ACTA UNIVERSITATIS AGRICULTURAE ET SILVICULTURAE MENDELIANAE BRUNENSIS

Volume 64 189 Number 5, 2016
http://dx.doi.org/10.11118/actaun201664051709

THE PERCEPTION OF INFORMATION BY ECONOMIC AGENTS ON THE DAIRY MARKET

Renata Hrubá[1]

[1] Mezouň 23, 267 18 Beroun, pošta Karlštejn

Abstract

HRUBÁ RENATA. 2016. The Perception of Information by Economic Agents on the Dairy Market. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis,* 64(5): 1709–1715.

In this study, data from a sample of Czech consumers are used to test the hypothesis that consumer behavior is influenced by attitude to global problem related to food. The model is estimated using probit analysis to predict food label use in deciding for a new cheese product. It is possible to draw conclusion about the attitude to global food issue that might's change consumer behavior.

Keywords: decision making behavior, label use, familiarity bias, perception of information, attitude, nutrient

INTRODUCTION

Supporting local dairy products such as transparent information about origin of milk as an ingredient in dairy products, for unprocessed foods, single-ingredient products and for ingredients that make up more than 50 % of a food and local resources have long been the most important issue in EU, presented European Commission. How poor education about food of origin and nutrition impacting consumers behavior? It is a reason integrated consumers' attitudes towards "origin of milk" and "nutrient security" support a model of rational decision-making behavior. Certain research studies indicate how attitudes related to place of origin and nutrient security influence consumer behavior in Europe (Grunert, 2005; Vermeier and Verbeke 2006). Several experiments demonstrate even stronger evidence that attitudes have an impact on decision making process (Zepeda and Leviten-Reid, 2004; Chen and Huang, 2013). Prior Zepeda and Deal (2009) examine that the value knowing place of origin of food came from, a relationship with farmers, indicating support for values, beliefs and norms influencing food purchase habits.

It is today an important factor for label use in decision-making process. There is still much to learn about the effects of changing attitudes and behavior. Putting the attention towards origin of food and nutrient security, it is necessary to analyze how attitudes could support food label use in decision making process.

This article extends a consumer-attitude behavior model. We examine the effects of information about "origin of milk" on food label use in decision making process at food market, especially the Dairy Market.

Perception of information

In the present study it is proposed that consumers' level of product familiarity of attributes affects his behaviour. Dentoni (2009) in his study has focused on local grown product, he explained that individuals not only developed evaluations for attributes but also from beliefs that these attributes are associated to objects and that ultimately they create their attitudes and behavioral intentions based upon both attribute evaluations and beliefs. Grunert *et al.* (2000) approved the relationship between perceptions of dairy product attributes and consumer purchased motive. Purchase motives should be indicative for quality dimensions in particular health-related, convenience-related and process-related dimensions. They investigated how new dairy products are launched in terms of communicating their benefits (e. g. functional food, which combine health and convenience and organic products which are positioned based on a production process). Consistently series

of empirical researches have verified that if an individuals' knowledge of attributes of foods is higher than the others then he/she may concern about global, environmental issues related to the food (Tilmanyho, 2008; Zepeda a Leviten-Reid, 2004). The further study presents evidence that consumers' attitudes motivate information seeking (Zepeda and Deal, 2009). Also consumer subjective evaluate of product characteristics selection and processing (i.e. confidence in choosing and processing product attributes for a choice decision task) (Park and Lessig, 1981).

On the other hand, consumer searches for and uses information about the product influences familiarity with a product (Park and Lessig 1981). It is expected to be found firstly high familiarity consumers' evaluation and decision biases among consumers who currently own the product and have relevant product knowledge. Secondly among low familiarity consumers', those who do not have prior product-usage experience, are not equipped with relevant information about brand differences and the functional product attributes, next among consumers' with medium familiarity, who have some product-usage experience, possess relevant information, but do not currently own the product. Park and Lessig (1981) examine decision (evaluation) biases and heuristics in different levels of familiarity of the product with specific attention to the impact on such information processing heuristics. The familiarity heuristic technique is typically useful only when the situation is not different from the time before previous consumers' behavior. Unless there exists some consumer loyalty to attributes. Dentoni (2009) analyzed the impact of credence attributes, including locally grown on consumers' attitudes towards agri-food products. He explained that a "locally grown" attribute is more used by low-familiarity consumers as a stereotype to evaluate the presence of other attributes of a product, such as its flavor or its safety. Similarly Rao and Monroe (1988) found that consumers with different levels of product familiarity use different cues to form their beliefs about the quality of a product.

Based on the previous section we assume the existence of "familiarity bias" in the Czech dairy market. Thus Consumers' level of product familiarity of attributes affects his behaviour. In the other worth consumers' attitudes towards information about food motivate information seeking during decision making process.

The form of the model is:

Use the information on the label in decision-making behavior = f (attitudes towards information of food).

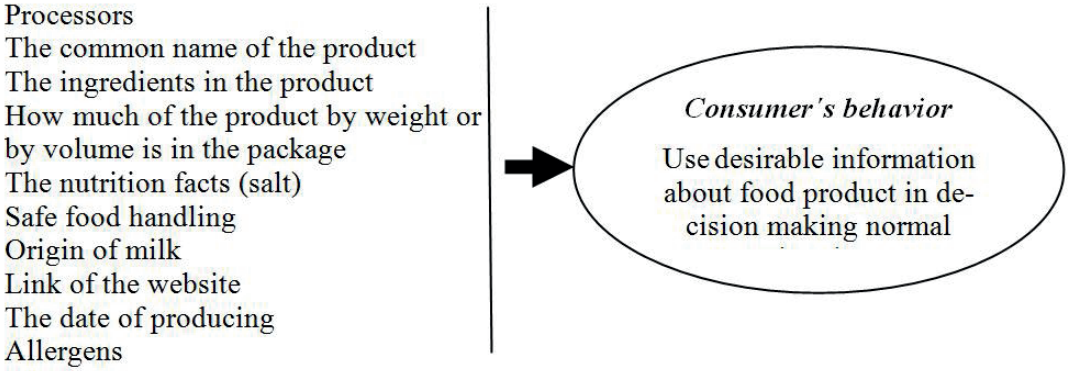
The model is estimated using probit analysis to predict food label use in decision-making under normal circumstances, and to examine of consumers' attitudes towards food origin and nutrient food security. The model is displayed in Fig. 1.

METHODS

Only a summary of the methods are provided, since the full study methodology was reported by Hrubá (2014).

Study design and respondents

The questionnaire is based on the survey conducted by the Consumer Interest Alliance Inc. (2007). The research was conducted in 2010–2011. The Questionnaire was a paper based. Respondents were students: 330 from the University of Czech Life Science in Prague, 300 from the University of South Bohemia in České Budějovice, 340 from the Mendel University in Brno, 200 from Masaryk University. All 1170 respondents were responsible for the purchase of cheese (First question on the survey). The sample is not statistically representative of younger and better educated students among the Czech population. More than 909 questionnaires were used for the model. Of the 909 youngsters following higher education in the 19–35 age groups, 595 were female (65 %). Table I and II shows the part of questionnaire from survey.



1: *Research model: Consumer-attitude behavioral model*
Source: Authors' own processing

The questionnaires

The questionnaire covered Czech consumer attitudes regarding information, beliefs concerning producers and behavioral patterns under normal situations. Responses to 10 attitudinal statements and 1 behavioral statement, were selected from the study and categorized into 2 groups for this study, namely:

Behavioral patterns regarding consumer use of information food labels

Statements regarding consumer attitudes concerning the information

In the Tab. I, there is the main part of a survey questionnaire. The respondents scored their level of attitudes a scale from 1 to 3 (1 being unimportant, 2 important, and 3 very important); behavior on a scale from 1 to 4 (1 being never, 2 rarely, 3 sometimes, and 4 always). The dependent variable is defined as using desirable information about food under normal circumstances. The explanatory variables used in the model include attitudes towards attributes on the food.

Statistical analysis

Statistical analysis was done with the Statistic software (Stata). Ordered probit regressions were used to explore the associations between behavioral patterns, beliefs and attitudes concerning food information. A probit model was estimated. This permits examining the marginal impact of variables on probability of using the desired information.

In order to analyze on the effect of attitudinal changes on consumer behavior, three steps of research on the predictive value of attitudes were determined. Variables in which it was found significant (value $p \leq 0{,}10$) and with positive coefficient was subsequently subjected to re-analysis of the multidimensional probit model. The development of models we should measure of change in attitudes on consumer's behavior. The model is supplemented by three factors; e.g. the threshold points (κ_1; κ_2; κ_3).

I: *Description and Means of Dependent Variables Used in the Analysis*

Description of variables	Never	Rarely	Sometimes	Always	Mean
When are you deciding for a new cheese product, do you in general?			%		
Find the desired information on the product label in normal situations?	13	17	35	35	1,92
Read the information on the product label?	12	20	39	29	1,86
Compare information on various product labels?	23	28	35	12	1,36

Source: Authors' own processing
Note: Responses range from 0 to 3, where coded as follows: 0 = never, 1 = rarely, 2 = sometimes, 3 = always.

II: *Description and Means of Independent Variables Used in the Analysis*

Description of variables	Unimportant	Important	Very important	Mean
How important is the following information on Edam for you?		%		
Processors	36	50	14	0,78
The common name of the product	30	40	30	0,99
What ingredients are in the product	21	47	32	1,12
How much of the product by weight or by volume is in the package	29	42	29	1
The nutrition facts (salt)	39	43	18	0,79
Safe food handling	37	43	20	0,83
Origin of milk	41	39	20	0,78
Link of the website	86	12	2	0,16
The date of producing	10	27	63	1,53
Allergens (healthy) food safety	53	22	25	0,71

Source: Authors' own Processing
Note: Responses range from 0 to 2, where coded as follows: 0 = unimportant, 1 =important, 2 = very important.

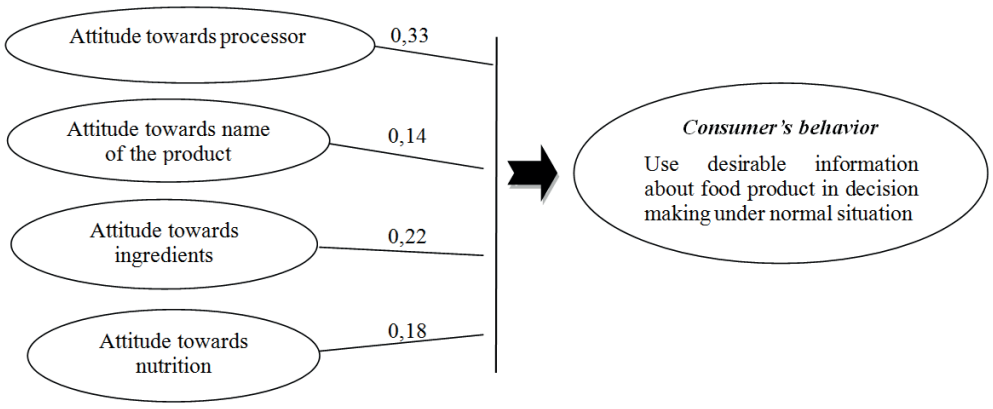
RESULTS

Czech consumers' behavioral patterns and attitudeconcerning food information

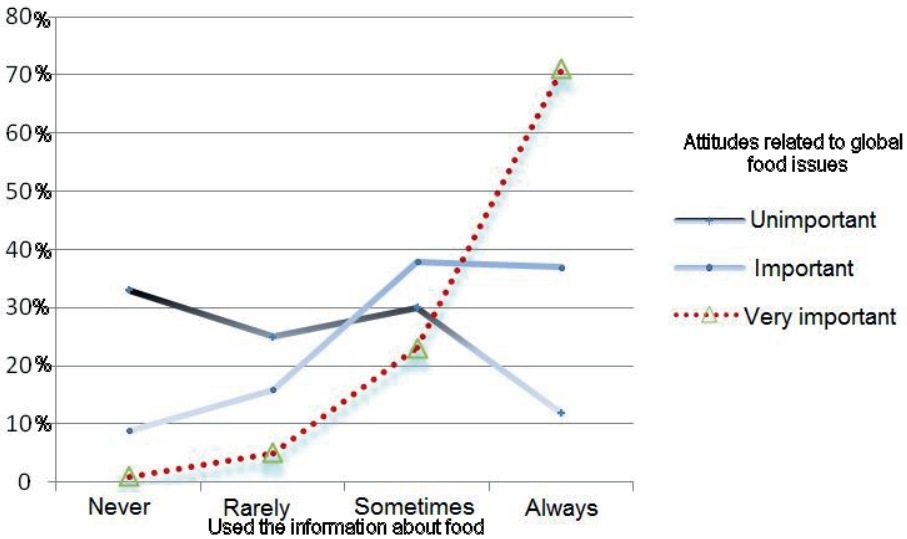
Tab. I and II shows the average answers for Czech consumers regarding all 11 attitudinal and behavioral patterns. The number of farmers' markets in the Czech Republic has grown significantly and Farmers' market provide a more information about origin of food, nutrient and biological value directly to consumers. Although more Czech students are now aware of the importance of nutrition, ingredients in the product, date of production, common name of the product, origin of milk and safe food handling, than at any time since a generation ago, less than 35 % used information about food. According to a 2013 Euro-barometer survey, 84 % of EU citizens consider it necessary to indicate the origin of milk, more than 90 % consider such labelling important for processed foods. It is possible that many students do not use or care about nutritional information, food of origin etc. provided on food packages as beneficial because they are not critical about food quality and safety. They are not influenced by recent news within the European agro-food system about food and nutrient security stated by European Commission or European Food safety Authority.

More than 40 % of females 'always find the desired information about characteristic of a new cheese product', otherwise 7 % of females 'never used'. On the other hand, 26 % of males 'used the information about characteristic of a new cheese product' (21 % never used). Evidently most females 'read the characteristic information about new cheese products (35 %). Males have different tendencies, only 23 % 'read characteristics information about a new cheese products always'.

An average attitude towards nutritional value is 0.79 (for 317 subjects it is important, while for 273 subjects it is not important). It shows a similar



2: *Research model: Consumer-attitude behavioral model*
Source: Authors' own processing



3: *Predicting behavioral patterns related to the food*
Source: Authors' own processing

tendency to compare the information about products (for 113 subjects always, sometimes 291 subjects). The value of an average attitude for information about the composition of products is 1.12; an average for the date of manufacture is 1.53; for weight is 1, the raw material is 0.78 and manufacturer is 0.78. Information about allergens and links on web side is unimportant for more students. It thus seems that students sometimes use information (39–39 %). The students also develop a more favourable attitude towards freshness: date of product and health related topics: healthy, nutritional and dietetic value.

Regression coefficients are presented in Tab. III. a comprehensive test of the significance of the model is given by the "log likelihood ratio Chi-square". The followed predicted regression model coefficients are different from zero.

Consumer level of product familiarity of attributes affects his behaviour

Attitudes about ingredient in the products, the nutrition value and the importance of name of the products, the processors significantly increase the probability of using the desired information, while concern about the allergens in the food significantly decreases the probability of using the information on food labels. The reason for this result is not clear. However it is possible that many students have less knowledge about food allergies. They do not need to read about them on the food label. However in response to the food allergies in the area of consumer health protection, many of the national organizations of state offices improved the communication of risks from allergens and more educated consumers.

The lack of significance of any of the links of web site, the date of production and safe food handling is necessarily important/ unimportant for all groups. Attributes have no significant effect on the probability of using the desired information. The only origin of ingredients and weight of the packages positive affected the probability of using the desired information at the ten-percent level.

In general the marginal effect of the positive significant variables identifies who used desired information about food. The problematic issue related to ingredients in the product, the nutrient fact is clearly the dominant factor such as the processors and name of the products (see Tab. IV – Coefficient for ordered Probit Analyses of model from Table III). The results are displayed in Fig. 2. There are positive coefficients from reanalysis of the multidimensional probit model. Those who use information about food before buying were influenced by information about processors.

Predicting behavioral patterns related to the food is graphically illustrated in Fig. 3 (decision under normal circumstances). In the ordered probit regression model, the probability of a particular outcome is determined by the area under the density function between relevant thresholds. The model provides predictors of each level of behavior. Attitudes about those attributes of food being more important increase the chances of using desired information by 70 %, while a negative attitude toward these information's decrease the probability of using desired information by 10 %. No interest in these attributes raises the chances of never using desired information by 30 %, while an attitude of great important reduces the chance by 1 %. Change of attitude affects decreases among those who "never search for product information" (by 30 %) as well as increasing "search-rates" (by 60 %). In other words, changes in attitude have greater effects on consumer behavior.

III: *Probit Analysis of solving problematic issue related to the food and Purchase decision*

Description of variables	Solving problematic issue	
	Coefficients	Significance
How important is the following information on Edam for you?		
Processor	0,314	0,000
The common name of the product	0,135	0,005
What ingredients are in the product	0,200	0,001
How much of the product by weight or by volume is in the package	0,072	0,168
The nutrition facts (salt)	0,0174	0,003
Safe food handling	0,0516	0,387
Origin of milk	0,0815	0,123
Link of the web site	-0,115	0,232
The date of producing	0,042	0,450
Allergens	-0,1016	0,043

Source: Authors' own processing
Note: Responses range from 0 to 2, where coded as follows: 0 = unimportant, 1 =important, 2 = very important.

IV: *Coefficient for ordered Probit Analyses of model from Table III*

Description of variables	Solving problematic issues	
	Coefficient	Significance
How important is it to you the following information on Edam?		
Processor	0,3277	0,00
The common name of the product	0,1425	0,00
What ingredients are in the product	0,2229	0,00
The nutrition facts (salt)	0,1766	0,00

Source: Authors'own processing
Note: Responses range from 0 to 2, where coded as follows: 0 = unimportant, 1 =important, 2 = very important.

DISCUSSION AND CONCLUSION

This article attempts to examine the attributes of food affecting consumers' use of information on food labelling. The problematic issue related to ingredients in the product, the nutrient fact is clearly the dominant factor such as the processor and name of product in using the desired information, while concern about the allergens in the food significantly decreases the probability of using the information on food labels. Fitzgerald *et al.* (2008) in this issue of nutrition knowledge, food label use found that food label use could be a moderator of the association between nutrition knowledge and dietary behaviors. Other research showing that organic produce have lower pesticide and nitrate residues than conventional produce and that some organic foods have higher levels of antioxidants than their conventional counterparts (Winter and Davis, 2007). This finding supports a need to better educate students' about "negative" nutrients such as sodium, "positive" nutrients such as vitamins, minerals and aged of cheeses, differences between organic and convenience production. Consistently, today the Agriculture committee in EU is more emphasis on education and promotion healthy eating and the consumption of local foodstuffs amongst children.

This research study was conducted in 2010 – 2011. The majority of students only sometimes to look at information. In addition, some students (64 %) have relationship to the processors, fewer students' perceived nutrition (61 %), and milk of origin (59 %) to be great cue. It was found that the attitudes of individuals who process information that is important to them, have a higher predictive value for behavior than attitudes which are unimportant (Haugtvedt and Priester, 1997). Therefore the group of questions in the survey are first, attitudes towards information; second, cognitive variables that consist of behavior (use desired information about food under normal circumstances).

In this study we found that consumer with the more familiarity to the name of the product are more likely to use the desire information during decision to buy a new product than others. This effect can also have important implications for transparency requirements by governments through national standard (production practices, product characteristics etc.) and disclose information about product. Many of researches support that private standards are playing an increasing role in the governance of agricultural and food supply chains as a tool for consumer protection (Henze *et al.*, 2014). The qualification criteria of a national standard are the results of federal regulations in Canada to manufacture various types of cheeses. Similar requirements for sensory properties are found in Germany. The interest in production processes also had led to consumer rejection of certain types of technology. This goes mainly for the use of genetic modification, which has met with considerable consumer resistance in Europe (Grunert, 2000). If the level of prior interest predict how they will behave during buying a new product, some with higher familiarity will find the specific type of cheese, while others will not interest about this.

Consumers' level of product familiarity o attributes affects the use of desired information, as well as thinking on food label. Diet, economic and ecological-related problems have all made it evident that consumers need to think about how to ensure access to sufficient, affordable, healthy and safe food for their population. Changes in attitude all those information's, not only one of them, have greater effects on consumers' behavior. This is in contrast with the proposed the quality perceptions process by Olson (1972) who concentrated on consumers' perception one attribute of the product as indicators of product quality. This result is more consistent with model by Kupsch *et al.* (1978) who proposed a model, which combines elements of information processing theory and an attributed models. The effect of a cue on perceived quality depends on the level of one or more other cues. From the study by Dentoni (2009) consumers have become increasingly concerned with the quality, safety, and production features of food, the demand for food products with credence attributes (e. g., origin, organic, locally grown, environment-friendly) on product labels have been garnering increased attention.

To sum up, the results support existence of "familiarity bias" in the Czech dairy market according to theories. Today consumers' evaluation and decision biases are expected to be found among consumers who solving problem towards food related to nutrient, component of the product, the processors and specific characteristics of the cheese than others consumers.
In this context the study also highlights the importance of attributes "origin of milk" and relationships to processors. Results of the study are important today because cities are starting to see food as a driver for other sustainable urbanization policies around issues including transport, health, land-use planning, employment, waste management and climate-change adaption. Currently the new greening policy of the Common Agricultural Policy has created opportunities for sustainable production and distribution systems. It can be concluded that the effect (effect on consumer attitude towards a product e.g. is the product locally-grown, fresher, environmental issue, safety, etc.) on consumer attitude towards product exists and the available information does not fulfil its function. Thinking about global issue related to food improves competitiveness of cheese products.

Acknowledgements

This paper was supported by Project No. IGA ČZU 201111210071.

REFERENCES

CONSUMER INTEREST ALLIANCE 1997. *Report on focus group study of cheese standards and consumer interest*. [Online]. Available at: http://ciai.ca/website_reports/Cheese_full07.pdf.

DENTONI, D. 2009. *Branding agri-food products with credence attributes*. Dissertation thesis. Michigan State University.

DIJKSTERHUIS, A., SMITH, P. K., BAAREN, R., B., WIGBOLDUS, D., H., J. 2005. The Unconscious Consumer: Effects of Environment on Consumer Behavior. *Journal of consumer psychology*, 15(3): 193–202.

FITZGERALD, N., DAMIO, G., SEGURA-PÉREZ, S. and PÉREZ-ESCAMILLA, R. 2008. Nutrition and knowledge, food label use, and food intake patterns among Latinas with and without type 2 diabetes. *Journal of the American Dietetic Association*, 108(6): 960–967.

GRUNERT, K. G. 2005. Food quality and safety: consumer perception and demand. *European Review of Agricultural Economics*, 32(3): 369–391.

GRUNERT, K. G., BECH-LARSEN, T., and BREDAHL, L. 2000. Three issues in consumer quality perception and acceptance of dairy products. *International Dairy Journal*, 10: 575–584.

HAUGTVEDT, C. P. and PRIESTER, J. R. 1997. *Conceptual and methodological issues in advertising effectiveness: An attitude strength perspective in Measuring Advertising Effectiveness.* Lawrence Erlbaum Associates, Inc.

HENZ, B. and SCHUETT, f. and SLUIJS, P. J. 2014. Transparency in markets for experience goods: experimental evidence. *Economic Inquiry*, 53(1): 640–659.

HRUBÁ, R. 2014. Food and nutrient security: Model of decision making under information uncertainty. In: *IMPROFORUM International Scientific Conference*.

CHEN, M., and HUANG, C. 2013. The impacts of the food traceability system and consumer involvement on consumers' purchase intentions toward fast foods. *Food Control*. 33: 313–319.

KUPSCH, P., HUFSCHMIED, P., MATHES, H. and SCHÖLER, K. 1978. *Consumers' structure of quality evaluations and information-search behaviour with regard to the purchase of durables*. Opladen, Monheim.

OLSON, J. 1972. *Cue utilization in the quality perception process: a cognitive model and an empirical test.* Dissertation thesis. Purdue University.

PARK, C. AND LESSIG, V. P. 1981. Familiarity and its impact on consumer decision biases and heuristics. *Journal of Consumer Research*, 8: 223-230.

RAO, A. R. and Monroe, K. B. 1988. The moderating effect of prior knowledge on cue utilization in product evaluations. *The Journal of Consumer Research*, 15(2): 253–564.

THILMANY, D., BOND, C., A., and BOND J. K. 2008. Going local: exploring consumer behaviour and motivations for direct food purchases. *Amer. J. Agr. Econ*., 90 (5): 1303–1309.

VERMEIER, I. and VERBEKE, W. 2006. Sustainable food consumption: exploring the consumer "attitude-behaviour intention" gap. *Journal of Agriculture and Environmental Ethics*, 19(2): 164–194.

WINTER, C. K. And DAVIS, S. F. 2007. Are organic foods healthier? *CSA News*, 52(4): 2–13.

ZEPEDA, L. and LEVITEN-REID, C. 2004. Consumers' views on local food. *Journal of Food Distribution Research*, 35 (3): 1–6.

ZEPEDA, L. and DEAL, D. 2009. Organic and local food consumer behaviour: Alphabet theory. *International Journal of Consumer Studies*, 33: 697–705.

Contact information

Renata Hrubá: hrenata@post.cz