TRANSPORT PACKAGING IN DAIRY INDUSTRY AS A STRATEGIC FACTOR IN PROCUREMENT MANAGEMENT

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Abstract

Transport packaging ensures the preservation of all product specifications, protects against negative external influences, but in certain cases it further raises the presentation value of the product on the shelf. Theoretical part of the paper will deal with the importance of transport packaging, logistics and communication in the development of packaging boxes and the marketing part of product positioning on the shelves of retail chains. Herewith, will be shown the results of a research conducted among the employees of the purchasing sector on the territory of the Republic of Croatia, exclusively among employees who are engaged in the work with the transport packaging. The research has included the most important factors when developing transport packaging, including the modern trends, levels of cross-functions of cooperation of procurement and other functions at the development of the transport boxes. The importance of transport packaging will be also shown on the example of the dairy industry of a large agricultural company. Numerous dairy products are produced in two dairies owned by the above said company and different types of packaging boxes are used. Numerous specifications make the transport boxes almost identical, but also numerous factors make them very different. We will show the practical differences between the individual boxes and describe all the factors when creating transport packaging, an indicative annual consumption, a comparison of the same box when observed with different varieties of produced quality, percentage price difference due to the different parameters and the quality of the used material. The main research limitation is the lack of public data related to the types of transport boxes used by dairies in the Republic of Croatia.

Keywords: transport packaging, strategic procurement management, dairy industry, cross-functional cooperation, cost optimization.

1. INTRODUCTION

Procurement, regardless of whether it was a strategic or operational procurement method, is in charge of numerous groups of materials. Companies that have production facilities, especially the dairy industry, must have extremely developed methods of procurement of packaging. Any food industry has its own specifics in terms of development and procurement of packaging materials; however, this paper will focus on transport packaging. The survey questionnaire was conducted among the employees of the procurement sector, and respondent's answers related to the transport packaging will be presented in detail, also the other most important factors as well as the level of cross-functional cooperation. The above research was conducted in order to confirm or reject the hypotheses that were set in advance. When commencing additional research, the situation was clear that it was impossible to find public data of large dairy companies related to the packaging they use, especially transport packaging. Since there are numerous dairies in existence, this paper will study the transport boxes used by a large agricultural company. The abovementioned agricultural company in its complex has an extremely developed agriculture structure, animal husbandry, viticulture, production of delicatessen products and dairy industry. With regard to its own milk production, it produces dairy products from its own milk, obtained on its own farms where the cows are fed with the animal fodder from their own production facilities. Such encircled production "from the field to the table" offers exceptional quality dairy products from the two dairies owned by the aforementioned large agricultural company. Precisely because of the stated quality, the task of procurement, marketing, sales and production is a joint cooperation in creating quality, marketing attractive and logistically and price affordable transport packaging. Hypotheses were set before the start of the research:

H1. Employees' attitudes about packaging characteristics will differ significantly with regard to seniority (length of service), with those with less seniority agreeing more that quality, appearance and design are more important than the price and savings of packaging than those with more seniority.

H2. Modern trends in cardboard packaging design, such as the natron (brown) box variant, have significant support from purchasing sector employees.

H3. Quality cross-functional cooperation is a prerequisite for satisfactory results when creating and redesigning the cardboard packaging.

2. PREVIOUS RESEARCH AND LITERATURE OVERVIEW

Supply of cardboard packaging is an extremely specific area within the procurement sector, because it is quite restrictive to search for the previous research that has been done strictly on that topic. Because of such limitations, also work that demonstrated the results of the research that were proceeded among the employees,

students and consumers from other geographical areas have also been included, but on the topic of cardboard or transport packaging.

By means of survey questionnaire encompassing 28 questions, 200 employees from the largest group of dairy industry "Pegah" were observed. In terms of infrastructure, durability is considered as number one priority, followed by texture and materials. In terms of product awareness, production data is the most important factor in promoting a product, followed by the expiry data. Other factors including producers' information, product specifications and brand name are also considered as secondary important factors. In terms of technical factors, temperature is the most important factor followed by the environmental factors. Finally, communication was the last important factor, which influenced on consumers (Azad & Mohammadi, 2013).

The research was conducted on the consumer's habits of consuming milk, yoghurt and drinks based on yoghurt. Participants did not perceive milk products as tasty or pleasurable. For yoghurt and yoghurt drinks, only product packaging that communicated a certain 'flavour' was perceived as tasty by the participants. Participants divided yogurt drink into only four impressions. The explanation for this may be that yoghurt drink is a relatively new product category with only a few product variants of this category available in the Dutch supermarkets. The goal of the research was to support packaging designers when developing packages that better align with consumer perception (Gelici-Zeko et al, 2013).

In total of 300 respondents were submitted to research for the purpose of visibility (by testing) on shelf ready transport packaging, and also their specific functions and quality of this type of packaging. It was concluded that customers mostly notice shelf ready boxes in smaller stores (100%), however, they are less visible in hypermarkets (85%) and supermarkets (80%). According to respondents, they replied that for them the most important is to have no problems of taking out the product from the transport "shelf ready" boxes and also that they can return the product back if they change their minds, with regard to the product purchase. Interesting design, technical appearance and its simplicity are not positioned so high. The conclusion is that the transport boxes should contain more visible information about products (Korzeniowski, 2009).

Packaging is a witness of time and it follows industrial and economic development, social events and demanding conditions of consumers and markets (Bolanča et al, 2019). Cardboard boxes meet packaging requirements are cheap, provide a good visual impression and adapt to the product, to the method of distribution and the consumer needs (Petrić et al, 2012). The use of appropriate packaging materials and systems is of utmost importance to safeguard the improvements introduced in the manufacturing process as a whole and to ensure that the product lives up to the expectations of the people that consume these products (Cruz et al, 2007). The main function that companies have traditionally assigned to packaging has been related to the protection of products during distribution from a producer to the end consumer (Rundh, 2013). Creating an efficient packaging process demands correct, systematic standardization of documentation, information and criteria (García Arca et al, 2019).

Transport packaging has its primary role to protect products during transport and to preserve their basic properties. Whether it is products that are packaged in their

own packaging (dairy products) or products that are transported in their original form (tomatoes), transport packaging must fulfil its role. Packaging manufacturers, together with the procurement, must carefully weigh between the specification of the transport boxes and their price.

The logistics of milk bricks has no special requirements for conservation as it happens with other milky products like cheese, yogurt and cream (Garcia Arca et al, 2014). The nature and the characteristics of the dairy product to be packaged define the selection of the appropriate packaging material and method (Ščetar et al, 2019). The effectiveness of a package can be determined during shelf-life testing or by combining information's together from the break-point testing (Tehrany & Sonneveld, 2010). During transportation from manufacturer to the retailer's distribution warehouse there can be logistical consequences if the capacity measured by pallet changes due to manipulating the different cartons. In this case there is a chance to obtain a larger capacity with the adding new boxes, primarily when add one row of cartons onto the pallet (Erceg & Trauzettel, 2016).

The transport of dairy products can represent a particular challenge due to the sensitivity, shelf-life and structure of milk-based products. The basic packaging must meet all the set criteria by the production, and the transport packaging has the task of ensuring the logistical safety of the product and the basic marketing purpose on the shelves. If the specifications of the transport boxes are observed, there will be no difference between the milk boxes and those for delicatessen products or wine. Due to its high circulation, there may only be a procurement requirement to reduce the number of colours used and the complexity of the design in order to achieve the best possible price.

The assumption that packaging is recycled can only be made if it is recyclable by its design and if the packaging is actually collected, sorted and recycled in the respective country. Only then, a country-specific recycling rate for a type of packaging may be used (Wohner et al, 2019). For the packaging of the UHT milk, there is currently no more acceptable material than multilayer cardboard impregnated with the metal foil, which prevents the passage of light and thus prevents oxidation, but without any additional plastic closures added, but with a slightly perforated edge so that it can be torn off and open with fingers (Šćedrov & Muratt, 2008).

Ecological trends in the development and use of transport cardboard packaging affect modern marketing activities, and thus influence directly on the procurement activities related to transport boxes. Cardboard is increasingly becoming the best alternative to plastic, and even the natron paint found on the plastic containers is becoming an upward trend. The consumer's value and reward environmentally conscious companies that adapt their packaging towards the environmental standards. However, the price of organic products must in no way be higher than standard packaging, especially in the case of dairy products. It is precisely in these types of products that the elasticity of demand is extremely present.

Although traditional packaging covers the basic needs of food containment, advances in food packaging are both anticipated and expected (Ozatay, 2019). Innovative packaging technologies for milk and milk derived products are very important in the distribution process, development of extended life of the product, storage and the value added to the food and food products. Packaging is defined as a

tool that protects and contains goods with also the aims to minimize the environmental impact during the consumption of this product (Ghenai, 2012).

Traditional designs, advertising campaigns and other marketing activities have certain transience through the generations that such activities are reminiscent of youth and products that were present before, but the younger generations are looking for innovations and following modern marketing trends. Dairy products generally belong to the class of products that may not be attractive, but with a simple, modern, "wacky" and different approach, their packaging can be noticed.

Whipped cream, plain yogurt, and sour cream are the items that are most often affected by damage (e.g., the aluminium lid covering the cup gets torn). Dairy products are ordered daily, except by the larger hypermarkets that hold larger quantities of stock. Ordering takes an average of 38.2 (σ = 26.6) minutes per day (Reiner et al, 2013). Drinking yoghurts were kept in HDPE containers which were delivered from a nearby factory. All of the containers were sealed with tapes made of polyethylene and packaged in cardboard boxes with plastic film (González-García et al, 2013).

Dairy products that are liquid within their packaging are particularly sensitive to transport and the role of transport packaging is here particularly emphasized. During transport, several yoghurts may be damaged in the area of the cup or aluminium lids, which may result in the yoghurt spilling all over the entire product range. Often customers return the entire palette, which is a difficulty for the customer, and especially for the supplier due to the additional costs, lost time and profit. The dairy manufacturer by making an effort to create a satisfactory transport packaging reduces the risk of product damage and ensures safe delivery to the target warehouse or delivery location.

Most paper and cardboard food packaging materials are printed in offset print because it gives a better commercial appeal to the stored product (Richter et al, 2009). Natural fibres have gathered increasing attention because of their internal structure, which can generally guarantee high porosity. Among these fibres, cellulose is the most representative biopolymer and it is widely used for producing paper and cardboard (Asdrubali et al, 2015).

Natron box variants in 2021 are a proposed alternative by suppliers, procurement, but also consultants related to the development of transport packaging. With the simple transition from a white test liner to a plain (natron) test liner does not change the properties of the box, but there are achievements on additional savings. A certain negative side of the natron box variant is visible when printing the design. On a white test liner or box with a white background print, all colours come to a better expression. It is up to the procurement, marketing and sales to find a common agreement on how to harmonize all the mentioned specifications of the transport packaging.

3. RESEARCH METHODOLOGY AND ITS LIMITATIONS

Research done by the survey questionnaire was conducted among the supply business employees from the areas of the Republic of Croatia. Research was

undertaken during the June and July of 2021. In total of 64 respondents have answered, what is a small sample for the acceptance of important conclusions, but it can be determined that the number of respondents is relatively satisfactory, with respect that respondents were targeted exclusively from the territory of the Republic of Croatia, and that it's about a specific topic prevailing in the supply business.

The purchasing employees were targeted and contacted via Linkedln social network, and also through personal contacts, and it was emphasised that it was about a research dealing with the transport packaging, therefore replied the employees, stemming from the supply business that are directly concerned with the packaging, i.e., by purchasing and producing of transport boxes. The abovementioned targeted research is limiting in its scope, because it simply do not exist a very large number of companies on the territory of the Republic of Croatia, which are engaged in production activities that requires transport boxes to bring finished product to the end customers and the consumers. In Table 1 is shown the structure of the sample and research results.

Table 1. Sample structure (N = 64)

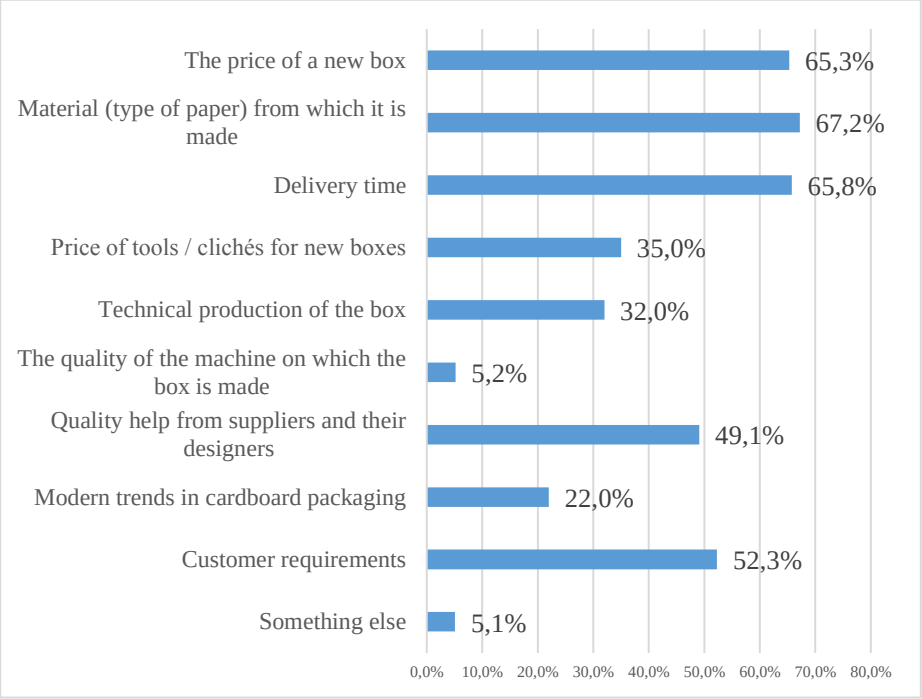
		n	Percentage
Gender	Male	28	43,8 %
	Female	36	56,3 %
Education	Secundary education	3	4,7 %
	Professional study	6	9,4 %
	University study	55	85,9 %
Company size	From 11 to 50 employees	4	6,2 %
	Between 51 and 250 employees	21	32,8 %
	More than 251 employees	39	60,9 %

Source: authors

4. RESULTS AND DISCUSSION

Before beginning of the research, the goal was set that the purchasing employees will solely be contacted, so to gain the more relevant replies. As a result of such limitations, it's difficult to assess that the specified research has been relevant to the global frameworks, but it can bring interesting findings on the national level. Results clearly follow a set of hypotheses, showing opinions and conclusions from the employees of the supply business on the issue of making and redesign of the transport boxes. It's an extremely specific area, but crucial in the entire chain of production and delivery of the final products to the distributors, customers and consumers. On Figure 1 is shown the most important factors when creating new transport packaging.

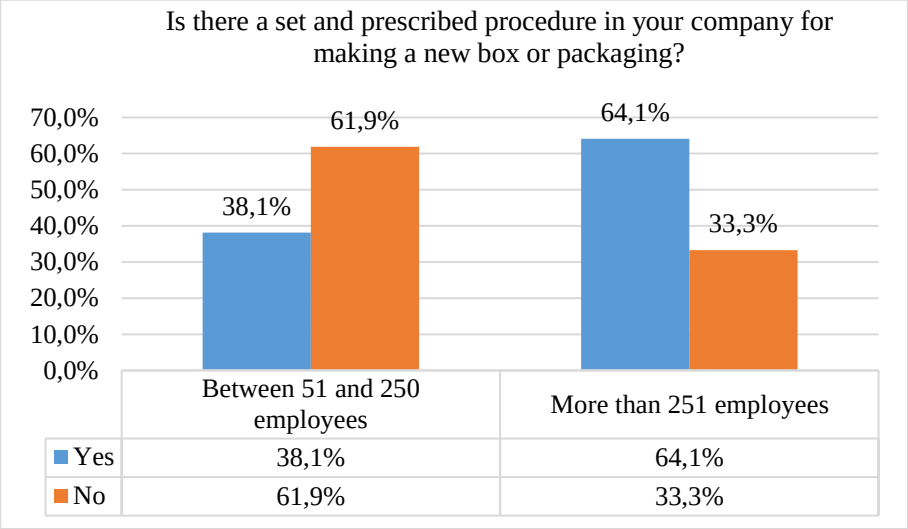
Figure 1. The most important factors when creating a new transport packaging



Source: authors

Participants consider the price of the box (65,3%), the material from which the box is made (67,2%) and the delivery time of the box (65,8%), to be the most important factors when creating new transport packaging. The basic priority for the procurement employees is to procure a quality product or service at the best price, so it is not surprising that the most common answer is related to the price. It is interesting to see that after comes the quality of the box and the delivery time. Deadline of delivery can be agreed upon, but with the careful planning, the impact of this factor can be eliminated. The quality of products in each case must occupy an important place in the priorities when making new boxes, if not the most important one. Without quality box construction from quality materials, the box cannot satisfy its primary function. The quality of the machine on which the box is made is considered as the least important factor (5,2%). On Figure 2 it's shown how the relevant procedures for the creation of new transport box depend on the size of the company.

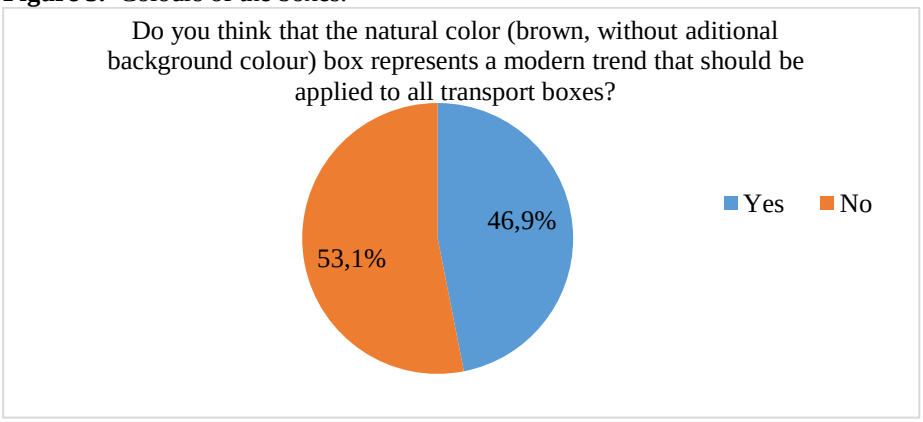
Figure 2. Procedure for making a new box or packaging



* On presented data for the companies sized from 11 to 50 employees has not been shown because only four contributors participated.
Source: authors

Employees who work in companies that have 51-250 employees, 61,9% stated that in their company does not exist prescribed procedure for making new boxes or packaging, while 64,1% of those who work in companies that counted more than 251 of employees, stated that such procedure does exist. Results show that most large companies have developed procedures for the development of transport packaging, which in large measure helps better quality and up to date cross-functional cooperation. By the rule, small companies have more agile communication, so they can quickly react to changes and to implement them, and this is a possible reason for the absence of the aforementioned procedures. Additional question has been related to the need for a set procedure, when the majority of participants in research (81,2%) considered that the necessary quality set of procedures of making the new boxes is of upmost necessity, which regulates what sector within the company has the determined level of responsibility, and also which activities should be carried out by means of the development of the new boxes. In Figure 3 is shown the answer to the current question in the procurement business, i.e., whether the boxes should be switched to the natron variant, in line with the modern trends.

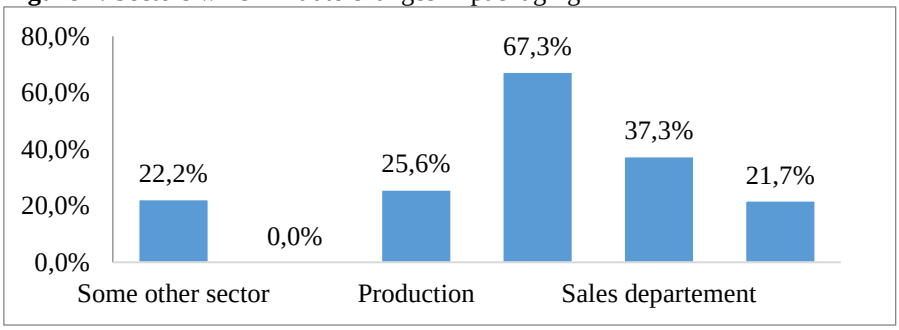
Figure 3. Colours of the boxes.



Source: authors

This chart represents a divided opinion of employees about the brown colour of the box as a modern trend that should be applied to all transport boxes. Half of the participants agree to specified colour (brown) that should be applied to all transport boxes, while half of them disagree and considered that it's not to be the case. The above result shows the division of agreement with the modern trends favouring the more usage of the natron box, i.e., for the more natural appearance of the box that is linked to the environmental awareness and recycling. The added value to the future research will be the present results of research of the opinions of customers and consumers on the topic of assessing the visual impact of ecological transport boxes, to incite the consumer's decision to final purchasing of the product. On Figure 4 is shown which sectors are involved in the development of transport boxes. Additional analysis of the opinion of marketing employees on this topic would be of extreme interest to present and compare with the opinion of employees of the procurement business.

Figure 4. Sectors which initiate changes in packaging



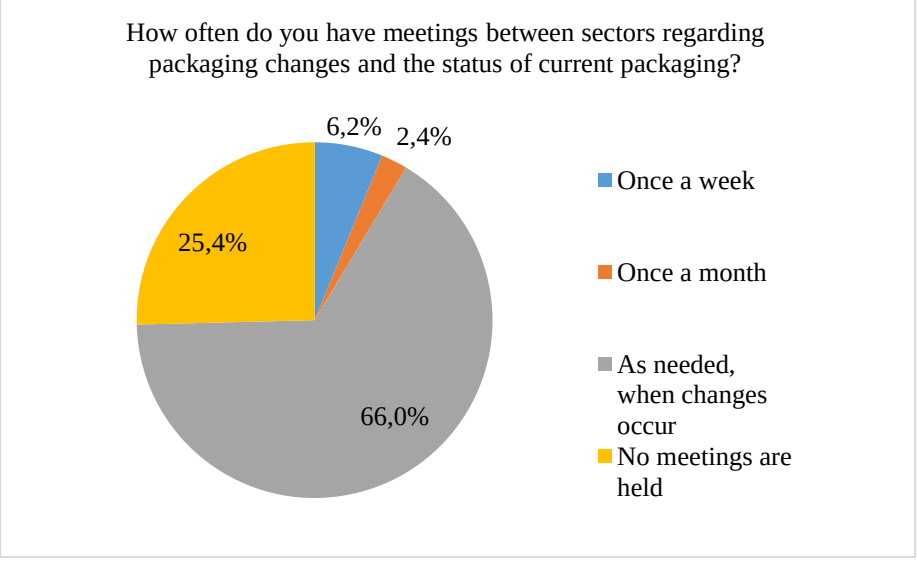
Source: authors

To the fullest extent, the participants perceive marketing sector as a sector that initiate a change in packaging (67,3%). However, finance sector, procurement and

manufacturing sectors at least participate in initiatives to change the box appearance, and in most of the cases is expected from the marketing sector to take a key initiative to the changes of transport packaging. Sales feedback information can be obtained directly from the market, from distributors and buyers of the product. Marketing, on the other hand, comes up with its own initiatives for change by following marketing trends on the market or when changing the brand image.

The second question was connected to participating of the sector in the development of new boxes, with the procurement sector in accordance to estimates of participants which, to the fullest extent participates to the development of transport packaging (78,6%), and to the lesser extent also participates the marketing (65,2%) and the production sectors (58%), respectively. The finance and legal services sectors are not at all involved in the production of transport packaging. The results clearly indicate that the cooperation between procurement, marketing, sales and production sectors is crucial in the process of developing of a new packaging. The established procedures standardize cooperation, and clearly define responsibilities and activities. Regardless to the set procedures, individual employees from each of the sector by their behaviour, knowledge and experience mostly contribute to the quality of change and development of packaging. On Figure 5 is presented the cross-functional collaboration, and shows dynamics of the meetings between sectors for the purpose of development and redesign of cardboard packaging.

Figure 5. Frequency of meetings between sectors



Source: authors

The companies in which employees hold the meetings between sectors at issue of changes the packaging and the status of current packaging, - in the most cases, meetings are usually hold as needed – only when it comes to a change (66,0%). We should pay attention to the fact that 25,4% of participants stated that such meetings

do not take place at all. It was confirmed that regular and quality communication between sectors improves cooperation, especially in situation of crisis. Respondents have confirmed that the relatively small number of meetings are held in accordance to the need, when it is, perhaps, too late to bring about the quality solutions, or to set deadlines for the execution of complex tasks that would be better resolved if the frequency of meetings were increased. In Table 3 are displayed purchasing employee's responses to the set claims, with regard to the length of their work service.

Table 3. Results based on years of service

	Length of service				
	2 to 14 years of service (*n* =31)		**15 to 26 years of service (*n* = 33)**		
	M	*SD*	*M*	*SD*	*t*
The transport box should primarily have the best price; quality is the second priority	2.19	1.17	2.64	1.27	-1.45
The load capacity of the box should be more important than the design and appearance of the box	3.87	1.12	4.27	1.01	-1.51
An initiative to improve the box is expected from the supplier	2.90	1.07	2.39	1.36	1.65
Insufficiently attractive appearance of transport packaging is direct cause of a decrease in product sales	2.94	1.03	3.21	1.08	-1.05
Savings on shipping boxes are more important than box design / printing	3.52	1.03	3.18	1.04	1.29
Weakening of the box (reduction of layers) is acceptable if significant savings are achieved	2.48	1.18	2.58	1.27	-0.29
The design of the box is desirable to often changes and it align with the modern marketing trends	2.90	1.19	2.88	1.11	0.08
During the production and revision of transport packaging, procurement and marketing consult with the logistics service	4.10	1.14	4.00	1.06	0.35

The change of the recognized visual / design of transport packaging is not required due to market trends	3.52	1.21	2.52	1.00	3.62**
The design of the transport box should be as simple as possible, with a maximum of use of two colours	3.81	1.25	3.76	1.06	0.16

** $p < 0.01$

Source: authors

By analysing of the arithmetic means of participant's responds on particular subjects, it can be observed that employees with fewer years of work service have somewhat different attitudes from those respondents with more years of work service. The cause can be found in the level of experience, from a different perception of modern trends, or a desire for a change. Therefore, those employees with more than 15 years of working service in something larger degree consider quality as a second priority, and for the transport box primarily to have the most favourable price, that the load ability of boxes should be more important than the design and the appearance, and the weakening of the box has been found acceptable if with its significant savings can be achieved. It can be concluded that the price is the key factor, and the quality of the box immediately occupies the second place. Employees with more years of work service, the box design do not place among the most important priorities. However, also there are more those respondents with less years of work experience, and therefore less the length of the work service, do believe that the box design should change frequently to harmonize the box design with modern marketing trends, and also that procurement and marketing consult with the logistics department when making and auditing the transport packaging. Here I would like to stress that by said I do not mean that the employees with less working service and experience are wrong, but it is interesting to conclude that there are significant differences in priorities between employees with different years of work service.

5. TRANSPORT PACKAGING ON THE EXAMPLE OF A LARGE AGRICULTURAL ENTERPRISE

Through the analysis of the theoretical framework related to cardboard packaging, it is concluded that this type of packaging is considered extremely important, but only for the protection of the product it transports. This conclusion can be observed in different ways, but each type of packaging is equally important for the procurement. In Table 4 is shown the share of cardboard packaging in the purchase values of the observed large agricultural enterprise.

Table 4. Share of cardboard packaging in purchase values.

Value of cardboard packaging in the total purchase value of packaging	15,59%
The value of cardboard packaging in the total value of procurement	0,59%
Share of cardboard packaging for the dairy industry in relation to the value of total procurement for two dairies	2,92%
The share of the value of cardboard packaging in the value of packaging procurement for two dairies	12,19%

Source: authors

The first comparison shows the share of the purchase of cardboard packaging in the total value of the purchase of all packaging. The procurement of packaging comprises transport boxes, plastic cups and lids, winery bottles, corks and bottle lids and pallet packaging. Cardboard packaging occupies 15,59 % of the total value of the purchase of packaging, which is a large percentage, if we take into account the various types of packaging that are ordered. The total purchase value of all orders is extremely high, given that it is an agricultural company engaged in farming, animal husbandry, pig farming, animal fodder factory, etc. In the total purchase value, the purchase of cardboard packaging makes only 0,59 %. If the comparison focuses on only two dairies owned by a large agricultural company, it is concluded that the purchase of cardboard packaging occupies 2,92 % of the purchase value of all materials and services observed for the two dairies. If we look at the procurement of packaging for two dairies, cardboard packaging occupies 12,19 %. In Table 5 is shown the list of boxes used by the two dairies, box dimensions, number of cardboard layers, wave type, outer layer material expressed in grams, and the material and weight in grams of the inner layer.

Table 5. Cardboard packaging specifications

					Outer layer		Inner layer	
The box name	Standard dimension	Number of layers	Layer designation (A, B, C, E, F, BC, CE, EF…)	Layer thickness (mm)	Material name	Weight (g / m2)	Material name	Weight (g / m2)
BOX OF SEMI-HARD CHEESE	315 x 260 x 208	5	BB	5,5	Test liner	100	Test liner	100
BOX OF FRESH CHEESE 500G	343x230x100	3	B	2,69	White test liner	120	Test liner	120
BOX FRESH CREAM CHEESE 100G-200G	321x153x115	3	B	2,5-3,0	White test liner	140	Test liner	135
BOX FRESH CREAM CHEESE 70G	365X186X112	3	B	2,69	White test liner	120	Test liner	120
BOX MILK WITHOUT DESIGN 1L	295X231X200	3	B	2,75	Test liner	120	Test liner	120
BOX MILK WITHOUT DESIGN 0,5L	303X220X118	3	B	2,75	Test liner	120	Test liner	120
BOX YOGHURT / CREAM 180G	392X265X50	3	B	2,70	White test liner	120	White test liner	120
BOX FOR BRANDS YOGHURT / CREAM 180G	372x292x38	3	E	1.50-1.65	White test liner	125	White test liner	125
BOX OWN BRAND CREAM / YOGHURT 180G	372x292x38	3	E	1.50-1.65	Test liner	110	Test liner	110
BOX OWN BRAND MILK 1L	288x230x213	3	B	2.50-3.0	Test liner	115	Test liner	115

Source: authors

It has been shown the ten boxes which are the most circulating type of boxes and the most important for the business of the two aforementioned dairies. The dimensions are adapted to the packaging of the products that need to protect and ensure adequate transport to the final destination, store or storage space. Most boxes are of B wave, while only the box for semi-hard cheeses is BB wave, which is a specific wave designation produced by only one manufacturer of the cardboard packaging in the Republic of Croatia, but it does not differ significantly from B wave. The material of all boxes is a testliner, but there is a difference in colour. The basic colour of the test liner is brown or natron colour, which represents the base colour of recycled cardboard. The white test liner is used in five boxes, mostly due to the need for quality printing and achieving more vivid and striking colours. In Table 6 is shown which

boxes have a design, what is the print type, number of colours, and a colour box coverage in percentage.

Table 6. Cardboard packaging design

The box name	FEFCO box type designation	Design	Type of printing	Number of colours	Colour coverage of the box surface (% of surface)
BOX OF SEMI-HARD CHEESE	204	yes	flexo	1	30,00%
BOX OF FRESH CHEESE 500G	451	yes	flexo	1	10,00%
BOX FRESH CREAM CHEESE 100G-200G	201	yes	flexo	1	20,00%
BOX FRESH CREAM CHEESE 70G	406	yes	flexo	1	10,00%
BOX MILK WITHOUT DESIGN 1L	406	no	-	-	-
BOX MILK WITHOUT DESIGN 0,5L	406	no	-	-	-
BOX YOGHURT / CREAM 180G	/	no	-	-	-
BOX FOR BRANDS YOGHURT / CREAM 180G	990	yes	flexo	2	20%
BOX OWN BRAND CREAM / YOGHURT 180G	990	yes	flexo	2	10%
BOX OWN BRAND MILK 1L	990	yes	flexo	2	15%

Source: authors

If we look at Table 6 in more detail, it can be concluded that only three of the boxes do not have a design. These boxes are not anyway unique and they do not represent a specific strategic decision to reduce the number of colours, but it is a requirement of customers of large retail chains. These three boxes intended for 1l milk, 0,5l milk and 180g yogurt / cream have their "sister" boxes in variants of the own brand of a large agricultural company. Boxes that transport products of their own brand have a specific design that has been carefully considered, but the number of colours and coverage of the box have been taken into account, so as not to drastically increase the price of the box. To achieve the best purchase price, it would be most efficient to work all boxes in the natron variant, without or with basic printing in one colour (company logo only). However, such a procurement requirement, as a rule, always comes to extremely high criticism of marketing and sales, which have the extremely demanding task of making products as recognizable as possible, especially if they are packed in shelf-ready boxes.

6. CONCLUSION

The first from the set of hypotheses (H1), namely, employees' attitudes about packaging characteristics will differ significantly with regard to seniority (length of service), with those with less seniority agreeing more that quality, appearance and design are more important than the price and savings of packaging than those with more seniority, has been confirmed. Employees from the purchasing sector who have more than 15 years of work service have confirmed that to them are the most important costs and potential savings, while the employees with less of 15 years of work service have confirmed that to them still are the most important factors of the design and technical characteristics of the box. Among the particles that examined the attitude of employees about the characteristics of packaging with respect to work experience, the most significant difference was for the particle "Recognized visual / design of transport packaging should not be changed due to market trends" ($t = 3.62$, $p < .01$). Significantly more employees with fewer years of service agree with this statement ($M = 3.52$). Previous research done by Azad and Mohammadi (2013) was carried out among a larger number of respondents from different sectors of dairy industry, and on the territory of Iran. In the above study was confirmed that to the staff is the most important factor the endurance of the box, followed by texture and material development. The results may be partially related, but here exists the limiting factor for that the research done in this paper covers only the procurement employees.

The second hypothesis (H2), - for the modern trends in cardboard packaging design, such as natron (brown) variants of boxes have a significant support from the employees of the procurement sector, the hypotheses is partially confirmed, given that 53,1% of procurement employees agreed with the statement that the natron box colour represents a modern trend that should be applied to the all-existing boxes. Future research would have to include the opinions of employees pertained to sales and marketing, as would be rendered results on the cross-functional level. Employees with fewer years of service from the supply sector are more inclined to the modern marketing trends in relation to the employees with the more work service. Partial confirmation of the hypotheses has to be taken with caution with respect to the small sample encompassed during the research; it would be interesting to obtain opinions of employees from the purchase sectors throughout Europe. Conclusion for the second hypothesis is to be linked with the remaining of the two mentioned research at the beginning of the paper, in which they are, on one hand, the students (Gelić-Rabbit, Lutters, Klooster, Weijzen, 2013), who confirmed that the customers are attracted to the specific colours present on the cardboard packaging; however, the results of the other research (Korzeniowski, 2009) stated that for the customers, the most important thing is the practicality of the box and the ease to take out the product.

The third hypotheses (H3) - quality cross-functional cooperation is a prerequisite for satisfactory results when creating and redesign of cardboard packaging, can be

considered confirmed. The cross-functional cooperation between the procurement sector and other sectors that effect on development of transport packaging is inevitable; without it there is no quality and rapid change or development of packaging. Procedures are the basis of cross-functional cooperation, and it is especially true in large companies where 64,1% of respondents have confirmed that such procedures do exist. The medium companies, these 38,1% of them, have developed procedures, but the aforementioned can be attributed to the greater dynamics through the cross-functional cooperation between sectors in medium companies. Larger companies, with more manufacturing plants, large number of employees and with a complicated hierarchy, by means of procedures is governing the mutual relations and makes an improvement of business operations. Cross-functional meetings are held as needed (66%), once a week (6,2%) and once a month (2,4%), which is an indicator of the presence of the cross-functional cooperation and understanding of cooperation between teams, when the topic indicate the further changes in packaging. An example of the procedure of creating and revising of the transport packaging is still one of the greatest examples where one can observe a clear involvement of multiple sectors, all with their clear responsibilities and tasks.

On the example of a large agricultural company on the territory of the Republic of Croatia, which owns two dairies, transport boxes were presented according to their detailed characteristics. Particularly has been shown the value of the packaging of the dairy industry in the total procurement of the company, i.e., the value of the procurement of packaging, the value of the total procurement of the two dairies and the value of the procurement of packaging for the two dairies that were presented separately. Transport packaging accounts for 15,59% of the value of total packaging procurement and 12,19% of the total value of packaging goes for the dairy industry. It is this data that shows the significant share of aforementioned packaging in the procurement sector. The observed large agricultural company is engaged in a number of other activities, and therefore the share of total procurement of transport boxes amounts only 0,59%. A total of 10 boxes were observed, which are quite similar in their characteristics, but they are also different. Several boxes differ only in design, as one type is intended for brands while the other types are used for their (company) own brand.

The real contribution of science can be observed through confirmations or partial confirmations of set hypotheses. By directly examining procurement employees dealing with transport packaging, the obtained results helped to understand modern trends in the development of transport packaging, awareness of the importance of cross-functional cooperation and what is more important for procurement employees - price or quality. Future surveys and research should cover more sectors (sales, marketing, manufacturing, logistics), but also the buyers from the areas of the Republic of Croatia, in order to bring concrete results and confirmation of hypotheses

on the issue of design of transport packaging. It would be interesting to see an impact of design and practicality of transport packaging or the boxes on the sales results of a particular product.

7. REFERENCES

Asdrubali, F., Pisello, A. L., D'Alessandro, F., Bianchi, F., Cornicchia, M., & Fabiani, C. (2015). Innovative cardboard based panels with recycled materials from the packaging industry: thermal and acoustic performance analysis. *Energy Procedia*, *78*, p. 321-326.

Azad, N., & Mohammadi, M. (2013). An empirical survey on factors influencing on packaging dairy products. *Management Science Letters*, 3 (7), 1901-1906.

Bolanča, Z., Milković, M., Bolanča Mirković, I. & Medek, G. (2019). Tehnološki razvoj etiketa, papirne i kartonske ambalaže u Hrvatskoj uključujući ekološki aspekt. *Annual of the Croatian Academy of Engineering*, 2019 (1), p. 36-50.

Cruz, A., Faria, J., & Van Dender, A. (2007). Packaging system and probiotic dairy foods, Food Research International 40, p. 951-956.

Erceg, A. & Trauzettel, V. (2016) Packaging in retail supply Chains, *16th. International scientific conference Business Logistics in Modern Menagement*, Osijek, Croatia

Garcia Arca J., Prado Prado, J. & Gonzales-Portela Garrido A. (2014). Packaging Logistics. A case study in dairy sector. *Book of Proceedings of the 7th International Conference on Industrial Engineering and Industrial Management – XVII Congreso de Ingenieria de Organizacion*, p. 585-593.

García Arca, J., Gonzalez-Portela, G. & Trinidad & Prado, A. (2019). Organizational best practices in packaging design. An analysis in perfumery and clean- ing products. *Direccion y Organizacion*. P. 5-19.

Gelici - Zeko, MM, Lutters, D., ten Klooster, R., & Weijzen, P.L.G. (2013). Studying the influence of packaging design on consumer perceptions (of dairy products) using categorizing and perceptual mapping. *Packaging Technology and Science*, 26 (4), 215-228.

Ghenai, C. (2012). Life cycle assessment of packaging materials for milk and dairy products. *Int. J. of Thermal & Environmental Engineering*, *4*(2), p. 117-128.

González-García, S., Castanheira, É. G., Dias, A. C., & Arroja, L. (2013). Environmental life cycle assessment of a dairy product: the yoghurt. *The International Journal of Life Cycle Assessment*, *18*(4), p. 796-811.

Korzeniowski, A. (2009). Shelf ready packaging in consumers' opinion. *LogForum – Electronic Scientific Journal of Logistics*, Vol. 5, Issue 2, No1.

Ozatay, S. (2019). Recent Packaging Applicationis in Dairy Industry, International Journal of Scientific and Technological Research, ISSN 2422-8702 (Online), DOI: 10.7176/JSTR/5-6-04 Vol.5, No.6. p. 25-29.

Petrić, D., Vusić, D. & Geček, R. (2012). Kartoni: od proizvodnje do konačne primjene, *Tehnički glasnik*, 6(2), p. 219-227.

Reiner, G., Teller, C., & Kotzab, H. (2013). Analyzing the efficient execution of in-store logistics processes in grocery retailing—The case of dairy products. *Production and Operations Management*, *22*(4), p. 924-939.

Richter, T., Gude, T., & Simat, T. (2009). Migration of novel offset printing inks from cardboard packaging into food. *Food Additives and Contaminants*, *26*(12), p. 1574-1580.

Rundh, B. (2013). Linking packaging to marketing: how packaging is influencing the marketing strategy, *British Food Journal, Vol. 115 No. 11*, pp. 1547-1563.

Ščetar, M., Barukčić, I., Kurek, M., Lisak Jakopović, K., Božanić, R. & Galić, K. (2019). Novi trendovi pakiranja mlijeka i mliječnih proizvoda, *Mljekarstvo 69, br. 1*, p. 3-20.

Tehrany, E. A., & Sonneveld, K. (2010). Packaging and the shelf life of milk powders. *Food packaging and shelf life, a practical guide. CRC Press, Boca Raton, London*.

Wohner, B., Schwarzinger, N., Gürlich, U., Heinrich, V. & Tacker M. (2019). Technical emptiability of dairy product packaging and its environmental implications in Austria. [available at: https://peerj.com/articles/7578/ access May 31, 2021]