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DEVELOPMENT OF CONSUMER PREFERENCES ON THE SIGNIFICANT MARKETS OF PIG MEAT

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Abstract

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The aim of the article is to describe the broader context and to verify the relationship of consumer preferences with the income situation of the population in selected regions of the world.This paper deals with the development of consumer preferences in case of pork meat commodity, through verification of relationship between consumption of pork meat and GDP per capita in selected regions (countries) of the world. Very strong relationship of dependency between the level of GDP / per capita and Consumption of animal protein / per capita has been proven through numerous scientific studies. There are also investigated the specifics, conditions and assumptions for the global market of the given commodity in the regional aspects. Consumer preferences (of investigated commodity) in the world are various due to many different factors. The current societal demand is characterized by a number of requirements for the organizations involved in the pork meat commodity chain. In the past has been considered as the most important measure to produce a cheap and safe food. Nowadays these requirements are extended on other important factors such as sustainable production, animal welfare, ethical procedures, etc. The largest extension of these requirements is typical mainly for the European markets. This creates a considerable upward pressure on costs of European businesses, which is one of the sources of their declining competitiveness in the global markets.

agribusiness, consumption, consumer preferences, dependence analysis, GDP

Breeding of pigs belonged in the Czech Republic to one of the most important sector of agricultural production. There is not a positive signal that the share of total production of Czech agriculture since 90's of the twentieth century has been steadily decreasing. There is a considerable decrease in number of pigs from 5106 thousand pieces (in the year 1981) to 1749 thousand pieces (in the year 2011). This development reflected the reduction in the volume of pork meat production in the Czech Republic and also reduction of self-sufficiency in this commodity below 60%. On the other hand, the reduction of domestic pork meat production can't be explained by the drop in demand. Pork consumption in the Czech Republic is stable in the long-term (between 40–50 kg per capita and year). A significant reduction in demand for pork meat did not result from reform of agricultural policy in the 90's, while it was one of the few commodities that its share in the consumption defended. In recent years, there are reflected problems in the competitiveness of European producers on globalizing pork meat markets, especially in terms of profitability of farming, thus the ability to succeed itself as inputs suppliers.

Generally, in the global context of the development of these markets, the consumption of pork meat, intermediate products and other meat products differs in terms of both structure and volume, according to dietary habits, lifestyle and religious traditions in the given region.

While the total average consumption of pork meat per capita and year in the world since the year 1961 almost doubled (from 8.03 kg to current 15.35 kg). The highest level of pork meat consumption is still in countries with high standard of living and its traditional production centres. Traditional producers of this commodity are mainly USA, Canada, Denmark, the Netherlands, Germany, Spain, Russia, Poland, France and the Czech

Republic (until recently). Among the regions with the highest consumption of pork meat per capita belongs Germany, Denmark, but also e.g. South Korea.

A typical phenomenon of current development is the increase in pork meat consumption, particularly in developing countries. The comparison of the pork meat consumption per capita between 1999 and 2009, with forecasts FAPRI (2011) for 2019 shows that the most significant increase in pork meat consumption is observed in Asian and Latin American countries (Brazil, Argentina, Mexico, Vietnam, China, South Korea etc.).

Growth of pork meat consumption according to FAPRI (2011) is expected in Russia, Australia and New Zealand. In contrast, in North America (Canada, USA) is expected decline (currently very high) consumption of this commodity. This reflects the changes in dietary habits of population in economically developed countries. Consumer preferences are changing in favour of a healthy lifestyle, which is associated with the reduction of excessive intake of animal fats.

Consumer preferences in the world are also different due to the demand for different parts of the carcass. The decline in market shares of producers from the EU 27 on the world markets and reduced competitiveness (e.g. Bečvářová, Vinohradský, Zdráhal, 2010; Tamáš, Bečvářová, 2012) is undoubtedly caused by high production costs due to strict regulations on animal welfare, environmental measures etc. It can't be expected, that the reduction in EU-27 exports to third countries would in the future fully compensated by increasing of consumption within the internal market.

Scientific studies of Keogh (2008), Swick (2006) and Wilska, Haanpèaèa (2006) confirmed the existence of a very high relation of dependence ($r^2 > 0.8$) between the level of GDP per capita and the consumption of animal proteins per capita and year. It was also proved the large relation of dependence ($r^2 = 0.7326$) between the level of GDP per capita and the meat consumption per capita and year (GIRA, 2008).

The objective of this paper is to describe the broader context in consumer preferences in the context of their income. Simultaneously to verify the relation of dependence the consumption of pork meat and GDP per capita in selected regions of the world. Based on these, specify conditions and assumptions for the global market of the investigated commodity in the regional aspects.

MATERIALS AND METHODS

Methodology is research based on examining relation of dependence between the level of GDP per capita / year and consumption of pork meat per capita / year. For this purpose it is used the correlation analysis. Dependence relation is evaluated by the coefficient of determination (r^2), which indicates the percentage of empirical values dispersion of the dependent variable due to diffusion of theoretical value of the dependent variable based on the estimated regression line. The relation of dependence scale according to (r^2) is shown in Tab. I.

I: *Relation of dependence scale according to (r^2)*

Range	Relation of dependence
$r^2 < 10\%$	Very low
$10\% \leq r^2 < 25\%$	Moderate
$25\% \leq r^2 < 50\%$	Considerable
$50\% \leq r^2 < 80\%$	Large
$80\% \leq r^2$	Very large

Source: Hindls (2006)

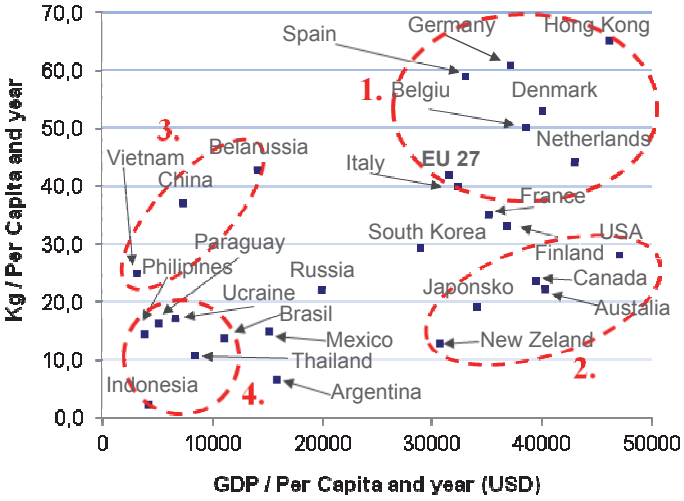
The sample of countries (regions) for detection of investigated dependence is determined with regard to the representation of the entire spectrum of countries according to the annual GDP per capita, including major consumer and production centres. From the sample have been earmarked 4 the most significant clusters (groups of states), inside of which have been during the more detailed analysis revealed a number of common characteristics (not only in terms of consumption and production of pork meat). These four clusters are further characterized. The analyses are based on the results of data processing from the databases FAO, FAPRI, World Bank, OECD and USDA. There were also used the scientific articles of journals specialised on researched issues.

RESULTS

Development of the consumption of pork meat is influenced by certain specifics in each determined group. Some specifics are common for the whole defined group and affect the classification of the given countries into individual clusters. There are however differences within each group, which can be seen in the detailed analysis of each country. The amount of pork meat consumption is dependent (to a certain extent) on the level of annual GDP per capita in given country. Relation of this dependence is further analysed for each of defined group separately. Fig. 1 shows segmentation of countries (regions) according to consumption of pork meat per capita / year and GDP per capita / year.

Group 1

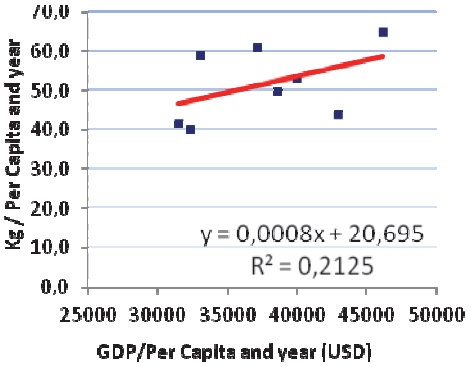
This group is characterized by **„surplus"**, ie very high pork meat consumption per capita and high-income of local population. This group includes the most EU countries and rich consumer centres such as Hong Kong. This covers also the Czech Republic, with an annual consumption of 41.3 kg of pork meat per capita (in the year 2010) and annual GDP per capita 25 299 USD (in the year 2010).



1: *Segmentation of countries according to consumption of pork meat per capita / year and GDP per capita / year (in the year 2010)*
Source: own elaboration based on the data of World Bank, FAPRI, FAO, OECD (2011)

The definition of group 1:

- GDP / per capita > 25 000 USD per year,
- Pork meat consumption / per capita > 40 kg per year.



2: *Dependence of pork meat consumption and GDP per capita (group 1)*
Source: own elaboration based on the data of World Bank, FAPRI, FAO, OECD (2011)

The characteristics of group 1:

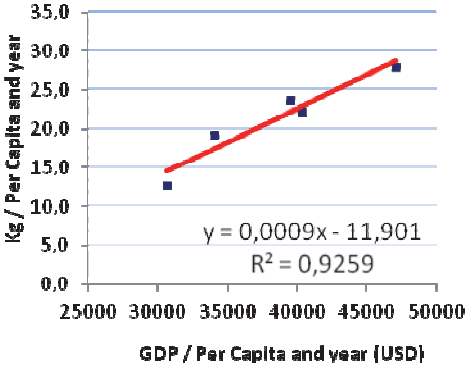
- **Low relation of dependence** between the annual GDP per capita / year and consumption of pork meat per capita / year, as demonstrated by the Fig. 2.
- Pork has (to some extent) irreplaceable role in the local diet.
- Traditional preferences of pork meat (small substitution effect).
- With the change of living standards can't be expected major changes in the consumption of pork meat (reduction in living standards = increase in demand for pork meat of lower quality).
- Highly differentiated demand, especially for pork meat (lean, organic, regional specialties, animal welfare, environmental measures, low price).
- Most of the traditional production centres, rich countries and major exporters (typical is the high degree of competition on local markets).

Group 2

This group is significantly represented by Anglo-Saxon countries (USA, Canada, Australia, New Zealand), but also e. g. by Japan. A typical feature of this group is **„substitution"** as the pig meat does not play the most important role in the local diet and is often replaced by other kinds of meat.

The definition of group 2:

- GDP / per capita > 25 000 USD per year.
- Pork meat consumption / per capita > 10–30 kg per year.



3: *Dependence of pork meat consumption and GDP per capita (group 2)*
Source: own elaboration based on the data of World Bank, FAPRI, FAO, OECD (2011)

The characteristics of group 2:

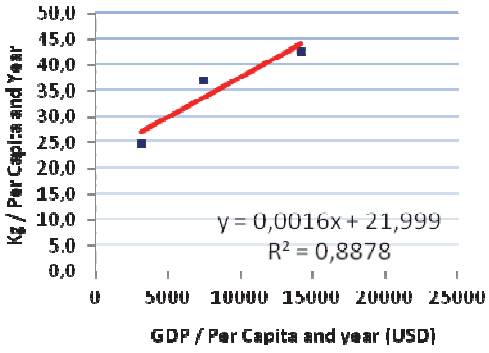
- **Very large relation of dependence** between GDP per capita / year and consumption of pork meat per capita / year, as demonstrated by the Fig. 3.
- Pork is the only the supplement to the local diet.
- Mostly preferences of other kinds of meat (large substitution effect).
- With the change of living standards can be expect major changes in consumption of pork meat (reduction in living standards = decrease in demand for pork meat).
- Highly differentiated demand, but not only for the pork meat.
- Often the traditional production centres, rich countries (typical is the high degree of competition in the local markets).

Group 3

This group is particularly characterized by fast growing economies (China, Vietnam), as well as Belarus, which are characterized by a **"strong preference"** of pork meat consumption despite the low annual GDP per capita.

The definition of group 3:

- GDP / per capita < 20 000 USD per year.
- Pork meat consumption / per capita > 20 kg per year.



4: *Dependence of pork meat consumption and GDP per capita (group 3)*
Source: own elaboration based on the data of World Bank, FAPRI, FAO, OECD (2011)

The characteristics of group 3:

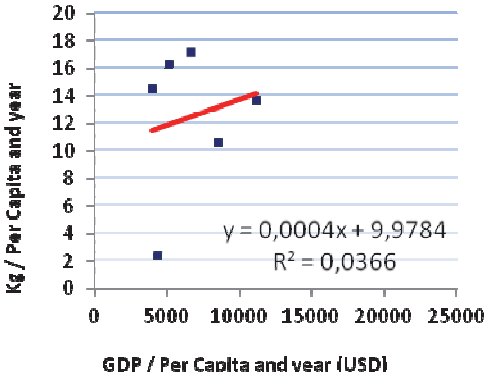
- **Large relation of dependence** between GDP per capita / year and consumption of pork meat per capita / year, as demonstrated by the Fig. 4.
- Pork meat is also very popular, but there is not sufficiently available for all consumers.
- Traditional preferences of pork meat (large substitution effect only in case of significant decrease in income of local population).
- With the change of living standards can be expect major changes in the consumption of pork meat (reduction in living standards = significant decrease in demand for pork meat).
- Very low level of differentiation in demand for pork meat (the main role = Price).
- Mostly the developing countries with a significant share of imported pork meat.

Group 4

This group includes countries such as Indonesia, the Philippines, Paraguay, Thailand, etc., characterized by a **„lack"** in the consumption of pork meat. The reasons for this lack can be associated with low purchasing power of local population and different preferences in consumption.

The definition of group 4:

- GDP / per capita < 15 000 USD per year.
- Pork meat consumption / per capita < 20 kg per year.



5: *Dependence of pork meat consumption and GDP per capita (group 4)*
Source: own elaboration based on the data of World Bank, FAPRI, FAO, OECD (2011)

The characteristics of group 4:

- **Low relation of dependence** between GDP per capita and consumption of pork meat per capita, as demonstrated by the Fig. 5.
- Pork meat is only available to a small group of the local population.
- Pork meat is not a traditional at this countries (mostly vegetable diet, also for religious reasons).
- With the change of living standards can't be expected major change in the consumption of pork meat (it would have to be her large increase).
- The very low level of differentiation in demand for pork meat (a shortage of this type of goods).
- Generally the poorest countries in the world.

DISCUSSION

The current social demand for pork meat is characterized by increasing differentiation. Therefore the segmentation in consumer typology is typical of their different requirements and

behaviour. This demand and market differentiation penetrates against the flow of the product supply in the current demand-oriented model of pork meat commodity chain, see Trienekens and Wognum (2009).

The current social demand is characterized by a number of requirements for the organizations involved in the entire commodity chain.

In the past, has been considered to be the most important measure to produce a cheap and safe food. Nowadays there is the enlargement of these requirements for further significant factors such as: **sustainable production, welfare of animals, ethical production, etc.**

The largest enlargement of these requirements is typical for countries in the EU. This creates a considerable pressure on increasing the costs of European businesses, which is one of the sources of their declining competitiveness on the global market.

The most important requirements for manufacturers of pork meat can be divided according to the following aspects: **economic, socio-economic** and **ecological**. The most important area of interest from an economic point of view (in various stages of pork meat commodity chain), see Trienekens and Wognum (2009).

To keep efficiency and competitiveness in the pork meat commodity chain it is necessary to evaluate in detail the requirements of consumers (requirements for the origin, sensorial characteristics, etc.). Mentioned aspects are becoming currently more and more important (in all stages of the pork meat commodity chain). Simultaneously is essential that businesses have managed to maximize the use of resources in order to maintain the economic profitability and competitiveness. As an example could be the optimal use of capacity of slaughterhouses or stability of the production processes. One of the biggest challenges of pork meat producers is the difficulty to sell (for a reasonable price) all of the carcass parts (not only the most wanted pieces). This is a specific issue because the fresh pork meat is quickly perishable. Nevertheless, costs of its storage in refrigerating rooms are high, therefor must be sold quickly.

The socio-economic and environmental aspects are highly cost-intensive requirements gained in popularity, mainly due to the recent crises of meat industry in Europe. A negative image of European meat industry sketched in the media that further spread concerns of consumers, who consequently demanded strict rooles in many stages of pork meat production. Nowadays, therefore, pork mea commodity chain address a wide range of social requirements related to environmental issues (handling manure, waste disposal), animal welfare (forms of housing, transport of animals) and ethical working practices (additives in feedings tuffs, medication use, monitoring the origin of ingredients). Current successful pork meat commodity chains are demand-oriented. They work with regard to the requirements and desires of consumers. Enterprises, using this system can take advantage of comparative advantage, by searching for a new paths creating higher added value, based mainly on the improvement of technology. In this way can modern businesses respond to the increasing demands of customers with regard to food packaging, increased demands for simplicity of preparing food, offer of semi-finished products, health and food safety.

Current consumer decides to purchase of pork meat on a wide range of **internal** and **external** characteristics associated with this commodity. Among the interior features include colour of meat, content of fat, marbling. External features as food security, price, nutritional value, added value, etc. The final decision of consumers on the purchase of pork meat depends to some extent on the internal and external characteristics of pork meat. The predominant factor is undoubtedly the particular experience of the consumer associated with the characteristics of the product such as: tenderness, juiciness, flavour and aroma. Nowadays increasingly important external features as animal welfare, food safety, disease threats, etc.

D'Souza (2007) states that some of the measures associated with the application of strict rules on the external characteristics negatively affect the quality of pork meat. Therefore, it is currently very difficult to deliver to the customer product and simultaneously fulfil all of the conditions associated with the required internal and external characteristics. The term „quality of pork meat" can be explained in different ways with regard to primary producers, processors, retailers and consumers. Hammond (1955), described the quality of pork meat as follows: „The quality of pork meat is the best defined by characteristics that consumers prefer and at the same time as they are willing to pay for higher than average price," but this definition only takes into account profitability and consumer demand. In present difficult conditions can't be so narrow view of the quality of pork meat accepted. There are necessary more appropriate quality characteristics, defining the factors affecting the quality of pork meat with regard of the entire pork meat commodity chains. From the current perspective, the quality of pork meat defined totality of features and characteristics that are important in terms of its nutritional properties, suitability for processing, human nutrition and ability to meet the growing demands in the market.

Current problems of the changing position of pork meat producers are therefore associated with a number of other criteria which must present producer or processor fulfil Increasing importance of quality criteria, the setting and compliance becomes a part of legislative procedure. The structure of pork meat production is largely influenced by the actors on the demand side of the pork meat commodity chains (distribution and finalizing channels). The fundamental problem

becomes finding suitable conditions for the optimal price that would meet the minimum quality requirements and at the same time has been able to determine competitiveness on the expanding globalized market.

Most strongly, the issue will be reflected in pressure for an increase the price competitiveness of EU-27 production in conditions of globalizing markets. Significant influence may be expected just in commodity chain pork meat, where external serious competitors are mainly producers from third countries. Simultaneously, the change in the global market seems to be reflected in the common market of the EU 27, between the members of the EU, where the criteria of competitiveness unquestionably ranks price and a quality of the product.

CONCLUSIONS

Pork meat and the pork products traditionally belong to fundamental food components that are incorporated into the daily diet of consumers in most of the countries in the world. The current social demand for pork meat is characterized by increasing differentiation. Therefore, segmentation of consumer's typology, explains their different requirements and behaviour. The demand and market differentiation penetrates against the flow of the product supply in the current demand-oriented model of pork meat commodity chains. While in the past was considered the most important measure to produce cheap and safe food, currently taking place extension of these requirements for further significant factors such as sustainable production, animal welfare, ethical procedures, etc. The largest expansion of these requirements is typical for the European market. This creates a considerable pressure on increasing costs of European businesses, which is one of the sources of their declining competitiveness on the global market. The fundamental problem becomes finding of suitable conditions for the optimal price that would meet at least the basic quality requirements and at the same time has been able to determine competitiveness in an expanding market. This competitive pressure is reflected precisely in pork meat commodity chain, which is typical by the strengthening of producers position from third countries. Increased competition on the world market induces changes in the EU common market

From a long term perspective can be seen in the production of pork meat in various global production centres major changes. The different development is visible among the traditional producers (from the EU, Canada and USA) and producers from developing countries. It is apparent sharp increase in production of China which is considerably moving away to other production centres. The increasing importance on the world market are gaining ground in this commodity countries such as Brazil, Vietnam and Russia, these countries have increased production, often with government support for the sector. The development of this sector is the compounded by the increasing demand for animal protein products in these regions of the world due to growth of living standards.

On the current global market of pork meat occurs to the mutual interactions between the individual global production centres. Producers with higher production costs are thus subjected to much stronger competition than on earlier protectionist protected agricultural markets. The problem of high production costs is typical particularly for producers in the EU-27 It is associated not only with technological requirements and cost of inputs, there are other important factors, such as high requirements on safety, animal welfare, environmental measures, high hygiene standards and other legal requirements.

Export directed from producers of the world's major production centres to the markets of developing countries in these context of more „threatened" by local producers increase production and thus increasing their self-sufficiency. Markets in most of the world's pork meat production centres are nowadays characterized by surplus. This group includes not only the majority of EU countries, but also rich consumer centres such as Hong Kong. In addition, some of the world's production centres leads to substitution in consumption, the pork is often replaced by other kinds of meat. This group includes the Anglo-Saxon countries (USA, Canada, Australia, New Zealand), as well as Japan). On these markets, in most cases in the future decade is not expected increase in pork meat consumption. The increase in pork meat consumption is expected in developing Asian and Latin American countries (such as Brazil, Indonesia, the Philippines, Paraguay, Thailand). Some countries in this region are characterized by even a strong preference for the consumption of pork meat (fast-growing economies such as China and Vietnam), that seek rapid increase in self-sufficiency in pork meat production. It is then a matter of strategic choice possible involvement of European producers and processors particularly as well as other relevant stakeholders across entire commodity chains of agribusiness (including services) to use this type of market opportunities.

SUMMARY

The paper is based on examining relation of dependence between the level of GDP per capita / year and consumption of pork meat per capita / year. For this purpose it is used the correlation analysis. The sample of countries (regions) for detection of investigated dependence is determined with regard to the representation of the entire spectrum of countries according to the annual GDP per capita,

including major consumer and production centres. The objective of the paper is to describe the broader context in consumer preferences in the context of their income. Simultaneously to verify the relation of dependence the consumption of pork meat and GDP per capita in selected regions of the world. Based on these, specify conditions and assumptions for the global market of the investigated commodity in the regional aspects. The current social demand for pork meat is characterized by increasing differentiation. Therefore the segmentation in consumer typology is typical of their different requirements and behaviour. The most important requirements for manufacturers of pork meat can be divided according to the following aspects: **economic, socio-economic** and **ecological**. To keep efficiency and competitiveness in the pork meat commodity chain it is necessary to evaluate in detail the requirements of consumers. These aspects are becoming currently more and more important (in all stages of the pork meat commodity chain). Simultaneously is essential that businesses have managed to maximize the use of resources in order to maintain the economic profitability and competitiveness. Nowadays, pork meat commodity chains address also a wide range of social requirements related to environmental issues, animal welfare and ethical working practices. Current successful pork meat commodity chains are demand-oriented. They work with regard to the requirements and desires of consumers.

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