IMAGE RESEARCH AS GUIDANCE FOR MEAT PRODUCTION

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SUMMARY

A market orientation to meat production requires that meat production is more closely adjusted to the (current and future) needs and wants of consumers in the target market. Marketing research has an important responsibility in providing insight into these needs and wants. Meat technologists have an important responsibility in initiating changes in the product and the production process to meet the consumer desires. The present paper, discusses how image research on meat products may contribute to market orientation in the meat sector.

Introduction

Increasingly, the market orientation is being adopted in the meat sector too. Implicit in the market orientation is that the organization takes a customer focus and responds to the customer needs and wants through a coordinated marketing effort (Kohli and Jaworski, 1990). Marketing orientation has been shown to be positively related to business performance (Jaworski and Kohli, 1993), and this relationship is particularly strong in markets that are characterized by high market turbulence and strong competition.

Like many other markets, the market for meat is characterized by highly demanding consumers and intense competition. For that reason, profitability of the meat sector may benefit from a market orientation. Such a market orientation would imply that the meat products delivered to the market are optimally adjusted to the needs and wants of the target market. One problem associated with this approach is that quality criteria adopted by consumers often differ from the quality criteria set in meat production. Basically, a market orientation in meat production implies that the gap that exists between consumer defined meat quality and production defined meat quality is closed.

A market orientation in the meat sector requires insight into consumer needs and wants. This insight should not be restricted to consumers' current needs and wants, but should also include future needs and wants as well as the exogenous market factors (e.g. competition, regulation, societal trends) that affect these needs and wants. Anticipation to future needs and wants is of particular importance to the meat sector, as changes in the product and the production process often require considerable time.

A key issue relating to the coordinated marketing response to the identified consumer needs and wants, is the selection of the appropriate physical product characteristics that ensure the most efficient and effective response to consumer needs (cf. Juran et al., 1974; Deming, 1982; Garvin, 1984). In addition to consumer needs and wants this requires insight into how physical product characteristics relate to consumer perception of meat products. Only when the company has knowledge about these relationships, it is able to select the appropriate product characteristics. Otherwise it might modify characteristics that have no linkage to consumer perception and hence will incur costs without obtaining the desired improvement in consumer quality of the product.

In the context of quality improvement, Steenkamp and Van Trijp (1990) refer to this process as consumer based quality guidance, a process consisting of three steps:

1. Identification of the quality judgments made by the consumers in the target market

2. Disentanglement of the quality judgments into its constituents

3. Translation of the consumer perceptions into physical product characteristics.

The ultimate goal of quality guidance is the formulation of technical product specifications that are related to consumer perception. Subsequently, the company must establish methods of production and quality control in order to actually meet the technical specifications. This final step belongs to the domain of production management (e.g. Juran et al., 1974; Feigenbaum, 1981).

Consumer perception of meat products

Product perception is a central concept in most consumer behavior models. It refers to the beliefs consumers hold about products. In the marketing context, products are conceived of as 'bundles of characteristics' (Lancaster, 1966), implying that product perception is a multi-dimensional phenomenon. Perception plays an important role in the formation of overall evaluative judgments. It is generally assumed that the overall evaluative judgments about products find their basis in the perception of those products on a limited number of more abstract product dimensions. These perceptual dimensions are the so called 'product benefits' from which consumer derive utility. Examples of these more perceptual dimensions would include 'sensory quality', 'ease of use' etcetera. Each of these perceptual dimensions may contribute to the overall judgment to a different degree, depending on how important this dimension is to the consumer. The more abstract perceptual dimensions summarize information of a larger number of concrete attributes that according to the consumer are correlated with each other, implying that they are cues for the same underlying construct (Steenkamp, 1989).

Consumer perceptions, both on specific attributes and the more abstract perceptual dimensions, reflect beliefs. Beliefs are associations consumers hold between attributes and products, i.e. the extent to which they believe that a product has certain characteristics. These beliefs may or may not reflect some objectively verifiable truth. For example, a widely held belief by consumers is that margarine contains more fat than butter. Although there is no objective basis for this belief, consumers associate butter more strongly to fat than margarine, and may be expected to act according to that belief.

Image research as guidance for product development

Figure 1 integrates the previously discussed concepts into a schematic representation of how consumers form product images. Consumers' overall evaluation of a particular product is referred to as the image of the meat product, defined as: "the overall evaluative judgment of the product, relative to other products, based on the perception of the products on underlying image-dimensions". Thus, consumers' affectively based image-judgments, result from a more analytical perception of the meat product on a number of so-called image dimensions.

As Figure 1 illustrates, consumer perceptions of meat products may find their basis in physical characteristics of the product, in communication around the product or in a combination of both. For example, consumers may hold beliefs about the taste of meat products they have never actually tasted. In such instances, beliefs about taste may well be based on communication around the product. For example, someone else told that this meat product has a very poor taste. But even when consumers have actually tasted a product, their beliefs may be based on personal experience (taste experience) in combination with communication around the product. Such beliefs not necessarily hold an objective relationship with physical product characteristics. This finding is well established and widely practiced in marketing, and it actually forms the basis for the development of brand images. In one classical study on the perception of beer, Allison and Uhl (1964) showed that consumers perceive differences among different brands of beer when brand names are known to them, even though they are not able to perceive differences among those beers in a blind taste test. Much of marketing communication effort aims at establishing associations between brand names and specific attributes (Aaker, 1990).

In terms of research guidance for meat production, Figure 1 is read from the right to the left. Questions that may be answered by this type of research are:

1. What is the image consumers have of different meat products?

2a. Which image dimensions constitute the overall image consumers have of meat products?

2b. What is the relative importance of each of the image dimensions in the formation of the overall image?

3. How do different meat products score on the relevant image dimensions. What are the specific strengths and weaknesses of the different meat products?

4. Which attribute perceptions underlie consumer judgment of the meat products on the image dimensions?

5. How do different meat products score on the attributes constituting the image dimensions?

The relevant problem in terms of production and marketing of a specific meat product may then be formulated as: "How can consumer perception of this particular meat product be improved, so that the overall image of the meat product improves". The answer to this question requires that for each relevant perception it is established whether this particular belief finds its basis primarily in (a combination of) physical product characteristics, or whether it is primarily based in communication, and thus might be 'objectively' classified as a misperception. The disentanglement of consumer beliefs into the contribution of product characteristics and communication, provides guidance into whether the marketing strategy should aim at product development to improve the product in terms of physical product characteristics or whether a communication strategy would be more appropriate to achieve the marketing goal.

Disentanglement of consumer beliefs into its determinants requires close cooperation between marketeers and meat technologists. Although marketeers can indicate which consumer beliefs have priority when the purpose it to improve consumer perception, they lack adequate insight into the relationships between consumer beliefs and physical product characteristics. Meat technologists on the other hand, are particularly knowledgeable about physical product characteristics, but often lack adequate insight into consumer perception and its relation to current and future needs and wants. Disentanglement of consumer beliefs into its constituents will most effectively be achieved through close and open cooperation between the two disciplines. Alternative, this insight may be obtained through more experimental set-ups, as shown by Steenkamp and Van Trijp (1990).

An image monitor (i.e. repeated consumer image studies over time) may be particularly helpful in this process for two reasons. First of all, its reveal the trends in consumer perception over time. In addition, it provides a quality control measure for the product improvement process.

The purpose of the present study is to show how this type of image research is conducted and how it may be used as guidance for meat product improvement. Three studies will be discussed with emphasis on an image-study conducted in 1990. Comparison over time will be made with reference to two other studies, conducted in 1987 and 1993.

Material and methods

Studies

The image study (Van Trijp, 1990), was conducted in 1990, sponsored by the Dutch Commodity Board for Livestock and Meat. Subjects were 895 members of a Dutch consumer panel, who held the main responsibility for the meat purchases in their household. Trends over time will be discussed in relation to two other consumer studies conducted by the Department of Marketing and Marketing Research of Wageningen Agricultural University. The first of these studies was conducted in 1986 (Steenkamp and Van Trijp, 1987) and comprised representative sample of 384 Dutch subjects. The other study was carried out in 1993 and comprised a representative sample of 505 subjects (Steenkamp et al., 1993). To a large extent, the three studies overlapped in terms of the concrete attributes on which the products were evaluated.

Procedure

In each of the three studies consumers evaluated meat products on a number of concrete attributes, using 5 point Semantic differential scales. Four meat products were included in all three studies and will be of primary interest here: pork, beef, poultry and fish. Selection of the concrete attributes on which the products were evaluated was based on an extensive study of the literature (Steenkamp and Van Trijp, 1988b), qualitative interviews with consumers and two pilot studies. Overall image (except in the 1987 study) was measured through three items that reflect overall evaluation of the meat products. These three items were: good-bad, attractive-unattractive and pleasant-unpleasant.

Data analysis

Image dimensions were identified through Principal Component Analysis of the concrete attribute scores. The factor structure of the three studies was virtually identical in interpretation. The internal reliability of the three items purportedly measuring overall image of the meat products was measured through Cronbach's alpha. Both studies revealed that these three items have sufficient reliability (Cronbach's alpha: 0.74 and 0.79 respectively).

Results

Analysis of these data provides insight into basic differences among the four meat products at different levels of concreteness: at the level of overall image, at the level of the underlying image dimensions and at the level of the concrete attributes.

Overall image

Table 1 gives an overview of the overall image of the meat products as well as the development over time.

Table 1. Overall image of four meat products and developments over time

	pork	beef	poultry	fish
1990	3.6	4.0	4.1	3.8
1993	3.4	4.3	4.2	4.2

Analysis of variance on the overall image scores for 1993 versus 1990 reveal that the overall image of fish and beef has significantly improved over time, whereas the image of pork has decreased over time. The image of poultry has not significantly changed over the time period 1990-1993. The results reveal that the imago of pork in the Netherlands is less positive than the imago of the other meat products.

Underlying image dimensions

The underlying image dimensions were identified through Principal Components Analysis on the consumer judgments of the concrete product attributes. The underlying image dimensions are interpreted in terms of factor loadings, the correlations between the concrete attributes and the more abstract image dimensions (after Varimax rotation). Four image-dimensions were identified that underlie consumer evaluation of overall image. Based on the patterns of factor loadings, these image dimensions are interpreted as:

Ease of use as is evidenced by high factor loadings of the concrete attributes: fits in with many different dishes, simple to prepare, and easily available. The second image dimension is interpreted as *natural production* and is a summary measures for the concrete attributes free of hormones, free of additives and animal-friendly produced. The third dimension is the *sensory quality* dimension, as is revealed by high loadings for the attributes: tender, high quality, good taste and (to a lesser degree) lean. The fourth image dimensions is more difficult to interpret, but will be interpreted as *special*, as the highest loading is for suitable for special occasions. The other items of this image dimension reveal that consumers often associated special products with higher price and lean products that are often more healthy.

Not all image dimensions necessarily contribute equally to overall image. Multiple regression analysis with overall image (the mean of the three evaluative items) as the dependent variable and each of the four image dimensions as independent variables was used to quantify the relative importance of each of image dimensions in overall image. These four dimensions account for 53% of the variance in overall image. The standardized regression coefficients reported in Figure 2 indicate the relative importance of each of the image dimensions and reveal that, although they all four significantly contribute to overall image, sensory quality is the most important image dimensions explaining overall image, while the relative contribution of natural production is much less.

Figure 2 compares the four products in terms of consumer perception of the four underlying image dimensions and overall image. This comparison provides a direct insight into the relative strengths and weaknesses of the meat products vis-a-vis the others. The Figure reveals that the strengths of pork lies dominantly in its ease of use. It is widely available, consumers are highly familiar with it, so they know how to prepare it and it fits in with many different dishes. Main weaknesses of pork are that it is not animal friendly produced, that it is not seen as a healthy and special product and that it does not score very high on sensory quality.

Main strengths of beef are that consumers associate it with healthy and special, and relatively easy in use. Main weakness is that consumers do not perceive it as a high sensory quality product, primarily due to consumer doubts about the tenderness of beef. Beef has an average scores on natural production.

Main strengths of poultry is that it is positively evaluated on sensory quality and ease of use. Main weaknesses are that it is not perceived as a special product and that consumers seem to have doubt about the animal friendliness of production.

Fish has its main strength in the consumer belief that is naturally produced. In addition, fish is perceived as a relatively healthy and special product of relatively good sensory quality. Main weakness of fish is that it is not very easy in use, probably partly due to the fact that consumers are not highly familiar with how to prepare fish.

Concrete attributes

Except of a comparison in terms of overall image and the underlying more abstract image dimensions, the results of these studies also allow for a more detailed comparison in terms of the concrete attributes. Space limitations do not allow for an extensive report of these comparison. So only the most important changes for each of the meat products will be briefly discussed.

For pork, a negative development in consumer perception was observed over the period 1987 to 1991 in terms of the attributes good taste and fits in with many dishes, whereas the results for natural production were mixed. Compared to 1987, consumer more strongly believed that pork was free of hormones, but they were less convinced about the fact that pork would be free of additives. In the 1993 study, consumer perceptions with respect to hormones and additives recovered to the level of 1987, whereas the consumer negative trend with respect to taste and fitness with many dishes stabilized at the level of 1991.

For beef, negative changes were observed for tenderness, taste, fits in with many dishes, and healthiness. Consumer perception with respect to leanness positive changed during this period. In the 1993 study consumer perception with respect to tenderness and healthiness recovered slightly but not to the level of 1987. Consumer perception with respect to tenderness stabilized at the level of 1991. The positive trend with respect to the perception of leanness continued. When compared to the 1991 situation, consumer perception of beef being a special meat product that is easily available increased, whereas consumer became more suspicious about the use of hormones and other additives.

For poultry, negative changes in consumer perception over the time span 1987 to 1991 were observed for tenderness, taste, fits in with many dishes, ease of preparation, price and free of additives. When compared to the 1993 situation, practically all of these perceptions recovered at the level of 1987 with the exception of free of additives which stabilized at the 1991 level. In addition, when compared to the 1991 situation, consumers became less convinced that poultry was animal friendly produced.

For fish, over the period from 1987 to 1991 negative changes in consumer perception of tenderness, taste ease of preparation, leanness, and free of hormones and additives were observed. In 1993, most of these perception recovered to or even above the level of 1987, except for leanness, and free of additives. Overall consumer perception positively changed over the period of 1991-1993, particularly in terms of animal friendliness, healthiness, special, quality and taste.

Discussion

The results presented in the previous section, allow for a number of important insights for the marketing of meat products. As discussed in the introduction section, consumer beliefs about meat products may find their basis in physical characteristics of the meat products, in communication around the meat product or in a combination of both. The most important implication in relation to meat production and meat marketing is to disentangle these consumer belief into the contribution of physical product characteristics and communication influences. This is a difficult task which often requires cooperation between marketing people and meat technologists. Alternatively, small scale experiments may enrich the insight into the extent to which physical product parameters that may relate to consumer perceptions. It is important to stress that such experiments extend

beyond the responsibility of expert panels, as expert panelists are actually trained to ignore information of communication in their sensory evaluation of products.

The results of the present study also allow for some generalizations across times. When we know how products are perceived by consumers on certain image dimensions, it is possible to relate them to trends in society as to which image dimensions may gain in importance to the consumer. One such dimension that is expected to gain in importance is animal welfare. Although in this study, is was the least strongly related to overall image, it is to be expected that this dimension will become more important in the near future. The meat sector should be aware of that and anticipate on this phenomenon.

Some limitations of the present study need also be addressed. First of all, the analysis of trends in consumer perception are based on three separate studies, several years apart. As such each of the three studies is a snapshot of the situation in a particular moment. As discussed in the introduction section, consumer beliefs about meat products, are not only influenced by physical characteristics of the meat products, but also by communication about the meat products (media etc). This influence may account for the great number of negative changes in consumer perception between 1987 and 1991. As most of these negative changes recovered in the 1993 study, we believe that most of the changes in 1991 were due to negative communication about meat during that time, negatively influencing the public opinion. Such effect might more clearly be investigated when a more continuous data collection is adopted. This implies more frequent analysis for smaller samples of subjects throughout time. Such an image monitor might also be used to quantify the effect of communication (e.g. commercial information, but also information by others) on the consumer perception of meats.

Second, in this study consumer perceptions of meat products were identified without reference being made to specific meat cuts within those meat products. Obviously, within a particular meat product consumer images will differ among meat cuts (e.g. beef steak versus minced beef). If the primary would be on meat cuts within a meat product, a very similar approach could be taken at a more specific level of analysis. Steenkamp and Van Trijp (1990) took an even more specific approach. In their quality guidance model they adopted the analysis at the level of quality differences within meat cuts. For this purpose, the asked consumers to evaluate different samples of meat cuts (blade steak, pork chop etc) and related consumer evaluations to physico-chemical characteristics of the meat cuts. Such analyses allow for research guidance at a very specific level and directly translate the consumer perceptions into technical specification that should be met by production (cf. Juran, 1974).

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