts”.

- h. *Databases of the consumer mind (It!® Studies)*. Created using experimental design of ideas (self-authoring conjoint analysis; Moskowitz *et al.*, 2001), the database comprises linked studies of 20–30 products in a single large category. The silos for the design comprise product features, benefits, etc. The database shows which ideas drive consumer interest, as well as the existence of latent segments, or individuals with different mind-sets (Moskowitz, German, & Saguy, 2005). Merging winning ideas from different product studies within the database can create new-to-the world products (Moskowitz, Gofman, Beckley, & Ashman, 2006).
- i. *Predefined datasets and a combinatorial system (Innovaid™)*. The above-mentioned database of the consumer mind revealed that the hardest task for the user was to collect the raw elements that would be used by the conjoint, combinatorial program. Moskowitz (2007) presented a set of 70 pre-compiled databases of elements for the food, beverage, and lifestyle industries. For food and beverage the database comprised six silos, all of which are ‘actionable’. The silos are appearance/texture, primary ingredients, special ingredients or additives, taste/texture, packaging, and merchandising in the store. The user is encouraged to mix and match the elements from different products, to create new-to-the world food and beverage ideas. The site is www.InnovAidOnline.net

Tools (3) – Selecting techniques for product innovation – the roles of consultant and client

Since innovation is a multi-faceted task in the food industry, the practical question often comes down to ‘which tools should the company use?’ Are some tools better than others? Are there institutionalized ‘best practices’ that have been ‘vetted’ by years of experience, and institutionalized by organizations such as the ASTM (American Society of Testing and Materials)? ASTM standardizes tests for measuring the characteristics of products.

The answer to the foregoing question is that the ability of a tool to help product innovation is a function of the nature of the problem, the expertise of the person using the tool, and the willingness of the company to try new approaches. There are no standardized methods, no ASTM of new product development and innovation.

Typically innovation in the food industry is facilitated by consultants from the outside. These consultants vary in the

tools with which they feel comfortable. Some consultants specialize in the very early ‘high touch’ aspects, watching and talking to consumers. Others specialize in the more quantitative approaches, such as experimental design of product ideas, and actual products. It is always a good idea to have several consultants with different points of view working on the innovation issues for a single company, because in that way the likelihood of a solution increases as the consultants are forced to deal with the problem, and with each other. Such interaction is always beneficial because it focuses attention on problem and solution, rather than on method.

The nature of the company itself is also critical in the selection of approaches. Companies, like consultants, have histories of experience with methods. For a company it is important go a bit beyond the boundaries of what has been done before, and what is assumed to be ‘tried and true’. To transcend the boundaries means that the company may have to try methods with which they are not comfortable. The problem is that the company leaves the comfort zone. If the company fails to leave that zone, however, the likelihood of success in innovation is diminished, perhaps greatly.

How should the company re-structure itself for innovation?

Today there are the big companies such as the multinational food companies (many American owned), large national companies, multinational supermarket companies, multinational ingredient, equipment and packaging suppliers, and of course the multitude of small/medium sized companies from whom innovation often comes. Also there are the changes occurring in the large food companies with production being more and more contracted to other companies, and the R&D resources being reduced in size – reducing the technological knowledge in the company. Furthermore, supermarkets are developing more and more of their own products in all price ranges. Also there are large new markets developing in Eastern Europe, China, and maybe India. It is a confusing picture overall, and difficult to see how innovation strategies and product development programs should and will be organized.

If we were to design the system of the future, one of the key things that we need to keep in mind is how the company is going to access the consumer’s mind? For 40 years we have seen silos erected, especially between R&D and marketing. R&D, first using expert panels such as the Flavor Profile (Cairncross & Sjoström, 1950), went on to create a sensory analysis world replete with elaborate test booths, exquisite yet excessive and unproductive statistical analysis and mapping, with no clear business accountability for the data that were generated. Although removing sensory analysis from R&D and moving it into marketing research sounds iconoclastic and inflammatory, such a move might be the only way that primary consumer

research can aid innovation. Otherwise the food industry will continue to suffer from a priesthood of tool-users but having no accountability, handing off non-actionable reports to a marketing group that cannot appreciate them. It's important that the two groups merge, that the marketing researchers understand the product developer's need for information to support innovation, and that the sensory analyst provide truly actionable information, not just sensory description. This structural reorganization will lead to better use of internal resources.

At a higher level, and as noted above at the start of this section, companies are already turning to their suppliers for innovation. R&D already recognizes that it cannot warehouse the talent inside for innovation. More of this intellectual outsourcing must be done. Rather than relying on the flavor or ingredient to provide substantiation that its submission 'meets standards', it might be beneficial to encourage these suppliers to use more advanced thinking, such as experimental design of ideas to help their customers innovate. Right now the economics are such that they discourage any extras; consumer insights is touted as a competitive advantage, but in fact the supplier's tight margins discourage most but the most prosaic tests and analyses. The suppliers can provide maps, and reams of data, but most of that is mindlessly churned out of the computer. Perhaps a more honest collaboration between customer and supplier would allow the supplier to provide better, possibly a bit more expensive 'insights' leading to innovation.

Two recent books in this area deserve mention in this regard, because they discuss these new collaborative roles, particularly in the innovation process, and specifically for the food industry. They are both edited books, comprising contributions from many experts in the field, and both quite recent. The first is *Accelerating New Food Product Design and Development* (Beckley, Foley, Topp, Huang, & Prinyawiwatkul, 2007). The second is *Consumer-led Food Product Development* (MacFie, 2007). Both books are worth looking at because they present a collection of new ideas, some from academia but mostly from the practical world of business where the academic ideas and approaches have been refined and battle-tested.

References

- Anonymous (2005). Consumers and mineral fortification. *Prepared Foods*, 173(6), 27.
- Ansoff, H. I. (1975). Managing strategic surprise by response to weak signals. *California Management Review*, VIII(2), 21–33.
- Backstrom, A., Pirttilä-Backman, M., & Tuorila, H. (2003). Dimensions of novelty: a social representation approach to new foods. *Appetite*, 40, 299–307.
- Bacon Jr., F. R., & Butler Jr., T. W. (1998). *Achieving planned innovation*. New York: The Free Press.
- Bech, A. C., Hansen, M., & Wienberg, L. (1997). Application of house of quality in translation of consumer needs into sensory attributes measurable by descriptive sensory analysis. *Food Quality and Preference*, 8, 329–348.
- Beckley, J., Foley, M., Topp, E., Huang, J., & Prinyawiwatkul, W. (2007). *Accelerating new good product design and development*. Ames: IFT Press.
- Blair, M. H., & Kuse, A. R. (2004). Better practices in advertising can change a cost of doing business to wise investments in the business. *Journal of Advertising Research*, 71–89.
- Box, G. E. P., Hunter, J., & Hunter, S. (1978). *Statistics for experimenters*. New York: John Wiley.
- Broniarczyk, S. M., Wayne, D. H., & McAlister, L. (1998). Consumers' perceptions of the assortment offered in a grocery category: the impact of item reduction. *Journal of Marketing Research*, 35, 166–176.
- Cairncross, S. E., & Sjostrom, L. B. (1950). Flavor profiles — a new approach to flavor problems. *Food Technology*, 4, 308–311.
- Cooper, R. G. (1993). *Winning at new products: accelerating the process from idea to launch*, (2nd ed.). Reading, MA: Addison Wesley.
- Earle, M., Earle, R., & Anderson, A. (2001). *Food product development*. Boca Raton, FL: CRC.
- Flores. (2005). brandDelphi a new ideation method to amplify weak signals. *Ph. D. dissertation in business*. France: Université de Grenoble 2.
- Ganchrow, J. R., & Mennella, J. A. (2003). The ontogeny of human flavor perception. In R. L. Doty (Ed.), *Handbook of olfaction and gustation* (2nd ed.). New York: Marcel Dekker.
- Hartmann, J., & Moskowitz, H. R. (2007). How to generate global insights to create global brands. Paper delivered at the *ESOMAR conference on insights*, May, Milan.
- Heymann, H., & Lawless, H. T. (1997). *Sensory evaluation of food: principles and practices*. New York: Chapman & Hall.
- Hoch, S., Bradlow, E. T., & Wansink, B. (1999). The variety of an assortment. *Marketing Science*, 18, 527–546.
- Holleran, J. (2005). Healthy ingredients — including soy — rank with consumers, manufacturers. *Stagnito's New Products Magazine*, 5(12), S10–S12.
- Huottilainen, A., Pirttilä-Backman, M., & Tuorila, H. (2006). How innovativeness relates to social representation of new foods and to the willingness to try and use such foods. *Food Quality and Preference*, 17, 353–361.
- Jaeger, S. R., Rossiter, K. L., Wismer, W. V., & Harker, F. R. (2003). Consumer-driven product development in the kiwifruit industry. *Food Quality and Preference*, 14, 187–198.
- Jaeger, S. R., Wakeling, I. N., & MacFie, H. J. H. (2000). Behavioural extensions to preference mapping: the role of synthesis. *Food Quality and Preference*, 11, 340–359.
- Kearon, J. (2006). *Creative consumers, adding inspiration to innovation*. ESOMAR Innovation Publications.
- MacFie, H. (2007). In: H. MacFie (Ed.), *Consumer-led food product development*. Woodhead Publishing.
- Mariampolski, H. (2006). *Ethnography for marketers: a guide to consumer immersion*. Sage Publications Inc.
- McEwan, J. A. (1996). Preference mapping for product optimization. *Data Handling in Science and Technology*, 16, 71–102.
- Meiselman, H. L., & Schutz, H. G. (2003). History of food acceptance research in the US Army. *Appetite*, 40, 199–216.
- Meullenet, J.-F., Lovely, C., Threlfall, R., Morns, J. R., & Striegler, R. K. (2008). An ideal point density plot method for determining an optimal sensory profile for muscadine grape juice. *Food Quality and Preference*, 19, 210–219.
- Moskowitz, H. R. (1983). *Product testing and sensory evaluation of foods: marketing and R&D approaches*. Trumbull: Food and Nutrition Press, Inc.
- Moskowitz, H. R. (1994). *Food concepts and products: just in time development*. Trumbull: Food and Nutrition Press, Inc.
- Moskowitz, H. R. (2007). Consumer-driven concept development and innovation in food product development. In H. MacFie (Ed.), *Consumer-led food product development*. Woodhead Publishing.

- Moskowitz, H. R., Beckley, J., & Resurreccion, A. (2006). *Sensory and consumer research in food product design and development*. Blackwell IFT Press.
- Moskowitz, H. R., German, J. B., & Saguy, I. S. (2005). Unveiling health attitudes and creating good-for-you foods: the genomics metaphor and consumer innovative web-based technologies. *CRC Critical Reviews in Food Science and Nutrition*, 45, 165–191.
- Moskowitz, H. R., & Gofman, A. (2007). *Selling blue elephants: how to make great products before people even know they want them*. Wharton School Publishing.
- Moskowitz, H. R., Gofman, A., Beckley, J., & Ashman, H. (2006). Founding a new science: mind genomics. *Journal of Sensory Studies*, 21, 266–307.
- Moskowitz, H. R., Gofman, A., Itty, B., Katz, R., Manchiaiah, M., & Ma, Z. (2001). Rapid, inexpensive, actionable concept generation and optimization – the use and promise of self-authoring conjoint analysis for the foodservice industry. *Food Service Technology*, 1, 149–168.
- Moskowitz, H. R., & Jacobs, B. E. (1989). Using in-market products to generate target sensory profiles in early stage development. In Wu. (Ed.), *Product testing with consumers for research guidance*, Vol. 1035 (pp. 64–74). Philadelphia: American Society for Testing And Materials, STP.
- Moskowitz, H. R., Porretta, S., & Silcher, M. (2005). *Concept research in food product design and development*. Iowa: Blackwell Professional.
- Myers, R. H., & Montgomery, D. C. (1995). *Response surface methodology: process and product optimization using designed experiments*. New York: John Wiley.
- Naes, T., & Nyvold, T. E. (2004). Creative design – an efficient tool for product development. *Food Quality and Preference*, 15, 97–104.
- Namiranian, L., & Ishmael, G. (2005). *The case for in-the-box innovation*. Paris: ESOMAR Innovate.
- Nielsen, A. C. (2005). Organic, no/low-sugar products top list of best-performing “good-for you” product segments – low-carb segment sales continue to wane. Available from: <http://us.acnielsen.com/news/20050502.shtml>. Accessed 18.10.05.
- Pangborn, R. M. (1970). Individual variations in affective responses to taste stimuli. *Psychonomic Science*, 21, 125–128.
- Pliner, P., & Salvy, S. J. (2006). Food neophobia in humans. In G. M. Shepherd, & M. Raats (Eds.), *The psychology of food choice: frontiers of nutritional science*, Vol. 3 (pp. 75–92). Oxford: CAB.
- Rozin, P., & Vollmecke, T. A. (1986). Food likes and dislikes. *Annual Review of Nutrition*, 6, 433–456.
- Stewart-Knox, B., & Mitchell, P. (2003). What separates the winners from the losers in new food product development? *Trends in Food Science & Technology*, 14, 58–64.
- Stone, H., Sidel, J. L., Oliver, S., Woolsey, A., & Singleton, R. (1974). Sensory evaluation by quantitative descriptive analysis. *Food Technology*, 28, 24–34.
- United Soybean Board. (2004–2005). Consumer attitudes about nutrition – insights into nutrition, health & soyfoods. USB National Report 2004–2005. 8 pages.
- Urban, G. L., & von Hippel, E. (1988). Lead user analyses for the development of new industrial products. *Management Science*, 34(5), 569–582.
- van Kleef, E., van Trijp, H. C. M., & Lunging, P. (2005). Consumer research in the early stages of new product development: a critical review of methods and techniques. *Food Quality and Preference*, 16, 181–201.
- Viaene, J., & Januszewska, R. (1999). Towards an integration of R&D and marketing in production development. *Journal of International Food and Agribusiness Marketing*, 10, 79–98.
- Vickers, Z. M. (1993). Incorporating taste into a conjoint analysis of taste, health claims, price and brand for purchasing strawberry yogurt. *Journal of Sensory Studies*, 8, 341–352.
- Zind, T. (2000). Casting a net for new ideas Internet’s continued proliferation presents opportunity to shave time off new product development. http://www.foodprocessing.com/Web_First/fp.nsf/ArticleID/MEAT-4P6UVH/