PACKAGING MATERIAL IMPORTANCE AND INFLUENCE ON FOOD CHOICES FROM LATVIAN CONSUMER POINT OF VIEW

Aija Ruzaike, Sandra Muizniece-Brasava

Latvia University of Agriculture, 2 Liela Street, Jelgava, LV-3001

Abstract

It is difficult to imagine distributing food without packaging in today's food system. Traditionally, food packaging fulfills the function of isolating the product from adverse effects of external environment factors, including physical, chemical and biological contamination.

Currently the information on the importance of food packaging on food choices from Latvian consumer point of view has been little studied, therefore the aim of this research was to identify how much of an influence packaging type and material has on consumer food choices, the determining factors when making food choices, as well as consumer awareness on the importance and innovation of packaging materials.

A questionnaire was carried out in order to ascertain consumers' knowledge and understanding. The survey included a total of 600 respondents who answered a total of 13 questions. This research analyses Latvian consumer perception of the current market situation in the food packaging sector and the importance of food packaging, as well as consumer attitudes towards the introduction of new innovative packaging.

The results show that Latvian consumers are aware of the role of food packaging in terms of product safety but they lack information on the significance of innovative packaging and packaging types; consumers would like to learn more about interaction between packaging materials and products, which in the future could affect their food choices.

Key words: *packaging, consumer, food choices*

1. INTRODUCTION

Packaging is an essential element of the market, affecting almost every industry. A suitable type of packaging is necessary for every product, including organically grown (Restuccia et al., 2010). In response to society's increasing demand, the packaging industry is constantly developing and improving (Realini et al., 2014). In today's global economy, product packaging is important, not only to ensure efficient distribution and storage, but also to promote ease of use and communication with consumers. A lot of attention is paid to the choice of packaging in manufacturing industry, particularly its ability to inform and persuade consumers (Makanjuola, Enujiugha, 2015). Due to the extensive range of functionality of packaging, it has become the third broadest manufacturing industry in the world, and in the developed countries it accounts for 2% of the Gross National Product (Mihindukulasuriya, 2014).

Food packaging is a broad concept that includes the diversity of shape, structure, material, colour, design and information (Lee, 2010). Packaging communicates with consumers through a number of its elements – it can be the visual design or the amount of information printed on packaging. Visual elements have a decisive role in the selection of product (Makanjuola, Enujiugha, 2015). Therefore, packaging has become a key marketing strategy, and it is essential to attract the attention of consumers (Varela et al., 2014). Packaging shape, colour and material are the first to be assessed by consumers when choosing food products, thus drawing the appropriate conclusions about their content (Becker et al., 2011; Koutsimanis et al., 2012; Varela et al., 2014). Physical properties of product packaging are largely influenced by consumer attitudes towards the products and their price, because different types of packaging usually cause subconscious symbolic associations for consumers and also encourage the consumers to think about product characteristics, opening and transportation options (Loose et al., 2013). A product packed in a smaller size package will have a lower selling price and therefore will be

available for a larger percentage of the population compared to a product in a larger and more expensive packaging (Makanjuola, Enujiugha, 2015). Successfully developed and adopted packaging is often a key factor when making a food choice (Tu et al., 2015). It has been shown that most consumers spend less than 8 seconds of their time when choosing a particular product, so it is important to create that first positive impression. An effective packaging solution is a key factor to the success of any marketing strategy (Parise, Spence, 2012).

Nowadays packaging is not merely used for marketing functions (Lee, 2010). Appropriate and qualitative packaging has a large role in maintaining the quality of the product and convenient use for consumers (Ahvenainen, 2003). Traditionally, packaging is used to protect the products from mechanical and external environmental factors, such as temperature, light, moisture, oxygen, enzymes, micro-organisms and other adverse effects by creating a physical barrier around the product (Feichtinger et al., 2015). For example, in the presence of oxygen the product undergoes significant changes, such as oxidation processes, vitamin loss, discoloration, aroma loss, enzymatic browning and development of microorganisms (Restuccia et al, 2010). The packaging material must meet high hygiene requirements, because it may serve as a potential source of microbiological contamination (Feichtinger et al., 2015). Depending on their functions, packaging materials have to ensure a number of requirements: mechanical strength (material has to withstand the force exerted by the packaging machine when forming the shape of packaging), gas barrier (O_2, CO_2, water vapour), resistance to elevated temperatures (the choice of the material depends on the required heat treatment regimen), migration restriction of packaging material components (Restuccia et al., 2010).

One of the main tasks of the food companies is to invest in research and innovation to be able to compete in the market. Market success in food packaging innovation development is largely dependent on the consumers' perception and response. New packaging technologies that ensure product safety and quality during storage are constantly introduced in the food market, however, manufacturers, who apply these new technologies for innovative food packaging solutions, cannot be sure whether the innovation will be an important contribution from consumer point of view. An important prerequisite is to clearly explain the functionality of the introduced innovation to be able to convince consumers about its importance. Positive information about innovative packaging is a necessary condition for its successful integration in the market (Chen et al., 2013). It is necessary to think about the functional advantages of the packaging as well as the visual presentation to initially attract attention and create an emotional bond with the consumer during this time of high level competition (Makanjuola, Enujiugha, 2015). It is one of the main reasons why consumers should participate in surveys in order that at the original product design stage appropriate packaging solutions could be applied.

Currently the information on the importance of food packaging on food choices from Latvian consumer point of view has been little studied, therefore the aim of this research was to identify how much of an influence packaging type and material has on consumer food choices, the determining factors when making food choices, as well as consumer awareness on the importance and innovation of packaging materials.

2. MATERIALS AND METHODS

This research analyses Latvian consumer views and knowledge on the importance of packaging materials in food production and storage process, the influence packaging type and material has on consumer food choices, the determining factors when making food choices, as well as consumers' opinion on innovative packaging materials and their integration in the food market.

A total of 600 respondents participated in the 13 question survey, of which 24 % were men and 76 % were women. The average age of respondents was 30.9 years. Initially, the questions were structured to determine which characteristics consumers pay attention to when making a food choice and what the essential conditions for purchasing these products are, e.g., whether packaging design, aesthetic appearance, packing size, type of packaging material, its functionality, ease of use and usefulness are significant. The survey identified consumer awareness of innovative packaging types and their use, the

attitude towards this type of packaging and implementation in Latvian food market, as well as the awareness of packaging importance on product safety during production process and storage, and the extent to which the product quality may depend on packaging.

Consumer awareness about the uses of packaging options and functionality was established, consumers were questioned about how much attention they would draw to the type of packaging if they were more aware of its importance to product quality determinants. An important question about the amount of money consumers would willingly pay extra for innovative packaging solutions compared to conventional (traditional) packaging was answered, taking into account if consumers were aware of its importance with regard to product safety and quality. Thereby the obtained information gives the idea about the necessary activities which need to be carried out before the innovation can be introduced in the food market.

The obtained data were processed using SPSS software package 16.0; differences among results were considered significant if p-value < 0.05. One way analysis of variance (ANOVA) and Tukey's test were used to interpret the results.

3. RESULTS AND DISCUSSION

Age, level of education and activity of respondents in the labour market were taken into account when analysing the results of the survey. The highest activity in completing the survey was observed in age group 25 to 35 years, but the least active respondents were 18 years old or younger. The youngest respondent who participated in the survey about the importance of food packaging was 11 years old, while the oldest was 65 years old. The results showed that the majority of the respondents (61%) had higher education, 34% had secondary education and 5% of the respondents had basic education. Assessing consumer interest towards innovative packaging solutions and therefore the possibility of increased product price, it was critical to determine the activity of respondents in the labour market. The results showed that 92% of the respondents were employed, while only 8% were unemployed. Consumer attitudes towards new food product entry into the market were not identical. Women showed significantly more distrust towards new food product and technology entry into the market than men (Rollin et al., 2011). Also in this case a trend was observed where women were more active in expressing their views on the importance of packaging materials. Overall 76% of women and only 24% of men participated in the survey.

Firstly, consumers' thoughts on the packaging material diversity in Latvian food market were determined (Fig. 1). The results showed that only a third of the survey respondents (34.4%) agree that there is sufficiently broad diversity of packaging materials used in Latvian market, while 10.7% of the respondents believe that the diversity of packaging materials is insufficient. Moreover, 25.2% of the respondents have not paid attention to the variety of packaging materials and are not able to express their views on the current situation of packaging materials in Latvian food market.

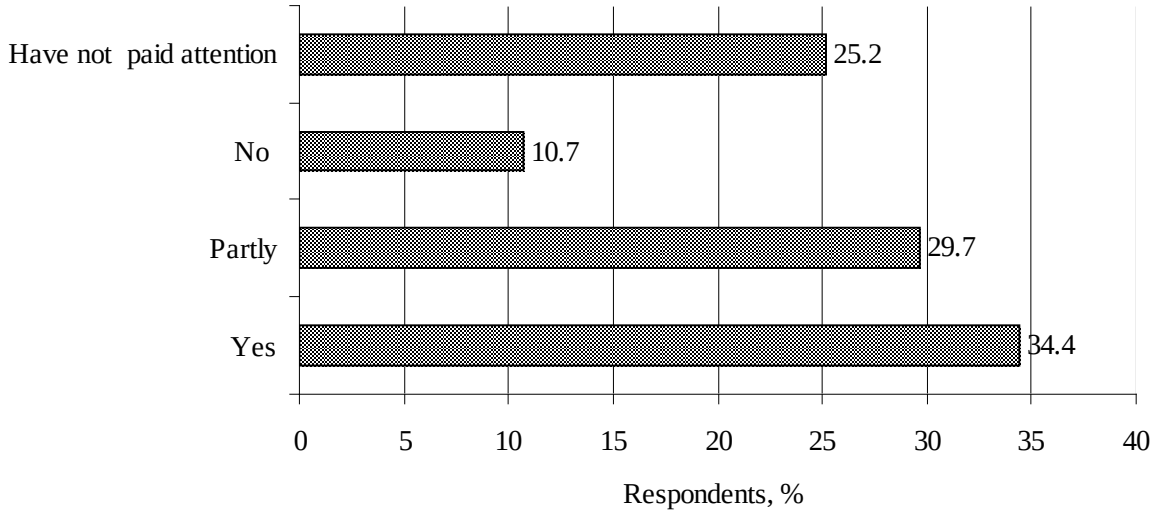


Figure 1. Do you think that in Latvian food market there is sufficient diversity of packaging materials?

To clarify the situation on packaging material diversity, it was important to understand which was the most widely used packaging material in Latvian food market from consumer point of view (Fig. 2). Obviously, packaging is the first thing consumers can evaluate if the packaged product is not visible. Therefore, the packaging industry requires continuous improvement to be able to meet the increasing consumer demand. Nowadays, the most widely used packaging material is polymer, which is the only material that allows the use of modified gas atmosphere packaging technology to obtain extended shelf life of products (Koutsimanis et al., 2012). In the survey, consumers were offered five different packaging materials: polymer, paper / cardboard, glass, metal / foil and laminated cartons to choose from. It can be concluded that consumers agree to the opinion of Koutsimanis et al. and find that polymer is the most widely used packaging material in Latvian market. The second most widely used packaging material is laminated cartons (12.3%), but the least widely used packaging material is metal and foil (0.8%) from consumer point of view.

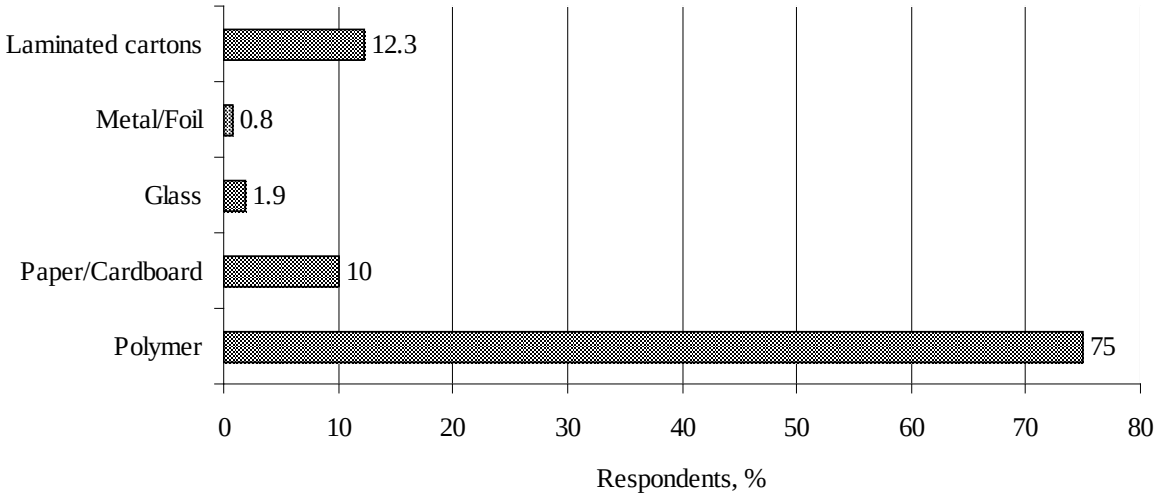


Figure 2. Which is the most widely used packaging material in Latvian food market?

Convenient trade and communication with the consumer can be listed as one of the most important functions of packaging, therefore, consumers were asked to state whether they paid attention to the packaging material and type when making food choices (Fig. 3). 30.2% of the survey respondents often paid attention to the type and material of packaging, but 7.3% of the respondents did it always and it had a great importance when making food choices. In addition, only 4.2% of the respondents found the type and material of packaging insignificant. These results suggest that the majority of respondents, if not always, then regularly pay attention to the packaging material used in the marketing of the product in Latvian food market.

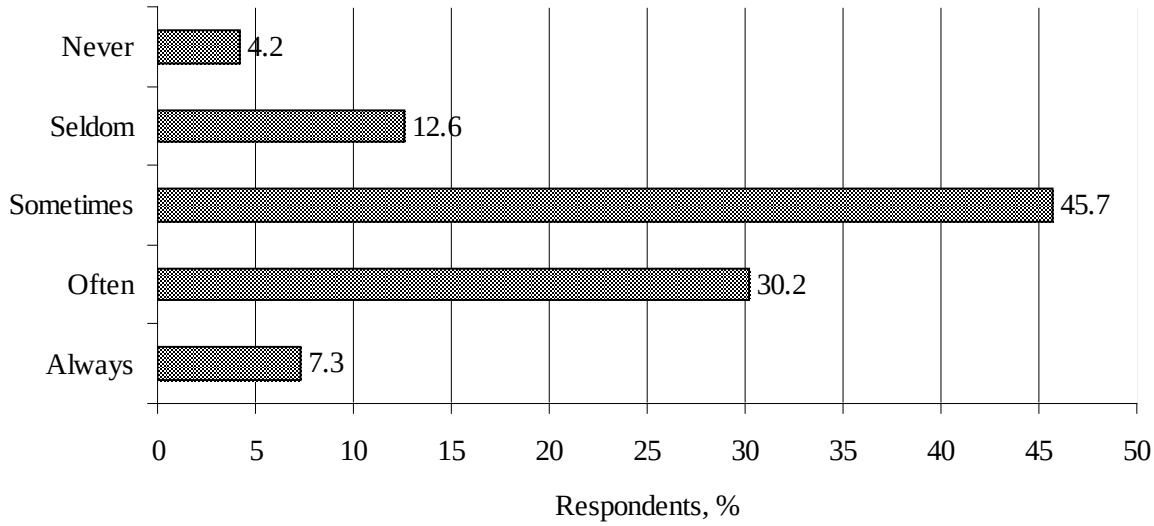


Figure 3. Do you pay attention to the packaging material used for food packaging?

It is important to know which factors consumers pay close attention to when making food choices and which functions of packaging are the most efficient to communicate consumers for producers to be able compete successfully in the food market; food choices are largely dependent on the ease of use of product packaging, packaging design and aesthetic appeal, and the amount of packaged product and its price (Koutsimanis et al., 2012). Therefore, consumers were asked to assess what factors they pay the most attention to when making food choices (Fig. 4). The packing process is one of the most important food processes; it is the final stage to ensure product quality during storage and transport. Food packing is designed to contain and protect food, as well as to provide all the necessary information about the packaged product. The primary function of food packaging is to ensure safe food from production stage to the consumer. Secondary function of food packaging is marketing (Han, 2014). However, sometimes the packaging and its design are key factors in approaching the consumer. The results showed that packaging design almost always affected 27.5% of the respondents' food choices, while it was sometimes important to 42.1%, and food choices of only 11.5% were always affected by packaging design. Packaging design is not the determining factor influencing food choices by Latvian consumer point of view, and the focus only on the design may not provide the expected results.

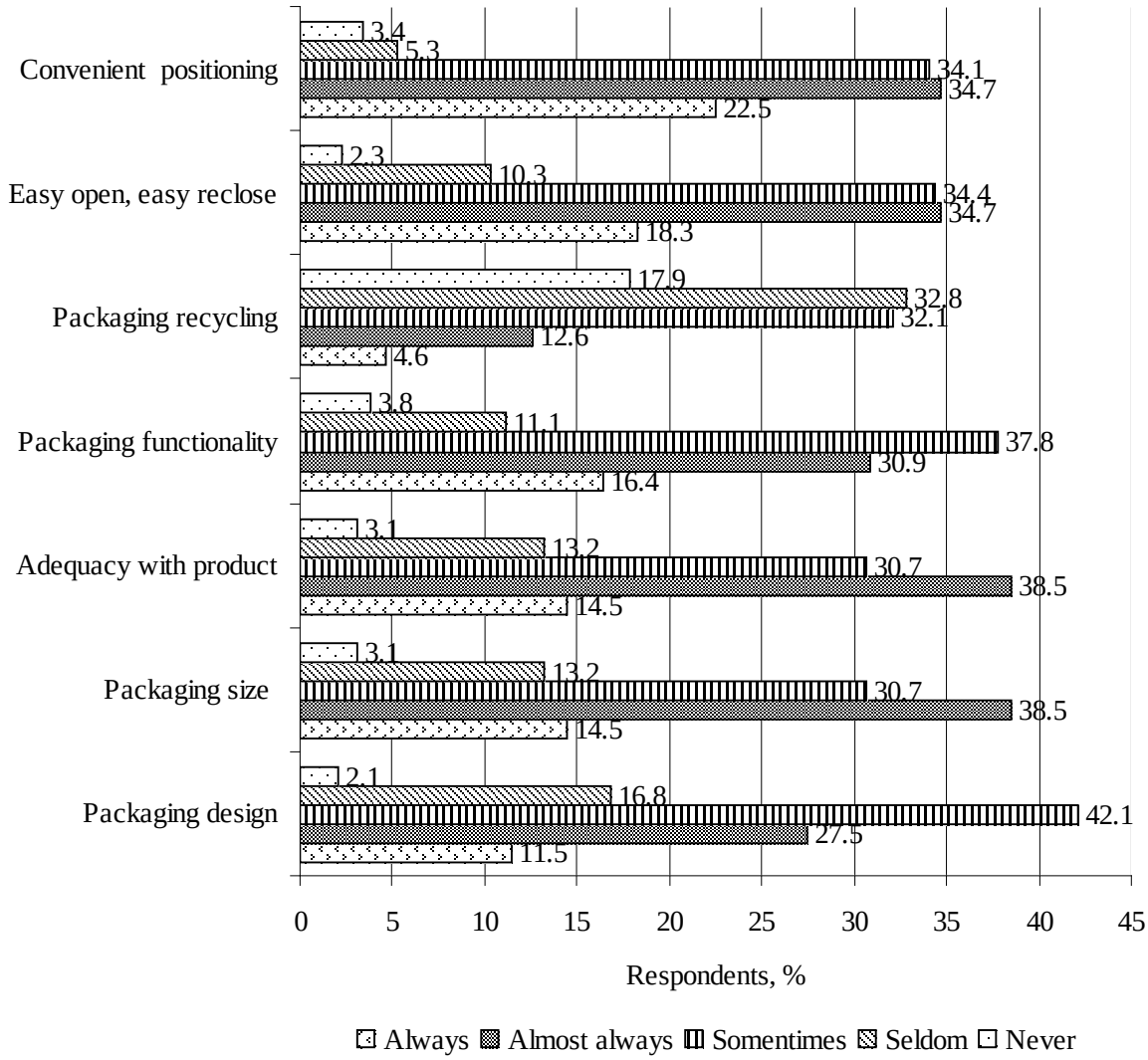


Figure 4. How often do these factors affect your food choices?

As previously mentioned, a successful integration of the product in the market depends not only on one decisive factor, so it is important not only to choose the attention-catching packaging design, but also to plan the optimal packaging size. The obtained results showed that packaging size almost always affected food choices of 38.5% of the respondents, and only for 3.1% of the respondents it was a neutral factor.

Food quality is largely determined by characteristics of packaging material, so it is possible to ensure product quality, extend the expiry date and reduce the volume of discarded food by choosing suitable packaging materials (Lee, 2010; Realini et al., 2014). 38.5% of the respondents almost always paid attention to the packaging and product cross-compliance and for 14.5% of the respondents it was one of the determinants. Nowadays, packaging material no longer meets only transportation functions from the producer to the consumer, but it also ensures that the quality of products remains unaltered during storage. With the development of modern technologies, mass media can inform the consumer about the functionality of packaging options. The survey showed that this factor was also becoming more topical when making food choices, as 30.9% of the respondents almost always evaluated the functionality of the packaging in relation to the product and 16.4% of the respondents always evaluated it.

Product packaging simplicity and ease of use for consumers is as important as product and packaging cross-compliance. Is it easy to transport and store, and open and reclose? Evaluating these conditions from the consumer point of view, 34.7% of respondents claimed that they almost always paid attention to the packaging opening, and convenient positioning, i.e., storage convenience at home (whether it will be easy to keep the product on a low shelf in the refrigerator or it will fall over etc.). Product packaging opening and positioning function must be as simple as possible in order for consumers to avoid negative emotions and associations, which may affect the consumption of the product in the future.

Most of the municipal waste consists of food packaging; therefore respondents were asked whether they paid attention to packaging recycling opportunities when making food choices. Packaging recyclability was important to only 4.6% of the respondents, while 32.8% rarely paid attention to packaging recycling options.

The success of innovation and technology development in the food packaging market is largely dependent on consumers' perception and response. Consumer point of view and attitudes towards innovation in the food market are crucial for the manufacturer to achieve considerable success (Chen et al., 2013). One of the main conditions for it is consumer information and education. Almost half of the respondents (43.4%) reported that Latvian food manufacturers only partly follow the new trends in the field of innovative packaging materials (Fig. 5), and 30.2% of the respondents had no opinion on this issue, because so far they had not paid increased attention to it.

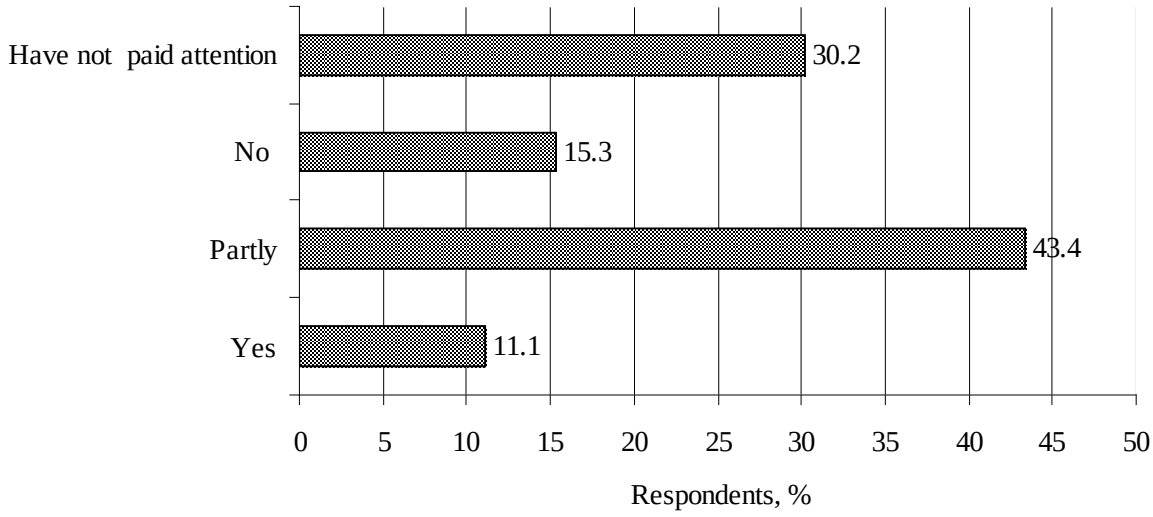


Figure 5. Do you think that Latvian food manufacturers follow the new trends in the field of innovative packaging materials?

Consumers were aware of marketing elements on packaging in Latvian food market as they were able to comment on the visual appearance of the packaging, but they lacked information about the reasons why new packaging is produced, whether it merely fulfils marketing functions or if it has any important functions in relation to the product and maintaining its quality. The awareness of new trends in the packaging sector in Latvian food market can be seen as inadequate. Such a conclusion could be drawn after analysing the response on whether consumers had noticed products that were packaged using innovative packaging solutions. Five innovative packaging solutions were suggested: biodegradable packaging, active packaging, intelligent packaging, retort packaging (product is heat treated in packaging) and self-warming packaging. More than half of the of the respondents (53.4%) were aware of biodegradable packaging materials in Latvian food market, but no conclusions can be

drawn in terms of consumer knowledge on the importance biodegradable packaging has on the product and the environment.

The second best known innovative packaging solution was retort packaging designed for heat treatment with the product, said 49.3% of the respondents. This answer could be justified by the fact that there is an increasing demand for products that are quick and easy to prepare, and one of such products is meals ready-to-eat (MRE). The most widely used type of production for ready to eat meals is heat treatment in package (Ito et al., 2014). It is important to note that over the last 10 years, MRE market has increased in Europe and experienced a steady growth (Olivera, Salvadori, 2012). Therefore, there is reason to believe that this kind of meal supply and demand in Latvian market is increasing, and retort packaging solution is becoming more recognizable.

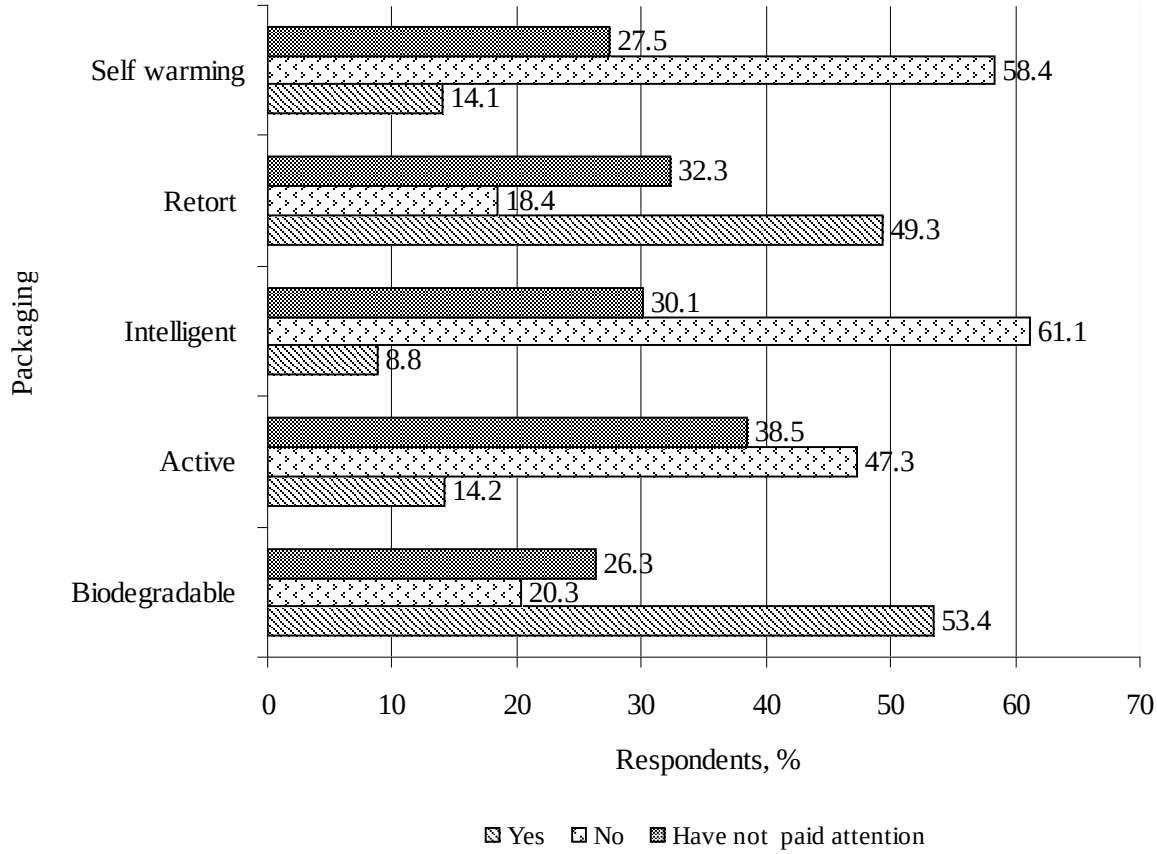


Figure 6. Are you aware of these innovative packaging solutions in Latvian food market?

Active (14.2%) and self-warming (14.1%) packaging were among the least known types of innovative packaging from Latvian consumer point of view, however, only 8.8% of the respondents had noticed intelligent packaging in Latvian food market. It can be concluded with certainty that Latvian consumers are unfamiliar with the use of new technologies and their introduction in the food market, which often prevents them from making the right food choices due to the lack of information and understanding of the functions this type of packaging has and why it should be used for specific types of products.

Being aware of the situation where the consumer is a major determinant of food consumption volume, it was important to find out whether respondents supported new packaging solution and technology introduction in Latvian food market and if introduced innovative packaging technologies would get consumers' attention (Fig. 7). The obtained results confirmed that the majority of the respondents (68.7%) supported new packaging technologies in food production, which in turn could mean that

consumers are interested and willing to appreciate the efforts and the means of producers in technological development. This is an important factor, as it justifies the fact that today's consumers are able to make changes and to look beyond the visual effects packaging provides.

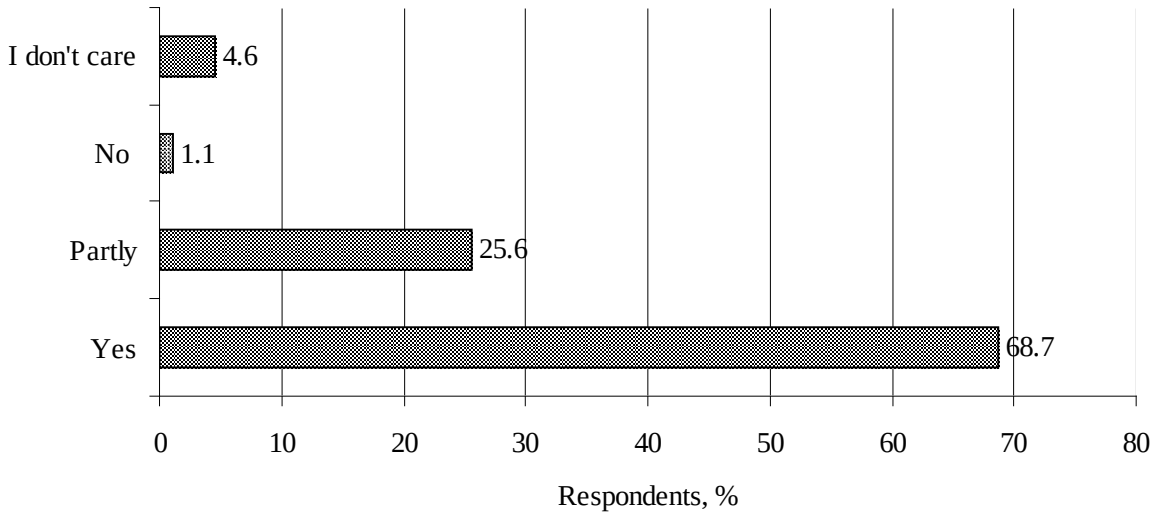


Figure 7. Do you support innovative packaging solution and technology introduction in Latvian food market?

Another important matter was the respondents' knowledge about packaging and its functions with regard to product safety and quality during production process and storage. The results showed that 68.8% of the respondents were aware of the packaging features that ensure quality and safety. Consumers were aware that packaging is not solely intended for transportation or to increase its cost. For 25.9% of the respondents information about the role of packaging was known a little and they would be willing to learn more. By contrast, 4.6% of the respondents were not aware of packaging and its functions with regard to product safety and quality during production process and storage, and 0.8% of the respondents were not interested in this matter.

70% of the respondents confirmed that they would pay a lot more attention to product packaging and it would be able to influence their food choices and modify the existing opinion about the packaging, if sufficient amount of information was provided about the packaging. Based on the information obtained, it can be concluded that it is essential to inform the consumer and justify the importance of the packaging choice when introducing new packaging technologies, thus ensuring a successful market outlets and gaining the trust of consumers, which is an important factor for a successful business.

One of the problems with the introduction of innovative packaging solutions is that the initial cost is significantly higher compared to traditional packaging solutions; hence it is important to determine whether consumers would initially be willing to pay more for the product and support innovation entry in the market. 45.5% of the respondents confirmed that they would be willing to pay up to 5% more for innovative packaging solutions of the price of the products in conventional packaging, if they were aware of the role and the importance innovative packaging solutions have in regard to the product. 19.1% would be willing to pay up to 10% more and 6.5% of the respondents would pay as much as necessary (Fig. 8).

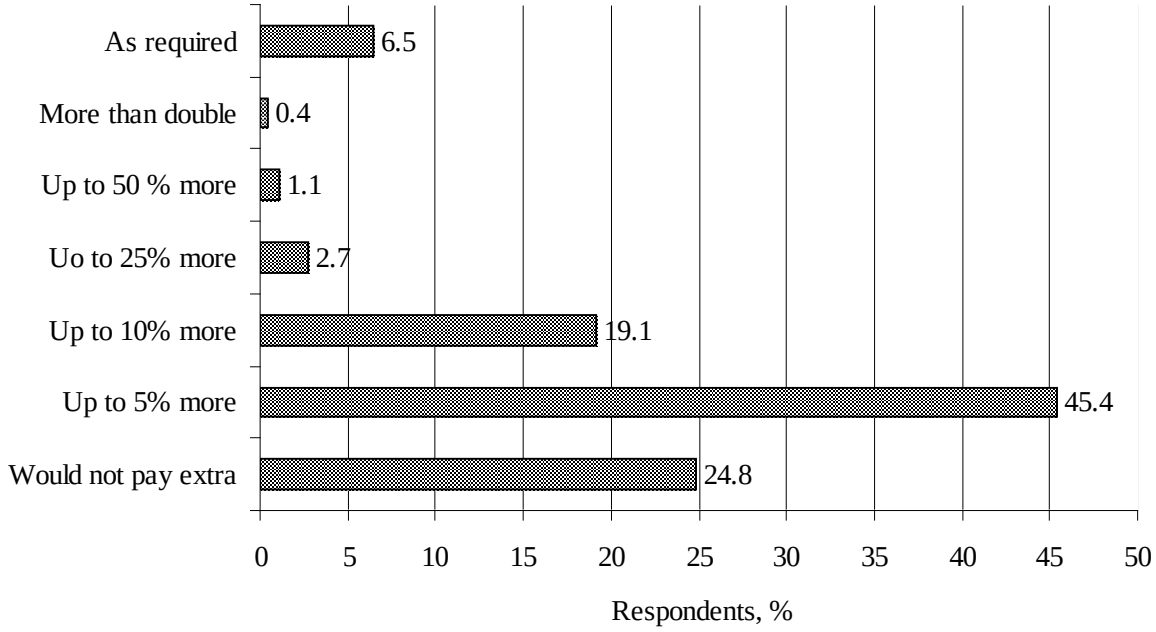


Figure 8. The amount of money consumers would willingly pay extra for innovative packaging solutions as a percentage of the price of the products in conventional packaging.

This opinion confirms that innovation is important and necessary, and consumers are interested to choose a safe, qualitative product. The producers have to take the lead and inform consumers about the innovations in an understandable way, not only limiting themselves to various packaging designs, but drawing consumers' attention to such relevant and important factors as food safety and quality retention using specific packaging. The conducted research shows that the consumer is interested in learning and obtaining more information about the importance of the packaging, and a mutual communication between the producer and the consumer could promote the development and demand for innovative packaging technologies in Latvian food market.

4. CONCLUSIONS

When making food choices respondents do not always pay attention to product packaging and type, a more important factor is whether the packaging has convenient positioning and the opening and re-closing function. However, the majority (68.8%) of the respondents are aware that packaging materials play an important role in terms of product quality and safety during the technological process and storage. If consumers had access to more information on the role and functions of the packaging, they would certainly pay more attention to packaging when purchasing foods.

Consumers have little knowledge on innovative packaging solutions, but respondents are interested in finding out more and support the introduction of innovative technologies in Latvian food market. Sufficiently widely available information as to why such packaging solutions are used is the decisive factor when making food choices. This study shows that manufacturers need to pay more attention to communication with the consumer, not only through the design of packaging, but also informing the consumer about the positive functions of packaging in regard to product safety and quality issues.

ACKNOWLEDGEMENTS

This research was supported by the project co-funded by Local resources research and sustainable use Programme "Agricultural Resources for Sustainable Production of Qualitative and Healthy Foods in Latvia (AgroBioRes) (2014–2017)". Project No. 4 Sustainable use of local agricultural resources for qualitative and healthy food product development (FOOD).

REFERENCES

Ahvendinen R 2003, 'Novel Food Packaging Techniques', CRC Press Woodhead publishing limited Cambridge England, pp.590.

Becker L, Rompay TJL, Schifferstein HNJ, Galetzka M 2011, 'Toughpackage, strong taste: The influence of packaging design ontaste impressions and product evaluations', *Food Quality and Preference*, vol. 22, pp. 17-23.

Chen Q, Anders S, An H 2013, 'Measuring consumer resistance to a new food technology: A choice experiment in meat packaging', *Food Quality and Preference*, vol. 28, no. 2, pp. 419-428.

Feichtinger M, Zitz U, Fric H, Kneifel W, Domig KJ 2015, 'An improved method for microbiological testing of paper-based laminates used in food packaging', *Food Control*, vol. 50, pp. 548-553.

Han JH, 2014, 'Charpet 1-A Review of Food Packaging Technologies and Innovations', *Innovations in Food Packaging* (Second Edition), pp. 3-12.

Ito R, Fukuoka M, Hamada-Sato N 2014, 'Innovative food processing technology using ohmic heating and aseptic packaging for meat', *Meat Science*, vol. 96, pp. 675-681.

Koutsimanis G, Getter K, Behe B, Harte J, Almenar E 2012, 'Influences of packaging attributes on consumer purchase decisions for fresh produce', *Appetite*, vol. 59, no. 2, pp. 270-280.

Lee TK 2010, 'Quality and safety aspects of meat products as affected by various physical manipulations of packaging materiāls', *Meat Science*, vol. 83, no. 1, pp. 138-150.

Makanjuola SA, Enujiugha VN 2015, 'How consumers estimate the size and appeal of flexible packaging', *Food Quality and Preference*, vol. 39, pp. 236-240.

Loose SM, Peschel A , Grebitus A 2013, 'Quantifying effects of convenience and product packaging on consumer preferences and market share of seafood products: The case of oysters', *Food Quality and Preference*, vol. 28, no. 2, pp. 492- 504.

Mihindukulasuriya SDF 2014, 'Nanotechnology development in food packaging: A review', *Trends in Food Science & Technology*, vol. 40, no. 2, pp. 149-167.

Olivera DF, Salvadori VO 2012, 'Kinetic modeling of quality changes of chilled ready to serve lasagna', *Journal of Food Engineering*, vol. 110, pp. 487- 492.

Parise CV, Spence C 2012, 'Assessing the associations between brand packaging and brand attributes using an indirect performance measure', *Food Quality and Preference*, vol. 24, pp. 17-2.

Realini CR, Marcos B 2014, 'Active and intelligent packaging systems for a modern society', *Meat Science*, vol. 98, no. 3, pp. 404-419.

Restuccia D, Spizzirri UG, Parisi IO, Cirillo G, Curcio M, Iemma F, Puoci F, Vinci G, Picci N 2010, 'New EU regulation aspects and global market of active and intelligent packaging for food industry applications', *Food Control*, vol. 21, no.11, pp. 1425 – 1435.

Rollin F, Kennedy J, Wills J 2011, 'Consumers and new food Technologies', *Trends in Food Science and Technology*, vol. 22, pp. 99-111.

Tu Y, Yang Z, Ma C 2015, 'Touching tastes: The haptic perception transfer of liquid food packaging materiāls', *Food Quality and Preference*, vol. 39, pp. 124-130.

Varela P, Antúnez L, Cadena RS, Giménez A, Ares G 2014, 'Attentional capture and importance of package attributes for consumers' perceived similarities and differences among products: A case study with breakfast cereal packages', *Food Research International*, vol. 64, pp. 701-710.