

## Health factor in food consumption

**Lőrinczi Krisztián**

University of Debrecen,  
Centre for Agricultural Sciences and Engineering,  
Faculty of Applied Economics and Rural Development,  
Institute of Accounting and Finance, Debrecen  
lorinczik@agr.unideb.hu

### SUMMARY

*Consumer lifestyle and health are relevant factors to understanding consumption preferences. In the last few decades the number of lifestyle diseases has dramatically increased. The main cause for these diseases is the change in lifestyle; including a lack of attention to physical activity and good nutrition. Health and lifestyle are important factors by purchase decision process. In accordance with these, I examine the consumer behaviour toward soft drinks with special regards to healthy lifestyle and the state of health. My examinations can be considered mainly as a qualitative research, which can serve as a basis for further analyses and research, however, the conclusions and experience gained from it are worthy of consideration. I differentiated five soft drink categories: ice tea, carbonated soft drinks, fruit juices, mineral waters, sport and energy drinks and studied the consumer behaviour toward them. The study focuses on the consumption of these and the factors influencing their purchase with special regards to lifestyle.*

**Keywords:** consumer behaviour, soft drink, way of life, health, marketing

### INTRODUCTION

#### The relation of marketing and way of life

The crucial success factor of every company is well-targeted and effective marketing. This applies obviously to the food industry companies' marketing. First of all it is necessary to be aware of preference and behaviour of the consumers forming the appropriate marketing strategy (Malhotra, 2005).

The last element of the economic chain is the consumer, he/she decides about the success or failure of a product. Every consumer wants to reach a higher utility level of their preference system. You must remember that well-organized production process and innovative product are in vain, if the consumer doesn't like it, then the product is not viable on the market (Gerybadze, 2004).

In order to make a product attractive for the consumers so that they decide in favour of it in the decision process, several marketing tools are available for the marketing experts of companies. However, for making the right step, the needs and requirements of the consumer should be known, which are greatly determined by his/her lifestyle (Lehota, 1999). Consumption is formed and determined by the attitude, habits and everyday life of people that is by their lifestyle (Schultz and Stiess, 2006). Of course, consumption should have benefits for the consumers as they strive to maximize their

utility. Such benefits can include nutritional benefits (products with low energy content, high vitamin content, and reduced fat content), the high culinary value, natural origin, excellent taste (Biacs and Szigeti, 2006).

Health plays an important role in lifestyle and in everyday life. Accordingly, health considerations might be important influencing factors in consumer decisions.

In harmony with this, food and health marketing was started also in Hungary, the major role of which is the emphasis on products having a beneficial effect on health and on dietary benefits and their integration into marketing communication. This should be communicated continuously to the consumer in an easily understandable way in the long run, thereby contributing to the health education of society, to the updating and improving of people's outdated or incomplete knowledge on nutrition (Berke and Molnár, 2006). The aim of marketing targeted at society as a whole – methodological application of marketing techniques – is to divert social behaviour to the right direction. In setting up an effective marketing, a properly targeted simple message is an important factor. Comprehensive, diverse interaction strategies and communication channels should be formed. In addition, a close co-operation is needed between the state, the companies, public organizations and communities regarding local programs and initiations in terms of a healthy diet (Thornley et al., 2007).

#### Way of life and lifestyle diseases

The concomitant phenomenon of the industrial and technological „boom” in the XXth century is the change in mankind's life. The observable cumulative everyday stress, the growing environmental pollution and the spread of sedentary jobs effect on people's way of life. Parallel with this phenomenon the people's physical strain has decreased. Nowadays in modern society man becomes comfortable, the majority of jobs requires increasingly less physical effort (Szakály, 2006). This change of modern life consequently should infer changes in dietary habits. Otherwise the change of the living conditions together with the traditional dietary habits could present a negative effect on the organism (Robertson and Mutru, 1999). Researches justify that in the last few decades these processes are responsible for the appearance and spread of lifestyle diseases (Szakály, 2004).

The lifestyle diseases, like coronary disorders, heart diseases, high blood pressure, diabetes or obesity cause the predominant part of all the mortality worldwide. These are such diseases which occur resulting from the way people live their lives. In developed countries and societies, these diseases become more frequent as economic growth starts (Bhikha, 2007).

These diseases are spread especially in the more developed Central and Eastern European countries. Based on previous researches and examining the Hungarian data apply to the association between health indicators and prevalence of food consumption we can ascertain similar results because in this country the lifestyle diseases are responsible for the mortality in a considerable proportion as well. Researches demonstrate that obesity is responsible in many cases for these diseases. In the case of cardiovascular diseases the influence of improper unhealthy eating habit is estimated higher than 30% (Szakály, 2006).

Obesity and the increase in the number of overweight people represent significant health problems. There are over one billion overweight people in the world and 300 million of them are critically obese. Obesity develops due to the imbalance of energy, caused by too high calorie intake in the long run and/or too low energy use; this is where the question of lack of physical activities should be mentioned as well. With respect to the relationship between lifestyle diseases and overweight, this is a burning problem (Nayga, 2008). The United States is the first in the list, two third of the people are obese or overweight due to the sedentary works not requiring intensive physical activities, people's lifestyles and dietary habits (O'Keefe and Cordain, 2004). According to scientific estimations, the number of obese or overweight people in the USA will be 80%. According to estimations, about 10% of the health system costs in the USA are directly related to obesity and the lack of physical activities (Community Health Needs Assessment, 2001).

These problems became a major topic also in Europe recently, especially in the United Kingdom, where the number of obese people tripled in the last twenty years (Nayga, 2008). In addition to its social effect, this problem has a serious economic impact, as it results notable costs due to the relationship between lifestyle diseases and obesity. The economic aspects of diseases are the examination of the patients, costs of medication and hospital care, care for people at home and the missed working time (Biro and Biro, 2000).

The costs of the health system can be considerably reduced via reducing the frequency of diseases by popularizing healthy lifestyle and healthy diet.

The increasing wealth of people in the developed countries, the aging of population and the increasing ratio of sick people contribute to the increase of demand for functional foods having beneficial effects on health (Jong et al., 2003).

Food marketing should pay special attention to emphasising healthy nutrition and lifestyle as a result of the lifestyle trends and bad dietary habits (Csapó et al., 2006). Regarding the close relationship between consumer behaviour and lifestyle, the influence of healthy nutrition on purchase decisions should be an important factor in the consumer purchase decision analysis (Deliza et al., 2003).

### **The health impact of soft drinks**

Soft drinks have a major role in the intake of liquids and energy necessary for life. A certain level of soft drink consumption can be part of a proper diet. The potential problems arise from excessive consumption endangering especially children and young people. In addition to the contents of soft drinks, the problem can be the displacing in consumption of other useful foods having an important role in nutrient intake mentioned above.

One of the health-related effects is weight gain due to the high calorie and sugar intake, which can result in overweight and obesity. The actuality and importance were already discussed in the previous chapter. Nowadays, the ratio of overweight citizens is over 80% in the United States and it is 50% in Hungary (European Commission, 2007). Significant research is performed on the relationships between the soft drink consumption and obesity, most of it is focused on children and the youth who are more endangered and for whom the formation and fixation of improper dietary habits may cause problems later (Nestle, 2000).

### **MATERIAL AND METHODS**

I carried out a survey between German students of Hohenheim (Stuttgart). In harmony with the objectives and nature of the research, I did not aim representative results. However, the consumption habits of young people are of determining importance in the formation of opinion about consumer behaviour toward soft drinks and in further studies. I performed a questionnaire survey, the students filled in the questionnaires themselves, which took 15 minutes in average. The final version of the questionnaire was created after several testing on smaller samples and focus group interviews, the results of which called for simpler, more understandable questions and a reduction of the time necessary for filling it in. Of course, the questionnaires were in German to avoid misunderstandings. In the final sample, 210 German students were involved.

In the analyses, relationships were sought between the answers with different statistical methods. In addition to descriptive statistics, I use the cross-tabs method to gain useful information on consumption, consumption influencing factors and demographic data. In addition, other statistical methods are used for several questions. I study the relationship between body mass index, an indicator of health status and the consumption of the different

soft drink categories. With principal component analysis, I create variables which differentiate the studied sample based on the expectations toward soft drinks and ideas toward soft drink consumption. In relation to this, I differentiate consumer groups, clusters by cluster analysis, this leads to similar conclusions as the principal component analysis. Furthermore, I study the utility levels of the interviewees regarding price, brand, sugar content and the relative importance of these features in the sample by full concept conjoint analysis.

**RESULTS**

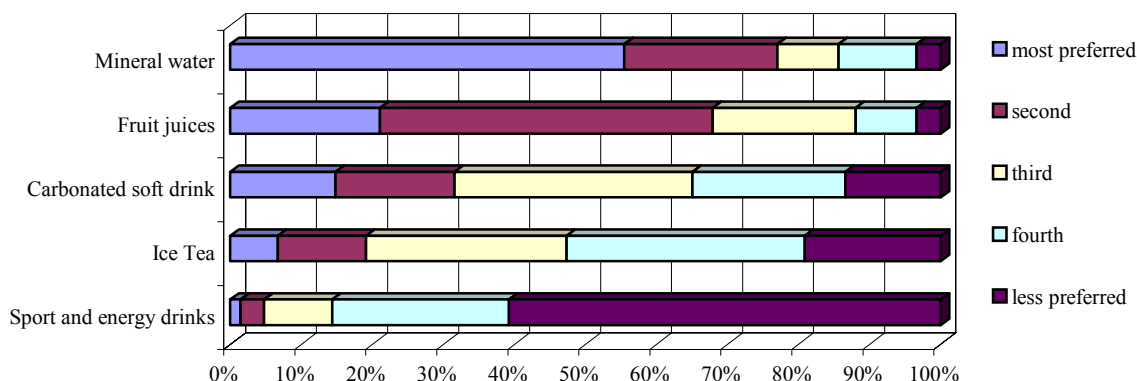
**Frequency of consumption**

It can be concluded for the soft drink categories that mineral waters are in the first place as regards popularity and the frequency of consumption. This is the most preferred category consumed in the greatest amount followed by fruit juices and then come the

categories of Ice Tea and carbonated soft drinks, there is not a great difference between the latter two in preference. Sport and energy drinks are in the last place, which is not surprising as this category focuses on a special limited target group and the consumption is also focused on a narrow area as we will see later. These results are shown in *Figure 1*.

Several methods can be suitable for studying the amount of consumption; all of them have advantages and disadvantages. I was curious how much the interviewees consumed from the different soft drink categories in the last week. Based on this, we can draw similar conclusions to the above, as a significant ratio of the students consume great amounts of mineral water, in average, students drink one litre mineral water per day. Regarding the amount of consumption, the previous order is also valid. In addition, it worth mentioning that more than 70% of the interviewees did not consume Ice Tea and sport and energy drinks at all, as we can see in *Table 1*.

*Figure 1: Soft drink preferences based on frequency of consumption*



Source: Own development

*Table 1*

**Consumption of soft drink categories (per week)**

	Ice Tea	Carbonated soft drink	Fruit juices	Mineral Water	Sport and energy drinks
Did not consume	73.8%	34.8%	17.6%	5.2%	78.1%
0 – 1 Liter	16.2%	41.0%	39.0%	3.8%	14.3%
1 < – 3 Liter	6.7%	15.7%	26.7%	5.7%	4.8%
3 < – 5 Liter	1.4%	5.7%	12.4%	13.8%	2.4%
5 < – 8 Liter	1.0%	2.9%	3.8%	18.1%	0.5%
>8 Liter	1.0%	0.0%	0.5%	53.3%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Mean (l/capita/week)	0.2119	1.2	1.94	7.88	0.165

Source: Own development

There are several explanations to the fact that somebody does not consume a particular type of soft drink. However, most of the people interviewed explained it by striving for a healthy diet and maintaining health. In the case of Ice Tea, more than 50% of the interviewees said that they do not like to consume it, because it is unhealthy. Regarding the carbonated soft drinks, the effects of which on health were discussed in the previous chapter, more than

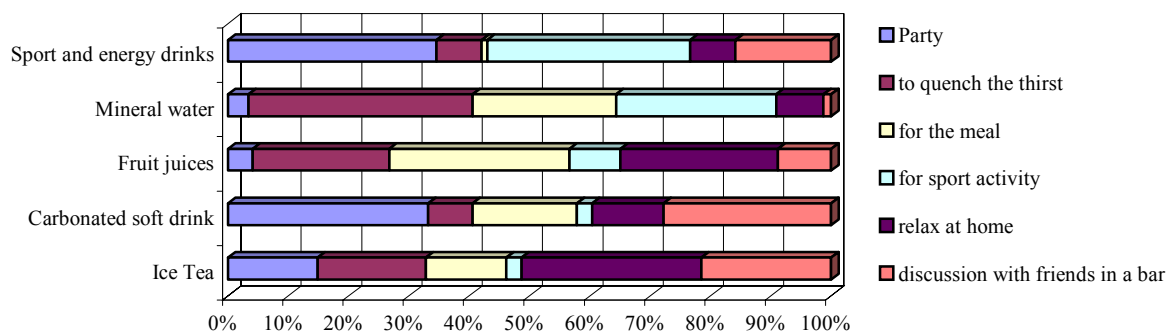
70% of them consider them unhealthy; therefore, they do not consume them. In the case of sport and energy drinks, it is interesting as three factors play are of similar importance in the prevention of consumption. In addition to the health factor, price and taste are also important, the fact that the consumers do not like the taste or consider it expensive are inhibiting factors.

## Consumption occasions

The next important aspect in the study of consumer behaviour was the mapping of the aim and the environment of consumption. I differentiated six categories. As active social events can be mentioned

parties and talking with friends at a bar. Important categories are sports, eating and relaxing at home. Another category is when somebody is only thirsty and wants to drink. In *Figure 2* can be seen that based on these categories, the soft drink categories can be well differentiated.

Figure 2: Occasion of consumption by soft drink categories



Source: Own development

Consumption of Ice Tea is mostly connected to relaxing at home and to a smaller extent to social gatherings. Consumption of fruit juices is definitely connected to meals and to drinking for quenching thirst. Consumption of carbonated soft drinks is connected to social events, especially to parties and meetings with friends at places of amusement, bars. Similarly, the sport and energy drinks can be easily classified as due to their content their consumption is connected especially to parties and active sport activities. For mineral waters, the main purpose is to quench one's thirst, and they are frequently consumed during meals and sport activities.

## Factors influencing consumption (brand, flavour, price, health)

As I discussed in the previous chapter, the consumer is influenced by many factors in the purchase decision process. From among these, I study the effect of some major features on the consumers.

The first aspect is the role of brand. Based on the opinions of the interviewees, interesting conclusions may be drawn. One of the most important conclusions is that most of the interviewed students do not have a favourite brand for the different soft drink categories, which predestines a minor role of brand in buying decisions. However, for those who have a brand preference, the monopolistic situation of brands is obvious. Such brands include Coca-Cola and Red Bull, which prevail in their specific categories. For mineral waters, it can be stated that the brand does not have an important role; even if there are popular brands among the consumers; none of them has a prevailing position.

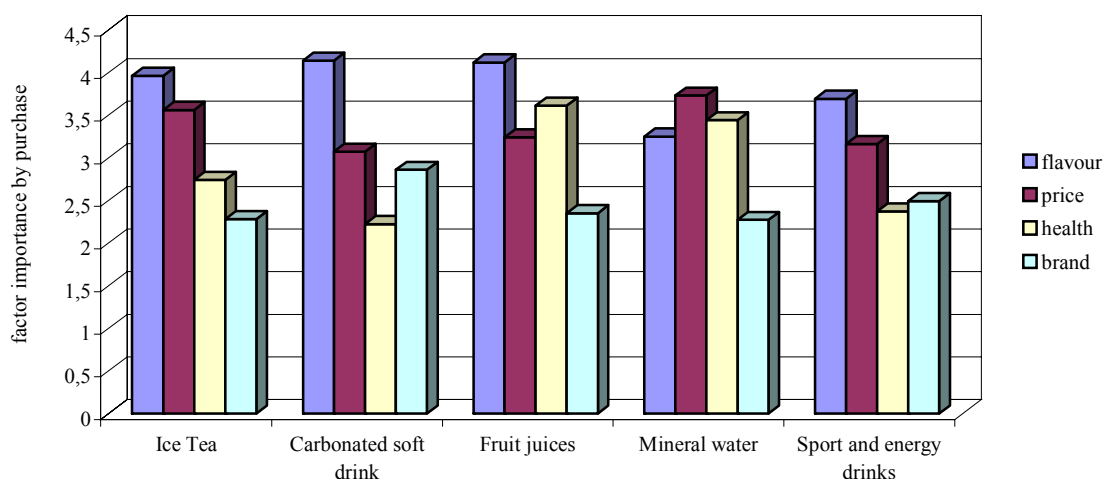
The diversity and high number of brands do not enable dominance.

In general, the flavour of the soft drink is the major factor; by the examined students; in decision making among the factors influencing consumption (price, flavour, brand, health), the most important is that the product should be tasty. The price is considered the second most important for the consumers, they strive to buy products at a favourable price. The next aspect which they consider is the effect of the product on health and the adherence to healthy lifestyle. Brand comes after all these factors in the preference system, the consumers adjust their decision to the already tested consumer brands, in accordance with the above brand doesn't have a prevailing role in consumer behaviour. These results are presented in *Figure 3*.

The importance of the factors influencing consumer decisions in the studied soft drink categories are presented in the previous figure on a scale from 1 to 5, with 5 being the most important. This also confirms the former statements that flavour and price are the two most important factors. Due to the nature of the product, the consumers consider price the most important factor for mineral water with health as the second and flavour is only the third. As it can be seen, health has a more important role in the case of fruit juices compared with other categories.

The considerable role of price is confirmed by another observation. When studying the purchasing attitudes of the interviewees, the ratio of utilitarian rational consumers for whom it is important that the product is worth buying for the given price is about 50%. Public spirit, social responsibility, health, lifestyle, self-expression were all secondary aspects by purchasing.

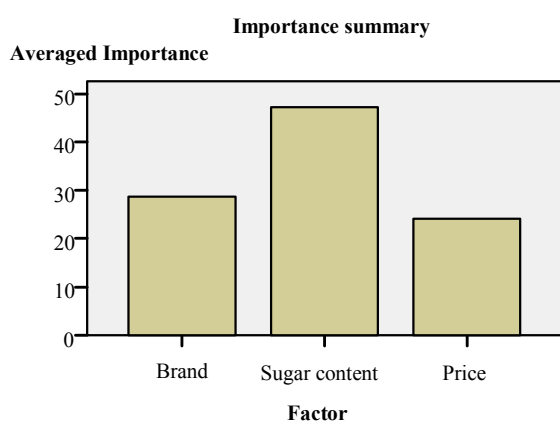
Figure 3: Importance of influencing factors by purchase decision



Source: Own development

The carbonated soft drinks are studied separately, I try to determine the relative importance and utility levels of the influencing factors using conjoint analysis. The analysis is conducted for brand, flavour and sugar content of a product, examining all factors at three different levels. The interviewees create a sequence among the nine stimuli or product alternatives formed in this way according to their preference system. From the summarizing statistics, it can be seen that based on the relative importance of the factors, sugar content is the primary factor in consumer decisions followed by the brand and the price which have almost the same level of importance. The values; as can be seen in Figure 4; were 47.2%, 28.6% and 24.2% for sugar, brand and price, respectively.

Figure 4: Relative importance of product factors



Source: Own development

We have obtained satisfactory results regarding the reliability of the examination, the model is reliable and both the Pearson and Kendall correlation coefficients are close to one and this is within the 5%

significant difference threshold (the significance value is lower than 0.05).

The utility levels according to the preference system of the interviewees are also worth attention. As I mentioned above, all factors had three different levels in the examination. The utility levels are shown in Table 2.

Utilities

Table 2

		Utility Estimate	Std. Error
Brand	Low level private brand	-0.606	0.209
	Medium level regional brand	0.100	0.209
	International premium brand	0.506	0.209
Sugar content	Zero sugar only	-0.209	0.209
	artificial sweetener		
	Less sugar with few artificial sweetener	0.315	0.209
	100% sugar no artificial sweetener	-0.106	0.209
Price	0,5 Euro	-0.606	0.181
	0,8 Euro	-1.213	0.362
	1,2 Euro	-1.819	0.543
(Constant)		6.213	0.391

Source: Own development

For brand, the results are as expected, the higher brand category a product has, the higher is the utility value, that is purchasing represents the higher utility level for the consumer. Regarding price, the negative linear relationship is well defined in harmony with our assumptions. With increasing price, the preference level of the given product is decreasing. In the factor analysis of sugar content, interesting conclusions could be drawn, the consumers do not prefer the extremes, both extreme values

(100% sweeteners and 100% sugar) received a negative value in their preference system. Based on the summarized data, they prefer the carbonated soft drinks in which a mixture of sugar and sweeteners is present in a small amount.

Based on the above statements, the features of the examined soft drink categories are summarized in *Table 3* according to the opinions of the interviewees based on consumption.

Table 3

Consumer attitude of soft drinks

	Ice Tea	Carbonated soft drink	Fruit juices	Mineral water	Sport and energy drinks
Extent of preference	Average	Average	Mostly preferred	Strongly preferred	Less preferred
Frequency of consumption	Mildly consumed	Mildly consumed	Frequently consumed	Very frequently consumed	Less consumed
barrier feature of consumption	Perceive unhealthy	Perceive unhealthy	no relevant information	no relevant information	Perceive unhealthy, expensive, not proper taste
Occasion of consumption	Relax at home	Social events, Party, discussion with friends in a bar	Mostly by meal or rather at home	To quench the thirst or rather sport activity and by meal	Active events, sport activity and party
Role of brands	Weak (Lipton)	Average level, Coca Cola	Weak, (Hohes C)	Very weak	Weak, (Red Bull)
Influencing factors of purchase	Flavour, price	Flavour, price	Flavour, health	Price, health	Flavour, price

Source: Own development

### Product ingredients

Consumers differ in their expectations toward the ingredients and content of soft drinks. In the next examination, I aim to determine whether consumer groups can be differentiated based on their requirements. I studied the effect of the presence or lack of different characteristics of soft drinks. These characteristics included vitamins, minerals, the amount of calories, sugar content, organic nature of the product and different additional materials which the consumers can expect from the product (e.g. caffeine). For studying this, cluster analysis and principal component analysis are used, where well differentiated groups are sought based on product features.

In principal component analysis, the correlation matrix of the studied variables provides satisfactory results, as the values are high, which means that there is a relationship between the variables, if there were independent variables, the analysis should be narrowed. The corresponding significance values are also acceptable at 5% level and the determinant of the matrix is also appropriate (0.6). By applying the Kaiser recommended Eigenvalue threshold, which keeps only the values higher than one, we kept three components in the model.

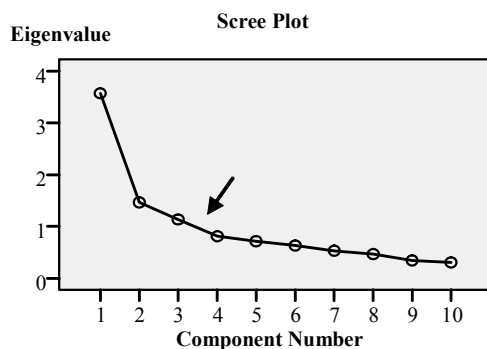
The Kaiser-Meyer-Olkin measure of sampling adequacy for the model is 0.75, which is higher than the recommended threshold of 0.5, based on these the principal component analysis can be classified good for studying the problem. The Bartlett hypothesis that the original correlation matrix is an identity matrix is refused at 5% significance level, which is also a satisfactory result.

On the in Scree Plot in *Figure 5*, it can be seen that three independent components are included in

the model based on the Eigenvalue threshold. Meaning of the components can be defined as follows: one is a low-energy feature, where the sugar-free nature of the product and the reduced calorie content are of primary importance. According to the second component, naturalness is important, organic products rich in vitamins, minerals, not containing artificial sweeteners or other additives. In the third group, the stimulating materials are of great importance such as guarana, caffeine and taurine contents. These three components explain 61.74% of the total variance of the observed variables, with all Eigenvalues above 1, which can be qualified a good result. Rotation helps to equalize the relative weight of the different components in the model as it can be seen in *Table 4*.

For better understand the achieved factors and the above mentioned three defined main meaning of the components I would present them in *Table 5*.

Figure 5: Scree Plot of the component



Source: Own development

Table 4

**Total variance explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.570	35.697	35.697	3.570	35.697	35.697	2.706	27.057	27.057
2	1.465	14.654	50.351	1.465	14.654	50.351	1.750	17.499	44.556
3	1.139	11.390	61.740	1.139	11.390	61.740	1.718	17.184	61.740
4	0.813	8.129	69.870						
5	0.716	7.161	77.031						
6	0.633	6.331	83.362						
7	0.534	5.340	88.702						
8	0.471	4.709	93.411						
9	0.348	3.480	96.891						
10	0.311	3.109	100.000						

Extraction Method: Principal Component Analysis

Source: Own development

Table 5

**Rotated Component Matrix**

How are you influenced by the following attributes?	Components		
	1	2	3
More vitamin	0.455	0.664	0
More calcium than usual	0.599	0.493	0
Contains fat burner	0.646	0	0.284
Zero sugar only artificial sweetener	0.831	-0.154	0
100% sugar no artificial sweetener	-0.137	0.618	0.470
Low sugar with few artificial sweetener	0.617	0.220	0.222
Low calorie	0.736	0.136	0.154
Organic (BIO) made from natural sources	0	0.752	0.101
contains guarana or taurin	0.181	0	0.847
With caffeine	0.236	0.141	0.785

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization

Source: Own development

For justifying the results, cluster analysis is made for the variables in which similar conclusions can be drawn via forming three well-defined clusters.

For the analysis, I select the hierarchical method and within this I form the clusters based on the smallest distance between the groups, for measuring the distance I use the squared Euclidean distance. When forming three clusters from the variables, similar clusters are formed as in the above results. One of them can be characterised as low-energy claim, the second shows the natural, organic product

features, while the third can be characterized by the importance of the different stimulating materials. The similar conclusions drawn from the two examination methods are meant to increase the reliability of the results.

**CONCLUSIONS**

Healthy lifestyle and its relationship with nutrition and emphasis on these play an ever-increasing role among consumers nowadays. Health as a factor also has an increasing role in analyses of consumer behaviour and accordingly in marketing. For the evaluation of the results, the qualitative and non-representative nature of the examination should be mentioned, accordingly, no far-reaching conclusions can be drawn, however, the results are worthy of consideration and they serve as a good basis for quantitative research. It is not surprising that the consumer decisions are still greatly determined by the price and flavour of the product, but health aspects also have an important role. The consumers involved in the study could be well differentiated based on their soft drink consumption habits and their expectations toward the health factor of the product.

According to the meaning of the components can be defined three different expectations: one is a low-energy feature, where the sugar-free nature of the product and the reduced calorie content are of primary importance, second shows the natural, organic product features, while the third can be characterized by the importance of the different stimulating materials.

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