



ORIGINAL SCIENTIFIC PAPER

Traceability in Croatian Meat Sector: are Consumers Aware of it?

Marija Cerjak^{1*}, Jasenka Gajdoš Kljusurić², Željka Mesić¹

¹ Faculty of Agriculture University of Zagreb, Zagreb, Croatia

² Faculty of Food Technology and Biotechnology, Zagreb, Croatia

Summary

The traceability of food and food ingredients along the food chain is an essential element in ensuring food safety. It is a tool for tracing product and processing information of food from sea/farm to table, so that relevant information can be found at a later point. Traceability has been introduced in Croatia in 2007 for all food and feed as well as related business operators.

The aim of this paper was to examine Croatian consumers' awareness and their attitude towards traceability of meat products, by means of a face-to-face survey on a sample of 120 respondents in Zagreb and surrounding. The research results show that the consumers' awareness level with regard to food traceability was very low. Consumers familiar to any extent with traceability mostly do not know any product or company with implemented traceability system. Lack of knowledge about traceability concept resulted mainly in indifference regarding existence of this system; respondents do not consider it as an important cue of meat products. Only a few respondents consider it as necessary and are ready to pay higher price for traced meat products.

The study confirmed that the traceability as part of the food quality and safety control is under-recognized term in Croatian market. Therefore, the education of consumers about the traceability and the presentation of the advantages this system offers is an important task of meat producers, in order to maintain consumer confidence in the safety and quality of their products.

Key words: Traceability, meat products, Croatia, survey, consumers' knowledge

Sažetak

Sljedivost hrane i njezinih sastojaka uzduž opskrbnog lanca je važan element u osiguranju zdravstvene ispravnosti hrane. Sljedivost predstavlja alat za nadzor puta hrane od polja/mora do stola. Uvedena je u Hrvatsku 2007. godine za svu hranu i hranu za životinje kao i za subjekte koji posluju s takvim proizvodima.

Cilj ovog rada bio je ispitati koliko hrvatski potrošači znaju o sljedivosti, te utvrditi njihov odnos prema sljedivosti mesa i proizvoda od mesa. Anketno ispitivanje je provedeno na uzorku od 120 ispitanika u Zagrebu i okolici. Rezultati istraživanja pokazuju da su potrošači vrlo malo upoznati sa sljedivošću. Čak i potrošači upoznati barem djelomično sa sljedivošću uglavnom ne poznaju niti jedan proizvod ili tvrtku s uvedenim sustavom sljedivosti. Zbog slabog poznavanja koncepta, ispitanici ne smatraju sljedivosti kao važno obilježje mesa. Tek nekoliko ispitanika smatra sljedivost važnom i spremni su platiti višu cijenu za proizvode s uvedenom sljedivošću. Istraživanje je potvrdilo da je sljedivosti, kao način kontrole kvalitete i sigurnosti hrane, nedovoljno poznat pojam na hrvatskom tržištu. Stoga, edukacija potrošača o sljedivosti i prikazivanje prednosti ovog sustava predstavlja važan zadatak proizvođača mesa, kako bi održali povjerenje potrošača u sigurnost i kvalitetu svojih proizvoda.

Cljučne riječi: sljedivost mesa, Hrvatska, anketno ispitivanje, znanje potrošača

Introduction

Consumers' fears, triggered by a series of high profile food safety incidents in the last decades (salmonella, BSE, E.Coli O157, foot and mouth disease) and technological developments such as GMOs, have been translated into serious concern about food safety, and ever-increasing demands for quality assurance and information about the way of food production and product origin (Cerjak et al., 2011, Hobbs, 2002, Bromley, 2001). Food safety has become a key issue for food industry and agricultural production in many countries (Fulponi, 2006, Huang et al., 2010). The traceability of food and food ingredients along the food chain is an essential element in ensuring food safety. Therefore, a variety of private sector and public policy traceability initiatives have emerged (Hobbs, 2002, Gellynck and Verbeke, 2001).

Traceability is related to product identification, tracing the background of raw materials and historical tracing of the process of manufacturing, processing, distribution and sale (Omejec and Pejić Bach, 2007). The major functions of traceability are to monitor food producers in order to avoid food safety problems, to connect producers and consumers and

to protect consumer rights (Huang et al., 2010, Zhou et al., 2010). Further, the traceability of food allows rapid withdrawal or revocation of certain foods from the market and data on traceability can be used to undertake targeted measures in conjunction with the relevant food.

Food safety hazards cannot be easily detected by consumers especially prior to purchase (Unnevehr and Jensen, 1999, Loader and Hobbs, 1999, Hobbs, 2002). Thus, food safety as a credence attribute (Hobbs, 2002, Röhr, et al. 2005) cannot be detected without products claims or quality signals, such as a label. These labels provide information to consumers helping them to have the confidence on the food they consume (Zhou et al., 2010) and such labels may increase consumer welfare through providing better consumer protection (Verbeke and Ward, 2006).

Due to the fact that food safety debates are very often associated with meat products consumers' perception and relative value of traceability in meat sector have been discussed in numerous studies (Gellynck and Verbeke, 2001, Dickinson and Bailey, 2002, Dickinson and Bailey, 2003, Dickinson et al. 2003, Hobbs et al., 2005, Dickinson and Bailey, 2005, Verbeke and Ward, 2006, Loureiro and Umberger, 2007, Song



et al., 2008, Lichtenberg et al., 2008, Verbeke and Roosen, 2009, Ubilava and Foster, 2009). In their paper, Cicia and Colantuoni (2010) made a review of studies on traceability and they showed that consumers from different countries are placing an increasing importance on traceable meat attributes, in particular "Food Safety", "On Farm Traceability-Country of Origin" and "Animal Welfare".

Traceability systems which become inevitable parts of mechanisms for safety and food quality management, has been introduced in Croatia in 2007 by the Food Act (Official Gazette 46/07). The Act requires fulfilment of traceability requirements for all food and feed as well as related business operators. For Croatia, whose domestic food market is rather small and the great part of food products are exported in the EU countries, one of the most important strategic decisions was the adjustment of the economy is the application of traceability system (Omeječ and Pejić Bach, 2007).

Traceability of meat products in Croatia has not been extensively researched by the current academic literature. The aim of this paper is to examine Croatian consumers' awareness and their attitude towards traceability of meat products as well as to study consumers' willingness to pay (WTP) on a traceability system using basic statistic tools. Since consumers have diverse views on quality and therefore purchasing motives and labelling preferences differ between groups of consumers (Bernués et al., 2003), multivariate exploratory techniques were used (Kwasiborski et al., 2009) to confirm or decline the classification of importance of labelling and traceability information for the consumer with different socio-demographic background.

Materials and Methods

A face-to-face survey was conducted with a sample of 120 respondents in Zagreb and surrounding in March and April 2010. A half of the respondents were randomly recruited from visitors of the fair "Products of the Croatian Village" held in Zagreb. The fair presented different products of Croatian villages such as: wine, cheese, honey, grappa, wooden artefacts (craftsmanship), and some village customs. Visitors of the fair had the opportunity to get to know and to buy the family farm products from different Croatian regions. Other halves of the respondents were surveyed in front of supermarkets.

The questionnaire used in the research was designed for a larger research and in this paper are presented only results of questions that regard importance of meat labels information, traceability knowledge and attitudes and respondents' demographics.

The data set of the interviewed consumers consisted of 66 women and 54 men (N=120) and the basic socio-demographic characteristics of the set are presented in table 1.

The data obtained from the survey were analysed in programs *Statistica v. 8* and *SPSS v.15* using basic statistics as well as the multivariate exploratory Techniques as Factor Analysis (FA) and Principal Component Analysis (PCA). The statistical software *SPSS* was used for descriptive statistics, the

regression and ANOVA (x = gender, age, education level, grow up place (country or town), family members, salary; and y_1 = label information (brand, origin, composition, expiration date), y_2 = traceability (familiarity, level of familiarity, importance of it and readiness to pay more for it). Results are presented as means, standard deviations and P-values, and differences of $P < 0.05$ were considered significant. The relationship between the different parameters generable from questionnaires - such as general data about the consumer and significant interest of the consumer regarding labelling and traceability - is difficult to describe and analyse using traditional statistics. Factor analysis and Principal Component Analysis were considered as appropriate multivariate methods. PCA is a data reduction method whereby correlated variables can be grouped together, identifying underlying dimensions of the data. PCA was performed using the software *Statistica v.8*. and all variables were scaled to unit variance before conducting the PCA.

Results and discussion

The average age of the respondent was 36.11 ± 11.27 years. Most of the respondents had finished secondary education (63%). More than two third of respondents grew up in cities (71%). About 75% of respondents live in 2-, 3- and 4-members families.

Table 1. Socio-demographic characteristics of the data set

Characteristic	Percentage (%)	Characteristic	Percentage (%)
Gender		Grow up place	
Female	45.0	Countryside	29.2
Male	55.0	City	70.8
Age (y)		Income* (per month)	
19-30	39.2	< 2500 kn	4.2
31-41	27.5	2501 – 5000 kn	23.3
42-55	28.3	5001 – 9000 kn	54.2
56+	5.0	> 9000 kn	18.3
Family members		Education level	
1	3.3	Elementary school	4.2
2	13.3	High school	63.3
3	27.5	University degree	32.5
4	34.2	* 1 € = 7.4 kn (http://www.hnb.hr/tecajn/htecajn.htm , accessed 20.05.20110)	
5	15.0		
6 or more	5.1		

It is known that the information reported on labels can be considered an instrument that improves consumer perception of meat quality, which makes it easier for the consumer to choose a product on the basis of preferences (Stranieri and Banterle, 2009). Half of the respondents in this study read only occasionally meat product labels, while one third of them read them regularly. The share of respondents reading different label information on meat products is presented in table 2.

Respondents mostly read expiration date (78.3% of them), followed by product origin (33.3%), food composition (30.3%) and brand (26.7%). Similarly, Bernués et al. (2003)

**Table 2.** The share of respondents reading (and not reading) different label information on meat products

Reading label information	%	
	yes	no
brand	26.7	73.3
origin	33.3	66.4
food composition	30.3	69.7
expiration date	78.3	20.8

found that the most important information for the European meat consumer was the origin and expiry date of the meat, while other important elements concern nutritional features, type of cut, traceability and quality controls. Verbeke and Ward (2006) findings reveal that Belgian consumer interest is moderate for origin and high for direct indications of quality like a quality guarantee seal or expiration date. They found out that the interest in label cues is specifically low among younger males. Stranieri and Banterle (2009) reported that Italian consumers make wide use of the meat label. With regard to mandatory meat labelling, the most important information was considered to be the country of animal origin, while the system of cattle breeding and cattle feeding are among most important voluntary information for Italians.

Croatian consumers are not very familiar with the traceability concept. Respondents' familiarity and perception of traceability significance have been reported in Table 3.

Only 18% of the respondents have heard of food traceability of which less than half believe to know enough about it. Further 27% of the respondents stated that they maybe have heard of it and more than half of them never have heard of traceability. Most of the respondents (95%) did not know any product or company with introduced traceability system with only a few of them mentioning big meat producer or big retailers with implemented traceability system.

Only 28% of respondents familiar at least to some extent with traceability consider it as an important product characteristic. Most of them (52.2%) are not sure if it is important for them or not and 19.5% of them consider it unimportant.

Similar results regarding knowledge about food traceability were found in the work of Song and co-workers (2008). They showed that most of Chinese consumers did not know much about food traceability system (FTS). However, when explained to them the majority (92.8%) considered FTS as necessary with 62.9% thinking the system could strengthen their confidence on consuming food. Hobbs and co-workers (2005) also found out that the traceability, in the absence of quality verification, was of limited value to individual Canadian consumers. Giraud and Halawany (2006) stated that for consumers from Greece, Lithuania, Norway, Poland and the Netherlands, "traceability" was a vague concept, and sometimes even unknown while consumers from France, Germany, Hungary, Italy, Malta, Slovenia and Spain had a quite good knowledge of what traceability is.

Only one fourth of the respondents in this study answered the question regarding willingness to pay for traceability. More

than half of them are not sure if they would pay extra price for traced meat, only 8% would pay an extra price (10-30% more), and rest of them would not pay additional price for traced meat.

The results of national focus groups conducted by Giraud and Halawany (2006) showed that participants from France, Greece and Italy were willing to pay more for a well-traced product if the difference in price is low while respondents from Spain and The Netherlands believed that one should not pay more for safety, because it is something that should be

standard for products. Dickinson and Bailey (2003) conducted comparable auctions in the U.S., Canada, the U.K., and Japan and find that subjects are willing to pay a nontrivial premium for traceability, but the same subjects show even higher WTP for traceability-provided characteristics like additional meat safety and humane animal treatment guarantees.

Presented results of this work are in accordance with results given by Lichtenberg and co-workers (2008) where the willingness-to-pay by German consumers has been different pursuant specific consumer groups. A majority considers meat traceability as important. However, the distinctive sensitivity to price exhibited is a result of the fact that traceability is only of secondary importance as an assessment criterion, after price.

The analyses of collected data are presented as frequency in tables 1-3. The analysis of two-factor with replication

Table 3. Consumers' familiarity and perception of the traceability significance, for meat products

Traceability information	N	%		
		Yes	Not sure	No
Familiarity	118	17.8	27.1	55.1
Importance	46	28.2	52.2	19.5
Readiness to pay extra price	37	8.1	56.8	35.1

(ANOVA) has shown that there is no significant difference among the gender regarding reading labels in general ($P < 0.005$), but just one label information, reading the expiration date, was not following the model and the female consumers behaviour (91% of them read expiration date) differs from male consumers behaviour (63%). According the ANOVA results, the education level and the place of growing up did not influence the importance of label information on meat products as well as respondents interest in traceability ($P > 0.005$, for all characteristics). But to be sure if this is the only conclusion that is presenting the relationship of the consumers' education level and growing up place vs. importance of meat products label information, the multivariate analysis was conducted on the same data set. All previous mentioned analyses were conducted because the data pre-treatment was considered essential to avoid wrong (or trivial) conclusions. In order to ensure multivariate approach between different parameters, that were collected during the interview, and in order to determine what influences the interest of the consumers regarding labelling and traceability methods, the principal component analysis was used to identify the basic dimensions or factors that explain correlations among multiple variables. In this way the panel homogeneity was analysed by a multidimensional approach using multiple factorial analysis (Brito et al., 2006; Cajka et al., 2010).

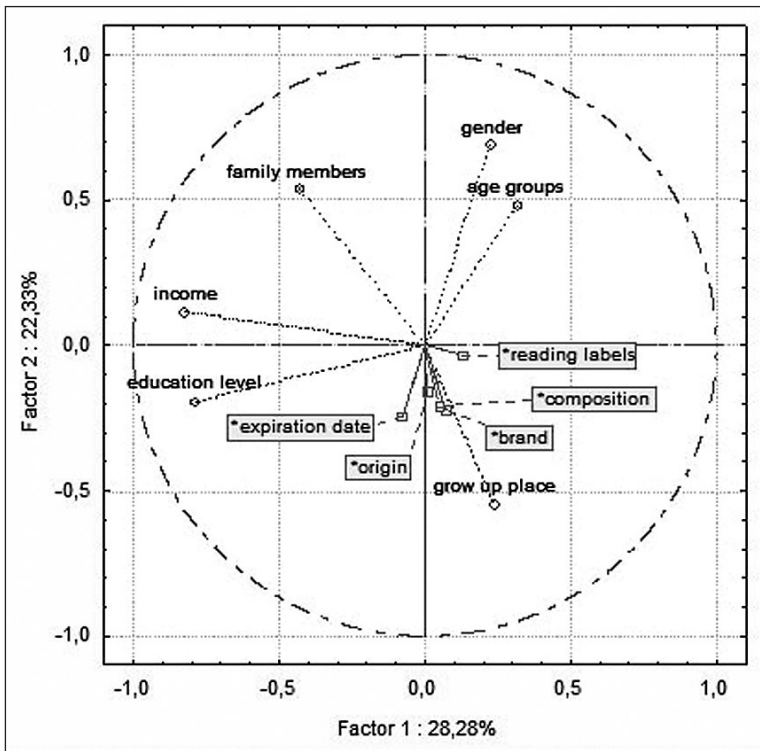
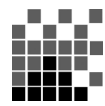


Figure 1. Relationship between consumers socio-demographic data and their monitoring of label information on meat products.

The results based on multivariate exploratory techniques (hereunder PCA) are presented with figures 1 (socio-demographic data of the consumers vs. reading of labels information) and figure 2 (consumers socio-demographic data vs. traceability).

Both cases show that the first two principal components explained over 50% (Factor 1 + Factor 2) of the variation concerning consumer perception of interest of meat labelling and traceability (Figs. 1 and 2).

The correlation circle (Fig. 1) underlined that attributes as education level and grow up place are related to information given on meat product labels. The level of education is significantly related to the monitoring of the expiration date of a meat product and the growing up place is defining if the consumer is interested in the meat product brand and origin, its composition and if he or she is even reading meat labels (origin, expiration date and education level are in the same part of the correlation chart). Those results are in accordance with findings of Bernués and co-workers (2003) where the consumers expressed a demand of most types of information on the label, especially origin, expiration date, information on the production system, the traceability and quality control but the authors did not compared the influence of the socio-economic parameters with it.

In the study of Verbeke and Vackier (2004), the profile and effects of consumer involvement in fresh meat as a product category was investigated. The results of their study have pointed out that this problem has a multidimensional construction, including dimensions as, "risk probability" and "risk importance".

Consumers' familiarity and interest regarding meat product traceability together with their WTP, in Croatia, was investigated and presented with a correlation circle, presenting the relationship

between consumers' socio-demographic data and their knowledge and attitude towards meat products traceability (Fig. 2). As expected, the readiness to pay more for meat products with traceability is primary correlated with the family income and the number of family members defines if the consumer will be interested in meat product traceability and cognition of such meat products.

Papers that study the effects of socio-demographic (or socio-economic) characteristics of the consumers and their knowledge and attitude towards meat products labelling and traceability using multivariate exploratory techniques are still rare. Using multivariate techniques in traceability systems (Galvão et al., 2010) has revealed that the traceability system is linked to the quality control (in fish production), and can be used as a tool to improve the quality of the seafood products pointing out that the traceability system alone does not improve the quality of the product (Galvão et al., 2010).

The functional traceability attributes, such as organizational efficiency, chain monitoring and individual responsibility, are important but were not investigated in this study. Extensions with respect to process attributes, such as production methods, are less relevant to the general population, being only of interest to specific market segments, i.e. consumers with a more negative perception of meat quality and lower consumption levels (Gellynck and Verbeke, 2001).

Conclusions

The research results show that the consumers' awareness level with regard to food traceability was very low. Even among those who have heard about traceability, majority do not have sufficient knowledge about it.

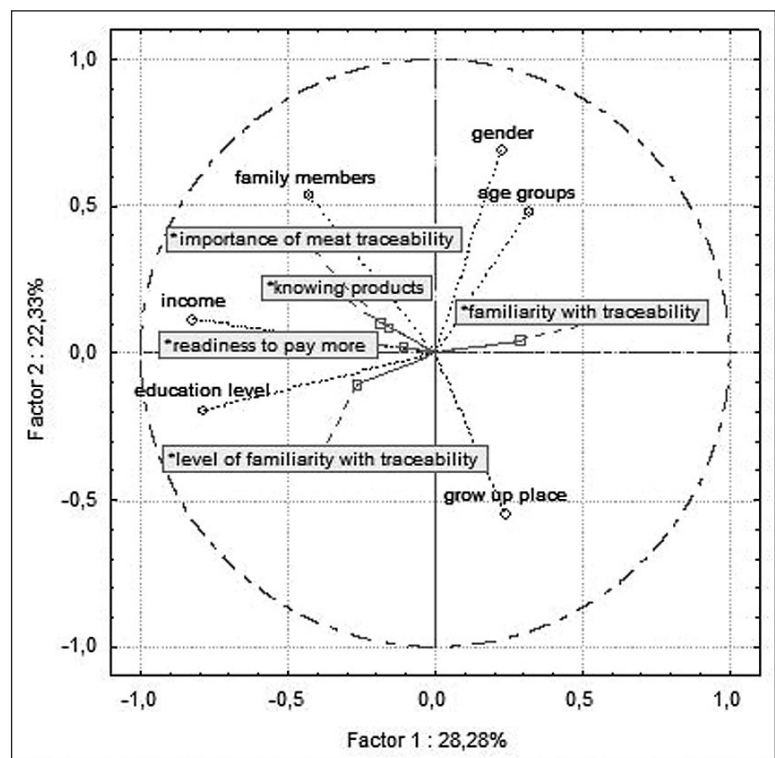


Figure 2. Relationship between consumers' socio-demographic data and their knowledge and attitude towards meat products traceability.



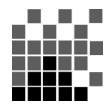
Lack of knowledge about traceability concept resulted mainly in indifference regarding existence of this system. Even respondents with some knowledge about traceability do not consider it as a very important meat product cue. Only a few respondents consider it as necessary in meat sector and are ready to pay higher price for traced meat products.

The study confirmed that the traceability as part of the food quality and safety control is under-recognized term in Croatian market. Although the ANOVA results indicated that the consumers education level and growing up place is not an important issue when the importance of label information on meat products as well as their interest in traceability are considered. But the multivariate approach in the data analysis denied it by explained over 50% of variable variance and stressing out that labelling of meat products is not sufficient and that the promotion is needed in order to create product awareness by all gender, age or education groups. The proposed multivariate exploratory methodology may prove to be an useful tool in selection of important information for the consumer, in the labelling and traceability system. Moreover, the information obtained applying this methodology could be considered as a way to check the information contained in the traceability system.

Therefore, the education of Croatian consumers about the traceability and the presentation of the advantages this system offers is an important task of meat producers, in order to maintain consumer confidence in the safety and quality of their products. It could be expected that with increased consumer awareness of the relationship between food traceability system and food safety, their willingness to consume traceable food will increase.

References

- Bernués A., Olaizola A., Corcoran K. (2003) Labelling information demanded by European consumers and relationships with purchasing motives, quality and safety of meat. *Meat Science*, 65 (3) 1095-1106.
- Brito G., Andrade J.M., Havel J., Díaz C., García F.J., Peña-Méndez E.M. (2006) Classification of some heat-treated liver pastes according to container type, using heavy metals content and manufacturer's data, by principal components analysis and potential curves. *Meat Science*, 74 (2) 296-302.
- Bromley D. (2001) Mad cows, drugged cows, and juggled genes. *Choices* (2nd Quarter), 6-9.
- Cajka T., Riddellova K., Klimankova E., Cerna M., Pudil F., Hajslova J. (2010) Traceability of olive oil based on volatiles pattern and multivariate analysis. *Food Chemistry*, 121 (1) 282-289.
- Cerjak M., Karolyi D., Kovačić D. (2011) Effect of information about pig breed on consumers' acceptability of dry sausage. *Journal of sensory studies*, 26 (2) 128-134.
- Cicia G., Colantuoni F. (2010) Willingness to Pay for Traceable Meat Attributes: A Meta-analysis, *International Journal on Food System Dynamics*, 1 (3) 252-263.
- Dickinson D.L., Hobbs J.E., Bailey D. (2003) A Comparison of US and Canadian Consumers' Willingness To Pay for Red-Meat Traceability. *Paper presented at the American Agricultural Economics Association Annual Meetings, Montreal, Canada, July 27-30, 2003.*
- Dickinson D.L. and Bailey D. (2002) Meat Traceability: Are U.S. Consumers Willing to Pay for It?. *Journal of Agricultural and Resource Economics*, 27(2) 348-364.
- Dickinson D.L. and Bailey D. (2005) Experimental evidence on Willingness to Pay for red meat traceability in the United States. Canada, The United Kingdom, and Japan, *Journal of Agricultural and Applied Economics*, 37 (3) 537-548.
- Dickinson D. L., Bailey D. (2003) Willingness-to-pay for information: Experimental evidence on product traceability from the U.S.A., Canada, the UK and Japan. *Economic Research Study Paper ERI 2003-12*, Utah State University, Logan, UT.
- Fulponi L. (2006) Private voluntary standards in the food system: The perspective of major food retailers in OECD countries. *Food policy*, 1 (1) 1-13.
- Galvão J.A., Margeirsson S., Garate C., Viðarsson J.R., Oetterer M. (2010) Traceability system in cod fishing. *Food Control*, 21 (10) 1360-1366.
- Gellynck X., Verbeke, W. (2001) Consumer Perception of Traceability in the Meat Chain, *Agrarwirtschaft*, 50 (6) 368-374.
- Giraud, G. & Halawany, R. (2006) Consumers' perception of food traceability in Europe, 98th Seminar, June 29-July 2, 2006, Chania, Crete, Greece 10047, European Association of Agricultural Economists.
- Hobbs J. E., Bailey D., Dickinson D.L., Haghiri M. (2005) Traceability in the Canadian Red Meat Sector: Do Consumers Care?. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, 53 (1) 47-65.
- Hobbs J.E. (2002) Consumer demand for traceability. IATRC Annual Meeting, December 15-17, 2002., Monterey, California
- Huang W-T., Liu C-C., Hsu Y-H. (2010) Consumer Perception of Rice Traceability for Three Metropolitans in Taiwan, *fromebookbrowse*, <http://ebookbrowse.com/consumer-perception-of-rice-traceability-for-three-metropolitans-in-taiwan-prof-huang-pdf-d35424053>
- Kwasiborski A., Sayd T., Chambon C., Santé-Lhoutellier V., Rocha D., Terlouw C. (2009) Specific proteins allow classification of pigs according to sire breed, rearing environment and gender. *Livestock Science*, 122 (2-3) 119-129.
- Lichtenberg L., Heidecke S.-J., Becker T.C. (2008) Traceability of meat: Consumers' associations and their willingness-to-pay. 2008 International Congress, August 26-29, 2008, Ghent, Belgium 43951, European Association of Agricultural Economists.
- Loader R., Hobbs J. E. (1999) Strategic responses to food safety legislation. *Food Policy* 24 (6) 685-706.
- Loureiro L.M., Umberger W.J. (2007) A choice experiment model for beef: What US consumer responses tell us about relative preferences for food safety, country of origin labeling and traceability. *Food Policy*, 32 (4) 496-514.
- Omejec D., Pejić Bach M. (2007) Sljedivost prehrambenih proizvoda hrvatskih poduzeća. *Zbornik Ekonomskog fakulteta u Zagrebu*, godina 5, 43-65
- Röhr A., Lüddecke K., Drusch S., Müller M.J., Alvensleben, R.V. (2005) Food quality and safety-consumer perception and public health concern. *Food Control*, 16 (8) 649-655.
- Song M., Liu L.J., Wang Z., Nanseki T. (2008) Consumers' Attitudes to Food Traceability System in China -Evidences from the Pork Market in Beijing., *Journal of the Faculty of Agriculture, Kyushu University*, 53 (2) 569-574.
- Stranieri, S., Banterle, A. (2009) Fresh Meat and Traceability Labelling: Who Cares?, *Third International European Forum on System Dynamics and Innovation in Food Networks - February 16-20, 2009 - Igls / Innsbruck, Austria*



Tedeschi P., Coisson J.D., Maietti A., Cereti E., Stagno C., Travaglia F., Arlorio M., Brandolini V. (2011) Chemotype and genotype combined analysis applied to tomato (*Lycopersicon esculentum* Mill.) analytical traceability. *Journal of Food Composition and Analysis*, 24 (2) 131-139.

Ubilava D., Foster K. (2009) Quality certification vs. product traceability: Consumer preferences for informational attributes of pork in Georgia. *Food Policy*, 34(3) 305–310.

Unnevehr L. J., Jensen H. H. (1999) The economic implications of using HACCP as a food safety regulatory standard. *Food Policy*, 24 (6) 625-635.

Verbeke W., Vackier I. (2004) Profile and effects of consumer involvement in fresh meat. *Meat Science*, 67 (1) 159-168.

Verbeke W., Ward R. W. (2006) Consumer interest in information cues denoting quality, traceability and origin:

An application of ordered probit models to beef labels. *Food Quality and Preference*, 17 (6) 453–467.

Verbeke W., Roosen J. (2009) Market Differentiation Potential of Country-of-origin, Quality and Traceability Labeling. *Estey Centre Journal of International Law and Trade Policy*, 10 (1) 20-35.

Huang W-T., Liu C-C., Hsu Y-H. (2010) Consumer Perception of Rice Traceability for Three Metropolitans in Taiwan, from ebookbrowse, <http://ebookbrowse.com/consumer-perception-of-rice-traceability-for-three-metropolitans-in-taiwan-prof-huang-pdf-d35424053>

Zhou H., Nanseki T., Hotta K., Shinkai S., Xu, Y. (2010) Analysis of Consumers' Attitudes toward Traceability System on Dairy Products in China. *Journal of the Faculty of Agriculture, Kyushu University*, 55 (1) 167–172.