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MEAT CONSUMPTION AS AN INDICATOR OF ECONOMIC WELL-BEING — CASE STUDY OF A DEVELOPED AND DEVELOPING ECONOMY

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ABSTRACT

The aim of the study was to verify the criterion of meat consumption as a marker of economic well-being, in economies at different phases of development. Meat consumption per capita is a widely used variable which is used to indicate the economic bases for the exclusion of meat and meat products from the diet. The study was performed simultaneously in Austria (a developed country) and Poland (a developing country) in 2015. Descriptive statistics, econometric and descriptive models were used to process the research material. Respondents were classified according to the wealth criterion, measured by the average income per household member in a given country. In the case of the developing economy, it was discovered that the meat consumption function takes the shape of an indifference curve. In the developed economy, once the income per household member exceeds 157% of the average national income, consumers exclude meat and other meat products from their diet for health reasons and reservations concerning the quality and origin of the meat. The consumption of meat in Poland is determined by income amount, at a greater degree than in a developed economy. Low income in Polish families is the reason for the exclusion of meat consumption.

Key words: well-being, meat, consumption, consumer preferences, incomes, household

INTRODUCTION

Meat is the basic group of food in many consumers' diet both in the developing and in the developed countries as it is a source of protein, ferrum, B vitamins, as well as elements important for building healthy tissues [Cosgrove et al. 2005, McAfee et al. 2010]. What is more, Johnson [2015] indicates this is an important dietary component in every age group. It promotes proper growth and development in children and ensures wellbeing and health of adults and seniors. The global per capita meat consumption reached 41.3 kg in 2005 when compared to 30 kg in 1980. Those changes were different in the developing and in the developed countries. Depending on the economic development level and the society wealth, it was found out that the meat consumption increased from 76.3 to 82.1 kg per capita in the developed economies and from 14.1 to 30.9 kg per capita in the developing economies. Importantly, according to FAO prognosis [2006], meat consumption will double by 2050 because of increased income in the developing countries and will result from the economic growth [Delgado 2003]. Additionally, according to the prognoses, in the decades to come meat consumption will approach a high though stabilising meat and meat product consumption level in the developing countries, similar to the one found in the developed ones [Vranken et al. 2014].

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The major purpose of this study was to verify the meat consumption index as the social prosperity indicator, taken as the relationship between income per one household member and the level of meat and meat product consumption broken down into consumers from a developed country, namely Austria (per capita GDP of more than EUR 47 thousand in 2016), and from a developing country, i.e. Poland, with the per capita GDP of about EUR 26 thousand).

LITERATURE REVIEW

Prosperity is a highly complex notion, and its nature has been studied by both economists and philosophers for ages. Prosperity should be understood as "doing well", as derived from Latin *prosperus*. However, a question emerges of how this doing is to be manifested and what spheres of social life it is to cover. According to Biernacki [2006], "doing well" or well-being satisfies the needs of a person with respect to basic goods, and since the goods should be useful, consuming them serves to satisfy those needs. It is important to prioritize those needs. For some people it is a priority to satisfy the necessities (eating, drinking), while others believe a sign of good life is to fulfill their spiritual needs. Such a diversity makes the definition and then measurement of prosperity ambiguous in terms of methodology and interpretation. Usually we speak of an economic prosperity and a social prosperity. According to Sen [1991], the economic prosperity is used to measure and evaluate the social prosperity, indicating the ethical value or "goodness" of interests of the whole community. The economic prosperity, on the other hand, means the utility of income [Kasprzyk 2012]. The prosperity measurement cannot be, however, reduced to measuring the economic development level of a state, as Kuznets turned the attention of NATO in 1934 to the fact that the welfare of a nation may be only slightly connected with the national income [Cobb et al. 1995]. The debate subject is, therefore, still the problem of what should be included in the prosperity calculation. According to Drabsch [2012], the aspects to be included in the deliberations on prosperity, are happiness, life satisfaction or quality of life. The prosperity concept based on the anticipated utility theory is a direction of a broadly studied quality of life which takes its single aspect in economy, i.e. the economic prosperity. Although this is a far-reaching simplification, it has been proved that there is a relation between income and the economic prosperity and this is a positive one. According to Campbell [1976], it cannot be assumed nonetheless that the objective improvement of living conditions is accompanied by the satisfaction with its current level.

Economic sciences have attempted to determine the prosperity levels in particular countries or regions, but prosperity has still been a multi-dimensional and highly subjective phenomenon. The complexity of this phenomenon is confirmed by the report published in 2009 by a commission led by Stiglitz, postulating development of further indicators describing the prosperity of individuals, societies and the sustainable development. However, despite efforts and searches no uniform prosperity measurement has been developed. Obviously, for international comparisons HDI, (human development index) is used, being a synthetic measurement of e.g. prosperity, including three fields of life [Nefs 2009]:

- life expectancy (average life expectancy);
- knowledge, evaluated based on the illiteracy and solarization;
- life standard, assessed based on the per capita GDP.

As human development index was assessed to be a measure not reflecting the social prosperity level fully, other measures were developed to determine the level of socio-economic development, including also the prosperity level. Those are the quality of life index (QLI) and the better life index (BLI) developed by OECD. The latter enables to compare the prosperity of countries based on such categories as housing conditions, financial expenditure, income, work safety and other. The studies carried out by Łopatka [2015] reveal that with respect to income, life satisfaction and housing situation Poland has achieved results below the average, while in such categories as security or education it is a leader, coming even before Austria which leads in terms of social prosperity calculated based on BLI.

The economic prosperity is a social prosperity component and is defined as a relationship between increasing wealth and its distribution in the society. As a result it should be claimed that depending on the dis-

tribution method and the capacities of wealth development by individuals creating the society, there may be significant differences in the prosperity level. A human creating a household which strives to achieve a specific standard of life in its actions, and the level of its prosperity is conditional primarily on the spendable income per one family member, is a part of the community. The income height, in turn, determines the living standard diversification in terms of quantity and quality [Kołodziejczak 2013]. The quantitative changes are reflected by the changed consumption volume which, according to Keynes [1956], is the only and ultimate business activity objective. Consumption results in increased domestic product and, consequently, the overall prosperity level. Although consumption has been criticised many times, it is beyond doubt that consumption is a component facilitating economies' growth although this may be just a short-term effect.

In the context of consumption, attention should be paid to food consumption, including meat. As indicated in the reference works, the income increase is accompanied by greater meat consumption in the developing countries, characterised by higher opulence of the society [Meissner et al. 2013], which may in turn lead to increased prices and destabilise food security [Hermann 2009]. However, as mentioned by Škare et al. [2016], the wealthy countries are expected to get even reacher, and the poor ones to get poorer. No outlook on the changes in meat consumption should neglect the fact that higher income enables the consumers to eat food of higher quality [Simo-Kengne et al. 2015] which is important both from the perspective of climate protection or health aspects, i.e. increased risk of cardiovascular diseases [Frazer 1999, Kelemen et al. 2005, Kontogianni et al. 2008] or of cancer [Cross et al. 2007, Kimura et al. 2007, Kabat et al. 2009].

As indicated by Vranken et al. [2014], the relationship between meat consumption and income may take the shape of upturned U because of problems related to environmental pollution and adverse effect of meat on health. However, it should be kept in mind that not all countries must be characterised by such a relationship because of the cultural and religious differences between them that affect the meat consumption level. As mentioned by Hubel et al. [2006], nationality has a significant impact on decisions related to food product purchase and consumption. What is more, there are certain mentions of doubts concerning the growth limit for the meat consumption [Vranken et al. 2014], concerns paying attention to the dependence between education and meat consumption level [Allais et al. 2010] and studies pointing to the need to consider ethical behaviour towards animals [Holm and Møhl 2000], or ensuring animal well-being in meat production. In developed economies consumers are interested to a higher degree in food production ensuring animal well-being [Henchion et al. 2014].

According to Henchion et al. [2014], the consumption trends indicate that the price and income will be less decisive for changes in this area. Most researchers claim that in the future the consumer choices will depend more on the quality or other factors, i.e. nutritive values or health-promoting properties. Obviously, the food quality is assessed subjectively by consumers (usually as sensory values), but the consumers demand food products (including meat ones) to be safe, healthy and guarantee high quality [Trienekens et al. 2012].

Nonetheless, the global meat consumption keeps increasing and is driven by population and income increase. However, price changes and other factors shaping meat consumption will affect not only the change in its consumption volume but rather choices of consumers who will decide to resign from red meat consumption for the benefit of white meat, produced in a way friendly for the environment and considering animal well-being (and consequently more expensive and healthier).

DATA AND METHODS

The study was carried out from January to March 2015 in two independent study samples, i.e. among Austrian and Polish consumers. To collect the study material, the diagnostic polling method, with the survey technique based on standardised survey questionnaire, was used. Likert and Guttman scales were used to create the survey questionnaire. Conclusions from the results obtained were drawn based on the description of the diagnosed phenomena and prospective regularities using the cause and effect analysis. Identification of a relationship between the income per one household member and the meat and meat product consumption

level was examined using an abridged econometric model verification procedure. The following assumption was made:

economic well-being = f(society wealth)
society wealth = Σ of household income
meat consumption = f(household income, culture, religion, other)
meaning: economic well-being ≅ f(meat consumption)

As the objective of this study was not to measure the effect of culture and religion on the meat consumption volume and as we compare European countries where certain differences in approach to meat consumption may take place but both countries originate from a similar culture, we decided the deviations in this respect should be considered a residual component (and together with other not included variables deemed incidental variables).

In connection with the proposed above-mentioned objective, two hypotheses were formulated:

- H.1. The consumption of meat and meat products increases together with the increase in the income per one household member among Polish respondents.
- H.2. The consumption of meat and meat products increases together with the increase in the income per one household member among Austrian respondents.

The identification of the relationships between the endogenous variable (meat consumption in kg) and the exogenous variable (per capita household income) was carried out based on the non-linear regression analysis. The studied relationships, expressed in algebraic terms, were subject to simplified verification procedure, suitable to study the econometric model goodness measures [Kufel 2011], eliminating the non-fitting observations.

The study of Austrian respondents enabled to gather 468 completed questionnaires and the one of Polish respondents brought 1,248 ones, meaning 1,716 respondents were examined altogether. To verify the relationship between the per capita income in a household and the meat and meat product consumption level, the answers of respondents who resigned from eating meat for any non-economic reasons where eliminated from both study samples. As a result, the basic sample of Austrian respondents comprised 419 observations, and the one of Polish respondents 1,232 records (with 1.3% of observations removed). Such a sample was subject to further verification procedure, its first stage being elimination of any discrepant observations. From both study samples, the observations discrepant from the theoretical line of the estimated model much above the calculated standard error (the standard deviation value would change during every consecutive model estimation by a repeated regression analysis) were removed. The elimination criterion adopted was the range equal to 2σ. This meant the observations where the residual component, resulting from the differences between value $\overline{Y}$ of the estimated model and the actual Y, went beyond the $(-2\sigma; +2\sigma)$ were eliminated. This was repeated until the maximum permissible number of observations was eliminated, i.e. to the limit of 20% of observations [Gawlik 2008], or until the residual component did not exceed $-/+2\sigma$. Following each elimination of a group of observations exceeding $(-2\sigma; +2\sigma)$, a repeated regression analysis was carried out to identify the best relationship possible. Having eliminated the maximum number of non-fit cases, the final regression analysis was carried out, resulting in the algebraic econometric model form. For those relationships, the following were analyzed: the goodness measures and the multiple correlation coefficient, standard error, Spearman's rank correlation coefficient and variation coefficient.

Eventually, 19.89% of observations were eliminated from the study sample in the developing country, meaning the final, refined study sample included 987 observations. For Austria, those were 19.57% and 337 observations respectively. For both study samples the regression lines, determining the actual data to the highest degree, were estimated based a on non-linear estimation.

Consumer preferences related to buying and eating meat and meat products were studied, considering also the income criterion. For every country, a group of consumers with income above the median for the sample, i.e. a group of wealthy consumers (marked as POL1, AUS1), and a group POL2, AUS2, including consumers with the per capita income below the me-

dian for the sample, i.e. a group of less wealthy consumers were distinguished. Table 1 presents the basic statistics describing the income value in Poland and Austria.

Table 1. Statistics describing the level of per capita income in the studied countries (EUR) in 2015

Specification	Poland	Austria
Minimum	160.00	316.00
Maximum	1 000.00	3 850.00
Mediana	480.00	1 610.00

Source: Own calculations based on the collected data.

The assessment of income per one household member revealed that for Polish respondents this was the amount of about PLN 1,852.71 (i.e. about EUR 450) when compared to about EUR 1,616.49 per one household member among Austrian respondents). This distinct difference in the income value between Polish and Austrian respondents results from the economic development level in the two countries and the social wealth. For Austrian consumers, it was found out that the poorest group of consumers has the income per one household member of about EUR 316. For Polish consumers, the lowest income value per one household member is about PLN 709 (EUR 160). The wealthiest households among the respondents from Austria had the average income per one household member of EUR 3,850 when compared to PLN 4,380 (ca. EUR 1,000) of the average income per one household member in Poland.

The data in Table 1 prove also that about a half of Polish consumers had the income below EUR 480 while in Austria that was 1,610, meaning that a "poorer" household member in Austria could spend the amount more than three times higher than the one in Poland.

RESULTS

The first step to assess the significance and scale of meat and meat product consumption depending on the income per one household member was the choice of consumers who did not eat meat or meat products for any reasons other than the income limitations and/or excess meat and meat product prices. The scale of excluding meat and meat products from the diet among Austrian respondents was higher than for the Polish ones, reaching the level of 10.5%, when compared to 2.1% of the Polish consumers. The diagnosed difference may be related to the consumers' habits, tradition and the specific nature of the national or regional cuisine [Stoličná 2011]. The diagnosed reasons for meat exclusion and the scale of this phenomenon in the studied countries are presented in Table 2.

Table 2. Reasons for meat exclusion from the diet among respondents in Poland and Austria (%)

Reason for exclusion	Poland	Austria
Vegetarian, vegan	9.52	36.00
Meat products are unhealthy	11.00	32.00
Low taste properties	17.00	26.00
High price	39.00	0.00
Low quality of meat products	19.00	0.00

Source: Own calculations based on the collected data.

Among the Austrian respondents, no difference was noticed in relation to the consumers' motives for eliminating meat from their diet from the income criterion perspective. The Austrian consumers' motives related to excluding meat and meat products were, therefore, independent from the income. Among the Polish respondents, it was noticed that the excess price criterion was selected in more than 74% of cases by the consumers classified into POL2 group of respondents. Similar results were obtained by Szwacka-Mokrzycka [2016, 2017]. That criterion was less important among consumers with higher income, i.e. POL1 group. In this group, the factors related to quality, sensory values and health-promoting properties of meat dishes were much more significant. Unfortunately for some Polish respondents meat and meat products are excluded from the diet due to their high price when compared to the income earned, for them meat and meat products may be almost luxury goods for this group. This insight is, therefore, an important indicator of poverty of some part of the society which was forced to resign from certain product types because of insufficient funds. Consequently, this motive does not belong to conscious convictions of customers

and is a result of economic constraints. This situation, i.e. poverty of families, is improving thanks to the social benefit programmes implemented in Poland, which have contributed to the significant reduction in poverty areas, especially among children.

The graphic presentation of the modelled relationships is shown in Figure 1.

The verification of hypotheses H1 and H2 did not provide any explicit results. The hypotheses assumed the positive value of the coincidence coefficient and the proportional (linear) increase in meat consumption in relation to the income level increase. For econometric verification of hypotheses H1 and H2 the goodness measures were used, the values of which are presented in Table 3. The relevant numbers are listed in Table 3.

The study of goodness measures for the model created to verify the study hypothesis H1 did not confirm its correctness due to the excessive (above 10%) value of the variation coefficient. It was similar for the hypothesis H2.

The verification of goodness measures for the model relationships between the level of per capita household income and the meat and meat product consumption did not corroborate the econometric correctness of the observed relationships.

Table 3. Goodness measures for the developed models

Hipothesis	Multiple correlation	R^2	V_e (%)	R_S	$\overline{R^2}$
H1	0.818	0.6693	18.14	0.7800	0.6689
H2	0.867	0.7515	11.25	0.7982	0.7500

Source: Own calculations.

The estimated relationships, though not confirmed econometrically, were characterized by very high multiple correlation coefficient values and high determination coefficient values. This means they are grounds for observing certain regularities resulting from the estimated regression functions. From the perspective of verifying the formulated study hypotheses, attention should be paid also to the shape and direction of the observed relationships.

For Polish consumers, it was found out that, in line with the hypothesis H1 proposed, the consump-

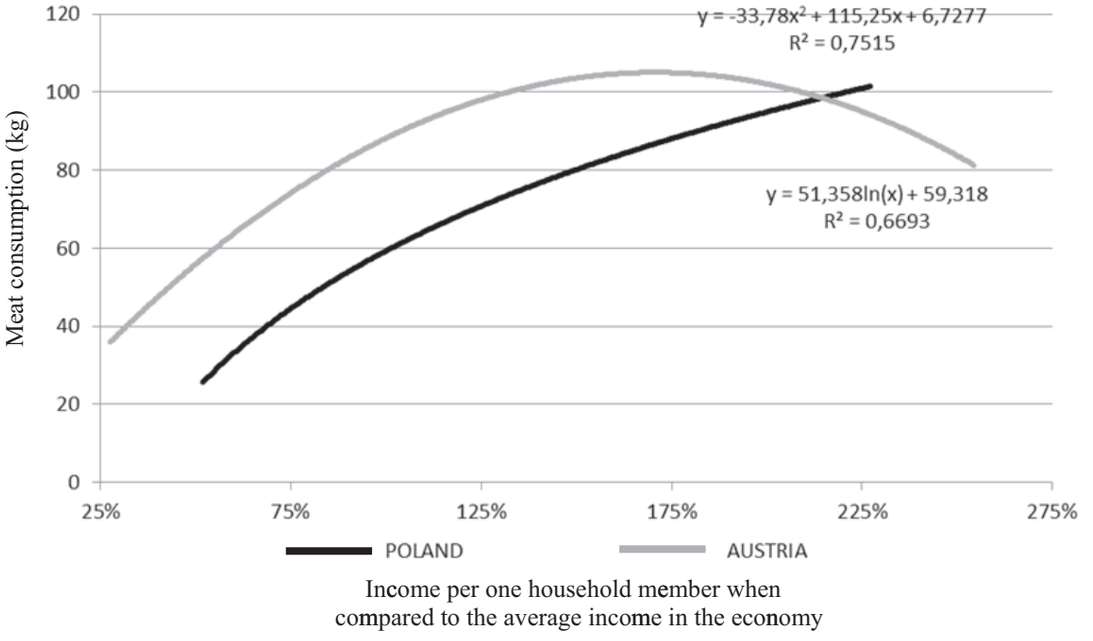

Fig. 1. Per capita household income and the meat and meat product consumption level in Poland and Austria

Source: Own compilation.

tion of meat and meat products grows together with the increase in the income per one household member. The increase in consumption, however, decelerates, meaning further income rise leads to the lower than proportional increase in meat and meat product consumption. Consequently, the estimated regression line takes the shape of a logarithmic function. From the economic perspective, it takes the shape similar to the utility function. This means we should point to the diminishing marginal utility of every meat and meat product unit consumed additionally. This can be grounds also for concluding that the demand for meat and meat products in the developing economy is not satisfied and is largely predetermined by the income height, as proven by the monotonic function. Consequently, although the econometric correctness of the estimated model has not been proven, there are grounds to confirm the hypothesis H1. Meat and meat products are considered to be ordinary goods by consumers from a developed country.

For Austrian consumers, it was found out that in accordance with the hypothesis H2 presented, the increase in the income per one household member is accompanied by the increase in meat and meat product consumption, but solely when the income does not exceed 170% of the average income per one household member in Austria. The estimated function maximum is at (170.59%; 105.03 kg), being the function extremum. Particular attention should be paid to the fact that just like for the consumers from a developed economy, the income rise leads to a lower than proportional increase in meat and meat product consumption (for $x \in (0 ; 170.59\%)$. The estimated quadratic function becomes a decreasing function as the domain of a function increases above 170.59%. As a result, along with a subsequent income growth, consumers resign from eating meat and meat products. This is indicative of a substitution effect. In such a situation meat and meat products are considered inferior goods, and as the income grows, they are replaced with other food products. As the estimated function is not monotonic, the hypothesis H2 was verified negatively.

The study carried out enabled also to determine the scale of spending on meat and meat products as percentage of income per one household member. The study was broken down into wealthy and less wealthy customers in two independent study samples. The list of results obtained is presented in Figure 2.

The list of spending on meat and meat products, presented in Figure 2, shows that the Polish and Austrian family uses 10% of its income for that purpose on average. At the same time, it should be stated that there are significant differences in the scale of

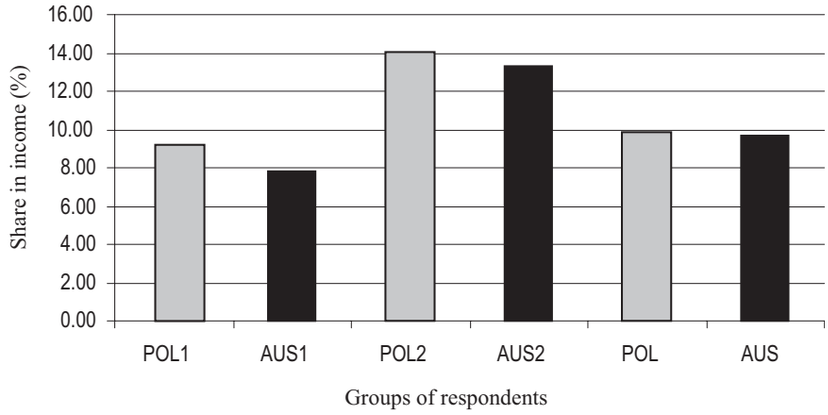

Fig. 2. Share of spending on meat and meat products in the income based on separate groups of respondents (description in the text)

Source: Own research.

spending between the groups of wealthy consumers (POL1, AUS1) as those households spent 9 and 7% of their income respectively to buy meat and meat products. The households with lower income (POL2, AUS2) spent about 14% of their income on that type of goods. The study carried out revealed that the respondents classified as less wealthy spend 4.6 p.p. on average, expressed as percentage of the income, on meat and meat products. Despite a lower nominal level of spending on meat and meat products among less wealthy consumers, because of the clearly lower average income level among the less wealthy respondents, the ultimate share of spending on meat and meat products among the less wealthy respondents is clearly higher than for the wealthier ones. The identified regularity indicates a lower meat consumption level among less wealthy consumers or purchase of food of inferior quality, which is cheaper. The presented results of studies among the Polish and Austrian respondents enable also to classify meat and meat products economically from the income flexibility perspective. On that basis it was calculated that the income flexibility of demand for meat and meat products among Polish respondents equals 0.31, when compared to 0.18 among Austrian respondents. In both cases, meat and meat products can be considered ordinary, basic goods, as confirmed also by the study results of Kwasek [2008]. Among the Polish respondents, the income flexibility value was higher, meaning the income rise results in increased demand for meat and meat products to a higher degree. Simultaneously, the income decrease may result in lower meat and meat product consumption to a higher degree than among the Austrian respondents. The identified difference proves the higher sensitivity of the Polish respondents to the income constraints which may result from still low income when compared to highly developed countries, e.g. Austria.

The diagnosed difference between the Polish and Austrian respondents may suggest that a tendency perceivable since 2011 may become stronger in the Polish society in the future, in accordance with which consumers reduce consumption of meat and meat products despite the increased social wealth. This change in most cases is not accompanied, however, by any economic pressure but it is a conscious choice of consumers. Simultaneously, the rule that less wealthy respondents declared lower consumption of meat than the wealthier ones has been observed both among Austrian and Polish respondents. Consequently, it can be declared that the economic criterion related to the per capita income in a household may be significant for the amount of the meat and meat products consumed. In both groups of respondents it was found out that the consumption of meat and meat products is lower among less wealthy respondents by about 11 p.p. on average.

The study revealed also the approach of consumers in the developed and in the developing country to meat and meat products. In the developing economy, it was found out that the income is a significant determinant of the meat and meat product consumption level. However, meat is considered to be ordinary goods, with the effect of diminishing marginal utility to be considered. This effect grows as the income rises. The study also indicated existence of similar relationship among consumers from the developed country, with this result observed solely among the less wealthy group of consumers. The increase in the consumers' wealth led to reduced consumption of meat and meat products, as indicated by the substitution effect. This group of respondents considered meat to be inferior goods.

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SPOŻYCIE MIĘSA JAKO WYZNACZNIK DOBROBYTU EKONOMICZNEGO – PRZYPADEK GOSPODARKI ROZWINIĘTEJ I ROZWIJAJĄCEJ SIĘ

STRESZCZENIE

Celem badania była weryfikacja kryterium konsumpcji mięsa jako wskaźnika dobrostanu ekonomicznego w gospodarkach na różnych etapach rozwoju. Zużycie mięsa na osobę jest powszechnie stosowaną zmienną, która służy do wskazywania ekonomicznych podstaw wykluczania mięsa i produktów mięsnych z diety. Badanie przeprowadzono równolegle w Austrii (kraj rozwinięty) i Polsce (kraj rozwijający się) w 2015 roku. Do przetworzenia materiału badawczego wykorzystano statystyki opisowe, modele ekonometryczne i modele opisowe. Badanych klasyfikowano według kryterium zamożności mierzonego średnim dochodem na członka gospodarstwa domowego w danym kraju. W przypadku rozwijającej się gospodarki odkryto, że funkcja konsumpcji mięsa przyjmuje kształt krzywej obojętności. W rozwiniętej gospodarce, w której dochód na członka gospodarstwa domowego przekracza 157% średniego dochodu narodowego, konsumenci wykluczają mięso i inne produkty mięsne ze swojej diety ze względów zdrowotnych i z powodu zastrzeżeń w kwestii jakości i pochodzenia mięsa. Konsumpcja mięsa w Polsce jest determinowana przez wielkość dochodów w większym stopniu niż w rozwiniętej gospodarce. Mały dochód w polskich gospodarstwach domowych jest przyczyną wyłączenia mięsa z konsumpcji.

Słowa kluczowe: dobrobyt, spożycie mięsa, preferencje konsumentów, dochody, gospodarstwa domowe