

Relation between price and quality of meat products in the Czech Republic

Type of Presentation: Case study

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Abstract:

The amount of soft meat products sold in Czech Republic is significant. They are a part of a tradition in the Czech Republic as well as in other neighbor countries. Unfortunately the last two decades companies were devoting a big effort to develop formulations allowing replacing the high quality raw materials by lower price ingredients. This effort is caused by the market pressure and fact that sensory parameters can be hold even if the raw materials do not follow the traditional formulations. In the year 1992 the regulations defining qualitative parameters for food were annulled and until 1997 the consumer protection was based only on general requirements of the law. In 1997 the food law was approved and in 2001 the general requirements for meat products were defined. Since 2003 the qualitative parameters are valid (including the definition of meat used for meat products preparation – application of European directive). In the year 2008 the request was sent to the EC for registration of some traditional meat products.

In the case study the evolution of price and qualitative parameters in relation to the legislative state and amounts of sale of traditional products is discussed.

Introduction:

Regulatory measures defining the quality of products are discussed as a very important tool to protect consumers' interests. On the other side each regulatory measure is complicating the free market and without effective control measures, the impact must not be significantly appreciable. In the EU quality labels are used for the protection of most known products (PDO, TSG, PGI). In the Czech Republic many products are protected with the national legislation, which is partially based on the European directives and in the segment, which is out of common market by independent regulations as well. The goal of this work was to compare the price evolution in contrast to the evolution of the legislation defining quality parameters and methods detecting adulteration.

Methodology:

First of all the overview of the legislation determining quality parameters was prepared. In this relation key years in which the influence to the product price was expected were identified. In the similar way the description of methods detecting adulteration was done. The data about price evolution were taken from the statistics of Ministry of Agriculture of the Czech Republic. For the comparison the products in which qualitative parameters were regulatory defined as well as products where the quality is determined only by market demand.

Overview of products:

Product	Meat used	Minimum content of meat (or meat protein)	Regulation
Fermented salami	Pork 80 %	14 % meat protein	264/2003 Col.
Ham	Pork – 100 %	16 % meat protein	264/2003 Col.
Small sausage	Pork – 100 %	40 % meat	264/2003 Col.
Brawn	Pork – 100 %	-	-
Delicate sausage	Pork – 100 %	-	-

To eliminate the effect of raw material price, the average meat prices were collected in the same period. For the comparison the market price and consumer price of pork leg and beef forequarter. The ratio of the meat price on the product price (per kg) was calculated and compiled into the graph. For ham, small sausage, brawn and delicate sausage the product price was compared only to the pork meat price. In the case of fermented salami the meat price was calculated as 80 % of pork meat and 20 % of beef meat, which is the usual recipe in the Czech Republic.

Results:

Development the methods of detecting meat product adulteration:

The following parameters are estimated in meat products observing the local regulations; the meat, fat, water, salt and net muscle proteins content, the detection of mechanically separated meat, other animal proteins, plant proteins, fibre, starch and colorants.

Determining fat content in meat products follows the local standard (CSN 570147) and the international standard (ISO 1443), from 1994 in effect, using a gravimetric survey.

Water and salt content is determined following the ISO 1442 (CSN576021) and the ISO1841-1 or ISO1841-2, which were in effect from 1999. When determining the water content a sample of the meat product is dried at $103^{\circ}\text{C}\pm 2^{\circ}\text{C}$ till constant weight. The amount of salt is determined through the concentration of chloride anions.

At the end of the 90's the Czech authorities started to detect the presence of plant proteins, forbidden animal proteins with the immunochemical method ELISA. In the same period the authorities could also start to detect fibre in meat products where the use of fibre is forbidden.

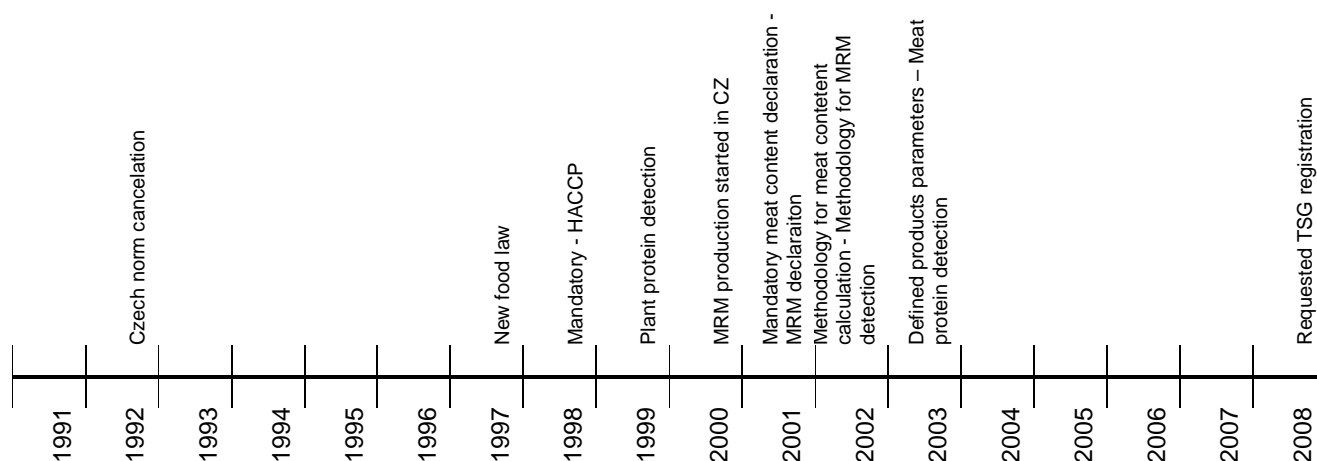
To detect the presence of mechanically recovered meat in meat products the content of calcium is determined. The average content of calcium is much smaller unless mechanically recovered meat is used. Then the content of calcium is obviously higher. Another way of detecting mechanically recovered meat is based on a histology method, where using alizarin as a colorant, to colour small parts of broken bones, which could be observed under a microscope. These methods were introduced in the Czech republic since the year 2002.

Another legislative requirement is to determine net muscle proteins in some products. This parameter can be determined in a direct or indirect ways. The direct way is based on the chromatographic determination of 3-methylhistidin. The indirect way is

based on the evaluation from the content of nitrogen and hydroxyproline. These methods are introduced since 2003.

At least but not the less regulations (notice 264/2003 Sb. Draft SANCO 2119/00, EC 2001/101, ECC/2429./86 Beef, ECC/1583/89 Pork) also define meat content in meat products and is in effect from 2001. Determining meat content is a complex method. It is necessary to determine the content of nitrogen, according to the Kjeldahl method, the content of fat, hydroxyproline, soya proteins, ash and water. Then, from the obtained values the following data are calculated; absolute content of proteins, sugars, flour, nitrogen from bakery products and from meat. There are several more calculations and corrections to be carried out before obtaining the final meat content in meat products.

The time scale of regulatory affairs and detection methods:

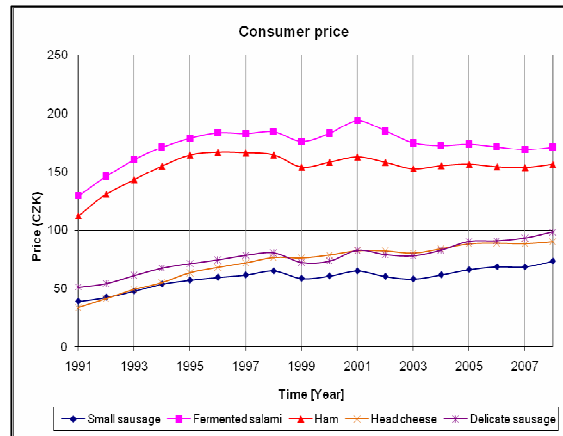


Progress of legislation:

Since the 80’s of the 20th century all the properties of meat products in Czech Republic were defined by the Czech norms. According to the political system changes after 1989, the market structure changed and it was impossible to hold all norms mandatory. Due to this situation in 1992 the norms were canceled and the quality and safety of food was regulated only by general standards for the customer protection, without any specific laws. This situation changed in 1997 when the food law was approved by the Czech parliament and a new period of regulation started. Since the year 2001 the regulation for meat products was changed and the declaration of meat content as well as mechanically recovered meat in meat products was clearly established. In the year 2003 qualitative parameters were defined for several meat products. These steps were expected to be influencing the price of meat products.

Comparison of prices:

Graph 1 is showing the evolution of meat price since the year 1997 until 2008. There is apparently an important price increase in the year 2001, which is merging in the increase of the products price (graph 2). Since 2002 the price of pork is relatively stable, only a slight continual price decrease is noticeable. The beef price is rather stable as well with a slight increase.



Graph 1: The consumer price development of meat

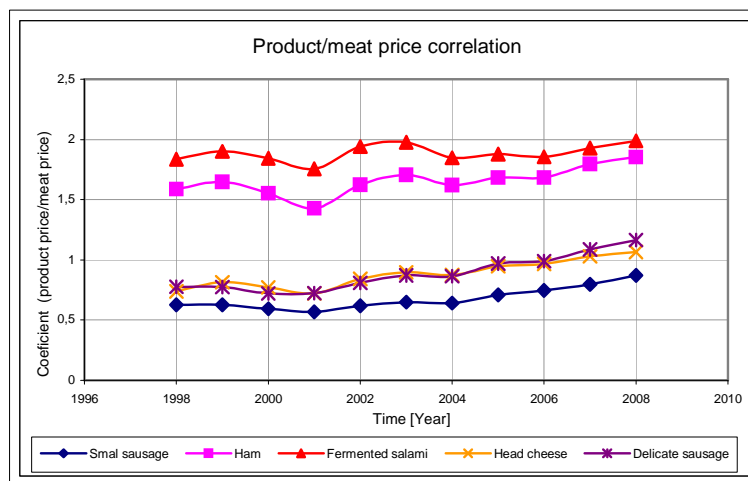
It is possible to see in graph 3 the comparison of product price and meat price. In



Graph 2: The price development of meat

the case of soft meat products where the main raw material is pork, it can be noticed that the ratio of meat price and the total product price is increasing. This can be discussed as increasing quality (meat content) in these products as well as the market compensation of the price. This phenomenon is evident in all products without the reference to the regulation (the effect is noticeable in regulated as well as non regulated products). Since

2002 the prices of products are rather stable or slightly increasing.



Graph 3: The product and meat price correlation

Discussion:

The article is showing that in the Czech Republic was not evident influence of the regulation to the price of products. This can be caused by the market balancing small deviations. The other theory can be based on the idea that the regulations were applied in the period when the products quality was very close to the parameters of regulated products. If we conclude that the products prices, which are out of the regulation are progressing in the similar way as regulated products it is possible to formulate an idea that the market is able to balance the quality of meat products without regulations. In the other hand the direct quality indicators of meat products were not included to the methodology.