
Consumer's Behavior in a Multi-Attribute Concept of a Food Product

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Abstract:

Purpose: The main aim of the research is to identify and model the attributes of a food product which are regarded as important during the process of the consumers' choice and to verify the methodology for the creation of the optimal market offer.

Design/Methodology/Approach: The carried out analysis was based on the assumption that a food product may be viewed as a collection of directly noticeable and unnoticeable features that are regarded as attributes (values) of the offer. The applied model of a food product is composed of three levels, each of them presenting the characteristic features of product's quality.

Findings: A sensory evaluation of the products made it possible to diagnose how consistent the consumers are in their declared sensory preferences for brand and non-brand products. It was established that the intention of purchasing a product is determined by its quality and taste preferences.

Practical Implications: The analysis may provide information for communicating with the market and promoting food products, especially when the intention of a producer is to change consumer's habits.

Originality/Value: The presented methodological approach may provide clues on what attributes should be constructed in the case of new food products.

Keywords: Consumer, marketing experiments, modeling attributes, food product.

JEL codes: D11, D12, M310.

Paper type: Research article.

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1. Introduction

Consumer decisions about the selection of food products are determined by various factors including internal and external product properties as well as consumer demographic and behavioural characteristics (Jaeger, 2006). The analysis of consumer preferences and behaviour should also take into account the fact that a food product may be perceived as a basket comprised of a certain number of observable and directly unobservable features accepted as the offer qualities or attributes. This aspect of the theory of multi-attribute perception and evaluation of a product is of significance in adjusting an offer to the target market expectations.

From the perspective of a purchaser being a decision-maker, the selected feature may be a selection criterion and a carrier of benefits that determine the competitive advantage of this product. This definition is proposed by several authors, Lancaster (1966), Nelson (1970 and 1974), Olson and Jacoby (1972) Darby and Karni (1973), Wierenga (1983), Steenkamp (1997), Grunert (1997), Frank (2006), Grzybowska-Brzezińska (2013). In assessing the competitiveness of a particular product offer, the consumer takes into account both the internal attributes (Olson, 1977) and the external attributes (Zeithaml, 1988) (this applies in particular to packaged products), mainly due to the fact that for the general public at large who are not experts, the attributes of experience and belief are crucial. The considerations are aimed at the identification and modelling of food product attributes. This study attempted to verify the following hypotheses:

H1: The external attributes of a food product have a stronger impact on consumer choices compared to its internal attributes.

H2: A strong brand strengthens the consumer evaluation of food product sensory attributes.

In order to achieve the key aims of the study, an extensive research project comprised of qualitative and quantitative research was developed. The study used the compositional approach along with the traditional sensory analysis which only applies the internal attributes of products; moreover, the research variant which took into account the external information on a product (brand, price, labelling) was used. The study was conducted based on the example of two types of products (for each one four brands were analysed), i.e., Vienna sausages and carrot juice.

2. Consumer Attitudes, Preferences and Choice of Food Products

The determinants of the development of the perception and preferences of food products are described in a variety of sections and, to a varying degree, take into account the factors that affect them. As Grunert (1997) points out a behaviourally oriented analysis of food choice by the consumer can be distinguished by several approaches, i.e., the information economy approach (Darby and Karni, 1973; Nelson, 1970; 1974), multi-attribute approach (Olson and Jacoby, 1972),

hierarchical models (Zeithaml, 1988; Grunert, 1989; Olson, 1989; Ter Hofstade *et al.*, 1998; Jaeger and MacFie). As part of the behavioural economics current, attempts are made to study and demonstrate that a human is an emotional being unaware of their own attitudes; moreover, the existence of consumers' hidden attitudes was found using advanced imaging methods by Zaltman (2003) and Maison (2004).

The perception of food products is shaped by external variables of the product, which are not specific for each product and may be used as general indicators of the values of any product type (Zeithaml, 1988; Silayoi and Speece, 2004; Silayoi and Speece, 2007; Ankiel-Homa, 2012). The main external factors that determine consumer choices associated with a product include advertising (Deliza and MacFie, 1996; Jaeger and MacFie, 2001), price (Doods *et al.*, 1991; Lange *et al.*, 2000; Rao and Monroe, 1989), brand name – label (Aarón *et al.*, 1994; Tuorila *et al.*, 1994; Wansink *et al.*, 2000), the origin (Doods *et al.*, 1991) as well as many other signs that can be of importance to the consumer, depending on the characteristics of each product or service (guarantee, origin, technical methods applied, etc.).

Consumers differ in terms of the perception and preferences of food product sensory guidelines (Courcoux, 2001; Semenou, 2007; Carbonell *et al.*, 2008) as well as in terms of the response (as regards the choice of a product) to the external guidelines (Jaeger and Rose, 2008; Gracia *et al.*, 2009; Lockshin *et al.*, 2009; Combris *et al.*, 2009). The model of product quality perception, proposed by Zeithaml (1988), is a conceptual model which shows various components of the perception of a food product, defined as internal and external attributes (variables) (Zeithaml, 1988; Olson and Jacoby, 1972) which are perceived at different levels and affect the perception with different strength. The value perceived by the customer is an overall assessment of product utility and is based on an analysis of what has been received as compared to what has been given.

3. Product Attributes and Food Consumer Preferences

In the literature concerning the issues of marketing concepts of a product, definitions of a product attribute are found rather rarely, which is definitely due to the complexity of the term. In descriptions of the competitive position of a product or a brand, the term "attribute" is often accompanied by other terms, e.g., a feature, characteristic, ownership, property, value, dimension or criterion, particularly popular in analysing consumer preferences or determining variants of the customer's decision-making process (Lancaster, 1966; Nelson, 1970; 1974; Olson and Jacoby, 1972; Darby and Karni, 1973; Wierenga, 1983; Steenkamp, 1997; Grunert, 1997; Russell and Lane, 2000; Lin, 2002; Sojkin, 2003; Miyazaki *et al.*, 2005; Frank, 2006; Wanat, 2010; Pabian, 2011; Grzybowska-Brzezińska and Rudzewicz, 2015).

Difficulties in unambiguously defining the concept of a product attribute are encountered while defining it from the consumer's perspective. The classifications

of food product attributes, presented in the literature, are related to the definition of product quality sought for by the consumer, in which its various components that provide the purchaser with benefits are referred to as “attributes”. The quality of food products, defined in multi-attribute terms, is presented in the aspect of internal attributes (Olson, 1977) or external attributes (Zeithaml, 1988). Olshavsky (1972), Steenkamp (1990) and Grunert *et al.*, (1996), when assessing the significance of quality attributes, integrated the internal and external guidelines of a product, taking into account their interpretation in the context of the development of experienced, sought-for/expected, or trust-based attributes.

In turn, Grunert (2002) points out that a consumer’s choice of food is affected by four groups of factors (referred to as quality attributes): sensory attributes, health attributes, manufacturing process attributes and convenience attributes. Hence, consumers are increasingly demanding information on health characteristics of food products. However, the consumer’s time and ability to process information are limited. In the classification of product attributes (or its quality), proposed by Grunert, difficulties are encountered in assigning factors, features and product values that can be referred to a health and process attributes (Grunert, 2002).

In comprehensive terms, food product attributes are ordered by Wierenga (1980). In doing so, he takes into account the significance of quality guidelines (characteristics) that are interpreted by consumers as sensory, instrumental or symbolic attributes. According to this classification, a set of characteristics composed by sensory, functional or symbolic attributes can be determined; moreover, it can be defined which of them, and to what extent, are attributes that are experienced, sought-for or, exclusively, based on the consumer’s trust in the content of statements provided by the supplier. The roles of consumer’s preferences and, consequently, the choice of a product will be determined by indicated features of the offer that are assessed and recognised by the purchaser prior to purchase (sought-for attributes), after the purchase through the experience, and those that cannot be verified in the purchase and consumption process, and the decision-making criterion is primarily trust in the manufacturer. The aspect of product attributes is also encountered in the marketing definition of a product, which is stressed by Levitt (1986) in his concept of product levels, which includes the product core and the real, extended and potential product.

4. The Role of Food Product Attributes in the Process of Making Consumer Choices

In the process of perceiving and shaping preferences with regard to a food product, a relationship is observed between technical specifications of the product (physical characteristics of the product) that affect the evaluation of the product in the context of expected attributes (through the internal quality guidelines) and the experienced attributes (through sensory characteristics) (Wierenga, 1983; Steenkamp and van Trijp, 1996; Poulsen *et al.*, 1996). Even though it is possible to show studies which indicate that physico-chemical features and sensory characteristics of products can

be regarded as “further” in explaining consumers’ behaviour as regards the choice, and it is possible that they will, to a limited extent, explain the preferences and choices made by consumers (van Trijp and Schifferstein, 1995).

External characteristics may indicate symbolic attributes based on trust (Bello *et al.*, 2000). As regards low-involvement products, consumers often use well-known brand names as informational guidelines that represent, in their opinion, a “package” of product attributes, while simplifying their own process of choice. These guidelines may also determine the perception of flavour, i.e., the sensory attributes (Hensel-Börner and Sattler, 2000; Wansink, 2003).

Having taken into account the concepts of consumer choice modelling, presented by Zeithaml (1988) and Wierenga (1983) who combine the decision, perception and preference model with the concept of a multi-attribute model of a food product according to Levitt (1986), this study proposes a model of consumer preference shaping on the food goods market. The model focuses on four main sets of dependencies, according to the assumption that decisions concerning consumption result from a multi-stage process in which a causal structure that explains the effects of different factors is hidden (Grzybowska-Brzezińska, 2013; Grzybowska-Brzezińska *et al.*, 2017).

The decision to consume the tested products is a result of the direct and indirect effect of factors including socio-demographic features, knowledge of a product, the perceived significance of attributes and the overall approval of a product. Within the model considered, the knowledge of a product affects the weight attached by consumers to product attributes. Socio-demographic features (shown in the diagram as “consumer features”) affect the process of building preferences at its every stage. The main advantage of this structure is that it enables the investigation into both the direct and indirect effect of various factors on consumption. It is probable that, in practice, there is simultaneity of the described dependencies. The level of knowledge of a product is also determined by socio-demographic characteristics, particularly the sex, age and educational background as well as the household composition.

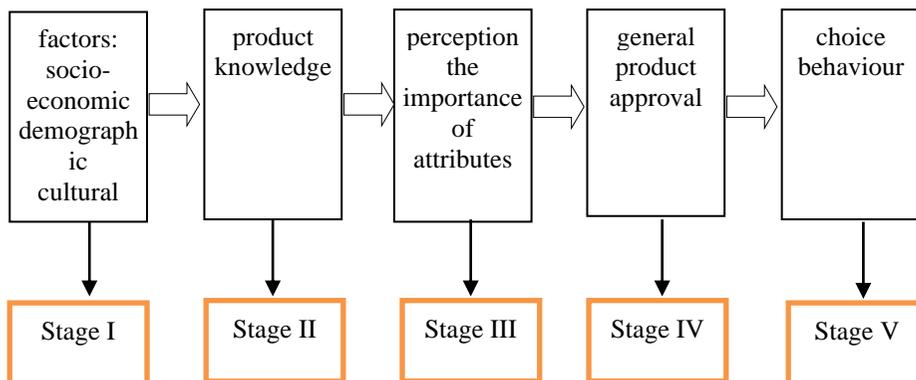
The food selection process is carried out in five stages and shaped by economic and social factors (Figure 1). In the addressed research issues presented further on in the study, the zone of the third stage, which is exposed in this model and takes into account the perception and significance of attributes, is of importance. The preference-shaping process, an assessment of product alternatives is carried out and, in this area, the consumer takes into account multi-attribute models of attitudes.

Further on in the study, the subject of consideration and analysis is stage III (process of alternative evaluation) since, at this stage, it is possible to determine the nature of consumer perceptions and preferences (utility functions) in relation to the selected food products. In the shaping of consumer choice preferences, the attributes of significance are those of a food product (product features that satisfy consumer

needs), which may be categorised into three classes (Wierenga, 1983) as sensory, instrumental or symbolic attributes that can be located in specific product layers (internal and external). This model takes into account the effect of internal and external guidelines on the development of consumer perceptions in relation to sensory, functional or symbolic attributes that are considered as the expected attributes (evaluated at the time of making the purchase), experienced attributes (during consumption) and based exclusively on trust in a brand or manufacturer.

The process of shaping consumer preferences is defined in three stages: the first stage is a product in terms of numerous guidelines that may be identified by the consumer as selection criteria which play a role in the formation of preferences. In this model (Figure 2), a food product is presented as three layers, each of which has its own characteristics (quality guidelines) perceived by the consumer as stimuli and interpreted in the form of product attributes.

Figure 1. The stages of the consumer food product choice decision-making process



Source: Grzybowska-Brzezińska, 2013, p. 85.

These include:

- characteristics (guidelines) interpreted as sensory attributes being a function of the most internal layer: physical or chemical properties (composition, flavour, aroma, colour) of the product (Wierenga, 1983; Peattie, 1995);
- characteristics (guidelines) interpreted as instrumental/functional attributes referring to the extended product concept: physical and chemical properties and aspects such as nutritional value, type of processing, size and type of packaging⁵ (Wierenga, 1983; Peattie, 1995). Instrumental or functional attributes: functions served in physiological processes (e.g. carbohydrate, protein or vitamin content),

⁵The consumer may attach great weight to the flavour and nutritional value while regarding the price and ease of preparation to be more significant. This is reflected by various weights within their preferences or utility functions.

packaging size, ease of preparation, preservation method; these can also be classified as instrumental attributes (Wierenga, 1983; Lane, 2000);

- characteristics (guidelines) interpreted as expressive/symbolic attributes relating to the most extended product concept include the brand name, advertising, packaging design, price, promotion, pro-social features, etc., (Wierenga, 1983; Lin, 2002; Miyazaki *et al.*, 2005).

The second part of the model is the shaping of consumer perception. Not only is the consumer's choice determined by objective guidelines or product characteristics but also by the way they perceive these attributes. Therefore, a "perception filter" was introduced into the model; it means that in the perception process, stimuli can be either lost or stored in the consumer's memory in a biased manner. Products may be attributed false properties which may result in a perception that will translate into consumers' preferences. Separate functions of preferences for sensory attributes as well as for instrumental and symbolic attributes were introduced into the model considered. This is because the perception of these attributes affects, to varying degrees, the shaping of the preference function which is formed in the process of making a decision to buy a food product. Partial utilities of sensory attributes as well as instrumental and symbolic attributes are components of the total preference function which emerges during the selection of product alternatives (Wierenga, 1983). Internal and external guidelines which participate in the attitude-shaping process will be of significance in creating attributes but will be different for particular groups of products. The fact that particular attributes may be identified and verified by the consumer to varying degrees and in different times and locations (classified as the sought-for, experienced and trust-based attributes), has already been mentioned many times.

However, when analysing how they affect the consumer at particular stages of the decision-making process, important research problems can be considered, and for the sought-for attributes (the expected and recognised in the store; the model indicated that they could be sensory, instrumental or symbolic attributes), it is important which ones, in each attribute category, are sought in the store, and which of their characteristics will be perceived by the consumer as stimuli. In the category of the experienced attributes (verified during consumption and remembered; these include mainly sensory attributes, e.g. flavour, and symbolic, e.g. brand), which of them, and to what extent, are they remembered and verified during consumption, and what is the consumer's awareness in this regard? Additionally, as regards the trust-based attributes (which are not verifiable in the shop or during consumption; these are the main attributes), which of the functional attributes are accepted by the consumer exclusively based on trust in a brand, and can sensory attributes also be interpreted based on trust? An attempt to provide answers to the research questions asked was made using the proposed research procedure.

Figure 2. *A model of the development of the consumer preference process in relation to a food product*

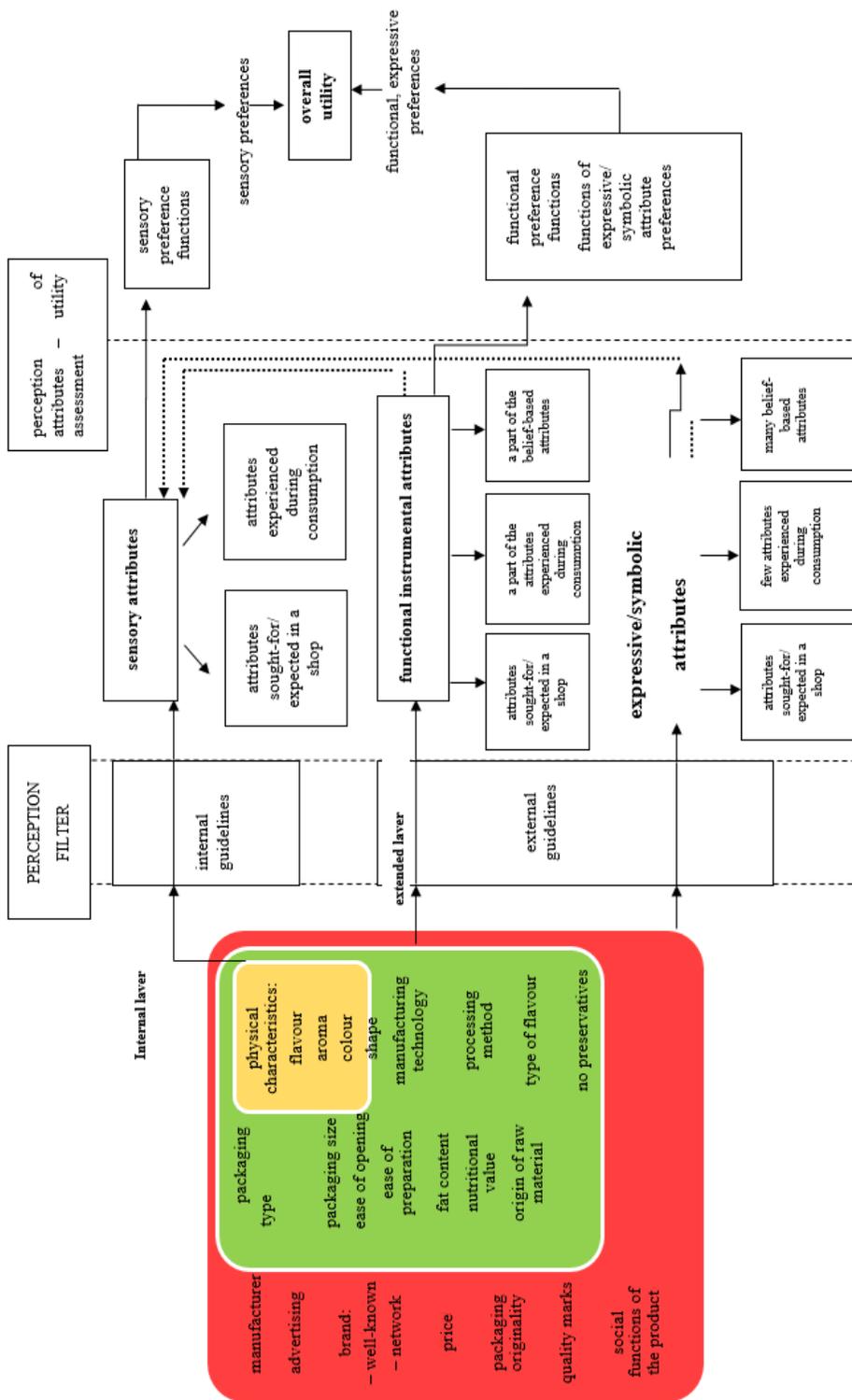


Figure 2. A model of the development of the consumer preference process in relation to a food product
Source: Grzybowska-Brzezińska, 2013, p. 87.

Within the framework of questions and problems emerging in the process of shaping the optimum offer for a food product that takes into account consumer preferences, it is important to establish the research proceeding and research methods that enable the verification of the described concept of a multi-attribute food product model developed within the framework of the target market consumer preferences.

5. Procedure for Research Into Consumer Preferences in the Shaping of Food Product Attributes

The presented theoretical model of the shaping of consumer preferences in relation to food product attributes shows that one of the main tasks of a consumer in this regard is to determine which attributes of a particular product have the greatest impact on the choice made by the consumer. Empirical research into consumer preferences uses historical observations and anticipatory data that describe consumer intentions. For the modelling of preferences, compositional methods were applied in the presented results. The proposed research procedure is an attempt to verify the possibilities for shaping the multi-attribute mode of a food product and serves to identify the internal and external characteristics of a product as well as to determine which of them will be sensory, instrumental or symbolic attributes and to what extent they shape the function of overall consumer preferences in relation to the specified product variant.

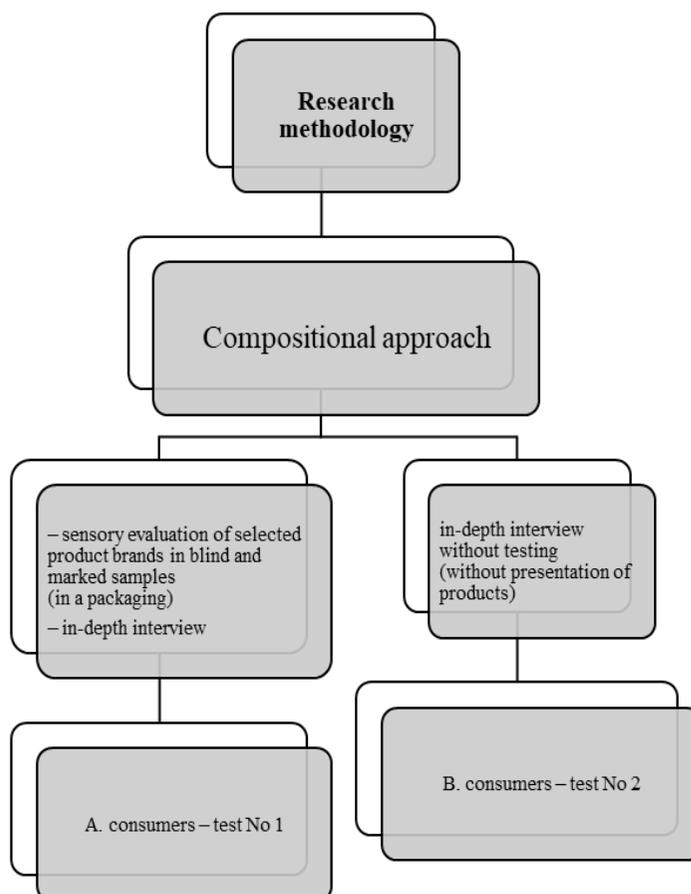
What is of significance here is 1) whether the food product attributes preferred by the consumer will be identified at the point of sale and which characteristics will then create the sought-for product attributes and 2) which features of the offer will be verified by the consumer through their experience, and which ones will be attributes strongly linked to trust in a manufacturer or brand (as the consumer cannot verify them either in the shop or during consumption).

Within this scope of research conditions, the aim is to identify and evaluate food product attributes that determine consumer choices, and to develop a methodology for the preparation of an optimal design of a market offer for a food product, which takes into account specified conditions of the consumption preference maximisation (the application aim). The identification of attributes of the food products under study, which has a significant effect on consumers' choices, will be possible when applying both quantitative and qualitative research methods and techniques.

By referring to the adopted theoretical model of shaping consumer preferences in the scope of the multi-attribute concept of a food product, the proposed research process takes into account the separation of internal and external features of a food product and the determination of potential sensory, functional and symbolic attributes. The proposed research procedure includes the identification of consumer preferences as regards a food product at the location of purchase (sought-for attributes) and during consumption (experienced attributes). The presented composition of research methods, the selected techniques of compositional methods, i.e., in-depth interview

helped assess the behaviour under the influence of stimuli that can be evaluated using a sensory evaluation and product presentation – an experiment including product presentation and tasting. The methods and pattern of research proceedings in the proposed research procedure are shown in Figure 3. The evaluation carried out by consumers is based on the assumption of their lesser knowledge of processes related to the manufacturing and the limited possibility for using this criterion for an offer analysis which is performed based on either the information collected during both the experiment and the use of products or current data available on the market. The evaluation of physico-chemical features of products is mainly related to consumer impressions which then shape their preferences (expectations about the quality and experiences of quality) (Grunert *et al.*, 1996; Poulsen *et al.*, 1996), and on this basis, an evaluation of the proposed product sensory attractiveness can be carried out.

Figure 3. Pattern of research proceedings in terms of tests for food product consumer preferences (own research)



When assessing the effect of the combination of both internal and external food features on consumer preferences, it is appropriate to apply the Makens' blind test technique (1965). Having considered the possibility for various perceptions of stimuli and the shaping of perception by consumers, in a qualitative study the consumers were offered tests, including sessions of sensory evaluation of marked and blind samples (Wedel and DeSarbo, 1994). This approach will enable the estimation of (product-specific) coefficients for all external attributes addressed in the study, which may have an effect on (information-based) "liking" as well as purchasing intentions. Sensory attributes of a food product are defined by the technical specifications of the product or organoleptic characteristics which are subjectively evaluated, and their perception is associated with the evaluator's predisposition (i.e. dependent on the tester's senses).

6. Verification of the Research Procedure Based on the Example of Selected Food Products

The concept of product attribute modelling and, consequently, the consumer preference function, is determined by the food product type; products with various sensory characteristics, which are diverse in the market offer, were selected for the study. In order to conduct the experiment, typical food products and beverages, for which the situation of consumption could be easily taken into account in the experiment, were selected (limitation of cooking processes). The tests were carried out based on the example of Vienna pork sausages and carrot juice. The main premises taken into account when selecting food products for the study included issues related to the development of product types in terms of consumption and manufacture and the prevalence of their consumption by various consumer groups in Poland, the availability of the offer for a product from the category "organic or traditional food", the products available in the market offer should be available in unit packet in retail trade, available as products with the manufacturer's proprietary brand and the commercial brand of discount store chain in Poland i.e., Lidl or Tesco, economic and organisational reasonableness.

The performance of tests No 1 enabled the verification of hypothesis No 1 (the external attributes of a food product have a stronger impact on consumers' choices compared to its internal attributes); the analysis of test No 1 and 2 results enabled the verification of hypothesis No 2 (a strong brand strengthens the consumers' evaluation of food product sensory attributes). Test No 1 will enable the collection of information on sensory preferences of a group of consumers who also carry out a sensory evaluation of the prepared product samples, identify the desirable features and the degree of their intensity in marked and unmarked samples. Test No 2 is the identification of consumers' preferences as regards the sensory, instrumental and symbolic features of products as well as their desirable level, and an evaluation of the probability of choice when using in-depth interview in quantitative testing.

As regards test No 1, in this part of sensory evaluation and in-depth interview, 70 consumer representatives were involved, who evaluated particular products using a three-step procedure for product evaluation, which enabled the estimation of preferences among customers with specific knowledge and a degree of awareness as regards the products being tasted. Sensory evaluations were proposed among consumers, as their ratings would be closer to the customers' market behaviours and more realistically presented preferences in terms of physico-chemical features of products. Test No 1 was carried out among the consumers deliberately selected for testing and in a separate group for each product type.

Test No 2 involved individual in-depth interviews among consumers and was carried out in a group of 650 respondents in three voivodeships in Poland (Warmińsko-Mazurskie, Podlaskie and Mazowieckie) among individual consumers aged over 18. The selection of respondents in the quantitative testing was carried out using the quota sampling method including the following demographic characteristics: gender, age, educational background, social and occupational group, place of residence, number of household members, monthly net income per person in the household, and average monthly expenditure on food in the household. These criteria were selected as they play an important role in the purchasing and consumption behaviour of individual consumers. According to the quota sampling assumptions, the sample structure, due to the specified variables (referred to as control characteristics), is representative for the studied population (Szreder, 2012). It was concluded that limiting the spatial scope of the research to the determined area would not significantly affect the obtained results. The analysis of results used descriptive statistics methods as well as principal component analysis, linear regression and multi-dimensional scaling.

The identification of food product attributes involved the determination of the declared, important features of the food products under study, obtained from the in-depth interview in tests No 1 and No 2. In the questionnaire form, based on which information was obtained for the diagnosis of preferences and the determination of intensity of the distinguishing features of product flavour, aroma, colour and consistency, a situation is encountered in which more than one characteristics refers to a specified attribute (e.g. in terms of flavour, the respondents evaluated the meaty, salty, smoked, spicy, fat, natural and delicate flavour). The testing used a seven-point scale of the degree of preference for and acceptance of a specific product flavour, aroma, colour and consistency. The scale was selected based on a study on the literature, in which Lähteenmaki and Tuorila (1994), Tuorila *et al.* (2008) confirmed that seven-point scales had a similar discriminating power as the five- and nine-point scales, and selected a seven-point scale.

The respondents indicated the weight of each feature using a seven-point positional scale: 1 – completely undesirable, 2 – undesirable, 3 – rather undesirable, 4 – neutral (neither desirable nor undesirable), 5 – rather desirable, 6 – desirable, 7 – very desirable. Due to such a design of the questionnaire form, the research problem

becomes a multi-level one. This is because it is necessary to determine as to whether the flavour, aroma, consistency and colour affect the probability of purchase and the price of Vienna sausages, and to check whether a particular characteristic of the flavour, aroma, colour and consistency actually affects the attribute it determines.

7. Empirical Identification of Food Product Attributes which Takes Into Account Consumers' Preferences

7.1 Sensory Attributes of Food Products as a Determinant of a Consumer's Choice

Analysis of the development of sensory attributes, verified using data from test No 1. The study used the compositional approach along with the traditional sensory analysis which only applies the internal attributes of products; moreover, the research variant which took into account the external information on a product (brand) was used. In order to identify the intentions of the choices being made, two tasting variants were used: the first variant was aimed at determining the acceptance of unmarked samples, which involved separating the relative impact of external product characteristics in the analysis of sensory preferences, while the second variant was aimed at identifying the information-based sensory acceptance. As a result of testing unmarked samples of four product brands in each of the analysed groups (Vienna sausages, carrot juice), and after the acceptance of each of them in terms of the presented characteristics, the respondents evaluated the probability of the purchase of the tasted product and suggested the price level. The respondents were asked to subjectively evaluate, after the tasting of a product sample, the acceptance of flavour, aroma, colour and consistency characteristics of the offered product samples. The verification of the impact of preferences of product sensory characteristics on the probability of purchase and the suggested price was estimated using linear regression by the least squares method. In order to indicate consumer preferences while taking into account only the sensory features, the information obtained from the tasting of unmarked samples by consumer representatives was used.

An analysis of the results of the sensory quality evaluation, the probability of purchase and the declared price level for the products under study indicates a significant impact of the brand on the declared ratings among the consumers. In most samples evaluated by the respondents, a lack of confirmation of the presented product sample qualities ratings was noticeable. Subsequent tastings meant different perception of the flavour, aroma, colour or consistency, and clearly visible differences in the evaluation of qualities were observed following the introduction of described samples to the study and the presentation of products in packaging. When evaluating Vienna sausage samples, consumers tasting products with brands of manufacturers with strong market positions evaluated these product qualities more favourably. A network brand lowers the perception of the qualities of the samples being tasted as shown in Table 1:

Table 1. Significance of a brand in the evaluation of food products within particular product types and respondent groups

Product brands	Respondents' declarations		
	Sensory acceptance	Probability of purchase	Declared price level
Vienna sausages			
Tesco – network brand	↓	↓	↓
Berlinki – manufacturer's brand, market leader in Poland	↑	↑	↑
Sokołów – manufacturer's brand, strong pretender's brand	↑	↑	↑
Baltonowskie – manufacturer's brand, organic product	–	–	–
carrot juice			
Lidl – network brand	–	–	↓
Hipp – strong manufacturer's brand, organic product	↓	–	↓
Marwit – strong manufacturer's brand	↑	–	↑
Vitaminka – strong manufacturer's brand	↑	–	↑

Note: „↑” a positive impact of the brand on the evaluation of products; „↓” a negative impact of the brand on the evaluation of products; „-” neutral role of the brand in the evaluation of products;

Sensory evaluation of food products is possible prior to purchase where products are sold without packaging or where it is possible to taste a particular product in the shop. In a situation where the consumer chooses products in packaging, they can evaluate the sensory features of the offer after the purchase (during consumption), while in the shop, the decision-making criterion is, *inter alia*, the experience or the guarantee of appropriate quality that can be considered equivalent to the brand by consumers. The perception of a brand and its position on the market may also provide information on the qualities of a product. As indicated by the respondents who evaluated the sensory qualities of Vienna sausages with a manufacturer's brand and network brand, the flavour and aroma were definitely more attractive in the products with a manufacturer's brand as shown in Table 2:

Table 2. Sensory attributes of Vienna sausages in products with a manufacturer's brand and a network brand (mean values)

Specification	A mean value of the evaluation of sensory feature qualities		Cohen's <i>d</i> effect
	manufacturer's brands	network brands	
Flavour	5.45	3.65	0.635
Aroma	5.54	3.36	0.890
Colour	5.35	4.12	0.484
Consistency	5.52	3.10	0.770

Note: Rating on a scale from 1 to 7, where: 1 – very low, 7 – very high.

Source: Own research.

The respondents participating in the study indicated the differences in the qualities of flavour, aroma, colour and consistency in products with a manufacturer's brand and network brand, in favour of products with strong brands as shown in Table 3:

Table 3. Sensory attributes of carrot juice in products with a manufacturer's brand and a network brand (mean values)

Specification	A mean value of the evaluation of sensory feature qualities		Cohen's d effect
	manufacturer's brands	network brands	
Flavour	5.4	3.4	0.890
Aroma	5.2	3.4	0.812
Colour	5.2	3.7	0.621
Consistency	5.6	3.9	0.732

Note: Rating on a scale from 1 to 7, where: 1 – very low, 7 – very high.

Source: Own research.

A product with a diverse market offer available for carrot juice is evaluated by the consumers participating in the study when taking into account a greater number of sensory criteria, and its higher sensory qualities are confirmed by a well-known manufacturer's brand. The study indicates that a strong brand strengthens the evaluation of food product sensory attributes. This also indicates the problem of the need for verification of consumer perception and preferences for any food product in relation to both the internal and external attributes of this product (Olshavsky, 1972). The need for consideration of the impact of a brand on the identification of flavour and other sensory features, in view of the commercialisation of food products was noted by Bárcenas *et al.*, (2001) and Wansink (2003). Principal component analysis (PCA) enabled the identification of the main factors that determine the choices of the tested products as shown in Table 4:

Table 4. Selected main components of significance in the process of purchase of the food products under study

Main components	Vienna sausages	Carrot juice
Factor 1	Freshness - smoked flavour - fresh meat aroma	Naturalness - carrot flavour - sweet aroma - orange colour - cloudy consistency
Factor 2	Naturalness - aroma of spices	Freshness - refreshing taste - sweet aroma - orange-red colour

Source: Own research.

As regards the products included in the study on products, consumers seek freshness. When describing the results in terms of two main principle components, category-dependent components were selected. Specific criteria for a particular group of

products include smoked flavour, fresh meat aroma or spice aroma for Vienna sausages, while carrot flavour and orange colour were the characteristics of carrot juice. For juices and beverages, sweet flavour, sweet aroma, refreshing aroma are also characteristic criteria for the evaluation of sensory qualities.

Routine shopping translates into decisions made under the influence of stimuli or experience, in which the choice is determined upon impulse. Without tasting and evaluating product features, the respondents are certain that a manufacturer's brand guarantees higher sensory qualities. Sensory features of food products are also attributes which the respondents evaluate based on trust in a brand, and positive experience and the components related to information concerning the technological and social qualities result in subsequent shopping.

The instrumental and symbolic attributes may be identified in food products by the purchaser based on the information provided on the packaging. These are guidelines that the consumer considers while evaluating the attractiveness of product features, and selects those offering most benefits. The results of the study as regards the identification of external features of the products under study were presented; they are verified by the respondents using the information provided on the label, and on its basis, they seek instrumental and symbolic attributes in the alternatives being evaluated. The process of evaluating product qualities and the separation of attributes, i.e. the shaping of attitudes and preferences, is carried out by the consumer based on the selection of guidelines of the quality of a particular offer which, in the case of instrumental and symbolic attributes, is the information provided on food product packaging.

The key issues to be addressed are 1) which pieces of information serve as quality guidelines which the consumer takes into account in order to select instrumental and symbolic attributes in a particular product offer and 2) which categories of information will, in the respondents' opinions, be reliable and determine purchasers' preferences. The first part of the study addressed the hierarchy of product feature significance evaluated based on information (Vienna sausages and carrot juice) that is considered by consumers in the purchasing process and referred to as a valid and reliable selection criterion. This part of the study enabled the indication of trust in particular information that will be the criterion for choosing food products. An attempt was made to check if the level of trust in a particular brand may be transferred onto information on product attributes by evaluating trust in specific information provided on the packaging of products with a manufacturer's brand and network brand⁶.

⁶*In order to determine the significance of the problem, Student's t-test for dependent samples was applied. It was assumed that trust in the information provided on the packaging of products with well-known brands differed significantly from trust in information provided on the packaging of products with a network brand. It was also assumed that the distribution in groups was similar to normal distribution. Having compared the test probability with the*

Functional as well as symbolic attributes are considered by the consumer in the process of evaluating alternatives, and their most attractive level in a specified variant determines the choice. The type of information and the way of presenting it on the packaging can be crucial, particularly for routine shopping. Tables 5 and 6 present the results of declarations made by the respondents as regards the significance of the features of Vienna sausages that may serve as selection criteria and the attributes sought at the place of purchase.

Table 5. Functional attributes of Vienna sausages and their perception in products with a manufacturer's brand and a network brand

Attributes	Significance of features		Level of trust in attributes or information on attributes		
	Mean	Percentage of indications	manufacturer's brands	network brands	Cohen's <i>d</i> effect
			mean		
no phosphates added	4.668	48.0	4.605	3.6990	0.371
no monosodium glutamate	4.976	58.0	4.836	3.021	0.380
no preservatives	5.208	83.0	4.410	4.115	0.330
packing method (vacuum packing)	4.714	58.2	4.894	4.265	0.422
reduced salt content	4.560	25.0	4.564	3.895	0.352
reduced fat content	4.339	37.0	4.610	4.131	0.364
organic product (organic method of meat procurement)	4.762	39.0	4.852	4.016	0.356
meat type (pork)	6.231	57.7	4.981	4.311	0.420
packaging weight (200–250 g)	4.920	69.4	5.221	4.431	0.462
shelf-life (14 days)	6.672	73.1	5.878	4.951	0.614
ease of consumption (no casing)	5.288	48.0	4.863	4.296	0.384
meat content (approx. 80–90%)	6.555	65.5	5.221	4.267	0.484

Note: Rating on a scale from 1 to 7, where: 1 – insignificant, no trust, 7 – very significant, very great trust

Source: Own research.

When considering the characteristics of instrumental and functional attributes which, in consumers' opinion, play an important role in the process of purchasing carrot juice, it is necessary to point out that, in their opinion, a high quality of a product is mainly determined by technological aspects. Moreover, the consumers participating in the study expect the availability of a product and indicate the convenience of packaging use as an important aspect. The knowledge of what is recognised by the

significance level ($\alpha = 0.05$), the hypothesis was verified for the tested features for all product categories. In order to determine the impact of a brand on trust in the information provided on the packaging, a standard effect according to the scale proposed by Cohen was used (0.2 – a low effect; 0.5 – a medium effect; 0.8 – a high effect) (Cohen, 1998, p. 44).

consumer as a guarantee of high quality, i.e., such quality which meets their expectations is also very important. This is because quality, from the customer's perspective, is understood as a set of all product/service properties which comprises the ability to satisfy the established and suggested needs (Tables 7 and 8).

Table 6. Symbolic attributes of Vienna sausages and their perception in products with a manufacturer's brand and network brand

Attributes	Significance of features		Level of trust in attributes or information on attributes		
	Mean	Percentage of indications	manufacturer's brands	network brands	Cohen's <i>d</i> effect
			Mean		
price (PLN 5.45 per 250 g)	5.745	48	4.786	4.063	0.442
indication "made from top quality meat"	4.827	39	4.605	3.964	0.390
brand (Berlinki)	5.540	38.4	5.528	4.525	0.517
environmentally-friendly packaging (biodegradable, potentially recyclable packaging)	4.605	48	4.722	4.021	0.386
price support (a reduction by approx. 20%)	5.203	39	4.586	4.193	0.442
habit (repeatability of flavour)	5.411	49	5.538	4.703	0.565

Note: Rating on a scale from 1 to 7, where: 1 – insignificant, no trust, 7 – very significant, very great trust

Source: Own research.

Table 7. Functional attributes of carrot juice and their perception in products with a manufacturer's brand and network brand

Attributes	Significance of features		Level of trust in attributes or information on attributes		
	Mean	Percentage of indications	manufacturer's brands	network brands	Cohen's <i>d</i> effect
			Mean		
no sugar added	5.374	67.0	4.820	4.100	0.363
no artificial colours or preservatives	5.741	78.0	4.167	3.877	0.243
reduced energy (calorific) value	4.788	25.0	4.920	4.700	0.087
organic product (raw material originating from organic agricultural sources)	4.917	58.0	4.460	4.100	0.131
packaging type (glass bottle)	4.879	72.3	5.567	4.533	0.751
pasteurisation type (low-temperature pasteurised)	4.631	47.8	5.167	4.567	0.523
shelf-life (several weeks)	6.284	76.4	5.533	5.100	0.168
(standard) nutritional value	5.566	47.5	4,700	4.567	0.126

convenience of packaging use (possibility for consuming juice directly from the packaging)	4.769	55.1	4.827	4.820	0.067
vitamin content (increased)	5.809	88.6	4.850	4.103	0.573
carrot content (approx. 100%)	5.986	78.3	4.600	4.033	0.360

Note: Rating on a scale from 1 to 7, where: 1 – insignificant, no trust, 7 – very significant, very great trust.

Source: Own study.

An offer of a product and its characteristics of instrumental and symbolic attributes are definitely more attractive and desirable for products bearing the manufacturer's brand. The content of information provided on a unit packet of puree juices with a network brand is evaluated at the lowest level of trust, similar to the perception of symbolic attributes.

Table 8. Symbolic attributes of carrot juice and their perception in products with a manufacturer's brand and a network brand

Attributes	Significance of features		Level of trust in attributes or information on attributes		
	Mean	Percentage of indications	manufacturer's brands	network brands	Cohen's <i>d</i> effect
indication "natural juice"	5.554	57.0	5.233	4.100	0.513
indication "fresh juice"	4.880	39.0	5.333	4.133	0.624
information on health benefits arising from drinking carrot juice	5.235	45.4	5.533	4.200	0.631
brand (Kubuś/Vitaminka)	5.211	46.6	5.867	4.867	0.732
environmentally-friendly packaging (biodegradable, recyclable packaging)	4.610	39.4	4.700	4.100	0.151
domestic manufacturer	5.946	49.7	5.900	4.933	0.884
environmentally-friendly manufacture	4.811	48.6	4.900	4.150	0.121
price support (a reduction by approx. 15%)	5.120	48.7	4.567	4.167	0.239
habit (repeatability of the flavour and consistency)	4.534	45.0	5.333	4.333	0.532
region of manufacture (north-eastern Poland)	4.757	49.7	5.233	4.267	0.807
advertising (TV)	4.048	24.6	4.567	4.167	0.239

Note: Rating on a scale from 1 to 7, where: 1 – insignificant, no trust, 7 – very significant, very great trust.

Source: Own research.

7.2 Multi-Attribute Concepts of Food Products

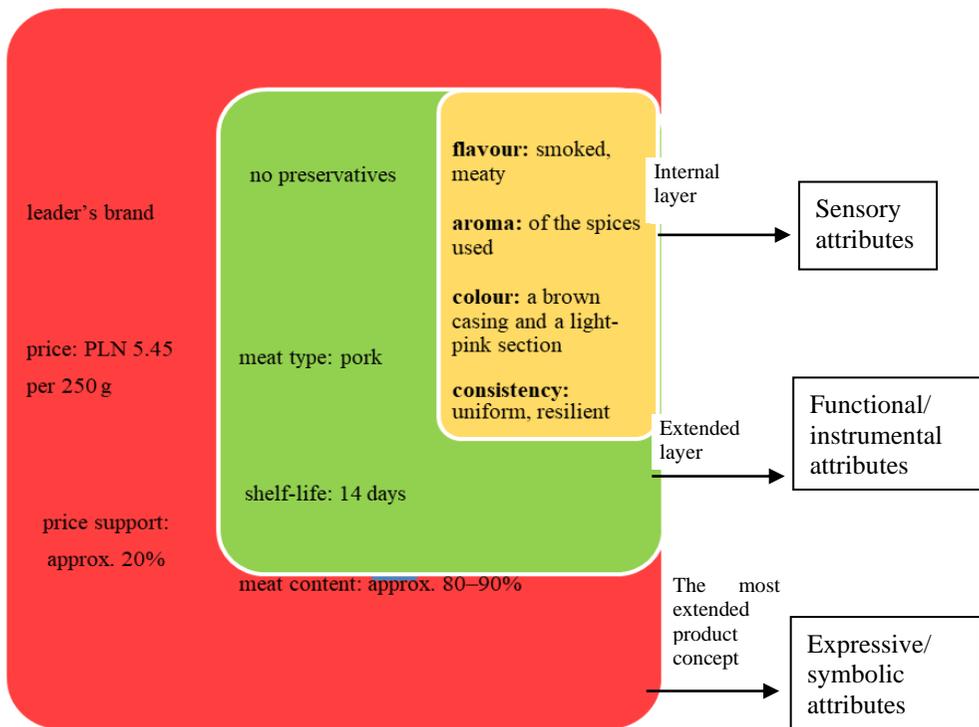
Food product attributes, i.e., carriers of benefits and a source of consumer satisfaction, are sought by consumers and used as an evaluation criterion in the decision-making process. Attributes of an offer are built into the internal and external structure of the product. In the decision-making process, the consumer evaluates sensory attributes which they identify through the intensity of the colour, flavour, aroma or consistency. These are internal characteristics of a food product (product core). Functional attributes are product's feature interpreted by the target market as technological or use qualities, and these are the external aspects of a product which are identified by the purchaser using the information provided on the packaging (the basic or real product, or the extended external product layer).

At the most extended product level (the extended product layer), there are symbolic attributes, also referred to as prestigious ones which are considered by the consumer in their decisions as determinants which reduce the risk of choice, which mainly include the brand, price and information on promotional activities carried out by the manufacturer (e.g. environmentally-friendly product qualities). The multi-attribute concept of a product, presented as a multi-layer market offer model and proposed by Levitt, which was used in the presentation of the consumer's decision-making process, may be an important issue in the development of a product proposal. The benefits offered by a food product in this concept are included in the zone of internal (sensory qualities) and external features (brand, price, technology) which affect the purchasers' attitudes and preferences.

In conclusion, the preferences of the consumers under study in relation to the sensory attributes of the evaluated products, identified during quantitative tests (test No 2), are presented in Figures 4 and 5.

In conclusion, the preferences of the consumers under study in relation to the sensory attributes of the evaluated products, identified during quantitative tests (test No 2), are presented in Figures 4 and 5.

Since the reliability of an information source is one of the main factors that determine the perception of quality attributes based on belief (Grunert, 2001), reliable and dependable attributes and levels are needed (Northen, 2000). The lack of consumer-oriented information is one of the main reasons for the lack of consumer trust in the industry, hence the indication of the manufacturing system attributes, i.e. appropriate product labelling and the brand strategy, are effective components of communication (Caswell and Mojduška, 1996). The information efficiency of a label is higher when the quality assurance systems in place are reliable and effective (Dalen, 1996; Northen, 2000; Wall *et al.*, 2001).

Figure 4. A desirable structure of food product features - Wiener sausages

Source: Own research.

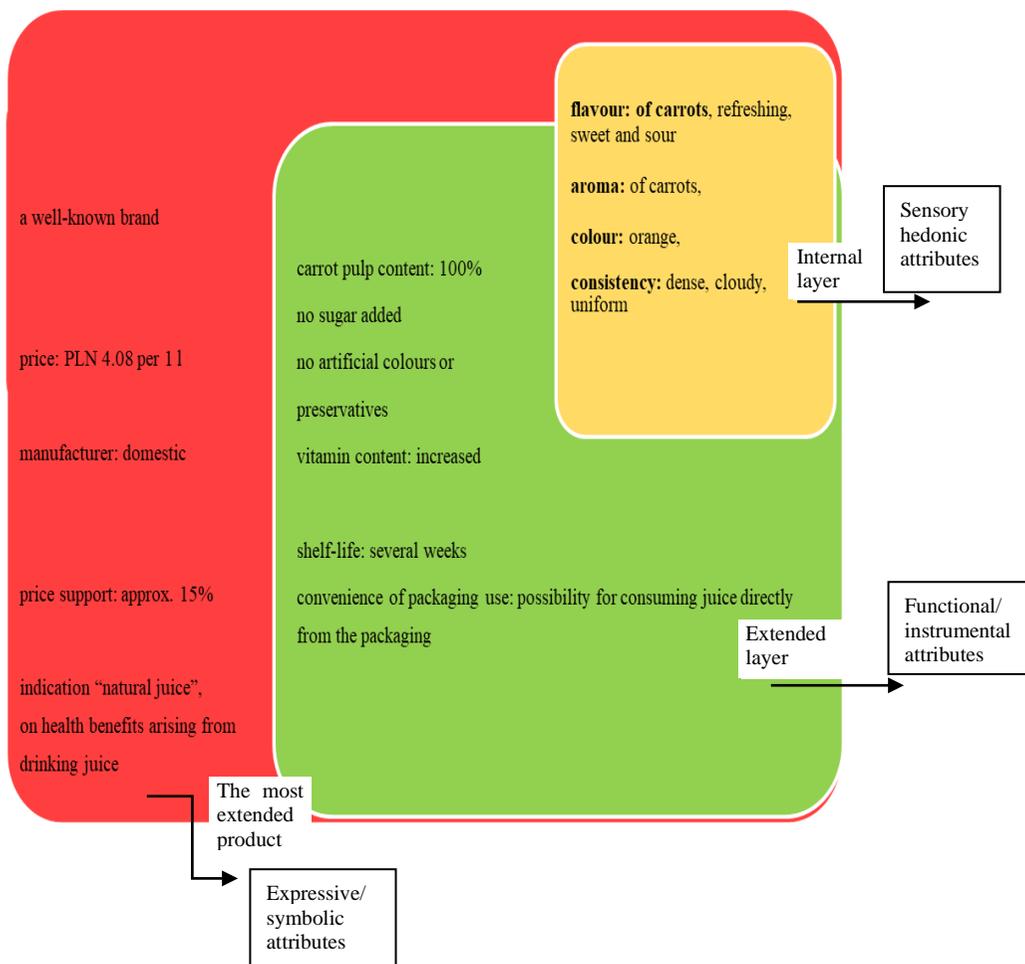
8. Conclusion

The perception of food products is formed based on the external (e.g. advertisement, price, purchase location, brand) and internal factors associated with the evaluation of sensory qualities. As indicated by the study results, the significance of sensory characteristics determines the purchasers' choices, but the evaluation of their qualities is considered by consumers based on the information on the product brand. As regards the manufacturer's brands, the respondents declared that the sensory qualities of Vienna sausages and carrot juice were higher, and the information provided on the packaging of branded products was more reliable. In conclusion, it can be stated that "the external attributes of a food product have a stronger impact on consumer choices compared to its internal attributes".

Designing food products is a very important component of product range management. In the process of creating the concept of a new product, it is necessary to determine which attributes of a particular product have the greatest impact on the choice made by the consumer as well as to collect information on consumer perceptions and preferences. Certainly, this information is not always a guideline for designing a product in an engineering sense (Earle *et al.*, 2007). This is because an

engineering concept of a product specifies the features of a consumer's product in measurable, metric units that can be presented in prototypes in order to check as to whether a particular project meets the specification requirements. Each specification comprises parameters and values which should be of decisive importance to the consumer as well as acceptable, realistic and easily achievable (Jonsdottir *et al.*, 1998).

Figure 5. A desirable structure of food product features - carrot juice



Source: Own research.

When analysing the perception of features and their characteristics that can be formed by food product attributes and, consequently, create the optimum choice and the level of target consumer preferences, it is necessary to indicate the significance of partial utilities of the attributes under consideration. This is because it appears that the attractiveness of a product offer, measured using the weight of specific attributes

and their characteristics, has different shares and significance for various product types.

Considerations concerning the determinants of the food product attribute shaping process in terms of consumer preferences enable the identification of the main tasks of manufacturers and product managers from the food sector, which include:

- the need to take into account a food product's health-promoting qualities in the process of shaping its attributes;
- the need to increase the communication value of packaging, e.g. the provision of reliable information concerning technological aspects;
- taking into account the different significance of sensory attributes of food products in decisions of purchase, e.g. higher significance for diverse products, lower significance for homogeneous products;
- the need to identify the instrumental and functional attributes, and the assessment of their significance in consumer preferences in relation to various products, *inter alia* the composition and manufacturing technology which ensures traditional processing;
- an emphasis on the shaping of a positive image of a proprietary brand as a symbolic attribute which ensures the reliability of a product, and determines its choice;
- the need to learn in detail about the consumer requirements, and their exclusively active participation in the development of modifications and new concepts of a food product.

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