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IMPACT OF CONSUMER PRICES AND CASH INCOME ON CONSUMPTION OF DAIRY PRODUCTS

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Abstract. In the paper is modeled demand for dairy products based on the consumer price of milk product and disposable cash incomes available to households of employees, households of self-employed persons and pensioners by regression and correlation analysis and marketing research. In examining the consumption of dairy products was quantified elasticity of demand, own price elasticity, indirect (cross) elasticity of demand, substitution relationships, complementarity and association.

Key words: incomes, consumer prices for dairy products in the households of employees, households of self-employed persons and pensioners, income and expenditure elasticity, modeling of demand for dairy products, substitution, complementarity, association

INTRODUCTION

Analysis of demand and supply of food products is an essential part in making decisions by consumers, primary agricultural producers, processors and retail chains. In recent years, particularly in the times of the ongoing economic crisis, in the professional community and practice has grown interest in analysis of consumer behaviour in relation to changes in prices, income level, considering the differences in food consumption, between the different social and income groups. At present it is necessary to highlight the importance of income in the family budget. Its level significantly affects the expenses that have to be spent on consumption and other services needed for live. The purchasing power of many households do not allow to fully meet demand for food. Issues of nutrition and food chain is given much attention in Slovakia as part of the government, the manufacturing sector, as well as an intellectual level queue. Previous numerous works and studies [Križová 2007, Kubicová and Lušňaková 2009, Foltys and Kirchnerová 2012]

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and others point out, that nutrition and overall consumption of milk and milk products in Slovak households does not reach recommended rations of food.

AIMS AND METHODS

Food expenses take a special place at the final consumption of households. When income grows, the marginal propensity of expenditures on food decreases until it reaches a point where the energy consumption is independent on income. Food consumption is not increasing anymore and may also decrease due to changes in the objective conditions of consumption. Food costs are close to relative saturation and due to the effect quality, decrease in expenditures is relative and does not reach an absolute and saturation. Demand reacts for income growth inelastically in a case of goods and hence the foods, which supply (consumption) comes close to saturation.

When processing numerical material, which was taken from the website of Statistical Office of the Slovak Republic (income, expenditure and household consumption in the Slovak Republic) and also obtained through market research of purchase of milk and milk products, were used the methods of regression and correlation analysis and detection of association and contingency of qualitative characters.

When evaluating the results of the questionnaire survey were used contingency tables and tests of independence:

Chi-square (χ^2) test of contingency

$$\chi^2 = \sum_{i=1}^{R}\sum_{j=1}^{S}\frac{(n_{ij} - m_{ij})^2}{m_{ij}} \tag{1}$$

Intensity of associations of the quality variables plural sorted data (A, B) was determined by Pearson coefficient – *Cp*

$$Cp = \sqrt{\frac{\chi^2}{\chi^2 + n}} \tag{2}$$

The values of *Cp* – with association growth increasing from zero to close to one – expresses a high degree of dependence between the characters A, B.

The income elasticity of demand for food were analyzed by multiple linear regression function. A linear regression model of demand for dairy products (q_i) is based on the relationship (3) and (4)

$$q_i = f(P_1, I) + e_i \tag{3}$$

respectively:

$$q_i = f(P_1, P_2, .., P_n, I) + e_i \tag{4}$$

where: q_i – demand for *i*-th milk product per person in kg per year;
P_1, P_2, ..., P_n – prices in € of individual *i*-th dairy products in kg;
I – net cash income (NCI) in € per person per year;
e_i – random, residual component.

Statistical evidence of the regression parameters and appropriateness of the chosen regression model was verified by using the index of determination R^2.

Text is supplemented by tables. Data processing and calculations were performed by using Microsoft Excel software.

RESEARCH RESULTS AND DISCUSSION

Modeling of demand for cheese and curd

Cheese production in Slovakia due to the nature of the natural environment and a long tradition of breeding cattle, sheep and goats provides a fairly wide range of sheep cheese and cheese products as well as their quality. In recent years, assortment of cheeses has substantially changed and the quality of production of cheese and sheep cheese has improved as well. There were improved mainly the technological conditions of production, building of quality assurance systems of production (HACCP systems, IS 9001), all legislation was set on EU level and promotion in domestic and foreign markets increased.

Although the cheeses become increasingly popular in the group of consumers, their price is quite high due to the average cash income of surveyed households. Demand for cheese in consideration with their consumer prices P_i and cash flows in the surveyed households are characterized by linear demand functions and regression parameters listed in Table 1.

In the households of the self-employed persons, increase of the consumer price of cheese and curd was seen in decrease of its demand by an average of 0.645%, whereas, increase of cash income of 1% caused increase in demand for cheese and curd by an average of 0.416%.

Table 1. Estimates parameter of demand functions for cheese and curd (q_i)

Households	$q_{ij} = b_0 + b_1$ price $+ b_2$ income	Elasticity		R^2
		E_{PDi}	E_{IDi}	
Employees	$q_{i,z} = 6.731 - 0.2678\ P_i + 0.00421\ PR$	–0.215	0.233	0.464[a]
Self-employed persons	$q_{i,s} = 8.372 - 0.7622\ P_i + 0.00705\ PR$	–0.645	0.416	0.517[a]
Pensioners	$q_{i,d} = 7.403 - 0.2502\ P_i + 0.00071\ PR$	–0.149	0.302	0.310[a]

[a] Model statistically significant at 10% significance level ($\alpha < 0.10$).

Source: SO SR, COICOP, own calculations.

Based on the index of determination (R^2) and the estimated parameters of the regression functions of demand for cheese and curd, which takes their values in the range from 0.517 to 0.310 can be so clear, that in the surveyed households, the consumer demand for cheese and curd is from 51.7 to 31.0% affected by the cash incomes of the household and consumer unit price of cheese and curd.

During the surveyed period, consumer demand for cheese, as opposed to the demand for drinking milk, was developed in accordance with the expected theoretical principles and intuitions. With an increase in consumer prices of cheese and curd by an average annual rate of €1, consumer demand responded the most flexible in the households of self-employed persons by decreasing in demand of 0.7622 kg per person, while in the households of employees demand declined by only 0.2678 kg and in households of pensioners by 0.2502 kg per person. In the households of pensioners, demand for cheese curd was affected in 31% by cash incomes and consumer prices of cheese and in 69% by other factors, not included in the model. In the group of self-employed households impact of the consumer price of cheese and cash income on demand for cheese was shown significantly, to 51.7% ($R^2 = 0.517$) and other, in the model untracked factors, affected demand only by 48.3%. In terms of Polish consumers, Wysocki and Kurzawa [2006] stated index of determination $R^2 = 0.883$ and the income elasticity for cheese $E_{IDi} = 0.43$.

Modeling of demand for other dairy products

Declining consumption of drinking milk is, due to the entry of new technologies in food production, opening of the market and increased supply of sour milk products in retail chains and advertising is in Slovak households, increasingly substituted by other dairy products, especially with higher added value. In 2011, from the total cash expenditures on milk, cheese and eggs, households of pensioners spent on other fermented products 62.61%, from which on cheese and curd – 31.63%, on other dairy products – 16.35% and on yoghurts – 14.63%. Households of self-employed persons spent on cheese and curds 30.47% of funds, 17.04% on yoghurt and 15.44% on other dairy products. Approximately the same proportion of funds was spent on the dairy products in the households of employees.

Based on the index of determination (R^2), as shown in Table 2, could be concluded that the estimates of the multiple linear functions parameters explain the dependence of the demand for other dairy products (q_i) on the unit price (P_i) and the average annual income (PR) in 55.8% up to 63% and only 44.2%, respectively 37% is accounted on the other factors, untracked in the model.

Table 2. Estimates parameter of demand functions for other dairy products (q_i)

Households	$q_{ij} = b_0 + b_1$ price $+ b_2$ income	Elasticity		R^2
		E_{PDi}	E_{IDi}	
Employees	$q_{i,z} = 8.615 - 1.583\ P_i + 0.00092\ PR$	–0.426	0.409	0.630[a]
Self-employed persons	$q_{i,s} = 5.661 - 1.298\ P_i + 0.00145\ PR$	–0.354	6.774	0.574[a]
Pensioners	$q_{i,d} = 13.855 - 3.272\ P_i + 0.00133\ PR$	–0.558	0.409	0.558[a]

[a] Model statistically significant at 10% significance level ($\alpha < 0.10$).

Source: SO SR, COICOP, own calculations.

Based on the coefficients of income and price elasticities of demand for other dairy products can say that demand is growing in all surveyed households according to intuition and theoretical assumptions of supply and demand. The increase in consumer prices

caused decrease in demand for other dairy products, while increase of the cash income of the households contributed to increased demand.

Coefficient of own prices conversion of other dairy products shows that the increase in the consumer price of 1% resulted in decrease in domestic demand in households of pensioners of 0.558%, in the households of employees of 0.426% and in households of self-employed persons only of 0.354%. Elasticity indicates similar trends [Thiele 2008]. Cash expenditures in these households respond more elastic to changes in cash income. Increase of cash income in the households of self-employed persons of 1% would make the increase in demand for other dairy products of 6.774%, while in the households of pensioners and employees only of 0.409%.

Modeling of demand for butter

In Slovakia, total consumption of butter oscillated with small fluctuations at around 3 kg per person per year over the previous seven years (from 1998 to 2004), but since 2004 the consumption of butter gradually decreased and stabilized at about 2 kg per person per year. In 2011, consumption was highest in households of pensioners (2.78 kg per person per year). The households of employees consumed 2.08 kg per person per year, the households of self-employed persons – only 1.91 kg. The gradual reduction and stabilization of consumption of butter was caused by a wider offer of substitute vegetable fats for favourable consumer prices.

Linear models of demand for butter in different groups of households explain the dependence of demand (q_i) on the consumer prices of butter (P_i) and cash income (PR) at level 16.6 to 3.45%. The highest tightness of demand dependency for butter is expressed by the coefficient of multiple correlations is seen in the households of employees (Table 3).

With an increase in the consumer price of butter of €1, the households of pensioners respond by decreasing of demand for butter in an average annual rate of 0.096 kg per person. Households of employees and self-employed persons, as opposed to households of pensioners, responded by reducing of demand for butter when increasing its unit price and their consumer buying behaviour did not comply according the law of supply and demand. The same differently, but not elastically responded households in terms of cash incomes. To increase the income of 1% the households responded by slight reduction in the demand for butter, especially in households of pensioners. The increase in cash income of 1% in the households of pensioners led to decrease in demand for butter of 0.061%, while in the households of employees demand for butter decreased of 0.353%,

Table 3. Estimates parameter of demand functions for butter (q_i)

Households	$q_{ij} = b_0 + b_1$ price $+ b_2$ income	Elasticity		R^2
		E_{PDi}	E_{IDi}	
Employees	$q_{i,z} = 1.849 + 0.112\ P_i - 0.00017\ PR$	0.329	–0.354	0.166[a]
Self-employed persons	$q_{i,s} = 1.719 + 0.071\ P_i - 0.00009\ PR$	0.224	–0.226	0.035[a]
Pensioners	$q_{i,d} = 3.276 - 0.096\ P_i - 0.00004\ PR$	–0.198	–0.061	0.039[a]

[a] Model statistically significant at 10% significance level ($\alpha < 0.10$).

Source: SO SR, COICOP, own calculations.

in households of self-employed persons – 0.226%, these households probably substituted their consumption of butter by vegetable fats and oils.

Modeling of demand for yoghurt

In Slovak households, yoghurts belong among the most common and most popular sour milk products. According to the technological process for producing, yoghurt has a characteristic texture and rheological consistency. White yoghurt is made only from milk ingredients and without added starch, gelatin or other stabilizers. Yoghurts are often flavoured with fruit, chocolate and cereals. Fermented dairy products such as buttermilk and yoghurt are well tolerated even by those people, who can not digest lactose. Yoghurt provides similar nutrients as milk, is a good source of protein, vitamins B and D and minerals.

In the households of pensioners and self-employed persons, consumer demand for yoghurt did not develop according the laws of supply and demand. With increase of the yoghurt unit price, consumers continued to increase demand for yoghurt, which was more significant mainly in the households of self-employed. Only in the households employees, demand for yoghurt responded in accordance with the laws of supply and demand and an increase in the yoghurt unit price of 1% reduced demand of 0.167%. In the households of employees, with the money income increase of 1%, demand for yoghurt increased in diameter up to 1.567%, so demand for yoghurt in this group of households was elastic (Table 4).

There had been demonstrated a strong correlation dependence of demand for yoghurt on its consumer unit price and on the cash incomes mainly in the households of employees (r = 0.908), while in households of pensioners and self-employed persons (whose demand for yoghurt was not bound by the laws of demand) was experienced only moderate correlation dependence (r = 0.761, respectively r = 0.621). Multiple regression model of demand for yoghurt in these households captures variability of demand dependance on the unit price of the product and the money income to 38.51% respectively to 82.4%.

Table 4. Estimates parameter of demand functions for yoghurt (q_i)

Households	$q_{ij} = b_0 + b_1$ price $+ b_2$ income	Elasticity		R^2
		E_{PDi}	E_{IDi}	
Employees	$q_{i,z} = 8.856 - 0.564\ P_i + 0.00363\ PR$	–0.167	1.567	0.824[b]
Self-employed persons	$q_{i,s} = 2.784 + 2.242\ P_i + 0.000073\ PR$	0.617	0.033	0.385[a]
Pensioners	$q_{i,d} = 2.734 + 1.069\ P_i + 0.00103\ PR$	0.281	0.419	0.579[a]

[a] Model statistically significant at 10% significance level ($\alpha < 0.10$),
[b] Model statistically significant at 10% significance level ($\alpha < 0.05$).

Source: SO SR, COICOP, own calculations.

Modeling of substitution relationships of demand for drinking milk

Milk accompanies people from birth throughout all life and is also the raw material for producing other food products, allowing producers to offer a wide and varied scale of substitutes in the market. In recent years, human nutrition adversely reflected declining

consumption of drinking milk, which is now under the recommended amount of food (91 kg per person per year). Previous surveys have prooved that the choice of the dairy affects mainly the price, taste, brand and product quality [Stávková et al. 2007]. On correlation of milk quality and production parameters points Foltys and Kirchnerová [2012]. Consumers consider price of milk and dairy products for high. Lower consumption of drinking milk is caused by a low level of consumer awareness and lack of understanding of its vital role in human nutrition. In recent years milk has been presented as one of the major sources of human nutrition during the International Day of Milk.

Based on the multivariate linear regression function and model of demand for drinking milk (q_i) features that in the households of employees the substitution function of demand fulfill mainly other dairy products, while the demand for yoghurt, cheese and curd is in a complementary relationship with the consumption of drinking milk. Complementary effect reflects economic relationship between changes of price and demand for goods which complement each other by the new consumer features. The substitution effect is the opposite of the complementary effect. Increase in the price of drinking milk in the households of employees raises in accordance with effects decreasing demand for this product and increasing demand for substitutable products (for other dairy products), but has no or almost no impact on the demand for independent products (after drinking milk). According to the pension effect [Vincúr 2000], increase (decrease) in prices is simply not reflected in demand for the concerned products, but leads to a decrease (increase) in purchasing power and therefore induces changes in the structure of consumer spending, which are analogous to those driven by changes corresponding to changes in this pension.

Parameters of multiple linear regression function of demand for drinking milk (g_i) in households of employees provides the regression equation:

$$g_i = 22.455 + 57.148\, P_1 - 6.986\, P_2 - 12.274\, P_3 + 16.106\, P_4 + 0.0102\, P_5 \text{ with } R^2 = 0.842 \quad (5)$$

where: P_1 – price in € of drinking milk in kg;
P_2 – price in € of yoghurts in kg;
P_3 – price in € of cheese and curd in kg;
P_4 – price in € of other dairy products in kg;
P_5 – net money income in € per person per year.

Within 2004–2011, consumer demand for drinking milk was on average level 45.71 kg per person per year. As the parameters of multiple linear regression functions in the households of employees show, these substitute consumption of drinking milk when increasing its unit consumer prices by increased consumption of other dairy products. Indirect (cross) price elasticity of demand ($E_{gi,\,P4} = 0.804$) indicates that demand was inelastic and drinking milk price increase of 1% was shown in increasing (substitution) demand for other dairy products on average 0.804%, the consumption of which was at an average of 8.47 kg per person per year.

Demand and consumption of cheese, curd and yoghurt are characterized by complementary relationships that depending on the change in price and demand complement each other by the new features and when increases the price of first product, decreases the demand for the other product and vice versa. Complementarity of demand effect in relation to the consumption of yoghurt expresses the cross-price elasticity on level ($E_{gi,\,P2} = -0.396$) and in relation to consumption of cheese and curd ($E_{gi,\,P3} = -1.478$).

Parameters of multiple linear regression function of demand for drinking milk (g_i) in the households of self-employed persons are expressed by regression equation with following parameters

$$g_i = 29.317 + 99.724\ P_1 + 60.533\ P_2 - 30.989\ P_3 - 50.787\ P_4 + 0.0246\ P_5 \text{ with } R^2 = 0.687 \quad (6)$$

Based on the parameters of the regression linear function can be concluded, that in the households of self-employed persons demand for drinking milk is in the complementary relationship with demand for cheese and other dairy products and due to the change in the price complements each other. Consumer demand for drinking milk (average of 46.42 kg per person per year) in this group of households is substituted by an increased demand for yoghurt and indirect (cross) price elasticity of demand ($E_{gi,\ P2} = 0.8897$) indicates that demand was inelastic and drinking milk prices increase of 1% was accompanied by point increase in demand for yoghurts of 0.8897% and an average annual consumption of yoghurt on level 8.77 kg per person.

Complementarity effect of demand for cheese and curd relative quantifies the coefficient of price elasticity ($E_{gi,\ P3} = -3.744$) and the effect of demand for other dairy products ($E_{gi,\ P4} = -2.497$) with an average annual consumption of other dairy products 8.37 kg per person.

Parameters of multiple linear regression function of demand for drinking milk (g_i) in the households of pensioners reflects the regression equation, which is given by the parameters:

$$g_i = 23.280 + 0.330\ P_1 + 118.714\ P_2 - 20.081\ P_3 - 76.960\ P_4 + 0.005\ P_5 \text{ with } R^2 = 0.942 \quad (7)$$

Consumer behaviour and demand for drinking milk in the households of pensioners shows the comparative consistent trend of behaviour of demand for this product, as was demonstrated in the households of self-employed persons in the period between 2004 and 2011. In the households of pensioners, within the compared households, the consumer demand for drinking milk (average 62.89 kg per person per year) was the highest price and in the cases of price increasing of drinking milk is substituted by increased demand and consumption of yoghurt. Indirect (cross) price elasticity of demand for drinking milk ($E_{gi,\ P2} = 4.516$) suggests that drinking milk price increase of 1% was shown in increase of demand for yoghurt in average of 4.516% and showed an average annual consumption of yoghurt on level 9.10 kg per person. In terms of Polish households, Gulbicka and Kwasek [2006] stated index of determination $R^2 = 0.93$, income elasticity of whole milk consumption $E_{IDi} = -0.076$ and income elasticity of skim milk $E_{IDi} = 0.164$.

Demand and consumption of other dairy products (cheese and curd, other dairy products) act in the complementary relationship, which with the new consumer features complement each other. Complementarity effect of demand for cheese and curd relative quantifies the coefficient of price elasticity ($E_{gi,\ P3} = -1.667$) and the average annual consumption of cheese was 8.74 kg per person and demand for other dairy products ($E_{gi,\ P4} = -2.518$), and their average annual consumption was 8.47 kg per person. Consumer prices of drinking milk were in monitored households more less balanced, prices of the other dairy products were in the households of pensioners substantially lower (in average of €0.2).

RESPONSES OF THE RESPONDENTS ON THE INCREASE IN PRICES OF DAIRY PRODUCTS IN TERMS OF ECONOMIC STATUS OF HEAD OF HOUSEHOLD AT WORK

The results of a marketing survey, which was conducted in 2010 on a sample of 528 respondents, indicate (Table 5) that most respondents would slightly reduce the amount of purchased dairy products when the price increases. Such reaction is manifested primarily by students (55.64%), the households of unemployed (50%) and households of pensioners (44.74%). On increase in prices of purchased dairy products more or less unresponsive the households of self-employed persons (61.25%), employees (48.72%), and in 39.47% also households of pensioners. However, the purchase of dairy products would be significantly reduced when their prices increase by households of pensioners (2.63%) and students (2.61%). On the similar cheaper products (substitution effect) would pass mainly households of pensioners (13.16%), households of employees (11.36%) and students (8.69%).

Table 5. Relative expression of dependence between economic status of head of household (social groups of households) at work and response to increasing prices of dairy products (%)

Responses of the respondents	Unemployed	Employees	Self-employed persons	Pensioners	Students
Unresponsive	45.45	48.72	61.25	39.47	33.04
Substituted	4.55	11.36	6.25	13.16	8.69
Slightly reduced	50.0	39.19	32.50	44.74	55.64
Significantly reduced	0.00	0.73	0.00	2.63	2.61

Source: Own research.

Relative expression of the respondents reaction on purchase of dairy products in the cases of increasing prices, linked to the economic opportunities arising from the position of head of the household at work (respectively from unemployment) are characterized by a statistical analysis examining qualitative characteristics (mode of action, the head of the household status at work) that would allow on a certain (selected) level of evidence, express association relationships between them and their intensity.

From the data contained in the contingency Table 6 and a chi-square can be said that has been proven statistically significant association between the economic status of the head of household at work and ways of households responses to higher prices of dairy products. Our evaluation shows that the calculated statistics $\chi^2 = 25.213$ is higher than the table value at 5% significance level and 12 degrees of freedom, i.e. $\chi^2 = 25.213 > > \chi^2_{0.05(12)} = 21.03$. Because we have rejected hypothesis H_0 of independence and accepted the alternative hypothesis H_1 is the actual question of the its measurement. To measure the intensity of association, we have used Pearson's contingency coefficient $C_p = 0.213$ on the basis of which can be concluded that, tightness of dependency between economic status of the head of the family at work and from this resulting incomes and and the reaction of households on increasing dairy prices is only modest.

Table 6. Contingency table expressing reaction on the increase in price of dairy products in terms of the position of head of the household at work

Indicator	Unemployed	Employees	Self-employed persons	Pensioners	Students	Total
Unresponsive	10	133	49	15	38	245
Substituted	1	31	5	5	10	52
Slightly reduced	11	107	26	17	64	225
Significantly reduced	0	2	0	1	3	6
Total	22	273	80	38	115	528

Source: Own research.

From the results of survey can be concluded that the increase in prices of dairy products has a negative effect on the consumption of milk and dairy products, especially in those social groups of households (households of pensioners, unemployed and students) who are not able to ensure the higher income.

CONCLUSIONS

In connection with the economic crisis in Slovakia, economic and social conditions contribute to further deepen the differences not only in income but also in the behaviour of people in the consumer market.

The share of expenditures on milk and dairy products in total consumption expenditures was the highest in the households of pensioners and between 2004 and 2011 represented an average of 25.61% annually, in the households of employees was lower – on the level 20.1%. The lowest share of food expenditures (19.33%) had the household of self-employed persons, which in turn showed a relatively higher share (18.95%) of expenditures on milk and dairy products.

Based on multivariate linear regression function and model of the demand for drinking milk results that in the households of employees is substitution function of demand met by other dairy products, while demand for yoghurt, cheese and curd is in a complementary relationship with drinking milk.

In the households self-employed persons, consumer demand for drinking milk is in the complementary relationship with demand for cheese and other dairy products. Consumer demand for drinking milk (average 46.42 kg per person per year) in these households is substituted by increased demand for yoghurt and indirect (cross) price elasticity of demand ($E_{gi, P2} = 0.8897$) characterizes that demand was inelastic and increasing of drinking milk prices of 1% was accompanied by increasing demand for yoghurts of 0.8897% and by average annual consumption of yoghurt 8.77 kg per person.

In the households of pensioners, the consumer demand for drinking milk was on average annual level 62.89 kg per person, within the compared households was the highest one and in the cases of drinking milk price increasing was substituted by increasing demand and consumption of yoghurt. Indirect (cross) price elasticity of demand for drinking milk suggests that drinking milk price increase of 1% was shown in demand increasing for yoghurt in average of 4.516% and showed the average annual consumption of yoghurt 9.10 kg per person.

In the households of pensioners, demand and consumption of other dairy products (cheese and curd, other dairy products) performs in the complementary relationship.

Consumer prices of drinking milk were in the monitored households more less balanced, but the prices of other dairy products (as well as prices of cheese, yoghurt, butter) were significantly lower in the households of pensioners (in average of €0.2 per measurement unit) and therefore were probably lower quality.

It has been proven statistically significant association between the economic status of the head of household at work and the ways of response to higher prices of dairy products ($\chi^2 = 25.213 > \chi^2_{0.05(12)} = 21.03$). Pearson's contingency coefficient $C_p = 0.213$ indicates that the tightness of dependency between response of households to increasing prices of dairy products and economic status of the head of the family at work and from this resulting incomes is only modest.

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WPŁYW CEN KONSUMPCYJNYCH I DOCHODÓW NA KONSUMPCJĘ PRODUKTÓW MLECZARSKICH

Streszczenie. W artykule przedstawiono modele popytu na przetwory mleczne opracowane na podstawie ceny detalicznej produktu mlecznego i dochodu dyspozycyjnego w gospodarstwach domowych pracowników, gospodarstwach domowych osób pracujących na własny rachunek, a także w gospodarstwach domowych rencistów, przy zastosowaniu regresji i analizy korelacji oraz badań marketingowych. W analizach spożycia produktów mlecznych wyznaczono elastyczność popytu, elastyczność cenową, krzyżową elastyczność popytu, skłonność do substytucji oraz komplementarności.

Słowa kluczowe: dochody, ceny detaliczne na produkty mleczne w gospodarstwach domowych pracowników, gospodarstwa domowe osób pracujących na własny rachunek i rencistów, dochody i elastyczność wydatków, modele popytu na przetwory mleczne

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