

CONSUMER PERCEPTION OF BREAD QUALITY

L. Nagyová, P. Rovný, J. Stávková, M. Uličná, L. Maďarová

Received: February 19, 2009

Abstract

NAGYOVŠ, L., ROVNÝ, P., STÁVKOVÁ, J., ULIČNÁ, M., MAĎAROVÁ, L.: *Consumer perception of bread quality*. Acta univ. agric. et silvic. Mendel. Brun., 2009, LVII, No. 3, pp. 115–122

The aim of this paper is to evaluate consumers' perception of bread quality in Slovakia. Bread belongs to essential foodstuffs and we all have it served on our table every day.

Cereal products keep their importance in people's nutrition mainly because of their preventive effects on health. They saturate about 40% of the daily energy need of an average European, who in average acquires from cereals about 30% of proteins, vitamin B1, niacin and phosphorus, around 1/6 of fats (out of it 19% of linol acid), almost 60% of saccharides, ¼ iron and about 13% of vitamin B2 and calcium. If we add some cereal fiber which is an effective prevention factor of cardiovascular diseases, metabolic and oncological diseases of colon and anus, we will get a complex picture about positive effects of cereals in our nutrition. If we were to mark any foodstuff which has been accompanying the mankind in the course of history, it could be bread. Its consummation is spread in the whole world. Only the ones who once suffered from its lack have recognized its value.

It results from our research that consumers in Slovakia prefer consuming the *wheat-ray bread* (38.5%). The respondents – consumers prefer at choosing buying bread in terms of the external, subjective factors, the overall shape when choosing bread (45%) and dark color of crust (25%). They showed minimum interest in white color crust and packaging size. In terms of the internal, objective factors, the most important factor for respondents, for women as well as for men was freshness of foodstuffs followed by fiber (with a big difference) (12.82%).

Almost 60% of bread consumers claimed that they did not have any possibility to obtain the required information regarding bread in supermarkets and hypermarkets because it is not possible to find professional staff providing them with the required information. A different situation is in the classical, small, self-service, and specialized stores, where personal contact of a shop-assistant and a customer is more often. Results of the performed marketing research of consumer behavior in the market with bakery products will become a sort of the initial basis for departments involved in the research. The team of co-authors have the task to define bread quality on the basis of chemical analyses in accordance with consumers needs.

consumer, bread, quality, external – subjective characteristics, internal – objective characteristics

Food consumption belongs to people's joys and pleasures of life and is often perceived by consumers as an activity which should be paid much more attention, especially in connection with health. The reason for the concern of the public is the news propagated by media about unhealthy and even harmful effects of foodstuffs. Some statistical figures point to an enormous increase of diseases caused by foodstuffs. For this reason it is necessary to evaluate consumers' perception of bread quality in Slovakia. Bread belongs to essential foodstuffs and we all have it served on our table every day.

MATERIAL AND METHODS

We have analyzed in this paper the processed information acquired from the applied Research Project No. 4/2004/08 AV under the following title: „Objectification parameters of foodstuffs quality and their influence on consumers“. The Department of Marketing of the Faculty of Management and Economics of the Slovak Agricultural University in Nitra is in charge of this project. The project is being solved in cooperation with the Food Processing Research Institute in Bratislava and the Department of Hygiene and Food Safety, **Department of Storage and**

Processing Plant Products, Faculty of Food Biotechnology and Foodstuffs of the Slovak Agricultural University in Nitra. To obtain the primary data, a method of enquiry was used with the purpose to obtain the necessary data of the qualitative as well as quantitative character. Knowing consumers' potential is part of the analysis of the examined problem in order to obtain more information about the motives of consumers' behavior in the market and their relation to the quality of foodstuffs.

Primary data were obtained by direct questioning {face to face. The written replies were recorded in the questionnaires prepared ahead of time in the whole country of Slovakia. Verifying the correctness of questions, understandability as well as their completion was realized through the piloting {pre-test} on the sample of 10 respondents. 664 respondents from the whole country of Slovakia were involved in this research.

The questionnaire consists of two parts:

Part I: Information about the products, where part B contains questions aimed at bakery products (5 questions).

Part II: Information about respondents (8 questions).

Besides the numerous and percentual recordings, contingency tables were also used for questionnaire evaluation. A contingency or a cross-table is a combination of two (or more) frequency tables so that each inner cell represents a clear combination of the specific values (also called categories in this paper), which are cross tabulated variables. It makes it possible to find out the frequency, number of respondents involved in special categories for more than one variable. Observation of these frequencies enabled us to determine the relation between the cross tabulated variables. The contingency table is only suitable for nominal variables or the numeral variables achieving a relatively small number of possible values.

The contingency table serves as the basis for interpretation of the two properties of the examined objects. To form the contingency tables, the frequency distribution was taken into account.

Absolute and relative response multitudes to individual questions of the questionnaire are stated at qualitative characters. Relative multitudes have enabled the comparison of various multitude divisions between the files, which differ in their content and at the same time which make the interpretation of research results easier.

Absolute multitudes (n_1, n_2, \dots, n_k) indicate how many times a mark will occur. Their total equals their file size n .

$$n_1 + n_2 + \dots + n_k = \sum n_i = n$$

Relative multitude will be achieved as part of the individual, absolute multitudes within the entire file extent. A percent formula is possible.

$f_i = n_i/n$, for which it is valid that $f_1 + f_2 + \dots + f_k = \sum f_i = 1$, respectively a cumulative multitude $N_1 = n_1, N_2 = n_1 + n_2, \dots, N_k = \sum n_i = n$

RESULTS

Modern production management systems guarantee the necessary security and quality of foodstuffs. A good production practice is a kind of guarantee that the necessary procedures will be kept followed by the quality and security of the products which should be on the standard level. The HACCP systems (presenting the analysis of danger in critical control points) are aimed at those critical sites of the production process where it could come to contamination and they have to secure ahead of time that it wouldn't come to such a situation. Foodstuffs producers are made to keep the standards of quality management defined by the International Organization for Standardization (ISO).

The quality of foodstuffs depends on the quality of raw materials as well as on the quality of products distribution, their storage and sale conditions. Suppliers of raw materials, transporters, operators of storehouses and traders must be involved in the process of quality securing. It is highly important that foodstuff producers communicate with the prime producers and inform them about the demands concerning the quality of foodstuffs. They should also communicate with the buyers providing them with all necessary technical advice followed by final control. It should be carried out in order to check if during foodstuff transportation, storage and sale, all instructions relating the temperature, humidity and other conditions connected with foodstuff manipulation were kept in such a way that the quality is well preserved. At the same time it should be monitored if the warranty period of foodstuffs is not expired.

Packaging is also very important for foodstuff quality. It can extend the durability of products because it keeps them from water evaporation and penetration of microorganisms into them and helps to keep the freshness of products. It is also an important provider of information, for example about the way of cooking a product, food preparation, about its nutritive components or about the term until which a producer is guaranteeing for the quality and harmlessness of a product. Such information can help consumers at storing food and food preparation without reducing its quality and safety.

Cereals have been the major foodstuff for mankind for thousands of years. Grain contains almost all nutrients necessary for life. Here belong carbohydrates, 7–12% of proteins, 2–7% of fats with a high portion of acids essential to life, vitamins, first of all B1 and E and minerals such as iron. We must not forget about ballast substances which regulate our digestion process and are able to bind harmful pollutants. A supposal for a high nutritive value of cereal products is that the entire grain will be milled together with sprouts and cover.

Bread has a very important place in people's nutrition. We have many varieties of bread baked in bake houses. Basic kinds of bread would cover wheat breads, rye-, wheat-rye- and wholemeal breads, some special kinds such as graham breads, etc. Their chara-

cteristics is as follows: The name of *wheat bread* can be used for bread which contains at least 70 weight percent of wheat mill products out of the total weight of mill products. The *rye bread* has to contain at least 70 weight percent of rye mill products out of the entire weight of mill products. The *wheat-rye bread* contains at least 50 weight percent of wheat mill products and 10 weight percent of rye mill products out of the total weight of mill products.

The term *wholemeal bread* is used for bread that contains at least 70 weight percent of wholemeal mill products out of the total weight of mill products. At least 10 weight percent of at least two kinds of mill products other than wheat and rye was used for the production of wholemeal bread. There are also known many other kinds of bread. Here belong some kinds of special breads such as *potato bread* which belongs to the most favourite kinds of bread. In this special kind of bread also potatoes can be found besides flour. Here belong such kinds as soya-, corn-, rice-, graham-, sunflower and finish breads.

664 respondents got involved into the marketing research of consumer behavior in the market of bakery products from the entire territory of Slovakia. The primary data were obtained through casual choice of respondents.

Out of the total amount of the enquired respondents there were 63% of women and 37% of men

(Graph 1). It was assumed that most women take care of buying foodstuffs in their households.

Consumers in Slovakia, as it results from the realized research, show their biggest interest in buying wheat-rye breads (38.55%). The least amount of respondents showed their interest in buying breads with pour spout, potato- and wholemeal breads (Graph 2).

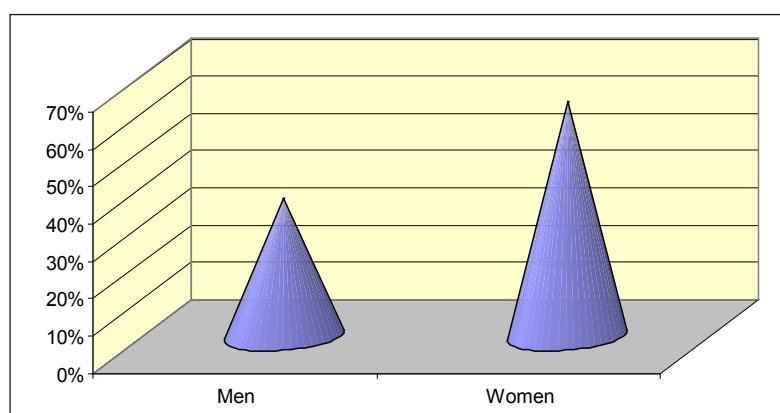
Table I a,b point to respondents preferences relating the kinds of bread according to sex and age

Respondents prefer buying freely laid bread (57%), which is in conflict with the requirements of the EU policy. In case of bread packaging, more interest was shown in the packaged sliced breads than in wholly packaged breads. (Graph 3).

In our research we were interested in the external, subjective, followed by the internal, objective bread characteristics which influence the Slovak consumers' behavior if they are buying this foodstuff.

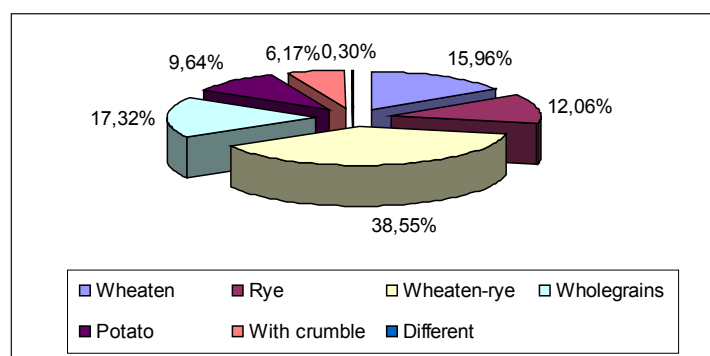
It is clear from graph 4 that respondents prefer the overall shape when buying bread (45%) and dark color of crust (25%), they showed less interest in white color crust, respectively the size of packaging.

Table II shows the differences within the preferences of individual external – subjective characteristic features between women and men.



Source: own research and processing

1: Percentage share of women and men participated on research



Source: own research and processing

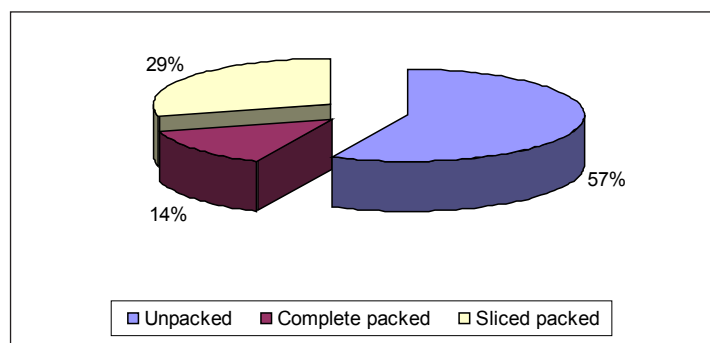
2: What kind of bread do you consume?

I: *What kind of bread do you consume?*

Kind of bread	Women by age						Women total
	do 25 years	26–35 years	36–45 years	46–55 years	56–65 years	66 and more years	
Wheaten	3.16%	0.90%	3.16%	0.60%	1.65%	0.30%	9.79%
Rye	1.05%	1.20%	1.05%	0.60%	2.26%	0.90%	7.08%
Wheaten-rye	3.16%	3.01%	7.98%	2.56%	6.17%	0.45%	23.34%
Wholegrains	2.71%	1.96%	3.77%	1.66%	1.20%	0.75%	12.05%
Potato	0.30%	0.30%	2.26%	0.75%	1.96%	0.30%	5.87%
With crumble	1.05%	0.60%	2.26%	0.75%	0.00%	0.00%	4.67%
Different	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	11.45%	7.98%	20.48%	6.93%	7.08%	2.71%	62.80%

Kind of bread	Men by age						Men total	Total
	do 25 years	26–35 years	36–45 years	46–55 years	56–65 years	66 and more years		
Wheaten	1.81%	1.51%	1.36%	0.15%	0.90%	0.45%	6.17%	15.96%
Rye	0.61%	1.96%	0.90%	0.61%	0.45%	0.45%	4.98%	12.06%
Wheaten-rye	3.16%	2.56%	4.37%	1.51%	1.80%	1.81%	15.21%	38.55%
Wholegrains	1.66%	1.05%	1.36%	0.60%	0.15%	0.45%	5.27%	17.32%
Potato	0.45%	0.60%	1.05%	0.75%	0.60%	0.30%	3.77%	9.64%
With crumble	0.00%	0.30%	0.30%	0.60%	0.15%	0.15%	1.51%	6.17%
Different	0.15%	0.15%	0.00%	0.00%	0.00%	0.00%	0.21%	0.30%
Total	7.83%	8.13%	9.34%	4.22%	2.41%	3.61%	37.20%	100.00%

Source: own research and processing

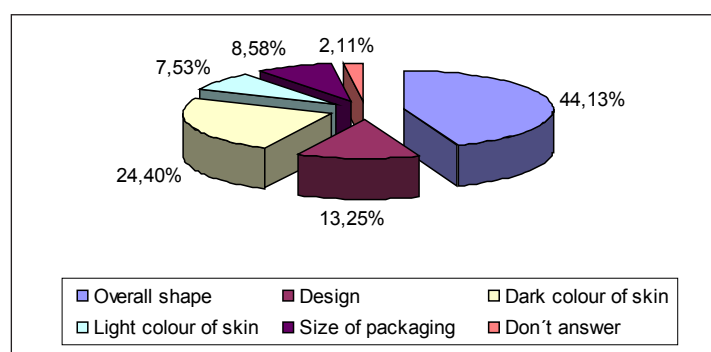


Source: own research and processing

3: *Which bread packaging do you prefer?*

The most important factor in answering this question was freshness, in women (49.3%) as well as in men (28.5%), followed by fiber (12.8%). Other characteristic features were not considered important in less than 4% of the questioned respondents. The views regarding individual characteristic features were not too different in men and women, nor from the point of age and education (Graph 5, Tab. III).

Almost 60% of respondents said that they did not have any possibility to obtain the required information regarding bread. The reason is that it is not possible to find professional staff in supermarkets and hypermarkets, which would be able to provide them with such information. A different situation is in the classical, small, self-service, and specialized stores, where personal contact of a shop-assistant and a customer is more often.



Source: own research and processing

4: What is the most interesting thing for you if you are buying bread in terms of the “external – subjective” characteristic features?

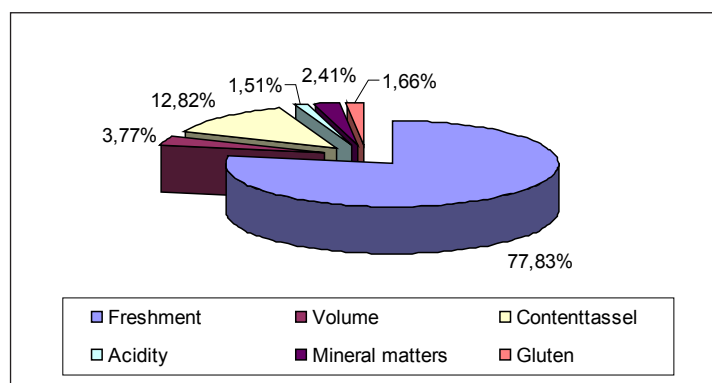
II: What is the most interesting thing for you if you are buying bread in terms of the “external – subjective” characteristic features?

External characteristics	Sex		Total
	Women	Men	
Overall shape	28.32%	15.81%	44.13%
Design	8.13%	5.12%	13.25%
Dark colour of skin	15.06%	9.34%	24.40%
Light colour of skin	4.52%	3.01%	7.53%
Size of packaging	5.87%	2.71%	8.58%
Don't answer	0.90%	1.21%	2.11%
Total	62.80%	37.20%	100.00%

Age	Overall shape	Design	Dark colour of skin	Light colour of skin	Size of packaging	Other	Total
to 25 years	8.28%	1.81%	4.67%	2.41%	1.51%	0.60%	19.28%
26–35 years	7.08%	3.46%	3.61%	0.60%	1.05%	0.30%	16.11%
36–45 years	13.86%	3.16%	7.98%	2.41%	1.66%	0.75%	29.82%
46–55 years	9.18%	2.32%	3.77%	1.05%	1.50%	0.15%	18.97%
56–65 years	3.31%	0.75%	2.41%	0.75%	2.11%	0.15%	9.49%
66 and more years	2.41%	0.75%	1.96%	0.30%	0.75%	0.15%	6.33%
Total	44.13%	13.25%	24.40%	7.53%	8.58%	2.11%	100.00%

Education	Overall shape	Design	Dark colour of skin	Light colour of skin	Size of packaging	Other	Total
Basic	0.90%	0.75%	0.90%	0.15%	0.30%	0.15%	3.16%
Secondary professional	7.08%	2.86%	4.22%	1.51%	2.11%	0.45%	18.22%
Secondary with graduation	13.10%	4.67%	8.89%	2.86%	2.71%	1.05%	33.28%
Undergraduate	23.04%	4.97%	10.39%	3.01%	3.46%	0.45%	45.33%
Total	44.13%	13.25%	24.40%	7.53%	8.58%	2.11%	100.00%

Source: own research and processing



Source: own research and processing

5: Which initiated „internal – objective“ characteristics are you interested in bread purchasing in?

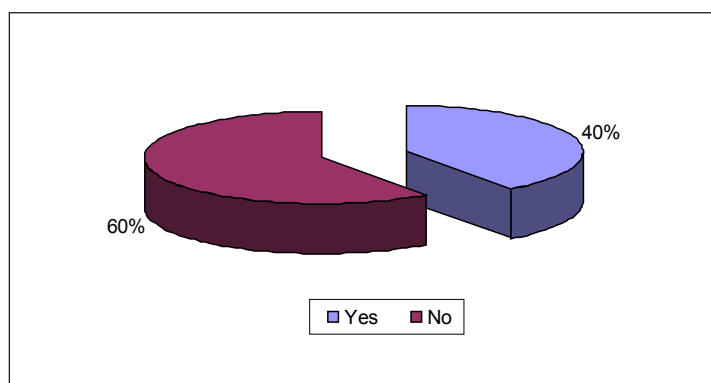
III: Which initiated „internal – objective“ characteristics are you interested in bread purchasing in?

Objective characteristics	Sex		Total
	Women	Men	
Freshment	49.32%	28.51%	77.83%
Volume	2.26%	1.51%	3.77%
Contenttassel	7.39%	5.43%	12.82%
Acidity	1.36%	0.15%	1.51%
Mineral matters	1.66%	0.75%	2.41%
Gluten	0.75%	0.90%	1.66%
Total	62.75%	37.25%	100.00%

Age	Freshment (humidity)	Volume (porosity of breadcrumb)	Content tassel	Acidity	Mineral matters	Gluten	Total
to 25 years	15.23%	0.15%	3.02%	0.00%	0.75%	0.15%	19.31%
26–35 years	13.12%	1.06%	1.36%	0.15%	0.15%	0.30%	16.14%
36–45 years	24.43%	0.60%	3.47%	0.15%	0.60%	0.45%	29.71%
46–55 years	13.48%	1.05%	2.42%	0.75%	0.75%	0.45%	19.00%
56–65 years	6.49%	0.45%	1.96%	0.30%	0.15%	0.15%	9.50%
66 and more years	4.98%	0.45%	0.60%	0.15%	0.00%	0.15%	6.33%
Total	77.83%	3.77%	12.82%	1.51%	2.41%	1.66%	100.00%

Education	Freshment (humidity)	Volume (porosity of breadcrumb)	Content tassel	Acidity	Mineral matters	Gluten	Total
Basic	2.26%	0.00%	0.60%	0.00%	0.15%	0.15%	3.16%
Secondary professional	13.86%	0.60%	2.86%	0.30%	0.60%	0.00%	18.22%
Secondary with graduation	25.30%	1.36%	4.22%	0.60%	0.90%	0.90%	33.28%
Undergraduate	36.30%	1.81%	5.12%	0.60%	0.75%	0.60%	45.33%
Total	77.71%	3.77%	12.80%	1.51%	2.41%	1.66%	100.00%

Source: own research and processing



Source: own research and processing

6: Do you have possibility to obtain demand information about free saved bread in store?

CONCLUSION

Cereal products keep their importance in people's nutrition mainly because of their preventive effects on health. They saturate about 40% of the daily energy need of an average European, who in average acquires from cereals about 30% of proteins, vitamin B1, niacin and phosphorus, around 1/6 of fats (out of it 19% of linol acid), almost 60% of saccharides, 1/4 iron and about 13% of vitamin B2 and calcium. If we add some cereal fiber which is an effective prevention factor of cardiovascular diseases, metabolic and oncological diseases of colon and anus, we will get a complex picture about positive effects of cereals in our nutrition. If we were to mark any foodstuff which has been accompanying the mankind in the course of history, it could be bread. Its consumption is spread in the whole world. Only the ones who once suffered from its lack have recognized its value.

It results from our research that consumers in Slovakia prefer consuming the *wheat-ray bread* (38.5%). The respondents – consumers prefer at choosing buying bread in terms of the external, subjective fac-

tors, the overall shape when choosing bread (45%) and dark color of crust (25%). They showed minimum interest in white color crust and packaging size. In terms of the internal, objective factors, the most important factor for respondents, for women as well as for men was freshness of foodstuffs followed by fiber (with a big difference) (12.82%).

Almost 60% of bread consumers claimed that they did not have any possibility to obtain the required information regarding bread in supermarkets and hypermarkets because it is not possible to find professional staff providing them with the required information. A different situation is in the classical, small, self-service, and specialized stores, where personal contact of a shop-assistant and a customer is more often. Results of the performed marketing research of consumer behavior in the market with bakery products will become a sort of the initial basis for departments involved in the research. The team of co-authors have the task to define bread quality on the basis of chemical analyses in accordance with consumers needs.

SÚHRN

Vnímanie kvality chleba spotrebiteľom

Cieľom príspevku je zhodnotenie vnímania kvality chleba spotrebiteľmi na Slovensku. Chlieb je základnou potravinou, ktorá sa takmer denne vyskytuje na jedálnom lístku každej rodiny. Obilninové výrobky si zachovávajú značný význam vo výžive obyvateľstva najmä zásluhou preventívneho účinku na ľudské zdravie. Saturujú okolo 40% dennej energetickej potreby priemerného Európana, pričom z obilnín získa priemerne 30% potreby bielkovín, vitamínu B1, niacínu a fosforu, približne 1/6 tukov (z toho 19% kyseliny linolovej), takmer 60% sacharidov, 1/4 železa a okolo 13% vitamínu B2 a vápnika. Ak k tomu priradíme ešte obilninovú vlákninu, ktorá predstavuje účinný faktor prevencie srdcovo-cievnych, metabolických a tiež onkologických ochorení hrubého čreva a konečníka, získame komplexný obraz o prospešnom účinku obilnín vo výžive. Ak by bolo možné označiť nejakú potravinu, ktorá sprevádza ľudstvo takmer celou históriou, mohol by to byť chlieb. Jeho konzumácia je bežná a rozšírená na celom svete. Len ten, kto poznal jeho nedostatok, vie aký je vzácny. Z výsledkov výskumu vyplýva, že spotrebiteľia na Slovensku uprednostňujú konzumáciu pšeničného – ražného chleba (38,55%). Respondenti – konzumenti pri výbere chleba uprednostňujú z hľadiska vonkajších subjektívnych faktorov celkový vzhľad (45%) a tmavú farbu kôrky (25%). Minimálny záu-

jem prejavujú o bledú farbu kôrky a veľkosť balenia. Z hľadiska vnútorných objektívnych faktorov tak u žien (49,32%), ako aj mužov (28,51%) je za najdôležitejší faktor považujú respondentí čerstvosť potravín a s podstatným rozdielom nasleduje obsah vlákniny (12,82%). Takmer 60% konzumentov chleba uviedlo, že nemá možnosť získať požadované informácie o chlebe, nakoľko v supermarketoch a hypermarketoch nie je možné stretnúť personál, ktorý by takéto informácie poskytol. Iná je situácia v klasických pultových, malých samoobslužných a špecializovaných predajniach, kde je častejší osobný kontakt predavača so zákazníkmi.

Výsledky realizovaného marketingového prieskumu spotrebiteľského správania na trhu pekárenských výrobkov sa stanú východiskovou základňou pre na projekte spolupracujúce pracoviská. Kolektív autorov má za úlohu definovať kvalitu chleba na základe chemických rozborov a v súlade s požiadavkami spotrebiteľov.

spotrebiteľ, chlieb, kvalita, externé – subjektívne vlastnosti, interné – objektívne vlastnosti

REFERENCES

- FORET, M., STÁVKOVÁ, J., 2003: Marketingový výzkum. 1. vyd. Praha: Grada Publishing, 160 s. ISBN 80-247-0385-8
- HORSKÁ, E., 2007: Medzinárodný marketing (International Marketing). Nitra: SPU, 2007, 223 s. ISBN 978 8080 699383
- GOLIAN, J., SOKOL, J., ZAJÁC, P., 2007: Food safety and the emerging new food products and food technologies In: Acta Biochimica Polonica. – Warszawa: Polish biochemical society, 1954. – Vol. 54, suppl. 1 (2007), s. 9. ISBN 0001-527X
- KOTLER, P., 2007: Marketing manažment (Marketing Management). Praha: Grada 207 s., ISBN 8024700166
- OBTULOVIČ, P., 2004: Bioštatistika. 3. vyd. Nitra: SPU, 2004, 132 s. ISBN 80-8069-432-X
- PŘÍBOVÁ, M. a kol., 1996: Marketingový výzkum v praxi. 1. vyd. Praha: Grada Publishing, 1996. 248 s. ISBN 80-7169-299-9

Address

prof. Ing. Ludmila Nagyová, Ph.D., Ing. Patrik Rovný, Ph.D., Katedra marketingu, Slovenská poľnohospodárska univerzita v Nitre, Tr. A. Hlinku 2, 949 76 Nitra, Slovenská republika, e-mail: Ludmila.Nagyova@uniag.sk, Patrik.Rovny@fem.uniag.sk, Prof. Ing. Jana Stávková, CSc., Ústav marketingu a obchodu, Mendelova zemědělská a lesnická univerzita v Brně, Zemědělská 1, 613 00 Brno, Česká republika, e-mail: jana.stavkova@mendelu.cz, Ing. Martina Uličná, Katedra štatistiky a operačného výskumu, Slovenská poľnohospodárska univerzita v Nitre, Tr. A. Hlinku 2, 949 76 Nitra, Slovenská republika, e-mail: Martina.Ulicna@fem.uniag.sk, PhDr. Ludmila Maďarová, Ph.D., Katedra odborného jazykového vzdelávania, Slovenská poľnohospodárska univerzita v Nitre, Tr. A. Hlinku 2, 949 76 Nitra, Slovenská republika, e-mail: Ludmila.Madarova@uniag.sk