CONSUMER PRIORITIES OF THE UKRAINIAN POPULATION IN THE MARKET OF PIG PRODUCTS

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Abstract

The main tasks of the study are: to determine the specificity of demand for certain types of slaughter pigs, to systematize the factors affecting it and to predict their impact on the short-term prospect.

Keywords: the market for pig products, demand, fat, pork, revenues

JEL Classification: L 66, Q 18

1 Introduction

Pork market is one of the largest food markets, the basis of its functioning has become the tradition, and its development has a significant impact on other food markets. The consumption of pork and fat is influenced by the location of the consumer (rural, city), characterized by different levels of purchasing power, dietary traditions, attitudes towards health, which affects the choices of pig slaughter products and their sources of income. Important factors influencing the consumption of pork are economic, religious, national, socio-cultural, as well as psychographic (relation to consumption of meat, etc.).
2 Data and Methods

The source information during the research was the normative basis of the state economic regulation of the pig products market, statistical and analytical information of the State Statistics Service of Ukraine, the Ministry of Agrarian Policy and Food of Ukraine. The calculations for the elasticity of consumer demand in the market of pig products were carried out using correlation-regression analysis. The balance method was used to substantiate the consumption of pork and fat for the future.

3 Results and Discussion

The results of the survey of buyers on the retail food markets of the cities of Kyiv, Khmelnytsky, Odessa show that the main factors influencing the choice of pork as a food product are sex - the vast majority of consumers of pork men, regardless of the fact that they often buy this type of meat exactly women; age is the target segment of consumers (78.3%) varies from 23 to 60 years, in the second place adherents of consumption of this type of meat - adolescents - is 11.9%. However, they do not prefer pork in their daily consumption by people aged 60-76 years, which make up 9.8% of the group of respondents; the purchasing power of the consumer is an important parameter in the choice of this type of meat; price - conditional element in combination with the previous parameter. According to researches, 63% of respondents consider the price factor to be an effective element in stimulating sales irrespective of the season [1].

During 2000-2016, the consumption of chilled pork per 41.5% per capita increased, while consumption of eats decreased by 32.7% and in 2016 it was 6.2 kg.

Thus, in 1991, the consumption of meat per capita in Ukraine was 74 kg, 28% of which was for meat, and 72% - for sausage wares. Together with the decrease in the solvency of the population, consumption of meat products decreased. In 2001, it was 33.6 kg, and the structure of sausage and meat was already 50%: 50%. In 2016 it was 54.4 kg per 1 person, 30% of which was consumed in the form of sausage products, and 70% - as meat. According to the forecasts of the FAO, by 2020, in the structure of consumption of meat by Ukrainians, 80% will be consumption of natural meat [2].

The proof of the above-mentioned tendency is the structure of the commodity assortment of meat processing enterprises, which, focusing on better satisfaction of consumer demand, expands the assortment of commodity positions of chilled and frozen meat.
The decrease in the consumption of fat, despite its traditional character, as one of the main types of food products of Ukrainian residents, is gradually decreasing, which is also an indicator of the level of material wealth of the population. A similar phenomenon was observed in the 30s of the last century in the United States. [3].

During 2000-2016, two periods can be distinguished in changing the choice of certain types of pig products. So, the first - 2000-2006, when the level of consumption of fat exceeded the consumption of chilled pork. It was characterized by a gradual increase in the purchasing power of the population while preserving the culture of food - consumer pork and fat were the priority products of consumers.

The second period - 2007 and to the present time. Despite the slight fluctuations in the purchasing power of the final consumer, the consumption of chilled pork exceeds the amount of consumption of lard, indicating significant changes in the nutritional structure of the population and, to a degree, on its availability and change in the taste preferences of the population.

It should be noted that by 2012 there was an excess of consumption of pork in rural areas compared with residents of large and small cities. In our opinion, this can be explained by the consumption of a significant amount of pork, which was produced in private peasant farms. Nevertheless, in the following years, the opposite situation can be traced, which indicates significant changes in the structure of food and consumer preferences of the urban population compared with rural ones. At the same time, in rural households, they consume much more fat than urban ones. This fact shows that rural residents, for some reason, in particular because of the lack of funds to purchase pork and the directing of a significant proportion of live pigs to compensate for the need for products of animal origin due to the consumption of lard. This tendency leads to an imbalance in the diet of the rural population.

An important indicator of a good nutrition of the population is to ensure the balance of its diets in accordance with reasonable consumption standards. It has been established that caloric nutrition of the rural population by 6.0% exceeds the average norms due to excessive consumption of fats and sugar (respectively 1.7 and 1.5 times higher than physiological norms of need). The percentage of fats in the total caloric content of the rations surveyed population exceeds the norm by 1.5 times. The amount of total fat and saturated fatty acids in the diets of rural population exceeds the recommended norms by 1.7 times. Among the fats, the overwhelming majority of animal origin, due to which the body receives one and a half times more calories than at the expense of plant. The ratio of polyunsaturated fatty acids to saturated fatty acids is 0.7 instead of
1.0. The level of cholesterol in the nutrition of rural residents by 30% exceeds the normative indicators, increases the risk of manifestation of various diseases [4].

It should be noted that during 2005-2016 there was a significant difference in the consumption of pork in ten decile groups of households, depending on the level of their total income (Table 1).

The given data on consumption volumes of pork for the period of 2005-2016 on major decile groups indicate their growth regardless of the level of consumer income and place of residence. Thus, the highest growth rate of pork consumption among urban households is observed in groups 1-3 and 6, due to increased purchasing power of the population. In general, consumption has increased more than twice in all groups, but no rational consumption has been achieved. This can be explained by the considerable influence of substitute products on the consumption of pork, in particular, poultry meat, which in the structure of consumption occupies a prominent place.
Table 1 Dynamics of consumption of chilled pork in decile groups of rural, city and, in general, for all households, kg / person

| Group | 2005 Total | 2005 Town | 2005 Village | 2010 Total | 2010 Town | 2010 Village | 2014 Total | 2014 Town | 2014 Village | 2014 in % to 2005 Total | 2014 in % to 2010 Total |
|-------|------------|-----------|-------------|------------|-----------|-------------|------------|-----------|-------------|------------------------|------------------------|
| 1     | 2,8        | 2,9       | 2,7         | 4,9        | 5,5       | 4,2         | 7,4        | 8,4       | 5,7         | 264,3                  | 289,7                  |
| 2     | 3,9        | 3,7       | 4,3         | 7,1        | 7,3       | 6,9         | 9,0        | 9,5       | 8,2         | 230,8                  | 256,8                  |
| 3     | 4,5        | 4,1       | 5,2         | 8,9        | 9,3       | 8,1         | 11,2       | 11,9      | 9,8         | 248,9                  | 290,2                  |
| 4     | 5,2        | 5,1       | 5,3         | 10,1       | 10,2      | 9,7         | 11,9       | 12,8      | 10,3        | 228,8                  | 251,0                  |
| 5     | 6,1        | 6,2       | 6,1         | 11,8       | 12,1      | 11,4        | 13,9       | 14,3      | 13,1        | 227,9                  | 230,6                  |
| 6     | 7,2        | 7,2       | 7,1         | 13,7       | 14,1      | 12,7        | 15,9       | 16,0      | 15,6        | 220,8                  | 222,2                  |
| 7     | 8,6        | 8,8       | 8,1         | 15,5       | 15,7      | 14,7        | 17,3       | 16,7      | 18,7        | 201,2                  | 189,8                  |
| 8     | 8,1        | 7,5       | 9,9         | 18,2       | 18,8      | 15,5        | 20,1       | 20,1      | 20,0        | 248,1                  | 268,0                  |
| 9     | 9,3        | 9,5       | 8,8         | 18,6       | 18,1      | 20,9        | 19,1       | 18,8      | 20,1        | 205,4                  | 197,9                  |
| 10    | 12,3       | 12,5      | 11,9        | 22,6       | 22,2      | 25,2        | 26,5       | 25,5      | 30,2        | 215,4                  | 204,0                  |
| Total | 5,9        | 6,1       | 5,6         | 10,8       | 11,5      | 9,3         | 12,6       | 13,3      | 11,4        | 213,6                  | 218,0                  |

Source: Compiled and calculated according to the data of the State Statistics Service of Ukraine.
It has been established that during the investigated period the ratio in the volume of consumption of pork among the 10 and 1 groups of urban households with different income levels changed - from 1.9: 1 in 2005, in 2010 - by 1.28: 1, 2016 - 1.65: 1. This circumstance is caused by a change in the purchasing power of individual social groups.

In our opinion, reduction of this the ratio in 2010 compared to 2005-2016 can be explained by an increase in the level of consumption of pork by the household members of the first group, respectively, by 35% and 32%, and the decrease in the last group of households by 8.8% against the corresponding indicator in 2005 and a slight increase compared to 2016. The main factor is the level of purchasing power of the population, which varied significantly during the period under investigation. So, low-income people in 2010, with increasing purchasing power, had the opportunity to buy relatively more pork, and with a higher level, they reoriented on consumption of substitute products: beef, fish, etc.

In order to determine the impact of household incomes on the level of consumption of pork, we calculated the coefficient of elasticity (Table 2). The value of this factor is high, with the exception of the last group of consumers. The highest value of the coefficient of elasticity was recorded in the population with a income level of 1001-1250 UAH / month, the lowest was -0.151 in the group with an income level of 5001-6000 UAH / month.

Table 2 Calculation of the coefficient of elasticity of consumption of pork depending on the level of consumer income, 2016

| Groups by average per capita income per month, UAH | Total aggregate resources, ths. UAH / year | Actual consumption of pork, kg | Estimated consumption level | Derivative | Coefficient of elasticity |
|-----------------------------------------------|------------------------------------------|-------------------------------|-----------------------------|------------|--------------------------|
| till 500                                      | 5,089                                    | 2,51                          | 4,0                         | 0,5904     | 0,751                    |
| 501–750                                       | 7,849                                    | 5,22                          | 5,6                         | 0,5711     | 0,800                    |
| 751–1000                                      | 10,687                                   | 8,06                          | 7,2                         | 0,5512     | 0,819                    |
| 1001–1250                                     | 13,615                                   | 9,04                          | 8,8                         | 0,5307     | 0,823                    |
| 1251–1500                                     | 16,500                                   | 11,17                         | 10,3                        | 0,5105     | 0,819                    |
| 1501–1750                                     | 19,388                                   | 11,86                         | 11,7                        | 0,4903     | 0,811                    |
| 1751–2000                                     | 22,479                                   | 13,89                         | 13,2                        | 0,4686     | 0,798                    |
| 2001–2250                                     | 25,434                                   | 15,44                         | 14,6                        | 0,4480     | 0,782                    |
| 2251–2500                                     | 28,414                                   | 16,62                         | 15,9                        | 0,4271     | 0,765                    |
| 2501–2750                                     | 31,336                                   | 17,18                         | 17,1                        | 0,4067     | 0,746                    |
Groups by average per capita income per month, UAH | Total aggregate resources, ths. UAH / year | Actual consumption of pork, kg | Estimated consumption level | Derivative | Coefficient of elasticity
---|---|---|---|---|---
2751–3000 | 34,428 | 17,61 | 18,3 | 0,3850 | 0,724
3001–3250 | 37,362 | 21,28 | 19,4 | 0,3645 | 0,702
3251–3500 | 40,419 | 18,42 | 20,5 | 0,3431 | 0,677
3501–3750 | 43,632 | 17,67 | 21,6 | 0,3206 | 0,649
3751–4000 | 46,334 | 21,24 | 22,4 | 0,3017 | 0,624
4001–4250 | 49,398 | 24,98 | 23,3 | 0,2802 | 0,594
4251–4500 | 52,568 | 22,95 | 24,1 | 0,2580 | 0,562
4501–5000 | 56,629 | 26,65 | 25,1 | 0,2296 | 0,517
5001–6000 | 64,277 | 28,44 | 26,7 | 0,1761 | 0,424
over 6000 | 95,889 | 28,49 | 28,8 | -0,0452 | -0,151
Total | 21,125 | 12,64 | 12,6 | 0,4781 | 0,804

Source: Compiled and calculated according to the data of the State Statistics Service of Ukraine.

The given calculations allow to reveal the regularity that with the increase of the level of incomes of consumers the coefficient of elasticity decreases, which is quite obvious and indicates the reorientation of consumers to other types of meat products when changing their purchasing power.

Consequently, the results of the study indicate that pork is a food supply for high-income households in both urban and rural areas. The proof of this conclusion is the significance of the calculated variability of the consumption of pork.

The manifestations of the signs of the economic crisis in the country are growing volumes of sales of fat and the price of high quality pork is reduced. Potential consumers make stocks of those slaughtering pigs that can be stored for a long time. In such a situation in the country, the purchasing power of the population is low, it does not visit public catering establishments, which accordingly leads to a decrease in the consumption of high quality pork. [5]

During 2005-2016 there is a gradual decrease in the level of consumption of fat in general for all categories of households. Thus, in 2016, it increased in the first and tenth groups of households, due to a decrease in purchasing power of the population and the lack of prerequisites for lower food prices.

During the investigated period, there was a significant difference between the levels of consumption of fat and urban and rural households. Thus, in the given
period, the consumption of bacon was higher in rural households compared to urban ones, due to the difference in purchasing power levels and the specifics of fat as a product of long-term storage and high energy value, which, in the use of manual labor, is a source of energy for a rural dweller.

In our opinion, the main factor affecting the relation between households is the volatility of purchasing power of the population of cities and rural areas. During 2005-2010 this ratio was 1: 1,2, in 2016 - 1: 1,3.

At the same time, in the years 2005 and 2016, in the 1-4 groups of households, the ratio of consumption remained almost unchanged, indicating a similarity of consumer preferences in the use of fat by the urban and rural population with low incomes. However, in 5-10 groups of households in 2016, compared to 2005, the proportion in the consumption of fat by rural and urban households has increased, indicating a change in the priority of choosing meat consumption and the role of a personal economy in providing food. The share of fat consumed by members of rural households in 2016, coming from a personal auxiliary farm, amounted to 21-30%, at the same time in urban - 0,9-2,3% (Table 3).

An important element in forecasting consumer demand for any type of food, including lard, is the calculation of demand elasticity indicators, depending on the level of income (Figure 1).

According to the calculations of the elasticity of the consumption of fat depending on the level of income of the population, the demand is inelastic. Correlation-regression equation of dependence of consumption of fat on total resources of population has the following form: urban households - \( y = -0.002x^2 + 0.2171x + 3.0733 \). According to statistics, the average aggregate income in households in Ukraine in 2016 amounted to 21,125 thousand UAH, while the estimated level of consumption of eats per 1 person is 8.55 kg (in fact - 6.2 kg). The calculated value of the coefficient \( R^2 = 0.5977 \) indicates that 59.77% of the consumption of fat depends on the level of the per capita income level of the population.

Figure 1 Correlation-regression equation of dependence of consumption of bacon per capita incomes, 2016

Source: Compiled and calculated according to the data of the State Statistics Service of Ukraine.
| Group | 2005 | 2010 | 2016 | 2016. in % to 2005 | 2010 p. |
|-------|------|------|------|-------------------|--------|
|       | Total| Town| Village| Total| Town| Village| Total| Town| Village| Total| Town| Village|
| 1     | 4.2  | 4.2 | 4.3   | 6.0  | 5.7 | 6.3    | 4.6  | 4.3 | 5.0    | 109.5| 102.4| 116.3 |
| 2     | 5.4  | 4.9 | 6.1   | 6.0  | 5.4 | 7.0    | 4.8  | 4.5 | 5.4    | 88.9 | 91.8 | 88.5  |
| 3     | 6.4  | 6.3 | 6.7   | 6.9  | 6.5 | 7.9    | 5.5  | 5.1 | 6.2    | 85.9 | 81.0 | 92.5  |
| 4     | 7.2  | 6.6 | 8.3   | 7.6  | 6.9 | 9.2    | 6.2  | 5.7 | 6.9    | 86.1 | 86.4 | 83.1  |
| 5     | 7.9  | 7.5 | 8.6   | 8.3  | 7.4 | 10.0   | 7.0  | 6.2 | 8.8    | 88.6 | 82.7 | 102.3 |
| 6     | 8.2  | 7.3 | 10.2  | 8.2  | 7.6 | 9.9    | 7.3  | 6.1 | 9.8    | 89.0 | 83.6 | 96.1  |
| 7     | 8.8  | 8.3 | 9.8   | 7.8  | 7.5 | 9.0    | 8.3  | 7.3 | 10.3   | 94.3 | 88.0 | 105.1 |
| 8     | 8.5  | 7.2 | 12.0  | 8.2  | 7.5 | 11.5   | 8.8  | 7.4 | 13.9   | 103.5| 102.8| 115.8 |
| 9     | 7.7  | 6.6 | 10.9  | 8.5  | 8.2 | 10.0   | 7.6  | 6.2 | 12.0   | 98.7 | 93.9 | 110.1 |
| 10    | 9.1  | 8.0 | 12.9  | 7.8  | 7.3 | 11.8   | 8.5  | 7.1 | 13.6   | 93.4 | 88.8 | 105.4 |
| Total | 6.8  | 6.4 | 7.7   | 7.3  | 6.8 | 8.4    | 6.2  | 5.6 | 7.3    | 91.2 | 87.5 | 94.8  |

Source: Compiled and calculated according to the data of the State Statistics Service of Ukraine.
It was established that favorable conditions in the pork market were in favor of bacon and offal and decreased on pork. As the main reason we should consider the decline in living standards of the population. Obviously, the subjects of management immediately responded to this situation: they were reorienting to growing and fattening sebaceous pigs.

This is confirmed by a poll conducted by the meat traders in the Khmelnitsky retail food market as of 06.12.2016. Almost all of them replied that today the greatest demand is for fat, meat of poor quality, as well as by-products of the first category. It should be noted that in December 2011, in the retail food markets of Ukraine, the ratio of the price of bacon to the cost of pork was 1:72, and in 2016 - 1: 1.23. That is, there is a process of equalizing prices for the main slaughter products, which is a reflection of demand for them.

During 2011-2016, the decrease in sales of pork was detected by 15% and, accordingly, the growth of sales of lard by 12%.

Regarding the seasonality of retail sales of pork and lard, there is a slight increase in demand in the winter and in May-June. However, significant seasonal fluctuations have not been observed, which is due to some degree of minimization of the influence of religious factor. So, the coefficient of variation in consumption of pork is 0.3-0.35, which testifies to uniformity of consumption regardless of season (Table 4). Confirmation of these calculations is the results of surveys of residents of the Kiev and Khmelnytsky regions, conducted by the author in 2013-2016. Only a quarter of those polled (24.5%) are planning to follow the rules and regulations of the Great Lent, with the share of those who intend to keep fast for all the rules for seven weeks is only 2.8%. This circumstance is evidence of a departure from the rules and rules laid down in the tradition of nutrition.

We believe that this circumstance is predetermined, first of all, by a low living standard of the population, which as a result does not have the ability to purchase sufficient quantities of substitute products during the post period in order to balance the diet in terms of caloric content and nutrient content. It is obvious that, provided that consumption of food accounts for about 55% of total household expenditures, the issue of food diversification is inappropriate. It should be noted that low purchasing power also determines the minimum consumption of meat products by the population, mostly of low quality.

The absence of significant seasonal fluctuations indicates the minimum set of food consumed during the year by the population. The orientation of the formation of a diet based on carbohydrate and vegetable fats with a simultaneous reduction in consumption of other food products is evidence of the imbalance of food in the population, which is trying to secure its energy needs at the expense of economically accessible products.
Table 4 Volumes of sale of lard and pork on the retail food markets of Ukrainian cities and their price correlation

| Month       | 2011           | 2012           | 2014           | 2016           |
|-------------|----------------|----------------|----------------|----------------|
|             | Volume of sale of pork, с | Volumes of sales of lard, с | Volume of sale of pork, с | Volumes of sales of lard, с | Volume of sale of pork, с | Volumes of sales of lard, с | Volume of sale of pork, с | Volumes of sales of lard, с |
| January     | 28609          | 13589          | 2,11:1         | 2,05:1         | 28025          | 12883          | 2,18:1         | 1,85:1         |
| February    | 30524          | 14915          | 2,05:1         | 2,46:1         | 27304          | 12604          | 2,17:1         | 1,81:1         |
| March       | 29401          | 14338          | 2,05:1         | 2,52:1         | 27244          | 12339          | 2,21:1         | 1,75:1         |
| April       | 35596          | 17694          | 2,01:1         | 2,61:1         | 30755          | 26842          | 1,15:1         | 1,96:1         |
| May         | 29485          | 13752          | 2,14:1         | 2,66:1         | 33200          | 21082          | 1,57:1         | 1,95:1         |
| June        | 31241          | 14904          | 2,10:1         | 2,57:1         | 35646          | 23638          | 1,51:1         | 1,85:1         |
| July        | 29287          | 13963          | 2,10:1         | 2,41:1         | 31923          | 19827          | 1,61:1         | 1,79:1         |
| August      | 28691          | 13824          | 2,08:1         | 2,13:1         | 29322          | 17073          | 1,72:1         | 1,76:1         |
| September   | 28998          | 13488          | 2,15:1         | 1,89:1         | 29172          | 15997          | 1,82:1         | 1,61:1         |
| October     | 29261          | 13798          | 2,12:1         | 1,74:1         | 29788          | 16295          | 1,83:1         | 1,49:1         |
| November    | 29715          | 14127          | 2,10:1         | 1,67:1         | 30428          | 16585          | 1,83:1         | 1,45:1         |
| December    | 30928          | 14794          | 2,09:1         | 1,72:1         | 32010          | 17886          | 1,79:1         | 1,55:1         |
| Total       | 361736         | 173186         | 2,09:1         | 2,20:1         | 364817         | 213051         | 1,71:1         | 1,74:1         |

Source: Compiled and calculated according to the data of the State Statistics Service of Ukraine.
4 Conclusions

Calculated coefficients of elasticity of consumption of pork indicate that with an increase in consumer income, the coefficient of elasticity is reduced, which is quite obvious and is a confirmation of the reorientation of consumers to other types of meat products when changing their purchasing power. Pork is proven to be a food for high-income households, both in urban and rural areas, as evidenced by the value of calculated variability of pork consumption.

The specificity of consumption of pork and fat is determined on the basis of purchasing power fluctuations of the population of cities and rural areas. Thus, during the period of 2005-2010 this ratio was 1:1.2, in 2014 - 1:1.3, while in 2005 and 2016 in 1-4 groups of households remained almost unchanged, confirms similarity the priorities of low-income urban and rural populations.

Calculations of the elasticity of the consumption of fat depending on the level of income of the population made it possible to establish that demand is inelastic. The calculated level of consumption of eats per person is 8.55 kg (in fact - 6.2 kg), calculated value of coefficient \( R^2 = 0.5977 \) indicates that 59.77% of consumption of fat depends on the level of per capita income of the population. It is evident that the level of prices for interchangeable products, such as pork, beef, poultry and other types of meat, is also influenced by the consumption of bacon, in addition to consumer income.

Thus, the main consumer of pork is the population with low and average levels of total incomes, and fat - mostly low. In the context of growing crisis phenomena in the country, the consumption of bacon and low-pork pork is increasing, which is reflected in the respective price ratio between them, while consumers are oriented towards self-sufficiency of pig slaughter products at the expense of a private peasant farm and close family ties. At the same time, in a low income level, demand for low-grade sausages and meat products based on pork will increase.

Consequently, the favorable situation in the pork market was in favor of lard and by-products and decreased on pork, so the subjects of management immediately turned to growing and fattening sebaceous pigs.

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