

## **PACKAGE PREFERENCES OF LIQUID DAIRY PRODUCTS BUYERS**

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**Key words:** preferences, packages, package characteristics, dairy products.

### **Abstract**

Contemporary packages evolve continually. In the old days the packages were to secure, first of all, protection of the products placed on them. Today they assume all the time new functions, which causes that their role increases systematically. The study aimed at identification of the factors influencing the choice of the liquid dairy products packages. It was found out that the following factors had the largest influence on the decisions by the buyers: taste of product in a given package and shelf life of the product in it. It was also shown that the package preferences of buyers are conditioned by demographic and economic factors characterizing them.

### **PREFERENCJE NABYWCÓW DOTYCZĄCE OPAKOWAŃ PŁYNNYCH PRODUKTÓW MLECZARSKICH**

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**Słowa kluczowe:** preferencje, opakowania, cechy opakowania, produkty mleczarskie.

### **Abstract**

Współczesne opakowania nieustannie się zmieniają. Niegdyś miały zapewniać przede wszystkim odpowiednią ochronę umieszczanym w nich produktom. Dziś spełniają wiele nowych funkcji, co sprawia, że ich rola systematycznie rośnie. Celem pracy była identyfikacja czynników wpływających na wybór opakowań płynnych produktów mleczarskich. Stwierdzono, że największy wpływ na decyzje nabywców mają: smak produktu w danym opakowaniu i długość okresu przechowywania w nim produktu. Wykazano również, że preferencje nabywców są uwarunkowane charakteryzującymi ich czynnikami demograficzno-ekonomicznymi.

## **Introduction**

Contemporary packages – protecting products quality increasingly well, visually attractive, ergonomic, ecological, possessing the possibility of controlling quality of products or warning against expiration of the shelf life date (CICHÓN 1996, KOSIOROWSKA, LESIÓW 2005) – evolve continually. In the old days the package was, first of all, to provide adequate protection for products stored in them. Today the traditional functions of packages (protective, economic) have been complemented with newly created functions such as promotion, information, education and ecology (LISIŃSKA-KUŚNIERZ, UCHEREK 2003). Assuming all the new functions causes that the package is increasingly often considered a special attribute of product placed in it. According to URBAN (1999), packages possess too many characteristics independent off the product to be able to treat them jointly. In case of liquid dairy products it is difficult to agree with that opinion unanimously; this is determined to a significant extent by their specificity (PANFIL-KUNCEWICZ 1998). Those products are “hidden” and their distribution without a package is absolutely impossible. As a consequence, the package – being somehow an integral part of the product – influences the market choices of buyers. Independent off whether we treat the package as a part of the product or as a separate element of it, its role is systematically increasing and, as stated by MRUK (1999), the competitive combat of enterprises to win buyers will become more the fight of packages than products.

Facing the increasing diversity of the market offer the buyer is facing the challenge of choosing the package. Assessment of the available market offer is made usually from the perspective of characteristics the packages possess, next values are assigned to those characteristics, and the choice is made. As a result, trying to appreciate the values of packages or disregarding them the buyer decides to purchase a product in a given package or resigns it. That choice, as it could seem, is not an easy one because the market is increasingly abundant and the competition within it causes that sometimes, because of the similarity of functions fulfilled by packages, it becomes increasingly uniform. As a consequence the buyer, although having a wide range of products to choose from, because of the similarity of functions fulfilled by competitive packages must carefully consider the decisions to be taken. Additionally, preferences of buyers are influenced significantly by demographic and economic conditions (GARBARSKI 1994). All that causes that the buyer makes the choice from many products in increasingly diversified packages on the basis of specific preferences.

Package preferences of buyers encompass many characteristics that are assigned to packages. According to GÓRSKA-WARSEWICZ (2003) all characteristics

that make the consumer purchase the product in a given package are important, however, from the economic point of view two of them should be of particular importance: package capacity and package type. As a consequence the goal of the study was to:

- identify the factors (characteristics) determining the choice of liquid dairy products packages;
- analyze selected characteristics of packages of major importance for product purchase decision;
- determine the influence of demographic and economic profile of the buyers on their preferences concerning the package capacity and type.

### Methodology of study

The studies were carried out on a random population of 677 respondents during the period from March till May 2006 in Olsztyn sub-region of Warmia and Mazury voivodship. The study on that population was carried out in large trade outlets: super and hypermarkets increasingly popular among the clients (KŁOSIEWICZ, GÓRECKA 2005), as well as neighborhood and company shops.

The questionnaire-based method was applied using the questionnaire consisting of three parts. The first of them covered opinions of the respondents concerning the factors determining the choice of package. The second part covered the information on the knowledge of ecological values of packages while the third part covered the characteristic of the demographic and economic profile of the respondents (gender, age, education, place of residence, household size, monthly income per capita in the household).

The results were subject to statistical analysis using the non-parametric independence test  $\chi^2$ . The dependence of covered characteristics was considered significant assuming the significance level  $\alpha < 0.05$ . In case of significant dependences the strength of the relation between the studied characteristics was assessed by applying the *V*-Cramer coefficient computed according to the formula:

$$V = \sqrt{\frac{\chi^2}{N \cdot \min(k - 1, w - 1)'}}$$

where:

*N* – number of observations, *k* and *w* – dimensions of two-dimensional matrix.

As a consequence of the possibility of selecting a number of possible answers or giving no answer by the respondents the results presented do not always total at 100%.

The covered population was dominated by:

- respondents aged up to 35 years (70.9%),
- women (75.9%),
- respondents with at least secondary education (72.7%),
- married people (49.8%),
- households consisting of 3 and 4 persons (53.1%),
- residents in towns with the population exceeding 60.000 (45.9%),
- people generating income from employment (73.7%),
- people shopping in super and hypermarkets (78.1%).

## Results and discussion

Influence of the individual characteristics of the package on purchase decisions was studied (Tab. 1).

According to more than 80% of the respondents the taste impressions of product in a given package (83.7%) and shelf life of product in the package (81.1%) had at least a significant influence on the product purchase decision. More than 70% of the respondents believed that functionality of the package and price of product in a given package were characteristics of significant influence on their preferences. From the perspective interesting to us significant positions in the ranking of package characteristics were taken by the packaging material (63.4%), package capacity (62.9%) and placing the producer's brand on the package (61.2%) – frequently associated with the product itself.

Additionally, more that 50% of the respondents also noticed the importance of information placed on the packages (53.2%) and their environment-friendly character (51.7%). Those were the characteristics ranked higher in the positive assessment of the package than characteristics such as the looks, shape and esthetics (43.2%) or lightness of the package (31.6%).

Further analysis covered selected characteristics of packages that because of their influence on the purchase decision took top positions in the ranking. Those were: taste impressions related to product in a given package, price, capacity and size of the package as well and environment friendly character of the package.

Taste impressions related to the product in a given package were the characteristic that the buyers of dairy products ranked the highest. As a consequence, the beliefs of the respondents concerning the influence of package type on taste values of products contained in them were determined (Fig. 1).

Table 1  
 Characteristics of the package and their influence on product purchase decisions  
 (percentage of respondents)

Package characteristics	Influence on purchase decision (rating) <i>N</i> = 677 (100%)					percentage of respondents for whom the package characteristic is "at least significant"
	insignificant	low significance	indifferent	significant	highly significant	
Package material	8.4	12.6	7.8	50.1	13.3	63.4
Looks, shape, esthetics	8.9	25.8	13.7	35.5	7.7	43.2
Functionality	2.5	9.6	8.7	47.1	24.8	71.9
Size, capacity	5.2	12.3	12.0	48.9	14.0	62.9
Lightness	18.2	26.6	14.3	24.8	6.8	31.6
Producer brand	7.2	13.7	11.1	44.2	17.0	61.2
Price	2.8	10.5	8.9	46.7	24.7	71.4
Taste impression of product in the package	2.1	1.6	5.3	27.3	56.4	83.7
Shelf life length	2.1	4.7	5.5	40.6	40.5	81.1
Additional information on the package	8.0	18.0	12.3	35.2	18.0	53.2
Ecology	7.5	15.7	15.2	34.0	17.7	51.7

Source: Own work based on own studies.

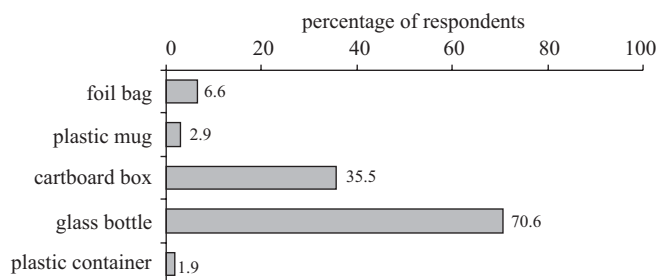


Fig. 1. Influence of package type on maintaining taste values of the product

Source: Own work based on own studies.

The highest percentage of respondents (70.6%) indicated glass bottle, and then cardboard box (35.5%) as packages securing the best taste values of products packed in them. The other types of packages scored much worse. In the decreasing order they were ranked as follows: foil, plastic container and plastic bottle.

Price of the product in a given package was another characteristic of the package that the buyers consider when selecting the package. The opinions of respondents concerning prices of liquid dairy products in different packages are presented in Table 2.

Prices of products in packages according to the respondents  
(percentage of respondents)

Table 2

Package type	Score $N = 677$ (100%)						
	cheapest	cheap	average	expensive	the most expensive	no answer	percentage of respondents for whom the package was "too expensive"
Foil bag	78.7	7.2	1.6	0.6	0.6	11.2	1.2
Plastic container	3.8	42.8	26.0	7.8	4.4	15.1	12.2
Cardboard box	3.2	17.9	26.3	25.4	16.7	10.5	42.1
Glass bottle	3.8	6.6	9.9	18.9	48.9	11.8	67.8
Plastic bottle	3.0	15.4	27.9	28.7	10.6	14.5	39.3

Source: Own work based on own studies.

Definitely the highest percentage of respondents (67.8%) considered the glass bottle the package that was "too expensive". The foil package was considered by the buyers the definitely cheapest package (only 1.2% of the respondents indicated the foil as "too expensive"). The respondents generally did not see the difference between prices of cardboard and plastic packages ranking them similarly from that perspective. This indicates that they treated them as compatible in price.

The buyer facing a shop shelf notices the package material from which the package is made and its capacity first. Considering the above Tables 3 and 4 present the types and capacities of packages for milk and drinks purchased by the buyers. Next, those characteristics were subject to statistical analysis (Tab. 5 and 6). The analysis covered the part of population that purchased dairy products "frequently" or "always".

The respondents purchased fresh milk most frequently in cardboard boxes (58.7% of the respondents) and in foil (26.5%). 90.6% of the respondents purchased UHT milk in cardboard box. The highest percentage of the respondents (69.9%) purchased yogurts in plastic containers. As concerns the other packages of yogurt available in the market (foil, cardboard boxes and plastic bottles) the buyers selected cardboard boxes the most frequently 23.7%).

Table 3

Liquid dairy products purchased in different packages  
(percentage of respondents)

Product	Package type				
	Foil	Plastic container	Cardboard box	Glass bottle	Plastic bottle
Fresh milk	26.5	–	58.7	6.4	10.3
UHT milk	–	–	90.6	–	–
Yogurt	5.4	69.9	23.7	–	9.0
Kefir	2.4	37.5	23.7	–	10.9
Buttermilk	1.6	23.7	45.0	–	10.6
Flavored milk	–	8.1	21.5	–	–
Sour milk	–	9.9	–	–	–
Other dairy drinks	–	–	10.6	–	–

Source: Own work based on own studies.

Kefir once available in plastic containers only still enjoyed the highest popularity among consumers packed in that type of packages (37.5%). On the other hand, cardboard boxes appearing increasingly frequently in the market were appreciated by 23.7% of the respondents. In case of buttermilk the preferred packages were plastic containers and cardboard boxes (23.7% and 45.0% of the respondents respectively). Cardboard boxes with a straw were the most popular packages among the buyers of flavored milk – the product targeted in particular at the youngest buyers. Sour milk and other dairy drinks (e.g. fruit and milk drinks) were purchased with a relatively lower frequency. As concerns sour milk the respondents' preferences were limited to the only type of package available in the market (plastic container). The other dairy drinks were purchased most often by the respondents in cardboard boxes.

Verification by  $\chi^2$  test concerning the influence of demographic and economic factors on the assessment of the packaging material influence on the purchase decisions showed a significant correlation in case of gender, marital status, place of residence and number of persons in the household (the assumed significance level  $\alpha < 0.05$ ) (tab. 4). It was found out that the choice of packaging material was influenced the strongest by the marital status ( $V = 0.132$ ), gender ( $V = 0.126$ ), number of persons in the household ( $V = 0.122$ ) and place of residence ( $p = 0.108$ ). In case of other tested factors such as age, education and monthly income of the household no significant correlations were found.

Table 4

Capacity of liquid dairy product package purchased  
(percentage of respondents)

Product	Package capacity							
	Up to 0.15 liter	↑0.15 – ↓0.25 liter	0.25 liter	↑0.25 – ↓0.50 liter	0.50 liter	↑0.50 – ↓1 liter	1 liter	Over 1 liter
Fresh milk	–	–	–	–	12.5	–	45.2	4.9
UHT milk	–	–	–	–	14.0	–	54.0	8.6
Yogurt	8.8	20.1	31.2	28.5	21.8	5.1	5.2	–
Kefir	–	–	–	18.0	21.5	4.7	9.9	–
Buttermilk	–	–	–	–	17.4	7.1	22.3	–
Flavored milk	1.0	2.8	5.6	6.2	5.5	–	–	–
Sour milk	–	–	–	–	6.7	3.0	3.1	–
Other dairy drinks	0.7	2.5	2.5	3.3	3.5	2.3	2.4	–

Source: Own work based on own studies.

Table 5

Assessment of packaging material importance for product purchase decisions and demographic and economic characteristics of the respondents

Demographic – economic characteristic	Assessment of correlation		
	$\chi^2$	<i>p</i>	V – Cramer
Gender	10.73	0.030	0.126
Age	13.68	0.206	–
Education	6.61	0.579	–
Marital status	23.60	0.003	0.132
Place of residence	23.79	0.022	0.108
Persons in the household	40.76	0.001	0.122
Including children up to 6 years	0.75	0.946	–
Children 7–13 years	2.06	0.724	–
Monthly household income	18.39	0.302	–

Source: Own work based on own studies.



Table 6

Importance of package capacity for product purchase decision and demographic and economic characteristics of the respondents

Demographic and economic characteristic	Assessment of correlation		
	$\chi^2$	$p$	V – Cramer
Gender	27.51	<0.001	0.202
Age	20.40	0.060	–
Education	17.15	0.020	0.071
Marital status	8.64	0.374	–
Place of residence	12.28	0.424	–
Persons in the household	11.12	0.802	–
Including children up to 6 years	4.36	0.359	–
Children 7–13 years	4.19	0.381	–
Monthly household income	26.12	0.052	0.082

Source: Own work based on own studies.

Women and men expressed different opinions concerning the influence of packaging material on the purchase decision. Men, different from women, generally did not care for the packaging material. As concerns the marital status it was found out that single persons in most cases treated packaging material as important (58.3%) or very important (23.3%) for the purchase decision. As concerns the number of people in the household, it was found out that in households consisting of two persons 80.4% of the respondents paid attention to the packaging material in taking the purchase decision. Every fourth respondent belonging to a household of at least five persons declared that the type of package was of low importance. Differences concerning opinions on the influence of packaging type on purchase decision were observed while analyzing the place of residence of the respondents. Those living in rural areas (64.0%) and small towns (23.3%) under 20.000 of residents considered packaging material important in the purchase decision while residents of medium size towns (20 000 – 60 000 population) considered it a factor of low importance among their preferences (Tab. 7).

Respondents having the choice of three different sizes of fresh milk and extended shelf life milk packages (0.5 l, 1 l, 1.5 l) most frequently chose milk in 1 liter packages (Tab. 4). During the recent years many different packages appeared in the market for special nutritive value products – yogurts, enjoying the highest demand among the dairy drinks (POŁOM, REJMAN 2006). The range of capacities of packages for those products changed as a surprisingly rapid pace. The studies show that consumers preferred yogurts in small packages, most frequently 0.15–0.25 l, 0.25 l and 0.25–0.5 l. The next two products,

Table 7  
Importance of packaging material for product purchase decision considering the demographic and economic profile of the buyers  
(percentage of respondents)

Ranking of importance	Total	Gender		Marital status			Place of residence (K residents.)			Number of persons in the household					
		F	M	single	married	widow/ widower	rural	< 20	20-60	> 60	1	2	3	4	≥ 5
Number of respondents	630	482	148	256	314	60	89	113	142	286	112	107	176	155	80
Unimportant	<b>8.4</b>	8.9	9.5	6.6	11.8	5.0	10.1	13.3	6.3	8.4	2.7	4.7	12.5	14.8	5.0
Low importance	<b>12.6</b>	12.0	18.2	17.2	10.8	11.7	14.6	8.0	21.1	11.5	17.0	7.5	11.4	11.6	25.0
Very important	<b>13.3</b>	15.4	10.8	10.6	15.6	23.3	7.8	23.3	17.8	15.1	11.6	14.0	14.2	16.1	15.0
Important	<b>50.1</b>	56.6	48.7	54.3	54.5	58.3	64.0	51.3	52.1	54.6	57.1	66.4	51.1	52.9	47.5
Hard to say	<b>7.8</b>	7.1	12.8	11.3	7.3	1.7	3.4	8.9	9.2	9.4	11.6	7.5	10.8	4.5	7.5

Source: Own work based on own studies.

Table 8  
Importance of package capacity for product purchase decision considering the demographic and economic profile of the buyers  
(percentage of respondents)

Ranking of importance	Total	Gender		Education			Monthly household income (PLN)				
		F	M	≤ vocational	secondary	tertiary	≤ 500	501-1000	1001-2000	2002-3000	> 3000
Number of respondents	625	481	144	144	313	168	43	93	135	108	123
Unimportant	<b>5.6</b>	4.6	9.0	4.9	5.1	7.1	7.0	8.6	2.2	7.4	6.5
Low importance	<b>13.3</b>	11.6	18.8	10.4	13.7	14.9	18.6	11.8	14.8	9.3	13.0
Very important	<b>15.2</b>	16.8	9.7	13.9	14.7	17.3	11.6	14.0	19.3	14.8	17.9
Important	<b>53.0</b>	56.6	41.0	59.7	48.9	54.8	41.9	47.3	50.4	61.1	56.9
Hard to say	<b>13.0</b>	10.4	21.5	11.1	17.6	6.0	20.9	18.3	13.3	7.4	5.7

Source: Own work based on own studies.

kefir and buttermilk, were most frequently purchased in 0.5 l and 1 l packages. Other dairy drinks (flavored milk, sour milk) were bought occasionally in all sizes of packages of those products available in the market.

Investigating the influence of demographic and economic characteristics on the opinions concerning the importance of package capacity for purchase decisions a significant correlation was found in case of gender ( $p < 0.001$ ), education ( $p = 0.02$ ) and monthly household income ( $p = 0.052$ ) (Tab. 6). It was found out that the choice of the package material was under the strongest influence of gender ( $V = 0.202$ ), monthly household income ( $V = 0.082$ ) and education ( $p = 0.071$ ). In case of other characteristics tested such as age, marital status, place of residence and persons in the household no significant correlations were found.

While in case of women package size played an important or very important role for purchase decision, in case of men it was of no particular importance. It was also found out that people with the lower than vocational education and people with tertiary education declared importance of package size for purchase decisions the most often (73.6% and 72.1% respectively). As concerns the monthly income of the household, the higher the income the more respondents declared importance of package size for the product purchase decision (Tab. 8).

During the recent years increasing attention is paid to the issues of ecology. Table 4 indicates that the buyers appreciate environment-friendly nature of the package. Opinions of respondents concerning ecological values of packages are presented in Figure 2. Respondents had the possibility of assessing four different types of packages: foil, plastic, cardboard and glass.

Respondents assessing from the ecological point of view the traditional cardboard packages as environment-friendly (61.0%) showed insufficient ecological knowledge on the characteristics of those packages. In assessing the ecological values of liquid dairy products' packages the respondents appreciated the value of glass bottle (62.5%) while cardboard boxes were most probably treated as traditional packages containing inside no aluminum foil at present practically not found in the market.

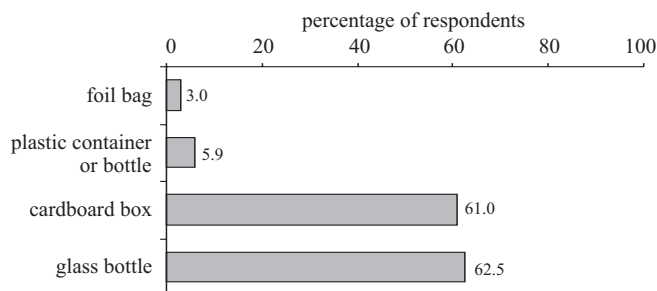


Fig. 2. Percentage of choices of the packages considered the most ecological  
Source: Own work based on own studies.

It could be expected that the better the knowledge of the buyers on ecology of packages the higher their responsibility for segregation of waste would be. It was found out, however, that the majority of the respondents did not segregate the waste (90.3%). Only 2.8% of the respondents stated that they select waste while 7.9% that they segregate waste sometimes only (Fig. 3).

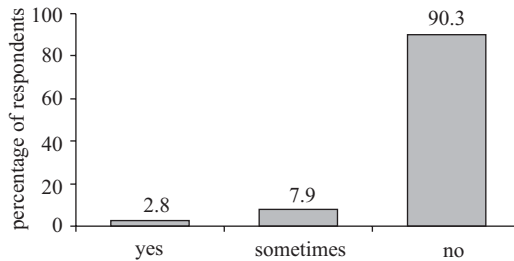


Fig. 3. Segregation of dairy products packaging waste

Source: Own work based on own studies.

The problem of package waste segregation and management is extremely important as the volume of packages disposed at landfills systematically increases. Absence of ecology-focused attitudes of buyers can result in negative consequences in the near future.

## Conclusions

1. According to the opinions of the buyers of liquid dairy products the package characteristics were ranked in their importance in the following top down order: taste impression of the product in a given package, shelf life of product in the package, package functionality, price, capacity and size, producer brand, information on the package and ecological aspects. This indicates that the buyers appreciate the highest those characteristics of the package that have the highest influence on maintaining the sensor values of the products

2. Buyers of liquid dairy products notice taste differences between products in individual types of packages. The highest percentage of the respondents (70.6%) ranked the glass bottle the highest followed by cardboard box (35.5%) as the packages securing the best taste values of products in them.

3. In the ranking of package prices (from the cheapest to the most expensive) the respondents gave the leading position to foil bags followed by almost equally ranked plastic bottle and cardboard box. Glass bottle was the most expensive package according to the respondents. The buyers of dairy products then notice price differences between products in different packages.

4. Package preferences of buyers of milk and dairy drinks concerning individual types and capacities of packages are diversified and depend on the product purchased, that is:

- fresh and UHT milk is most often purchased in cardboard boxes,
- kefir is the most popular in plastic containers,
- buttermilk is preferred in cardboard boxes and plastic containers,
- flavored milk and other dairy drinks are most frequently purchased in cardboard boxes.

5. The studies showed existence of correlation between the type and capacity of purchased packages and some demographic and economic characteristics of the respondents. As concerns the influence of packaging material on purchase decision, statistically significant correlations were found in case of gender, marital status, place of residence and number of persons in the household. As concerns the influence of package capacity, significant correlations were found in case of gender, education and monthly household income.

6. In the ecological assessment of packages of liquid dairy products the respondents showed insufficient knowledge. They ranked the highest the glass and cardboard packages followed by plastic and foil packages. As a consequence consumer education in ecology of packages is necessary.

7. The buyers of dairy products do not contribute with their behavior to improvement of the natural environment status (over 90% of the respondents do not segregate waste). That fact was linked to the earlier mentioned low level of knowledge on ecology of packages and it requires quick action to change that unfavorable situation.

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