

**Željka Zavišić**  
Zagreb School of Business  
Ulica grada Vukovara 68,  
10000 Zagreb, Croatia  
zeljka.zavistic@pvzg.hr  
Phone: +38516310871

**Neven Šipić**  
Zagreb School of Business  
Ulica grada Vukovara 68,  
10000 Zagreb, Croatia  
neven.sipic@pvzg.hr  
Phone: +385955365016

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**Marinko Jurčević**  
Faculty of Transport  
and Traffic Sciences  
Vukelićeva 4,  
10000 Zagreb, Croatia  
marinko.jurcevic@fpz.hr  
Phone: +38512380230

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# THE IMPACT OF PACKAGING DESIGN ON FUNCTIONAL FRUIT JUICE CONSUMERS' BEHAVIOUR

## ABSTRACT

Functional food is considered similar or the same as conventional food that is consumed as part of a regular diet and is shown to have specific physiologic advantages that can reduce risk of chronic diseases. Generally, products put in that group are the ones that are scientifically proven to improve health and prevent diseases. When considering fruit juices as functional products, it is important to emphasize that their primary function is not to relieve one of thirst, but to enhance health and sports activities (in case of isotonic, dietary and energy drinks), and also indicate lifestyle.

The research tried to cover this insufficiently researched territory. The focus of the research is functional food, with an emphasis on fruit juices, an area with very few empirical researches, especially when accepting new products through the influence of packaging. Branding and packaging attract the consumers' attention, identify a product, create interest, generate the product's psychological connotation and specify valuable product characteristics. If packaging is attractive enough to attract consumers' attention, it is very likely that consumers will try the product.

The goal of this research is to find out how great of a role functional fruit juice packaging has on consumers when making a purchasing decision.

**Keywords:** Design, packaging, functional fruit juice, consumers

## 1. Introduction

Accepting the concept of functional food and better understanding of its main determinants is the main factor for orientating the market towards functional food, developing products run by consumer feedback and market possibilities (Ares, Gámbaro, 2007).

Based on socio-demographic factors, typical functional food consumers are people with higher education, the senior population and people with health issues who must abide by specific diet restrictions. Based on gender, women are more frequent consumers and show greater interest for functional food than men (Siró et al., 2008).

The goal of food packaging is to contain food in a cost-effective way that satisfies industry requirements and consumer desires, maintains food safety, and minimizes environmental impact (Marsh, Bugusu, 2007).

New materials, mass production, big supply and distribution of similar products started to affect a change in thinking about product appearance and the meaning of packaging. Nowadays, packaging represents a type of advertisement. It is a crucial factor when making a purchase decision for many products.

Development in packaging design has long passed the point where physical protection is its only purpose. The protective function is still one of the main tasks of packaging, but it is only one of the conditions it needs to satisfy in order to be called a quality-designed product. Contemporary design aims to forecast, solve problems, and satisfy the needs of an entire life cycle (Koržinek, 2007).<sup>1</sup>

The consumer market for fruit juices and beverages has experienced increasing competition. Although a large variety of detailed design methods for a specific subset of design problems are available, literature does not present a universally accepted method for designing fruit juice packaging (Fey, 2000).

In addition, fruit juices with functional properties can ensure a competitive advantage to companies that produce them.

Based on differentiation – a competitive advantage exists when a company can ensure superior products/services than the competition (differentiation advantage), but at the same costs. The company's offer, in this case, has greater real or perceived value for customers (for which they are ready to pay a price premium) (Horvat et al., 2013).

As functional products are put in a higher price category, the main competitive advantage of functional food is product differentiation that, besides other things, demands continual investments in research and development and innovations in order to be able to offer products with a price premium and high added value. Design and product packaging have an important role here, because they can be a factor when making a purchase decision, which is also the main research hypothesis H1: Functional fruit juice packaging design and redesign represents the product's image consistency, while the auxiliary hypothesis states that packaging and local

producers' fruit juice designs are not behind foreign competition.

## 2. Literature review

Packaging is the science, art and technology of closing or protecting products in transport, while storing, selling and using. It refers to a process of designing, evaluating and producing packages. Packaging can be described as a coordinated system for transportation, storing, logistics, sales and use. Packaging contains, protects, safeguards, transmits, informs and sells merchandise (Klimchuk et al., 2013).

Many juice manufacturers have begun launching juice and smoothie products that are organic and feature clean, easy-to-read labels. For example, Bolthouse Farm's 1915 brand recently introduced a line of cold-pressed smoothies that are made with organic pureed fruits and vegetables. The line boasts an ingredient panel featuring no more than six ingredients and nutrient-rich fruits and vegetables (Del Buono, 2017).

The connection between packaging design and food waste should be acknowledged and valued by relevant stakeholders: food producers, manufacturers, brand owners, retailers, consumers, and in packaging regulations (Wikström et al., 2013).

Deliza, MacFie, and Hedderley (1999, 2003) demonstrated that consumers inferred product taste from the package/label, revealing many packaging attributes which affected product expectation and perception. Product information (e.g., nutritional, sensory, safety and ingredients) and technology information appeared to be important package attributes (Deliza et al., 2003).

Effective communication between the producer and the consumer about food and nutrition relies on delivering messages that consumers find believable and that convinces them that making healthy food choices is achievable (Borra, Earl, 2000).

Food packages usually include two different types of information: text, such as a brand name, and an image, such as a picture of the product. So far, most studies that have examined the influence of packaging on flavor perception have focused on textual information (Mizutani et al., 2010).

When shopping, the impact of packaging on product choice is proven to be important. It reflects all

its functions and attributes that attract buyers with diversity and originality. The product has to be “in accordance” with packaging because the message it transmits is uniform; packaging transmits experience and the nature of the product, moves our senses while shopping, and depicts an image of a product even before consuming (Tolušić et al., 2011).

Associations that can be brought about with specific outside stimuli are especially important for sensory marketing research and packaging design. Different product characteristics, like its colour, name, logo-type, packaging, etc. will, more or less implicitly, arouse a systemic semantic association that could play an important role in developing a successful marketing strategy (Schifferstein, Hekkert, 2008).

Investigating consumer motivations is relevant given that food industry efforts towards offering processed vegetables aim at addressing two major motives of food demand, namely the convenience and health motive. Finally, besides individual influences, also the potential role of time (moment of purchase) as a situational factor that may influence consumer’s conduct during the purchasing stage merits attention (Assael, 1995; Meiselman, 1996; Mowen, 1993).

The modern methods of consumer marketing would fail were it not for the messages communicated by the package through distinctive branding and labeling. Consumers make purchasing decisions using numerous clues provided by graphics and distinctive shapes of packaging (Robertson, 2009).

Some studies also show how colour harmony might differ from conventional principles when the context (i.e., fruit juice) is considered. Designers should therefore take into account properties or categories of products when using colours as a medium to communicate the characteristics of products to potential customers (Wei et al., 2014).

Along with the product’s physical characteristics, innovation and development, brand and price, packaging is a key element of the product’s image. Physical product characteristics entail a combination of the product’s characteristics aimed at satisfying consumer’s needs. Brand and packaging represent complementary parts of marking products that are important in creating and sustaining the product’s image. A constant increase in product choice and producers in the same category affect the brand’s importance and packaging that ease customer choice among thousands of different products (Mlivić Budeš, 2016).<sup>2</sup>

However, food packaging no longer has just a passive role in protecting and marketing food products. New concepts of active and intelligent packaging are due to play an increasingly important role by offering numerous and innovative solutions for extending the shelf-life or maintain, improve or monitor food quality and safety (Gontard, 2006). Various terms are used for describing new packaging technologies, e.g. ‘active’, ‘interactive’, ‘smart’, ‘clever’, ‘indicators’, etc. (Fabech et al., 2000; Gontard, 2000).

So, changes in retailing practices such as market globalisation and consumers’ way of life present major challenges to the food packaging industry, and it is very important how consumers will accept new products, and what role design will play in that process.

### 3. Research methodology

A more extensive research on consumers’ familiarity with the functional food concept was undertaken on a random sample in August of 2012, while data relevant to this topic were used in this paper (Zavišić, 2014). A survey was conducted in two cities in Croatia: Zagreb and Osijek. Zagreb was chosen as the capital and largest city in Croatia, and Osijek as the center of eastern Croatia and agricultural production. Due to specific socioeconomic reasons (different city development levels), this choice seemed logical. A questionnaire consisted of questions related to the consumers’ familiarity with the functional food concept and their buying habits connected to such products. 198 out of 313 respondents (63.26%) heard about the term “functional food”.

A primary research was conducted on a sample that includes respondents aged 18 and over.

Statistical methods were used in data analysis. Division according to place of residence, gender, age, professional qualification and monthly income were determined according to demographic and socioeconomic characteristics. Those characteristics were used later in the analysis as grouped variables. Graphic depiction of respondent’s sampling data was used in order to better visualize the data.

In the analysis, chosen descriptive statistics indicators for ordinal variables were calculated, while appropriate division was determined for nominal variables. Besides descriptive statistics, inferential statistics was also used. A chi-squared test was per-

formed in order to examine the correlation between the chosen characteristics. Nonparametric Mann Whitney and Kruskal-Wallis tests were used due to the nature of specific questions and the measuring scale on which responses have been noted in testing the significance of differences. Statistically significant are differences with  $p$  value less than 0.05 ( $p < 0.05$ ).

#### 4. Results

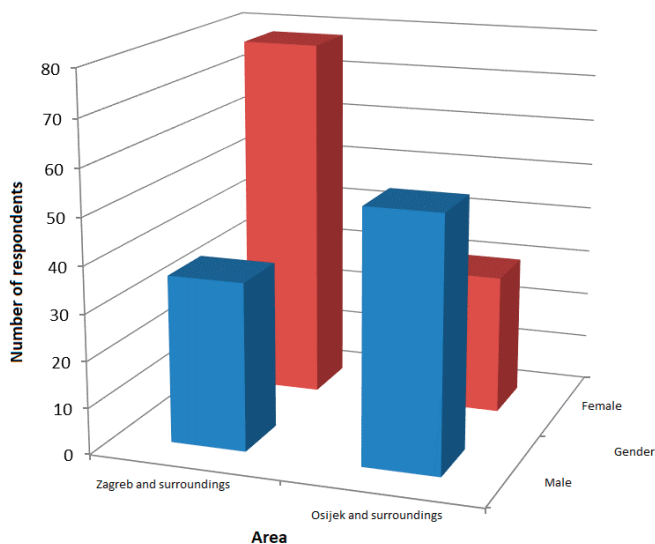
Parameters that related to the effect of packaging design on making a purchase decision were taken, apropos, what packaging design specifically represents to functional fruit juice consumers. The aim was to research how much packaging has to match the product's image that it represents.

##### 4.1 Demographic and socio-economic characteristics of respondents

313 respondents took part in the survey. Among them, 198 were not acquainted with the term "functional food", which represents 63.26% of the total number. Since the research was focused on the perception of the role of marketing in positioning fruit juices as functional food, respondents that were not familiar with the term were excluded from further analysis.

Among 198 respondents, 114 of them lived in Zagreb and its surroundings (57.58%), and 84 in Osijek and its surroundings (42.42%) at the time. There were 90 men (45.45%) and 108 women (54.55%) among the respondents. Graph 1 depicts the division of respondents according to the place of residence and gender.

**Graph 1 Respondents according to place of residence and gender**



Source: Authors

In order to find out what represents a good functional food packaging design and redesign to the respondents, they were asked to grade the following aspects: the product's usability, ergonomic adaptability, technical/economic sensibility and image consistency. Answers were given on a 5 level

Likert scale (1 – strongly disagree, 2 – disagree, 3 – neither agree nor disagree, 4 – agree, 5 – strongly agree). Table 1 contains the mentioned indicators of descriptive statistics based on the respondents' answers.

**Table 1** Chosen descriptive statistics indicators that relate to the meaning of good design and redesign of functional fruit juice packaging for respondents

Meaning	Arithmetic mean	Median	Mode	St. dev.	Coefficient of variation
Product`s usability	3.50	4.00	4.00	1.12	32.03
Ergonomic adaptability	3.63	4.00	4.00	0.83	22.89
Technical/economic reliability	3.61	4.00	4.00	0.86	23.79
Esthetic sensibility	3.91	4.00	4.00	0.89	22.85
Image consistency	4.25	4.00	4.00	0.64	15.14

Source: Authors

Based on calculated arithmetic means, it can be concluded that good design and redesign for fruit juice packaging mostly represents image consistency to respondents. The arithmetic mean only for that variable had a value greater than 4. Next, according to the respondents, is esthetic sensibility. Product usability, ergonomic adaptability and technical/economic reliability were evaluated as less important. Median and mode had a value of 4 for all the ana-

lysed variables. Standard deviations and coefficients of variation indicate that the level of variability in respondent`s rankings cannot be considered small, except in image consistency.

The Mann-Whitney test was performed for testing the significance of differences in the meaning of good functional fruit juice design and redesign related to their place of residence (Table 2).

**Table 2** Test results of the significance of differences in the meaning of good functional fruit juice packaging design and redesign related to their place of residence (Mann-Whitney test)

Meaning	Average rank (area)		Z	p
	Zagreb and surroundings	Osijek and surroundings		
Product`s usability	109.57	81.69	-3.595	0.000
Ergonomic adaptability	114.09	76.73	-5.027	0.000
Technical/economic reliability	102.86	90.48	-1.653	0.098
Esthetic sensibility	99.63	98.15	-0.196	0.845
Image consistency	103.47	90.77	-1.769	0.077

Source: Authors

In all analysed cases, higher average ranks were calculated for respondents from Zagreb and its surroundings. According to the Mann-Whitney test, for the people from Zagreb and its surroundings and Osijek and its surroundings, statistically significant are the differences in the perception of good

design and redesign of fruit juice packaging related to product`s usability and ergonomic adaptability.

Table 3 contains Mann-Whitney test results that were used to test the significance of differences between men and women in perception of good functional fruit juice packaging design and redesign.

**Table 3** Test results of the significance of differences in the perception of good functional fruit juice packaging design and redesign related to gender (Mann-Whitney test)

Meaning	Average rank (gender)		Z	p
	Male	Female		
Product's usability	86.67	106.68	-2.594	0.009
Ergonomic adaptability	78.09	114.72	-4.957	0.000
Technical/economic reliability	92.40	101.82	-1.265	0.206
Esthetic sensibility	95.43	102.00	-0.872	0.383
Image consistency	94.76	100.78	-0.843	0.399

Source: Authors

Even though in most cases the higher average ranks are determined for female respondents, based on the Man-Whitney test, there is a statistically significant difference in the perception of meaning about good functional juice packaging design and redesign between men and women related to product usability and its ergonomic adaptability.

Therefore, good fruit juice packaging design and redesign represents greater product usability and ergonomic adaptability for men, than women.

The Kruskal-Wallis test was conducted with an intention to test the significance of differences in good fruit juice packaging design and redesign between people divided into three groups. The test results are set forth in Table 4.

Average ranks indicate that younger people, in relation to other respondents, view good fruit juice packaging design and redesign as a representation of esthetic sensibility and image consistency, and less as technical/economic reliability. When compared with other respondents, good fruit juice design and redesign represents, in a greater degree, product usability, ergonomic adaptability and technical/economic reliability for the middle-aged population. For the older population, in relation to other groups, good fruit juice packaging design and redesign, in a lesser degree, represents product usability, ergonomic adaptability, esthetic sensibility and image consistency.

**Table 4** Test results of the significance of differences in the meaning of good functional fruit juice packaging design and redesign related to age (Kruskal-Wallis test)

Meaning	Average rank (age)			H	p
	24 and less	25 – 38	39 and more		
Product's usability	90.68	109.99	85.49	7.503	0.023
Ergonomic adaptability	95.53	109.16	80.65	8.458	0.015
Technical/economic reliability	92.61	104.41	93.03	2.381	0.304
Esthetic sensibility	113.61	92.34	84.90	10.081	0.006
Image consistency	111.99	95.11	77.14	13.354	0.001

Source: Authors

The Kruskal-Wallis test results show there are no statistically significant differences between at least two age groups, in case of perception of good fruit juice packaging design and redesign in relation to

technical/economic reliability. The Mann-Whitney test was conducted in order to determine if there is a statistically significant difference among age groups.

**Table 5 Mann-Whitney test results**

Meaning	Mann-Whitney test	Compared groups (age)		
		24 and less	24 and less	25 – 38
		25 – 38	39 and more	39 and more
Product`s usability	Z	-2.187	-0.392	-2.473
	p	0.029	0.695	0.013
Ergonomic adaptability	Z	-1.730	-1.537	-2.793
	p	0.084	0.124	0.005
Esthetic sensibility	Z	-2.513	-2.751	-0.789
	p	0.012	0.006	0.430
Image consistency	Z	-2.089	-3.513	-2.043
	p	0.037	0.000	0.041

Source: Authors

The results of the Mann-Whitney test show there is a statistically significant difference in the perception of good fruit juice packaging design and redesign in product usability between younger and middle-aged groups and between middle-aged and older age groups. A statistically significant difference exists between perceptions of people in middle-aged and older groups, regarding ergonomic adaptability. Younger and middle-aged people are statistically different in the perception of good fruit

juice packaging in esthetic sensibility, while regarding image consistency, there are statistically significant differences in the perception of people in all age groups.

Table 6 contains the results of the Mann-Whitney test used for the purpose of testing the significance of differences in the meaning of good functional fruit juice design and redesign related to professional qualification.

**Table 6 Test results of the significance of differences in the meaning of good functional fruit juice packaging design and redesign related to professional qualification (Mann-Whitney test)**

Meaning	Average rank (professional qualification)		Z	p
	Associate or Bachelor	High school		
Product`s usability	106.46	90.30	-2.079	0.038
Ergonomic adaptability	105.44	91.81	-1.833	0.067
Technical/economic reliability	95.48	98.08	-0.345	0.730
Esthetic sensibility	91.66	103.53	-1.569	0.117
Image consistency	88.91	103.79	-2.069	0.039

Source: Authors

Based on calculated average ranks, it can be concluded that for respondents with a higher degree, a good fruit juice packaging design in a greater degree represents product usability and ergonomic adaptability, and in a lesser degree technical/economic reliability, esthetic sensibility and image consistency. According to the Mann-Whitney test, statistically are significant differences in the per-

ception of good fruit juice packaging design and redesign with regard to product usability and image consistency.

Table 7 contains the Kruskal-Wallis test results used for the purpose of testing the significance of differences in the meaning of good functional fruit juice packaging design and redesign between people listed in three income groups.

**Table 7 Test results of the significance of differences in the meaning of good functional fruit juice packaging design and redesign related to monthly income (Kruskal-Wallis test)**

Meaning	Average rank (monthly income)			H	p
	Less than 2000	2000 – 5000	5000 and more		
Product's usability	85.35	98.81	109.45	5.733	0.057
Ergonomic adaptability	99.70	84.90	116.34	12.141	0.002
Technical/economic reliability	87.87	100.10	104.42	3.236	0.198
Esthetic sensibility	121.33	83.96	97.06	17.580	0.000
Image consistency	122.03	85.88	89.49	20.452	0.000

Source: Authors

Based on average ranks, one can conclude that people with lower monthly incomes, in relation to other respondents, view good fruit juice packaging design and redesign in a greater degree with regard to esthetic sensibility and image consistency, and in lesser degree with regard to product usability and technical/economic reliability. In relation to other respondents, people with monthly incomes from 2000 to 5000 kuna, a good functional fruit juice packaging design and redesign represent, in a lesser degree, the product's ergonomic adaptability, esthetic sensibility and image consistency. For people earning 5000 kuna or more, in relation to people

with smaller monthly incomes, a good fruit juice packaging design and redesign is represented in the product usability, ergonomic adaptability and technical/economic reliability.

The results of the Kruskal-Wallis test show that there are statistically significant differences between at least two income groups, regarding perception related to the meaning of good fruit juice packaging design and redesign in terms of ergonomic adaptability, esthetic sensibility and image consistency. The Man-Whitney test was performed in order to determine such groups in the analysis.

**Table 8 Mann-Whitney test results**

Meaning	Mann-Whitney test	Compared groups (monthly income)		
		Less than 2000	Less than 2000	2000 – 5000
		2000 – 5000	5000 and more	5000 and more
Ergonomic adaptability	Z	-1.675	-1.686	-3.507
	p	0.094	0.092	0.000
Esthetic sensibility	Z	-4.019	-2.572	-1.616
	p	0.000	0.010	0.106
Image consistency	Z	-4.347	-3.297	-0.354
	p	0.000	0.001	0.723

Source: Authors

The results of the Mann-Whitney test show a statistically significant difference in the perception of good fruit juice packaging design and redesign in terms of ergonomic adaptability between middle and higher income groups. There are no statistically significant differences in the perception of good fruit juice packaging design and redesign in terms

of esthetic sensibility, between lower and middle income groups and lower and higher income groups. In case of image consistency, statistically proven are differences in the perception of younger and middle income groups and younger and older income groups.



A part of the questionnaire related to questions on whether packaging and design of Croatian functional fruit juice producers is falling behind foreign competition, and if packaging and design are a guarantee of the product's quality. Answers were given on a 5 level Likert scale

(1 – strongly disagree, 2 – disagree, 3 – neither agree nor disagree, 4 – agree, 5 – strongly agree).

Table 9 contains the mentioned indicators of descriptive statistics based on the respondents' answers.

**Table 9** Chosen descriptive statistics related to attitudes on different packaging and design of functional juices

Statement	Arithmetic mean	Median	Mode	St. Dev.	Coefficient of variation
Packaging and design of local producer's functional juices are not behind foreign competition	3.63	4.00	4.00	0.91	24.99
Packaging and product design are not a guarantee of quality	4.07	4.00	4.00	0.90	22.23

Source: Authors

On average, a high percentage of respondents agreed with statements that packaging and design are not a guarantee of quality, while an arithmetic mean for a statement that packaging and design of functional fruit juice producers is not falling behind foreign competition was 3.63.

The Mann-Whitney test was performed for the purpose of testing the significance of differences about specific statements by the people from Zagreb and Osijek, and their surroundings. The test results are shown in Table 10.

**Table 10** Test results of the significance of differences in attitudes about packaging and design of functional juices related to place of residence (Mann-Whitney test)

Statement	Average rank (area)		Z	P
	Zagreb and surroundings	Osijek and surroundings		
Packaging and design of local producer's functional juices are not behind foreign competition	88.25	113.77	-3.352	0.001
Packaging and product design are not a guarantee of quality	96.90	101.88	-0.657	0.511

Source: Authors

According to the Mann-Whitney test, there are statistically significant differences between the attitudes of respondents from Zagreb and its surroundings and Osijek and its surroundings relating to the statement that packaging and design of local functional fruit juice producers are not far behind foreign competition. It can be concluded that people from Osijek and its surroundings believe more

than people from Zagreb and its surrounding that packaging and design of local functional fruit juice producers are not far behind foreign competition.

Table 11 contains the Mann-Whitney test results which were used to test the significance of differences in attitudes about specific statements between men and women.

**Table 11** Test results of the significance of differences in attitudes about packaging and design of functional juices related to gender (Mann-Whitney test)

Statement	Average rank (gender)		Z	p
	Male	Female		
Packaging and design of local producer`s functional juices are not behind foreign competition	108.52	91.15	-2.300	0.021
Packaging and product design are not a guarantee of quality	105.79	93.41	-1.648	0.099

Source: Authors

Higher average ranks were calculated based on responses by men in the case of the following statements: packaging and local functional juice producers are not far behind foreign competition, and packaging and product design are not a guarantee of quality. Results of the Mann-Whitney test indicate there are statistically significant differences in men`s and women`s attitudes towards the statement: packaging and local functional juice pro-

ducers are not far behind foreign competition. Therefore, men, more than women, agree that packaging and local functional juice producers are not behind foreign competition. The Kruskal-Wallis test was performed in order to test the significance of differences in attitudes related to specific questions between people listed in three age groups.

**Table 12** Test results of the significance of differences in attitudes about packaging and design of functional juices related to age (Kruskal-Wallis test)

Statement	Average rank (age)			H	p
	24 and less	25 – 38	39 and more		
Packaging and design of local producer`s functional juices are not behind foreign competition	109.53	84.10	109.15	10.965	0.004
Packaging and product design are not a guarantee of quality	104.59	95.46	95.55	1.405	0.495
Health claim increases functional juice sales	97.08	98.73	100.75	0.162	0.922

Source: Authors

For younger people, in relation to other groups, higher average ranks were determined for the following statements: packaging and local functional juice producers are not behind foreign competition, packaging and design are not a guarantee of quality and higher prices do not mean higher quality. When compared with other groups, higher average ranks were calculated for older respondents for the following statement: health statement increases sales

of functional drinks. The Kruskal-Wallis test confirmed a statistically significant difference between at least two age groups in relation to the following statements: local functional juice producers have an adequate supply (offer), packaging and design of local functional juice producers are not behind foreign competition. In order to determine among which groups a statistically significant difference exists, the Mann-Whitney test was performed.

**Table 13 Mann-Whitney test results**

Statement	Mann-Whitney test	Compared groups (age)		
		24 and less	24 and less	25 – 38
		25 – 38	39 and more	39 and more
Local producers of functional juices have adequate demand	Z	-0.339	-2.283	-2.274
	p	0.734	0.022	0.023
Packaging and design of local producer`s functional juices are not behind foreign competition	Z	-2.690	-0.477	-2.964
	p	0.007	0.633	0.003

Source: Authors

In the case of the first statement, a statistically significant difference was confirmed between the attitudes of younger and middle-aged people and middle-aged and older people.

Table 14 contains the results of the Mann-Whitney test used to test the difference in attitudes related to the stated questions between people with a higher degree and those who have a high school degree.

**Table 14 Test results of the significance of differences in attitudes about packaging and design of functional juices related to professional qualification (Mann-Whitney test)**

Statement	Average rank (professional qualification)		Z	p
	Associate or Bachelor	High school		
Packaging and design of local producer`s functional juices are not behind foreign competition	85.46	108.28	-3.014	0.003
Packaging and product design are not a guarantee of quality	98.04	98.85	-0.108	0.914

Source: Authors

According to the Mann-Whitney test, people with a higher education degree and those with a high school degree are statistically significantly different in the following attitudes: packaging and design of local functional juice producers are not behind foreign competition. Therefore, people with high school diplomas are keener to think that packaging and local functional juice

producers are not behind foreign competition, while those with a higher degree are more convinced that a health statement increases the sales of functional juices.

Results of the Kruskal-Wallis test (in Table 15) tested the significance of differences in attitudes about questions between people listed in three income groups.

**Table 15 Test results of the significance of differences in attitudes about different aspects of functional juices shopping related to monthly income (Kruskal-Wallis test)**

Statement	Average rank (monthly income)			H	p
	Less than 2000	2000 – 5000	5000 and more		
Packaging and design of local producer`s functional juices are not behind foreign competition	113.86	103.28	76.89	15.122	0.001
Packaging and product design are not a guarantee of quality	116.02	91.54	91.55	9.072	0.011

Source: Authors

According to calculated average ranks, it can be concluded that respondents with a lower monthly income agree more that packaging and design of local functional juice producers does not fall behind foreign competition, that packaging and product design are not a guarantee of quality and that health statement increases functional juice sales.

The results of the Kruskal-Wallis test show there is a statistically significant difference between at least two groups related to the following statements: packaging and design of local functional juice producers is not behind the competition, and packaging and product design are not a guarantee of quality. The Mann-Whitney test was performed in order to determine income groups between which statistically significant differences exist.

**Table 16 Mann-Whitney test results**

Statement	Mann-Whitney test	Compared groups (monthly income)		
		Less than 2000	2000 – 5000	5000 and more
		2000 – 5000	5000 and more	5000 and more
Packaging and design of local producer's functional juices are not behind foreign competition	Z	-1.570	-3.156	-3.399
	p	0.116	0.002	0.001
Packaging and product design are not a guarantee of quality	Z	-2.784	-2.420	-0.046
	p	0.005	0.016	0.963

Source: Authors

In the case of the first and second statement, the results of the Mann-Whitney test show that there are statistically significant differences in attitudes of people with lower and middle incomes.

### 5. Discussion

This research showed that respondents rated design and packaging of functional fruit juices in Croatia with an average grade of 3.5. On average, respondents expressed a high degree of similarity related to statements that packaging and product design are not a guarantee of quality, while the statement that local producers of functional fruit juices are not falling behind foreign competition has 3.63 as arithmetic mean.

It can be concluded, based on the calculated arithmetic means, that good design and redesign of functional fruit juice packaging represents consistency with the image. Only that variable had an arithmetic mean greater than 4.

According to the Mann-Whitney test, there are statistically significant differences in the perception about the meaning of good design and redesign in packaging functional fruit juices between the respondents from Zagreb and its surroundings and the respondents from Osijek and its surroundings

with regard to the product's usability and ergonomic adaptability.

Furthermore, according to the Mann-Whitney test, statistically significant differences exist in perception of good design and redesign of functional fruit juices between men and women related to the product's usability and ergonomic adaptability.

Average ranks indicate that the younger population, in relation to other respondents, views design and redesign of functional fruit juices more in relation to esthetic sensibility and consistency with image, and less with technical/economic reliability.

The younger and older population are statistically different in the perception of good design and redesign of functional fruit juices in relation to esthetic sensibility, while there is a statistically significant difference in image consistency for all age groups.

Based on calculated average ranks, it can be concluded that for respondents with higher education degrees, good design and redesign of functional fruit juices is represented in a higher degree by the product's usability and ergonomic adaptability, and in lesser degree by its technical/economic reliability, esthetic sensibility and image consistency.

In relation to other respondents, people with lower monthly incomes view good design and redesign of

functional fruit juice packaging, in a higher degree with regard to esthetic sensibility and image consistency, and in a lesser degree with regard to the product's usability and technical/economic reliability.

Besides that, research showed that respondents from Osijek and its surroundings were more likely to believe that packaging and design of functional fruit juices are not far behind foreign competition than respondents from Zagreb and its surroundings. In terms of gender, more respondents holding this opinion were males with high school degrees and lower monthly incomes.

Among the analysed data, the two following statements reflected an auxiliary hypothesis in itself, that producers of functional fruit juices in Croatia are adjusting to world trends in producing functional food, that is, the packaging and design of local functional juice producers is not falling behind foreign competition. Considering the attitudes of the respondents, this claim can only be partially accepted. The respondent's ratings undoubtedly show that local functional fruit juice producers have not yet reached a satisfactory level in production and functional food placement.

## 6. Conclusion

Packaging is one of the most important, if not the most important reason why a consumer chooses one product over the other. It is also a means with which companies try to influence customer's emotions. Research confirms that people do not buy guided by logic, but by their subconsciousness that is shaped by their feelings. A choice to buy some product is based on emotional stimuli. Therefore, investing in professional packaging is more than a return on investment in design and production. A brand looks professional with adequate packaging, differentiates from the competition, and increases sales, which is the most important aspect.

The whole packaging design is a process that involves working on the packaging design, design principles, creative process, production and questions related to preproduction. It is also connected to branding, business strategies, social responsibility and sustainability. A successful packaging design that will be used as a marketing driver for consumer products can be created with a successful synergy of all the elements.

The results of this research give an account of attitudes on the importance of the packaging of functional fruit juices by Croatian producers. The main hypothesis H1: functional fruit juice packaging design and redesign represents consistency in the product's image, can be considered as confirmed. An auxiliary hypothesis that packaging and functional fruit juices made by local producers do not fall behind foreign competition can be considered as partially accepted, meaning there is still space for growth, with arithmetic mean of 3.63.

The main limiting factor of this paper is that the research was done in only two cities. A suggestion for future research is to expand the research to two more cities (Rijeka and Split) and gain a larger sample. Besides that, it would be interesting to explore how a specific health statement located on the packaging can affect product sales.

As far as packaging itself is concerned, in the last decades, however, one of the most innovative developments in the area of food packaging is the 'active and intelligent' (A&I) packaging, based on deliberate interactions with food or the food environment. The purpose of 'active packaging' is the extension of the food's shelf-life and maintenance or even improvement of its quality. The purpose of 'intelligent packaging' is to monitor food freshness.

This would be particularly important for functional fruit drinks, so a research suggestion is to investigate reactions of Croatian consumers and the impact of marketing on future trends of active and intelligent packaging.

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*Željka Zavišić  
Marinko Jurčević  
Neven Šipić*

## UTJECAJ DIZAJNA AMBALAŽE NA PONAŠANJE POTROŠAČA FUNKCIONALNIH VOĆNIH SOKOVA

### SAŽETAK

Funkcionalnom hranom smatramo hranu izgledom sličnu ili istu kao konvencionalna hrana koja se konzumira kao dio uobičajene prehrane, a pokazalo se da ima ili može imati određene fiziološke prednosti kojima se može smanjiti rizik od kroničnih bolesti. Općenito se u tu skupinu ubrajaju proizvodi za koje je znanstveno dokazano da poboljšavaju zdravlje ili sprječavaju bolesti. Kada je riječ o voćnom soku kao funkcionalnom proizvodu, treba naglasiti da njegova današnja primarna funkcija nije samo utažiti žeđ konzumenta, nego se doživljava i na drugačiji način, odnosno kao proizvod koji primarno mora asociirati na zdravlje ili sportske izvedbe i energiju (u slučaju izotoničnih, dijetetskih ili energetske napitaka), a ujedno bi trebao na neki način nositi i obilježje stila života.

Ovim istraživanjem nastojalo se detaljnije prikazati u nas, dosada, tek neznatno istraženo područje. U središtu je istraživanja funkcionalna hrana, s naglaskom na voćne sokove, o čemu je u Republici Hrvatskoj do sada provedeno vrlo malo empirijskih istraživanja, posebno kada je riječ o prihvatanju novih proizvoda kroz utjecaj ambalaže u cijelom procesu. Markom i pakiranjem privlači se pozornost potrošača, identificira proizvod, stvara interes, generiraju psihološke konotacije proizvoda i specificiraju korisna svojstva proizvoda. Ako je pakiranje dovoljno atraktivno da privuče pozornost potrošača, velika je vjerojatnost da će doći i do degustacije i konzumacije proizvoda.

Cilj je ovog rada ispitati koliko ulogu dizajn ambalaže funkcionalnih voćnih sokova ima kod potrošača pri donošenju odluke o kupnji.

**Ključne riječi:** dizajn, ambalaža, funkcionalni voćni sok, potrošači

