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PhD dissertation

ORSOLYA FEHÉR

DOMINANT TRENDS OF PRODUCT INNOVATION IN THE SATURATING FOOD MARKET

Consultant:

Dr. Istvánné Hajdu

university professor

Budapest

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1. Antecedents of the work, objectives

1.1. Antecedents of the research

Food consumption is one of the most basic processes of human existence. Changes in nourishment and eating habits adjust to revolutionary achievements of social history but in other respects nourishment means much more to today's consumers than just mere physiological sustenance; potentials in the variety of food products have multiplied and expanded. The changes in consumer habits and market opportunities stimulate continual innovations in food industry.

The main goal of my dissertation is to explore innovation opportunities for the saturating food market by recognising those effects which influence food consuming behaviour and buying decisions. Food market is characterised by saturation because increase in consumers' food demand cannot be expected within reasonable time, due to economic, demographic and biological reasons. This fact is supported by statistics of fat, protein and all kinds of energy consumption. Furthermore, on the basis of a comparison among the European Union member countries and Hungary, it can be stated that the consumption of main products per capita shows much less deviation compared to the rate in developed countries than our relative economic backwardness would suggest.

Beside the biological and economic opportunities, the same saturation process can be seen on food store shelves too. During my research, often inevitably, I had to take into account not only statistics and other studies but my own experiences too, as I have been working at a national food trading store chain as an advisor in product development and quality assurance. Monitoring the launch and the life-cycle of more than one thousand private label products, knowing customer feedback, questions and sales data, all have strengthened those literature claims which say that traders take high financial risks and a huge task to find successful product innovation trends. The acute market competition forces manufacturers and traders to get to know customer behaviour, their latent and overt needs for the sake of effective product development. I believe that if we become familiar with the needs and habits of consumer classes, then product launches can be developed with positioning and the demand for the new product might be estimated.

- Through our literature review, without aiming at completeness, those effects and opportunities will be presented which I consider important and which might influence trends of product innovation regarding the options of the saturating market in our country (Fig.1.) After a detailed literature analysis, bearing in mind the depth of research, I narrowed down the investigation to three bigger subjects. The first part of my research focuses on examining the past and the present which in my opinion might affect the behaviour of the future consumer especially those consumers who will be the target group of product innovations to be expected.
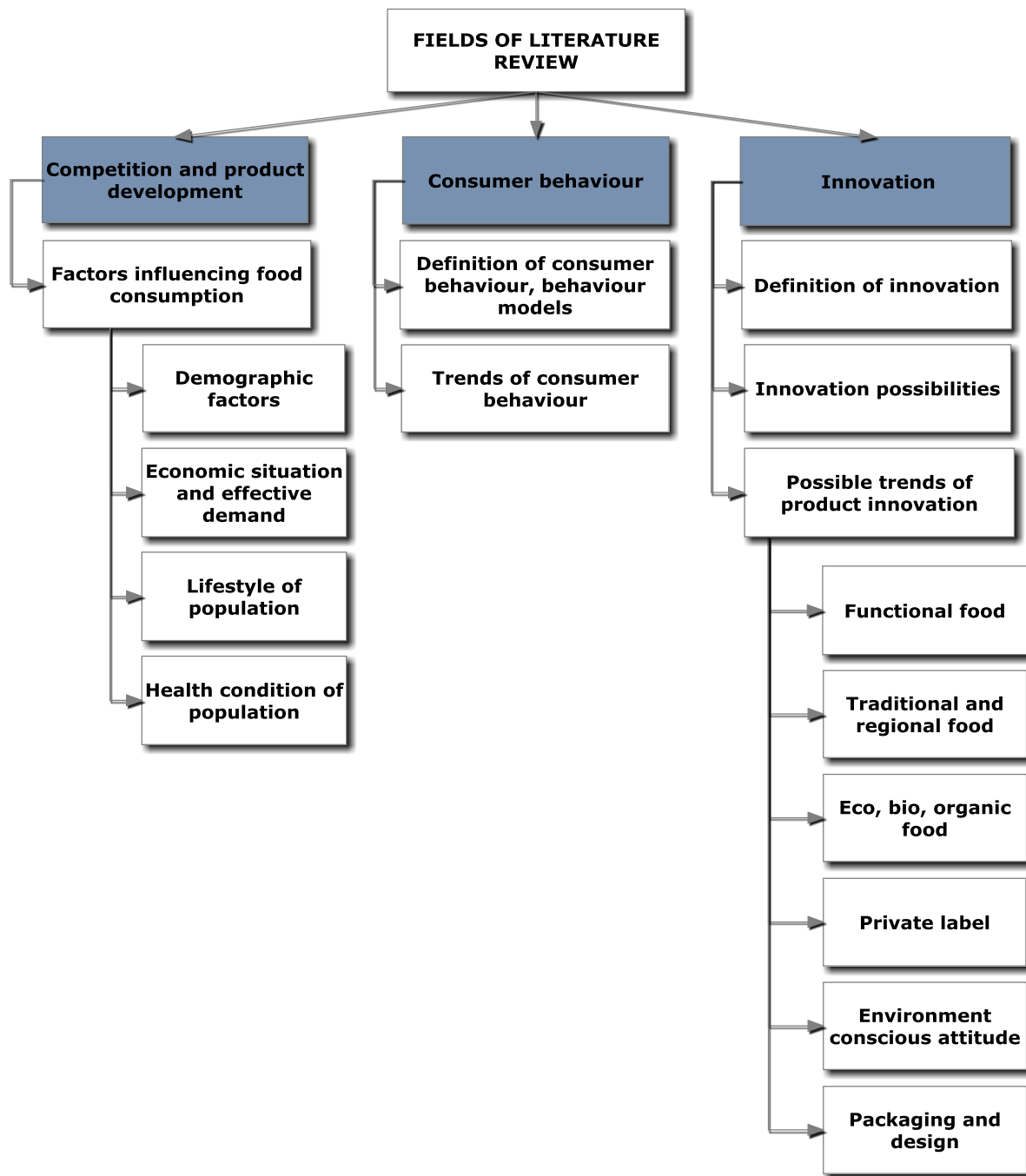
Fig. 1. Subjects of the literature review

- After having analysed the special literature I looked into what pieces of information are used to influence customers or their buying intention in Hungary in 2010 because a vital factor in the buying decision is product packaging. The label is a dominant source of consumers' decisions thus it might be an important tool for marketing and business innovations supposing that customers can understand all the implied information and they are not misleading for them. Customers give more and more attention to what food products they buy (MALOTA, 2007), and health consciousness is of major importance. Exploring the connection between nutrition and health along with the verification of the Hippocratic relation that food consumption greatly determines one's health condition, is one of the biggest achievements of medical

science in the 20th-21st century. This fact and its social and food industrial recognition gives opportunities for marketing innovations to strengthen the connection between food consumption and health in their communication strategies and product development activities. However this also involves the trap of applying such information which is unfamiliar, indifferent or which may even evoke negative feelings in the customer. I am of the opinion that it can already be seen that the major task of the coming years will be to improve real conversation between food manufacturers, trading companies and the consumers. For this purpose, to answer the questions of „from where – to where", I carried out complex examinations for the system-theory analysis of food related communication.

- In the second stage of my research I examined the communication activity conveyed by advertisements placed in printed media because beside the stimuli in shops, the media can largely influence food consumers' behaviour, attitude and last but not least their real or supposed knowledge of food industry and nutritional biology. The popularity of printed press is confirmed by AcNielsen market-researches. According to their surveys, advertisements in magazines have a much bigger influence on Hungarian consumers' food buying habits or knowledge than the European average. In our country every third person (37%) takes into consideration what they have read in the papers compared to the continental average of (27%) which accounts for only every fourth person (ÉLELMISZER, 2011).

- The third part of our investigation – starting from the results of the first two investigation sections - was built around the direct questioning of consumers because during product development decisions manufacturers mainly rely on the opinion of the market and herein the customers. The information displayed on products and the common wording used in media advertisements, the style, trends indicating popularity, and „calling statements" highlighted on packaging, all formed a basis to prepare the questionnaire and helped to determine the topics of research.

This dissertation primarily aims to help to improve effectively the dialogue between food industrial manufacturers and consumers and also tries to provide a complex picture about the system of trends or directions of food consumption and factors which influence product innovation, relying on present day Hungarian practice of communication and consumer behaviour.

1.2. Study objectives

The field of study can be divided into three parts based on the topics outlined in the antecedents of the research:

- In the first section we wanted find out that in the saturating national food market what major advertising arguments are used on product packaging by food manufacturers or traders and what relationships were between these arguments. We intended to map the system of arguments with which the characters of the economy try to influence consumers in this more and more acute market competition. Some featured argument systems (marketing messages) were built into the questionnaire because if customers do not know about and do not welcome these innovations then the innovation trends conveyed by these messages become questionable.

- The content elements of food related advertisements were assessed on the basis of ads found in mainly women magazines. While the pieces of information on packaging were basically transversal, the content analysis of magazines offered longitudinal (time span) comparison too. According to our observations the content and the forms of food related advertisements are in contradiction with each other sometimes. In many cases articles on healthy way of living can be found next to advertisements which often promote unhealthy food products. It might become highly essential in marketing innovation processes to solve these conflicts as customers require exact, unambiguous phrasing and correct information.

- The demand side of the food market was analysed by the help of direct consumer interviews. We wanted to find out to what extent those customers - who have seen an ever increasing food and information supply in the past 20 years- can realize the importance, significance of these pieces of information and how they influence consumer behaviour. Primarily, we were interested to know, how all that long-continued information is reflected in customers' thinking, in their food buying decisions or choices and to what extent the argument system of healthy eating can appear in buying decisions. Do forecasts prove that the majority of product innovation shows a trend mainly towards healthy eating related products? The questionnaire was based on a large-audience questioning. As a result of this a wide range of opportunities opened up to compare characteristics of decision making between various consumer classes and to explore the differences between them. If we become familiar with the habits and needs of certain consumer classes then product innovation can be designed with positioning.

Another explicit aim of this study was to discover how we can use the tools of modern artificial intelligence beside the traditional descriptive statistical methods to uncover the mechanisms of consumer decision taking. It was essential to present how different statistical hypothesis examinations and processes can be applied on a sampling population to discover its characteristics which cannot necessarily be described by normal distribution or ad lib continual distribution-functions in contrast with the traditional, classic mathematical, statistical approaches. In applied statistics it was great achievement of the past years that multivariate analysis methods which fit to different category variables have become widely known in professional circles. Consequently, it was important to define how the categorical main component analysis and these mathematical and statistical processes which consider the attributes of categorical variables can provide information about the basic features of the examined sampling population.

1.3. Hypotheses of the study

The hypotheses of this study are based on my ten-years of experience in food trade, personal consultations with national and international renowned experts as well as with not so well-known experts in this field, reviews and critical studies on numerous works of national and international authors and finally the main trends outlined in section 1.2.

H$_1$: Hungarian food product manufacturers use mainly the strategy of differentiation marketing thus they try to raise interest in potential customers by the help of information displayed on the products. The majority of highlighted information is about nutrient composition. *Marketing messages on the products have a strong connection with product composition related messages while the rest of the messages are only slightly relevant*.

H$_2$: Food related communication has gone through major changes in the past decades in Hungary. *Differentiation marketing has appeared in food advertisements and those advertisements which emphasize the functional feature of a product succeed more than before.*

H$_3$: *The interviewed Hungarian consumers can be grouped really well based on their attitudes towards food consumption and sharp differences can be seen between each consumer group – regarding socio-demographic attributes – in relations of food consumption and health.*

H$_4$: *A statistically proven relation can be found between clusters created on the basis of respondents' consumer attitudes and their real consumer attitudes*.

H$_5$: *Older consumers in the sample consider healthy eating more important because by the process of ageing nutrition related diseases also occur more and more frequently.*

H$_6$: *The examined consumers show distinctive differences compared to each other in judging certain food product features*. They can recognise functional features but in making their decisions recommendations by experts or scientific institutes may play a major role too.

2. Materials and methods

2.1. The subject and the methods of this study based on observation and content analysis

From the qualitative assessment methods, observation and content analysis were chosen as my methods as opposed to popular focus group interviews that are used in national practice. This choice was encouraged by the fact that unlike in the international literature (e.g.: ZWIER, 2009) there are very few researches of this nature in Hungary.

2.1.1. The method of observation

By using the method of observation our main goal was to assess what kind of influential information is conveyed by products that customers see at the place of purchase. The survey is a kind of market analysis to find out which product features were important to manufacturers to be emphasized in 2010/2011. Beside manufacturers, I assessed the strategies of food store chains too, because not only „brand" products were observed but „private label" goods as well. The survey recorded a snapshot of the product range of the observed food store chains in October 2010. The data collection was based on such products which were available for sale in retail packaging. Texts, graphical communication, pictograms and trademarks were also analysed.

The examined products were assembled in the following groups:

- cereals,
- pre-packed meat products,
- food products in display-fridge,
- alcohol free drinks.

This grouping was carried out (considering the basics of category management) „through the eye of the customer". Those products were grouped together which can be seen together on the same shelf or row, that are in the same field of sight. That is the reason why the yoghurt and cheese are in the same category or the mineral water is with the soft drinks.

The recorded messages were collected and network analysis was carried out to discover the relations among different pieces of information. The frequency was calculated by simple descriptive statistics. Then a sophisticated network analysis was carried out by the help of a UCINET software (Bogatti, 1996). This application field of network analysis is similar to the methodology of discourse-analysis and problem approaching methods (VAN DIJCK, 1985). Discourse analysis aims to find a connection between the applied statements within a message (Csigó, 2003). In our investigation, a set of statements displayed on a product was determined to be a message. The joint occurrence of different statements was organized clearly by a square matrix. The network analysis program was used to depict which statements occurred together on product packaging.

2.1.2. The method of content analysis

Content analysis means studying human communication of fixed forms (BABBIE, 2001), and the biggest question of the observation is to find out „what" is communicated. Pioneers of this method (NAISBITT & ABURDENE, 1990) used content analysis to determine major trends in modern American life. Content analysis is a technique of data

collection through which we collect information from books, periodicals, papers, the press, the radio, the television and we analyse all the collected information (SOMOGYI, 2002). It is supported by BLAXTER's (1996) definition, according to which content analysis is a way of data collection to give an objective, organised and quantitative description about the content of communication.

My target was to study advertisements and marketing messages of these ads in one of the most well-known women's magazines.

The significance of printed press has fallen into background by the prevalence of the internet but according to a study of Gfk Hungária (2009) and Ipsos National Media Analysis: eight Hungarian adults out of every ten usually read at least one paper. On average the readers bought 3,7 papers between July and December 2009..

According to reports (2009) of the Hungarian Advertising Association, the best-selling press publications (which are to be paid for) were able to reach over 1,1 million adult Hungarians with each and every issue in the second half of 2009. During that time, the most widely-read weekly was *Story* (on payment), while *Nők Lapja konyhája* was the most popular one in the monthly and other periodicity category.

It was a crucial factor to choose such press publications which are read mainly by women, mothers or housewives because they are the ones who deal with the shopping and cooking in households. (LEHOTA & TOMCSÁNYI, 1994).
Nők Lapja magazine seemed to be the proper choice because it has a great past of 60 years, has reached outstanding reading statistics and has always published food and food supplement advertisements in large numbers.

2.2.   Survey type research

During my questionnaire type researches my major goal was to study and analyse the food consuming habits and preferences of the Hungarian middle class in a wider sense. Consequently, I have never aspired to reach statistical representativity which means that it did not seem to be a realistic goal to try to give an overall picture of the whole Hungarian population regarding food consumption. As a result of this, I use the word 'population' and 'Hungarian consumer' without being representative, I must admit, as it was impossible to address those people who live in utter poverty and make up about 10-15% of the population, therefore it was outside my objectives. On the whole, I believe my investigations might serve as a guideline from many aspects. The middle-class which is the dominant target group of my studies and examinations does the largest proportion of food buying. Consequently, knowing the behaviour of this consumer class will give a chance to get more essential information regarding the whole population.

During the questionnaire survey we paid special attention to the so-called young consumers' opinion. This was of great importance for two reasons: on one hand, this consumer class will predict with its consuming behaviour pattern the thinking and attitude of the future Hungarian customer in the coming decades. On the other hand, obviously this consumer class will become the biggest buyer group of the newest and the most innovative type of products. The international literature widely discusses the fact that this consumer group will become the basic buyer of the most innovative and the most exceptional products.

3. Results

3.1.　　　Results of observation based investigations

3.1.1. Observation results of packaging of products in display-fridges

Manufacturers use most frequently the following words in highlighted information (in design, pictogram or in text format): "low in fat", "Hungarian product", "with vitamin" and "light" in case of dairy products, desserts and vegetable fats (Fig.2.)
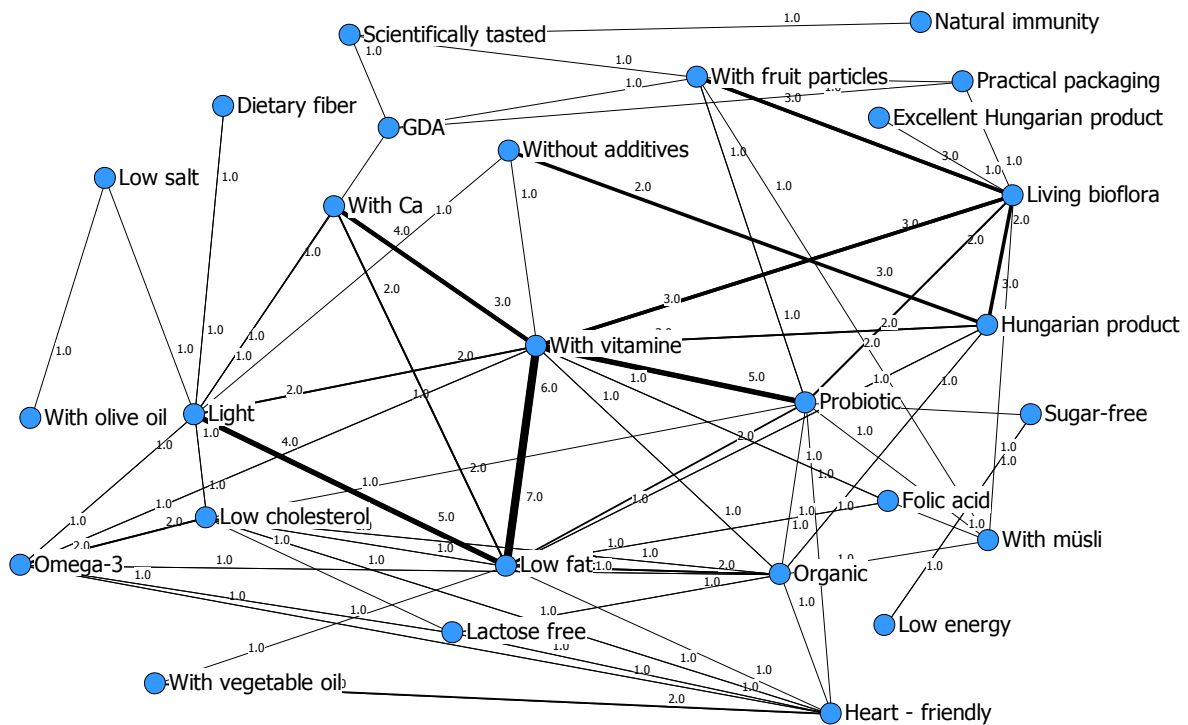
Fig.2.: The relationship network of information found on milk and other products in display-fridges

It can be clearly seen that a large number of messages were found on the products. The strongest connection can be seen between the statements of 'Reduced in fat', 'With vitamins', 'With Calcium' and 'Probiotic'. It aroused our interest that manufacturers quite often emphasized the benefits of Omega fatty acids with other statements. Buyer preferences regarding fatty acids were examined further in the questionnaire.

3.1.2. Summary of highlighted information on prepacked meat products

In the case of prepacked meat products the following features were emphasized by the manufacturers: "Hungarian product" (or highlighting symbols referring to Hungarian origin), "low in fat" and "gluten free product". The majority of highlighted information contained the wording "free from something" rather than emphasizing some added ingredient (e.g. caseum free, free from artificial colouring, free from artificial flavouring etc.). Beside the popular phrasing "free", it was markable that traditional product features, traditional ingredients,

technology or recipe formulas were also emphasized. This shows that manufacturers clearly realised the limits of using the functional food character. It is important to see that putting traditional products into prominence might be a means of product innovation. As it is thoroughly proved in section 5.3 there can be found a certain consumer class who needs traditional products and it provides a lasting and continuous demand for "classic" meat products.

3.1.3. Summary of highlighted information on cereals

In the case of cereals, the most often emphasized features or information were the following ones: "with vitamin", "with iron", "with Calcium", "from whole-grain", "with honey".
By using network analysis some frequent statement pairs could be observed such as "with vitamin"- "with iron" pair "vitamin"-"with Calcium", and "vitamin"-"with whole-grain".

3.1.4. Summary of highlighted information on non-alcoholic drinks

The most often highlighted features or information on mineral water, fruit juice and other non-alcoholic drinks were the following: reference to fruit content, vitamin-C, Hungarian product.

3.2.　　　Results of content analysis

In my work, the most significant and bench-marking women magazine was used as a source of food related marketing-communication for my studies and it can be proved that food related communication has gone through major changes in Hungary in the past years. In the 60-70's when the range of food products was fairly narrow, less and simpler marketing information was used in product advertisements than nowadays (H_2 hypothesis). The advertising arguments of products of that time seem to be over-simplifying and too outdated for us now.
In the past ten years the spread of functional food products can be traced back in advertisements although advertising of food supplements is increasing significantly and continuously. It is likely that the possibilities of small and middle-sized functional product manufacturers narrow down gradually in the competition fought against pharmaceutical type companies which are often supported by multinational funding. Multinational food industry companies try to keep their market share by creating a separate food supplement line of business (e.g. Nestlé Nutrition).

3.3.　　　Results of direct questioning investigations

3.3.1. The connection between food consumption and health

　　　The first substantial question in the investigation was to find out how respondents judge the relation between health and food consumption and what kind of attitudes they have in this field.
　　　Each answer was evaluated by simple tools of descriptive statistics (SVÁB 1981, KINDLER 1979). The results clearly show that there were significantly big differences between respondents from the aspect of how much they identify themselves with the answers.

During the examinations some questions emerged in me which seemed provocative in a certain sense. For instance, the statements which said: "*if a meal has been considered good for centuries then there is nothing to say against it*" or "*everybody in the environment consumes traditional, Hungarian foods*" show that respondents identified themselves with the answers strongly.

A great number of answers and conclusions came up during the analysis of the questions which called our attention to the fact that great ambivalence can be seen between consumers from the aspect of food consumption. If the case of the question: "*I worry too much about being overweight*" very few respondents identified themselves with the statement. Obviously, it contradicts the fact that the ratio of overweight and obese people in the Hungarian population is extremely high. According to the estimations of FORGÁCS (2004) there are approximately ten thousand different diet recipes, recipe collections in public property which means that there is a recipe per every thousandth inhabitant. It is enough to listen into an everyday conversation and we can be sure that the topic of eating: who eats, what, how much, why they eat, appears more often than any other topic.

All in all, we can conclude that by describing the sample statistically gives a very confusing picture about the food consuming behaviour and attitude of the Hungarian population.

The high values of dispersion and the fact that partly contradictory statements received about the same value indicate that it seems advisable to carry out some more in depth investigation in this field. For the purpose of further analysis, instead of using the traditional multivariate tools (SVÁB, 1979), I used categorical main component analysis (RENCHER 1996; VYAS & KUMARANAYAKE 2006) because it fitted better to the data system. This way we tried to filter out those typical consumption patterns which derived from the answers. By the help of categorical main component analysis it could be concluded that there were mainly three main components or as terminology says, three dimensions could be separated.

The main component values in different dimensions indicate that basically three directions of thinking are emerging. The **first direction of mentality** is fundamentally the health conscious consumer. This mentality is characterised by the following:

- Believes that nutrition affects the state of health,
- Tries to get to know more about the connection between nutrition and health,
- Accepts the fact that your food is your life,
- Tries to eat healthily, searches for health related products on purpose,
- Relatively well-informed and reads product labels,
- Interested in this topic, often talks about it with friends, contacts,
- Strives to buy healthy looking products even if they are not so filling, bit more expensive or might have an unusual flavour.

This group of buyers believes that they can stay healthy longer if they eat healthily. Their own personal experiences or other people's experiences play part in it and know some people personally whose health condition improved as a result of nutrition.

The **second dimension** on the other hand involves factors which are slimming-diet related or connected to the intention to change, shows high values of main component, with high significance of dieting and it emphasizes these elements:

- Worries too much about his/her weight,
- Feels tired, fatigue quite often,
- Accepts the fact that healthy eating is beneficial,
- But decides that it will be important later, if he/she becomes old or ill,
- Considers healthy eating as part of a slimming-diet,
- Often co-operates with doctors, and accepts the opinion that the topic and the idea of healthy or health-protecting products is over-exaggerated.

The **third tendency of thinking** accepts the connection between health and food consumption but also believes that health does not depend on nutrition, it rather says it is genetically determined. In this dimension those factors received high values which follow traditional aspects such as *"if a meal has been considered good for centuries then it should not be changed"* or *"in my environment people consume traditional, Hungarian foods"*.
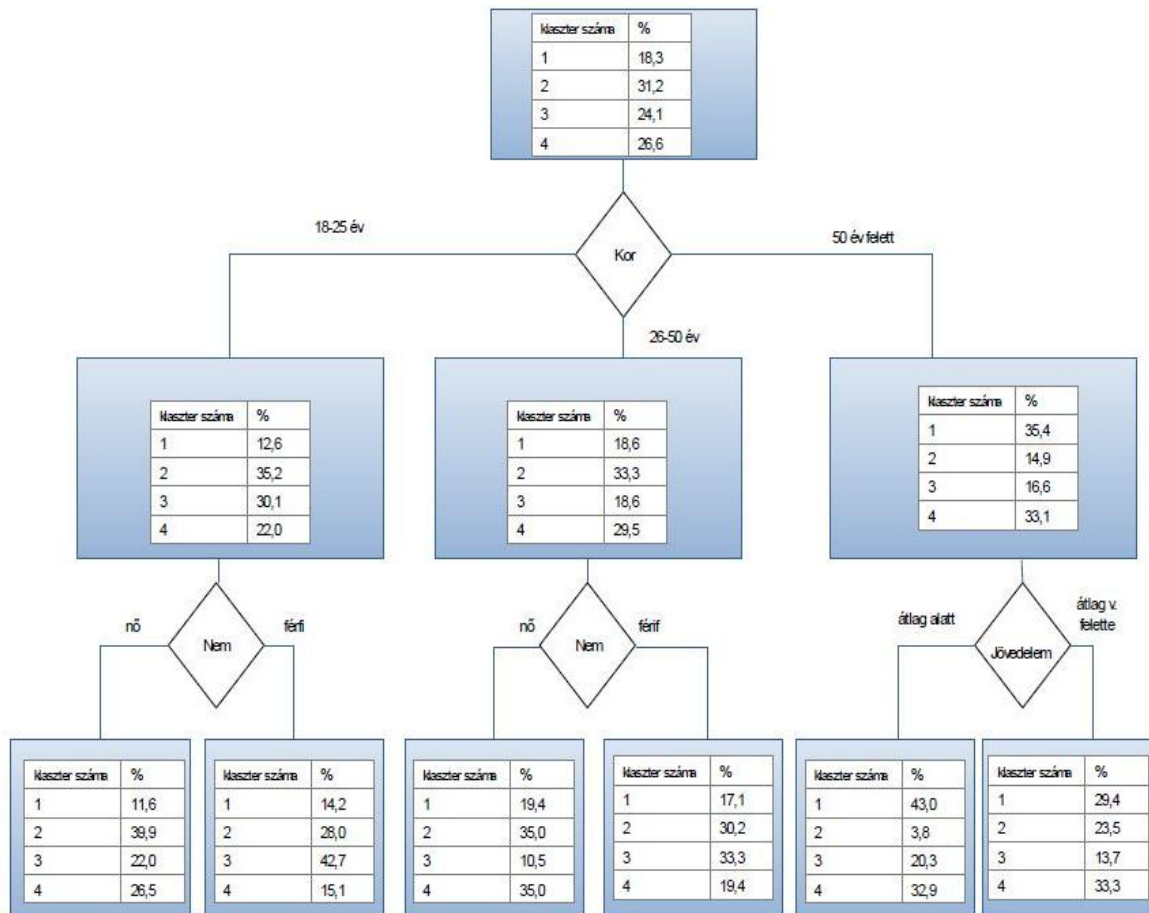
Both the second and the third dimension include the statement "I cannot figure out all the facts and information written on those products" with high factor values. It means that people cannot interpret all those pieces of information.

During my investigations after having done main component analysis, I could order main component values to each respondent. Thus three main component values were defined to every respondent and the cluster analysis was performed on the basis of all the above. Cluster analysis as a method means searching for a compromise between the accurate descriptions and separation of different groups. This compromise was found after several runs in a four part cluster structure.

In each cluster there was the same amount of respondents. For respondents in different clusters I defined the dispersion and the average values of the cluster on the basis of possible answers. The data show clearly that in almost every case significant differences could be detected.

The socio-demographic composition (Fig.3.) of each cluster was examined by the help of exhaustive CHAID algorithm based on the application of artificial intelligence (HÁMORI 1999; LEHOTA & KOMÁROMI 2008).

Basic differences in cluster grouping can be seen according to the age of respondents. It proves that younger generations possess quite dissimilar scale of values compared to previous ones from food consumption point of view. In the most health conscious cluster (number 2) the ratio of respondents under the age of 23 is twice as much than in the case of respondents above the age of 50. It was also interesting that the ratio of respondents showing traditional food consumption behaviour patterns was the highest in the same cluster. The reason for this might be that this generation has not faced any nutrition related health problems caused by improper food consumption yet. Further grouping was based on income level of older respondents and also on gender. It is also noticeable as a tendency that mainly women's consumption can be characterized by health conscious behaviour patterns within each age category.

Klaszter száma / %

Klaszter száma	%
1	18,3
2	31,2
3	24,1
4	26,6

Kor — 18-25 év / 26-50 év / 50 év felett

18-25 év:

Klaszter száma	%
1	12,6
2	35,2
3	30,1
4	22,0

26-50 év:

Klaszter száma	%
1	18,6
2	33,3
3	18,6
4	29,5

50 év felett:

Klaszter száma	%
1	35,4
2	14,9
3	16,6
4	33,1

Nem — nő / férfi (18-25 év)

nő:

Klaszter száma	%
1	11,6
2	39,9
3	22,0
4	26,5

férfi:

Klaszter száma	%
1	14,2
2	28,0
3	42,7
4	15,1

Nem — nő / férfi (26-50 év)

nő:

Klaszter száma	%
1	19,4
2	35,0
3	10,5
4	35,0

férfi:

Klaszter száma	%
1	17,1
2	30,2
3	33,3
4	19,4

Jövedelem — átlag alatt / átlag v. felette (50 év felett)

átlag alatt:

Klaszter száma	%
1	43,0
2	3,8
3	20,3
4	32,9

átlag v. felette:

Klaszter száma	%
1	29,4
2	23,5
3	13,7
4	33,3

Fig. 3.
Applying artificial intelligence to group respondents in each clusters

3.3.2. From attitudes to behaviour: real and intended consumer behaviour patterns in clusters

Main component analysis and cluster analysis were used together and it allowed us to determine the most characteristic consumer groups, however it was not enough to give an opinion about the real behaviour of each consumer group in the food market. For this purpose, in the following section of this study I tried to find out what the characteristics of certain consumer groups were regarding their behaviour, attitude in the market of concrete products. In answering this question I strived to determine product groups, product categories and the respondents were asked how willing they would be to buy them. Then the answers were studied and compared to find differences and similarities from the above aspect. This means that I intended to assess respondents' buying intention supposed by themselves which led to the chance of getting to know the buying behaviour of consumers in each cluster. In several cases significant differences could be found.

According to this part of my investigations it can be stated that my study proves that the grouping created by cluster analysis constitutes a stable foundation for predicting not only buyer but consumer behaviour patterns as well. It does not only apply to healthy or health protecting products but for example to consuming luxury goods too. It also might suggest that

this grouping system would be advisable to use for other food consumption related investigations as well.

3.3.3. Study of consumer behaviour by conjoint-analysis. How much is a functional product worth?

The first part of my conjoint-analysis (KOMÁROMI & LEHOTA, 1998) covers what kind of compromise is made by consumers with regards to product composition, expert's recommendation and price (Questionnaire, question 2.). The results of the conjoint-analysis support the idea that different consumers can realize the importance of added Omega-3 fatty acid but the recommendation by an expert institute plays a significant role in making their decisions too.
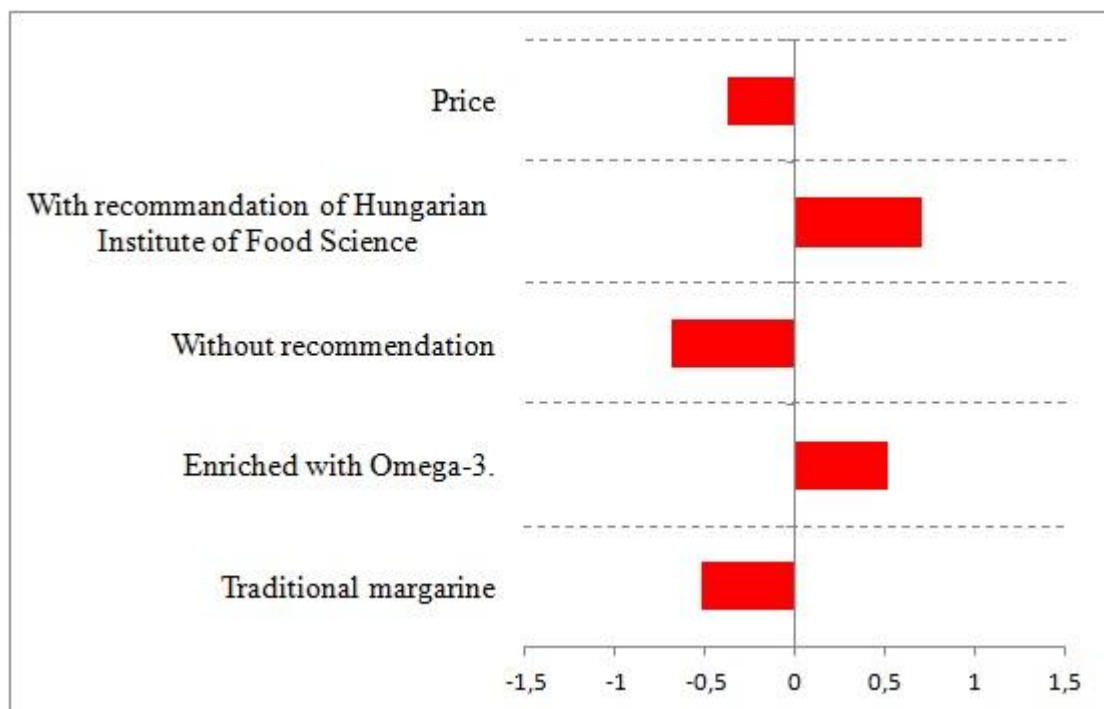
**Fig. 4.** The role of product composition, recommendation and advertising in the utility function

Product composition is prominent for women and younger generations and judging the composition of a product improves in direct proportion to education and income level. It indicates that the main consumers of functional foods are women who are more educated and have more income than the average. This group of consumers is the one who respect the recommendation of an expert more than other groups. Professional recommendation seems to have great importance in the case of younger generations and respondents with higher qualifications. Up to our expectations these groups are less sensitive to price.

All in all, we can claim that the main consumers of functional foods are buyers who live in bigger towns, are more educated and have more income than the average.

In the next section of my investigation I wanted to examine what opinion the customers had concerning the origin of certain physiologically-nutritionally useful

components or more precisely: in the form of food product or pharmaceutical product. The opinion of professionals differ very much. Many of them believe that functional food is the future from the aspect of biologically important components (e.g. vitamins and minerals intake) while there are others who think that consumers do not really mind if they have to take these nutritionally vital components in the form of pharmaceutical products.

Therefore, a conjoint analysis was carried out to see the absolute and relative significance of each product feature in buyer decisions. In my work the possible forms of vitamin-C intake were examined (Questionnaire, question 5.) The results of the conjoint analysis confirm that consumers prefer those types of products which contain vitamin-C in a natural form rather than in an artificial form.
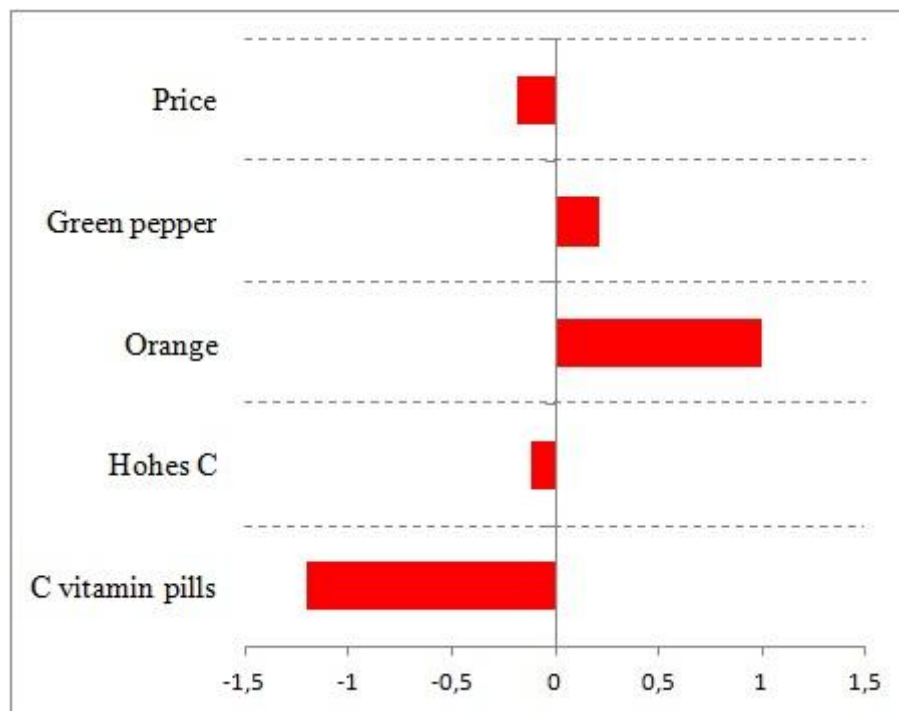
Fig. 5. Average and dispersion values of utility for each factor

It is worth noting that on the average, the respondents had the least favourable opinion about the tablet form carriers of vitamin-C and had a high opinion of orange (Appendix 7). Interestingly enough, their opinion about orange juice, (industrially processed form of vitamin-C) was in between the tablets and the orange, but their judgement of green paprika was not more favourable either. Thus, we can conclude that in the case of vitamin-C intake, the enjoyment value of the product was of great importance as well. Probably, that may lie behind the popularity of the orange.

The green paprika is worth mentioning because it is closely related to the Hungarian nutrition culture however it received a low position on the above assessment scale. This underlines the limits of marketing activities connected to horticultural product development.

The judgement of different product-alternatives showed great difference only in the case of the paprika. The male respondents considered it less acceptable than female respondents. From the aspect of price, men were significantly more sensitive to price than women respondents. One probable reason for this is that mainly women do the shopping or product purchasing and they have a better view of price changes in the food market.

It was striking that with regard to age, mostly older and middle-aged respondents refused pharmaceutical products while the orange as a product-alternative received relatively

low acceptance by them. However this generation showed the highest value of acceptance towards the green paprika as a product-alternative which might be an important factor to the marketing strategy of horticultural manufacturers. Furthermore, the older generation showed high values of price sensitivity. Another major relationship was found between education and natural vitamin-C meaning that those who had higher qualifications insisted on vitamin-C of natural origin more considerably than respondents with less education. My personal experiences can support this finding too. I made interviews with doctors and the conclusion confirmed that in many cases less educated people have the greatest respect for pills and medicine.

As regards the place of residence, respondents who live in the capital city accepted vitamin-C of pharmaceutical origin and Hohes C with the highest values. Sensitivity to price can be seen in this group to the largest extent. From the aspect of income level there were no substantial differences in the acceptance of pharmaceutical products, although respondents with income below the average level refused Hohes C as a source of vitamin-C to the highest degree.

On the whole we can conclude that consumers particularly insist on such functional substance intake which is of natural origin therefore they attach great importance to consuming products that provide valuable component intake and enjoyment at the same time.

3.4. Verification of hypotheses

The analysis of information displayed on food products confirm our H_1 research hypothesis and proves that Hungarian consumers can find numerous pieces of information on products and the manufacturers compete with each other to display plenty of information describing ingredients and composition.

In the 60-70's when the range of food products was fairly narrow, less and simpler marketing information was used in product advertisements than nowadays. In the past ten years the spread of functional food products can be traced back in advertisements although advertising of food supplements is increasing significantly and continuously. *(H_2 hypothesis).*

The combination of categorical main component analysis and cluster analysis gave markably separable consumer groups which support *(H_3 hypothesis).* The clusters show major differences with regard to socio-demographic factors and food consumer attitudes. The main dividing line is based on the gender and age of respondents. We can find substantial differences between male and female respondents and also between age groups. Young and middle-aged men are less open to healthy eating than women. Older respondents however did not prove to be more broad-minded concerning healthy products consumption (H_4).

My examinations verified that consumers can be separated well from the aspects of real and intended food consumption behaviour. Both the intended and the real behaviour patterns helped to define distinctive clusters (H_5). The relation between clusters based on attitudes towards consumer behaviour and real consumer behaviour could be detected.

My investigations also proved that in the case of modelling concrete consumer decisions, we can forecast consumers' preferences and scale of values based on their previous behaviour or their attitude towards food consumption.

The results of my work verify that different types of consumers show substantial differences in judging certain features of food products (H_6).

3.5.　　　　New and modern scientific results

I consider my scientific results new and modern because:

1, This is the first complex, review chart based classification in Hungarian language, discussing the national and international literature on innovation marketing of functional foods.

2, On an international scale, I was the first to use network analysis as an innovative tool to analyse the information displayed an food products.

3, The information on product packaging was analysed in a complex way (covering the whole set of communication) and it proved that statements about product innovation and differentiation marketing strategy is used to a high extent on products of the Hungarian food market. All the information on the products was examined together in its entirety.

4, We used long-term, longitudinal content analysis on a market-leader, Hungarian press publication to prove that content elements of food related advertisements change by time. The spread of functional food tendency could be traced and proved, although advertising of food supplements is increasing significantly.

5, With a mathematical-statistical analysis of attitudes connected to functional product features and food consumption, we could determine the main streams in mentality and the groups of the Hungarian middle-class from the aspect of functional, innovative product demand.

6, By the help of examining attitudes, intended and real consumer behaviour and the differences between these three factors, I could reveal the limits of innovative product development in the Hungarian market.

4. Conclusions and suggestions

4.1. Conclusions and suggestions related to displayed information on product packaging

- Through my investigations it could be proved that the information displayed on food products in many cases does not help but rather hinders the buying decision since there are usually too many statements on the packaging which are not easy to interpret even for professionals. It is surprising to see that in general there are relatively few statements related to health on products. Regulatory provisions allow a wide range of statements to be used by manufacturers. It would be worth investigating the reasons why manufacturers do not exploit the range of allowed health claims. In my opinion, it is caused by the lack of communication between authorities, traders and manufacturers. The only way to successful product innovation is co-operation among food engineers/technologists, science institutes, authorities, legislative bodies, advertising experts and traders.

- In many cases the highlighted information related to content features is too extreme. On the one hand, some are too general (e.g. "bio") on the other hand, the opposite extreme is statements including too un-interpretable or resounding phrases (e.g. "effectively helps to improve the lipid-profile of blood". I believe that in the future it would be more advantageous to use easy-to-understand information instead of "scholarly" phrases as a tool of differentiation marketing strategy.

- The third big group of labels and messages are those statements which emphasize that the product is additive free. It might be advisable to separate additives: some can be used to extend product storage time or to improve its value of enjoyment (artificial colouring, flavour enhancer, preservatives) and some are indispensable for technology and their usage does not involve any health risk. Otherwise, it is to be feared that consumers will refuse any product which contains additives.

4.2. Suggestions and conclusions connected to the analysis of food advertisements

- At this stage of my study, I proved that with the expansion of food market, the quantity, ratio of advertisements has increased too and their content has changed. While I was examining the past ten years in more details, it was striking that different trends emerged year by year. It might indicate a new field of research, to investigate what kind of factors induced the change in marketing argument system. Whether it was caused by social, international effects (the appearance of multinational companies) perhaps changes of legal provisions or the changing consumer demand generates the alteration of marketing messages year after year.

- During the analysis of advertisements, we could detect a growth in the ratio of food supplement ads. These type of ads promise quick and effective results often disguised as "medicine". The skin care product comes in the shape of an injection-syringe tube, while the energy drink has packaging similar to an infusion bottle. The spread of food supplement products (they often can be found in food stores) raise the question whether these products will hinder the innovation of functional products or not. Which product will customers prefer:

the Omega-3 enriched margarine or the tablet with Omega fatty acids? The answer is likely to influence the trends of product innovation. This view is supported by scientific researches in this topic, for instance the 115th. EAAE Seminar: The Economics of Food Choice and Health (Munich) in 2010 dealt with the issue of "Pill or Broccoli?" in particular.

4.3. Suggestions and conclusions connected to the results of consumer interviews

The third big part of my study –based on the results of the first two analyses- focused on examining consumers' opinion. The results of my work confirm the idea that consumers can be divided into distinctive groups from the aspect of their attitude towards different food products, and these groups exhibit significant differences from the aspect of consumer behaviour.

If we wish to forecast major trends of product innovation then on the basis of my analyses it might be supposed that characters of the Hungarian food market will turn to healthy type of products increasingly. Concerning consumer behaviour, the age of customers is a dividing line: younger generations are more open to health conscious eating than their parents. The results of our work stress that consumers' attitude and mentality is greatly specializing, and as a consequence of this, different consumer groups must be addressed by different methods and this fact should be taken into account by product developers. There is a need for innovations that keep tradition in view, but innovations based on up-to-date nutrition science are also needed.

I consider my study has practical value with relevant results because I arrived at verified conclusions with regards to information displayed on product packaging, to advertisements and consumer behaviour taken as a whole. The study of major product innovation trends is in harmony with the view that manufacturers largely rely on the opinion or needs of the market and especially consumers during product innovation decisions. It is essential to point out that consumer behaviour and thinking is extremely complex and it must be reflected in the communication with consumers. It would be a serious mistake to pick out only one or another aspect of consumer thinking. The controversial situation and experiences of food market indicate that we must not over-dimension any product feature. Products must be viewed in their complexity and cautiousness is needed with efforts which aim to emphasize the significance of for example, traditional or functional products without enough reason.

5. Publications in this field

Journal articles

Orsolya Fehér - Péter Boros - Judit Szigeti (2010): Store brand products on the market of health protective foods. Regional and Business Studies. Volume 2. No 2010. p. 45-52. ISSN 1789-6924

Orsolya Fehér - Péter Boros (2011): Network analysis of nutrition marketing communication on food packaging. International Journal of Management Cases. Volume 13. Issue 3. p. 584-591. ISSN 1741-6264

Orsolya Fehér - Péter Boros - Istvánné Hajdu (2011): Possibilities and limits for innovation in food trade. Journal of International Scientific: Ecology and Safety. Volume 5/1. p. 345-353. ISSN 1313-2555

Hajdu I-né - **Fehér O.** (2007): A kereskedelmi márkás termékek szerepe hazánkban. Élelmezési Ipar, LXI. évf. 2007/2 p. 50-55. ISSN 0013-5909

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Kasza Gyula - **Fehér Orsolya** - Kispál Judit - Ozsvári László (2011): Magyarországi eredetű élelmiszerek részesedése a hazai kiskereskedelemben. Gazdálkodás, 55. évf. 2. szám, p.143-152. ISSN 0046-5518

Conference publications

In Hungarian language (full paper)

Fehér O. – Hajdu I-né (2009): Egészségtudatos élelmiszerek szerepe a kereskedelmi márkás termékek forgalmazásában. II. Nemzetközi Gazdaságtudományi Konferencia, Kaposvár, 2009. ápr.2-3. CD p.1-6. ISBN 978-963-9821-08-8

Fehér O. - Hajdu I-né (2009): Kereskedelmi Márkák – Trendek és Tendenciák. Lokalizáció-Megoldás a fenntarthatóságra? LI. Georgikon Napok, Keszthely, 2009. október 1-2. p. 259-264. ISBN 978-963-9639-35-5

Fehér Orsolya - Boros Péter- Hajdu Istvánné (2011): Piaci trendek-élelmiszervásárlási szokások. Erdei Ferenc VI. Tudományos Konferencia. 2011. aug.25. (in press)

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Fehér O. - Hajdu I-né (2009): Kereskedelmi márkás termékek élelmiszergazdasági jelentősége. Lippay János-Ormos Imre-Vas Károly Tudományos Ülésszak, 2009. október 28-30. p. 228. ISBN 978 963 503 397 3

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International conference (abstract)

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Orsolya Fehér - Péter Boros (2010): Coop's strategy ont he market of healthcare foods. 6th International Nutrimarketing Conference. Kaposvár, 11th. November 2010. p. 30.