

CHANGES IN THE COST STRUCTURE OF HOGS FEEDING IN THE CZECH REPUBLIC

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Abstract

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Modern hog breeding has a long tradition in the Czech Republic it is the stable branch of livestock production. Its main task is to produce high quality pork meat, which must meet all requirements of the processors and the final consumer. Pork meat occupies for decades in Czech Republic first place in consumption per one inhabitant (per year) and it forms more than 50% of the total annual meat consumption. This branch also plays an important role for producers of cereals, which largely contributes to the overall size and stability of the agricultural sector. The increasing imports were the main reason why many Czech hog breeding farms has been reduced or completely eliminated. Reducing numbers of pigs in the last decade is a reflection of supply and demand for pigs. The objective of this paper is to evaluate the changes in the cost structure for fattening of hogs and indicate how these changes are reflected in the competitiveness of Czech agriculture enterprises. Choice of optimal strategy of breeding and hog feeding already affects not only the requirements of food security, requirements of quality and affordability. Currently are also very important requirements for animal welfare and environmental protection with an emphasis on the sustainability of production and high hygiene standards. These measures require high investments and operational costs are reflected in the worsening economy of pork meat production.

Keywords: agribusiness, agriculture, efficiency, feeds, costs, hogs, prices

INTRODUCTION

Agriculture is associated with the constant necessity to cope with the effects of the external environment and the need to adapt its new activities. The ability to succeed on the globalized environment becomes a key issue to ensure food safety and nutritional quality of the population. The Czech agriculture must face growing competition in the current conditions of liberalization of agricultural markets in the supply and demand parts of commodity chains. This applies not only in the domestic markets, but also within the EU common market. In addition, becomes more important a competitors from the third countries outside the EU. These new competitors are able (except effective production) to connect within the relevant commodity chains of agribusiness. Human nutrition assumes to produce the high amount of quality

animal protein. Pork meat is highly demanded source of animal protein, therefore is hog breeding and pork meat production irreplaceable part of animal production industry. In terms of ensuring the nutritional balance of protein plays this branch irreplaceable position of national economy (Stupka *et al.*, 2009). This is confirmed by numbers of animals and meat production, together with consumption per capita (Kvapilík, 2012). Modern intensive hog breeding has a long tradition in the Czech Republic it is one of stable part of animal production. Its main task is to produce high quality pork meat, which must meet all requirements of the processors and the final consumers. Pork meat occupies the first place in consumption per one inhabitant (per year) for decades in Czech Republic and it forms more than 50% of the total annual meat consumption. This branch also plays an important role for producers of

cereals, which largely contributes to the overall size and stability of the agricultural sector (Stupka *et al.*, 2009). Despite above mentioned facts, hog breeding is associated with the sectors of agricultural production, which after integration of the Czech Republic to the EU worst resist competition from other EU member states. The increasing imports were the main reason, why many Czech pig breeding farms has been reduced or completely eliminated (Abraham, 2009). Reducing number of pigs in the last decade is a reflection of supply and demand for pigs (Stupka *et al.*, 2009). Demand determines the quantity and quality of agricultural products and affordable cost conditions on the markets (Tamáš, 2010). Looking at the current trends in hog breeding and also generally in livestock due to the changing social environment defined in three areas. These are areas dealing with issues of food quality and safety, animal welfare and environmental requirements. After joining the EU is Czech hog breeding significantly influenced by mentioned issues, which plays a crucial role in the economy achieved production of individual farmers, and hence their competitiveness on the European and global market (Stupka *et al.*, 2009).

MATERIALS AND METHODS

To calculate the cost of fattening hogs was used the two stage cost calculation. When calculating the total actual cost, has been subtracted valuation of by-product (manure). To express the share of the cost of the main product were used calculation unit 100 of FD (feeding days) and 1 KG weight of gain. The cost of gain, were calculated as a proportion of the costs and overall weight of gain.

In the article is evaluated following cost structure. The cost of feed (litter) – represents the highest cost of hogs fattening, regardless whether they are owned or purchased. When valuing own food and bedding should be based on own costs. During the given reporting period, it is recommended to charge own production and consumption of food and bedding in intra-planned prices. For the purposes of calculations is determined the difference of planned prices and prices recorded from the final calculation of own production, which will be for the purposes of calculating assigned to consumed performance (Poláčková *et al.*, 2010).

The costs of pharmaceuticals and disinfectants – includes the costs of medicines, vaccines and vaccination disinfectants. Sick animals always cause losses and reduce potential income producer (Dietz, 2011).

Other direct material – includes the usage of small materials for maintenance and cleaning of the accommodation, allowable shortages and damages, up to the standards set by internal guidelines and identified in the inventory at the end of the year (Poláčková *et al.*, 2010).

The following items can include the costs of the identification chips using automatic feeding boxes,

cost plastic ear tags (if not used for marking pig tattoos) etc.

Other direct costs and services – including the usage of non-storable items such as water and gas, energy and fuel, repairs and maintenance of buildings and machinery equipment from external suppliers, veterinary and reimbursement for insemination, travel, consumption of small intangible material tax real estate, insurance holdings, the net book value of sold intangible and tangible assets, interest on loans and other services (Poláčková *et al.*, 2010).

Under the heading other services may be included in the cost of removal and disposal of carcasses and expenses related to the processing of feces etc.

Total labor costs – including all direct labor costs and contributions to statutory social security and health insurance for individual performances. This includes holiday payment of permanent employees (Poláčková *et al.*, 2010).

Depreciation of tangible and intangible assets – depreciation of tangible and intangible assets reflects the gradual depreciation (amortization) of fixed assets. Degradation rate should correspond to the creation of funds in the form of a compensation fund fixed assets formation (Sojka *et al.*, 2006). Accounting depreciation reflects the actual depreciation of property, therefore different from the depreciation in terms of tax legislation.

The costs of ancillary activities – this includes labor costs for items like tractors, trucking, coatings, repairs and maintenance carried out on own account.

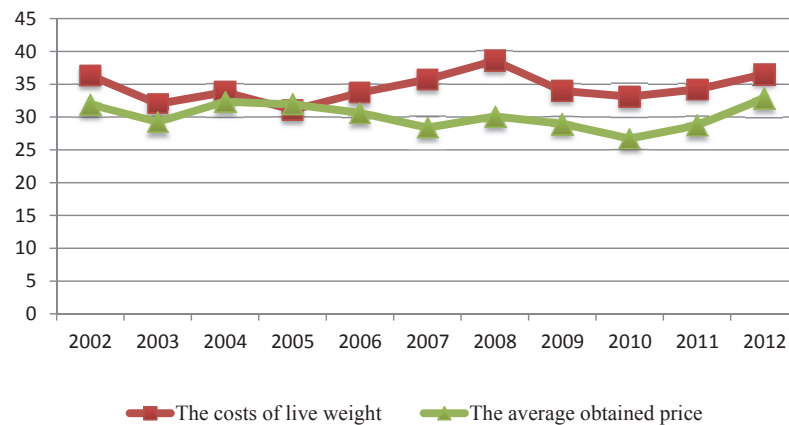
Overhead costs – includes mainly the costs of energy, repair costs, the cost of wear and tear tools, overhead wages, indirect depreciation of tangible fixed assets, overhead material.

Administrative overheads – item mainly includes costs related to corporate governance. This includes the salaries of executives, postage, telephone charges, computer office workers, the income tax expense on information technology, the cost of education workers, insurance (Poláčková *et al.*, 2010).

RESULTS

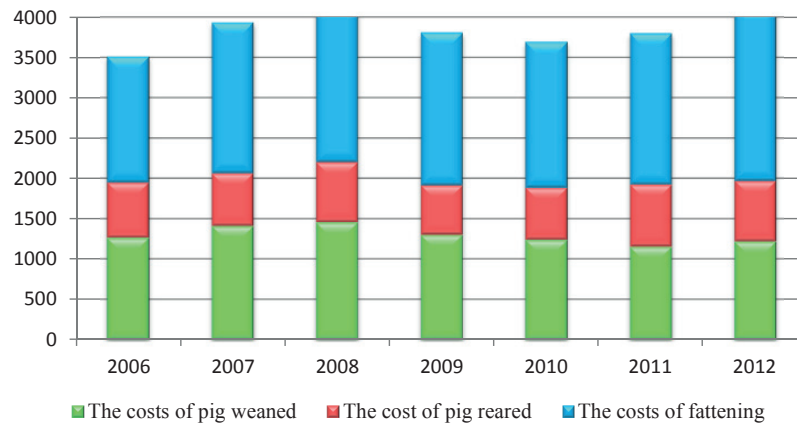
Due to the fact, that hogs can be reared in different carcass value, is comparison of the total cost of slaughter pigs relative. Appropriate indicator of cost comparison is the cost of 1 KG live wage. Comparison of the cost of 1 KG of alive wage, with an average realization price is shown on the Fig. 1. From there, it is apparent, that the realization prices are continuously below production cost. Hogs farming in the Czech Republic indicates loss for the entire reporting period. The biggest losses were achieved in 2008, when the loss amounted 8.48 CZK/kg of live wage.

The cost of slaughter pigs are the sum of costs for bred (purchased) piglet, costs in pre-fattening and fattening pigs. The cost of 1 KG of live weight is



1: Comparison of the cost of 1 kg of live weight, with an average realization price

Source: Own processing based on the data of IAEI (2013) and MA (2013)



2: The proportion of the different stages of fattening on the price of slaughter pigs in the years 2006–2012

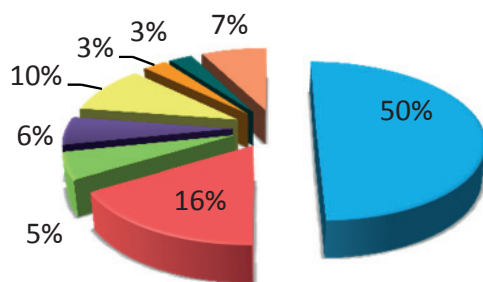
Source: Own processing based on the data of IAEI (2013)

projected efficiency across the entire pig breeding. From the Fig. 2 is clear that the cost of weaned piglet, slonly the pre-fattening costs represents 52–57% of the costs of the pig carcass. Although the fattening phase contributes to the cost of slaughter pig less than 50%. It is necessary to pay appropriate attention, because in terms of time and volume consumed feed, that is the most challenging phase.

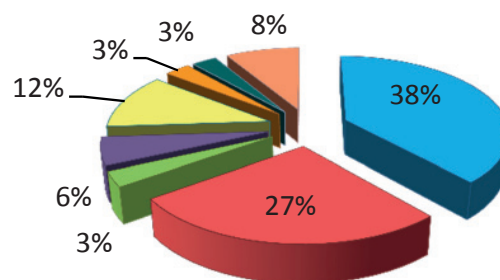
The Cost Structure of Fattening Hogs

From the Fig. 3, indicating the individual cost items is clar, that the cost efficiency of hog fattening is strongly influenced by the costs of feeds, which accounts for approximately 65% of total costs. The comparison of the year 2002 and 2012 shows, the apparent decline in favor of purchased feeds and individually produced feeds, which indicates overall

2002

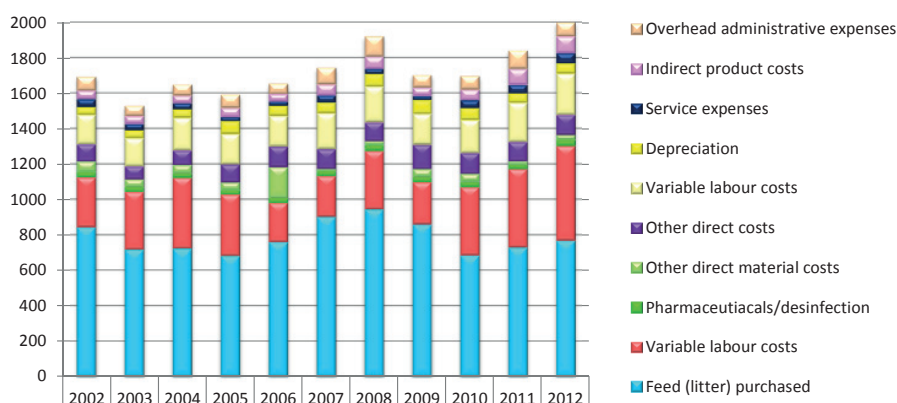


2012



3: Comparison of the cost structure of fattening pigs in the years 2002 and 2012

Source: Own processing based on the data of IAEI (2014)



4: Development of the total cost for 100 FD of pigs fattening in the years 2002–2012 (in CZK)
Source: Own processing based on the data of IAEI (2014)

reduction in the proportion of feeds only by 1%. The item: „Other direct material costs“ decreased by 2%. On the contrary Labor costs, which represents the second largest cost item, have increased by 2%. The item: „Overhead“, which is composed of Manufacturing and Administrative overheads increased by 1%. The percentage share of the costs of Ancillary activities, Depreciation of intangible and tangible fixed assets and Other direct costs and services remained unchanged.

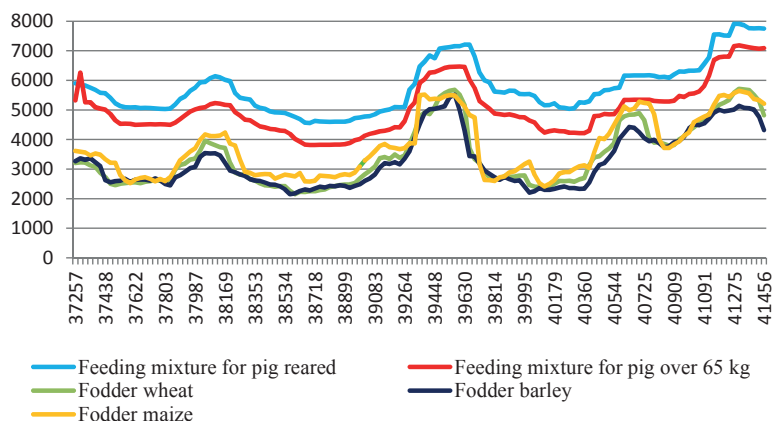
For the comparison of development of hogs fattening cost in the investigated period was used indicator: Costs for 100 FD (feeding days), which is demonstrated in the Fig. 4. In the year 2002 the total costs (ie. without any by-product) amounted 1691 CZK/100 FD. Therefrom was spent 843 CZK for Own feeds and 281 CZK for Purchased feeds. Due to the reduction in feed costs in the year 2003 occurred decline of total costs of by-product to the level of 1529 CZK/100 FD. In the year 2013 were the costs lowest in the entire monitored period. In the year 2014 the cost of feeds (especially Own feeds) increased and the total costs increased to 120 CZK/100 FD. The dramatic increase in costs occurred in the year 2008, when the cost for 100 FD

reached 1920 CZK (including the cost of Purchased feeds 943 CZK, the cost of the feeds from the Own production were 331 CZK).

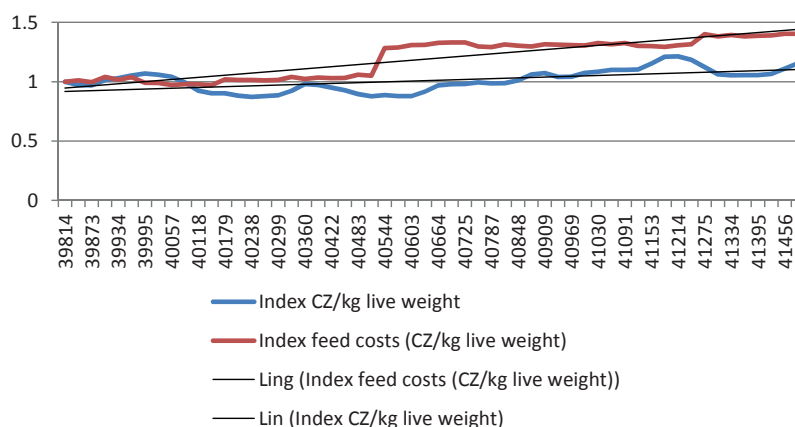
In the year 2009 there were monitored a decrease of feed cista, the total cost fell to 219 CZK/100 FD. The decline continued also in the year 2010, when total costs amounted 1695 CZK/100 FD. However, in the year 2011, costs have risen again and growth continued also in the year 2012, when the total costs were (for 100 FD) the highest in the entire monitored period. The total costs amounted 1998 CZK/100 FD this amount consists of purchased feeds: 768 CZK and feeds from own production: 534 CZK.

Feed Costs

The feeds are the most important cost item of hogs production cost structure. From this reason is profitability of hogs fattening directly dependent on the price of compound feed and feed grains, which creates the basic components of feeds (about 60% of the feed mixture). Since the year 2005 there are monitored monthly agriculture processors prices of compound feeds only on pre-fattening pigs and compound feed for pigs over 65 kg. The



5: Development of agriculture producers and processors prices (monthly) of feed grains and compound feed for pigs in the period 2002/01–2013/07
Source: Situation and Outlook Report: Feeds (2013)



6: Agriculture producer prices of feed costs (in kg of live wage) of slaughter pig (basic index, 1.00 = 01. 1999)

Source: Situation and Outlook Report: Pigs – Pork meat (2013)

development of this monthly monitored prices of compound feeds and the prices of agriculture producers prices of feed grains are shown in Fig. 5. The average price of compound feed for pigs over 65 kg in the year 2002 amounted 5 030 CZK/per ton, in the year 2003 the price dropped slightly and in the year 2004 came back to the level of 5 015 CZK/per ton. In the following years the prices of agriculture processors had declined, the lowest price was recorded in the year 2006, when it amounted 3 914 CZK/per ton. In the year 2008, the price climbed around 6 012 CZK/per ton, in the year 2009 there was an average reduction compared to the previous year 1 354 CZK/per ton and in the year 2010 the price has been reduced to 4 446 CZK. From this year, the average prices of agriculture processors grew, and in the year 2011 there was an average increase of 816 CZK/per ton, in the year 2012 the average price amounted 6 000 CZK/per ton. In the first half of the year 2013 were monitored highest average prices for the monitored period, when the price reached level of 7 122 CZK/per ton.

In the year 2002, the annual average price of compound feed for pigs in pre-fattening amounted 5 506 CZK/per ton. The following year, the price dropped by 6.4% to 5 176 CZK/per ton, in the year 2004, the price rose to 5 805 CZK/per ton. In the years 2005–2006 the price declined and in the year 2006 was at the level of 4 660 CZK/per ton, which was the lowest in the whole observed period. Noticeable price jump occurred in the year 2008, when the price compared with the year 2006 increased by CZK 2 155/per ton (by i.e. 46.2%). Subsequently, the price fell to 5 482 CZK/per ton (in the year 2009) up to 5 307 CZK/per ton (in the year 2010). Since the year 2011, prices of compound feeds for pigs in pre-fattening annually grew, and in the year 2012 was a ton of compound feed on an average of 6 771 CZK/per ton. Average price for the first seven months of the year 2013 amounted 7 816 CZK/t of feed mixtures.

The basic index of average monthly agriculture producer prices per KG of live wage per slaughter pig and monthly average incurred costs for feed per KG of live wage of pork carcass, which are illustrated in Fig. 6, indicates that the feed costs grow faster than agriculture producer prices of pork meat. Prices of agricultural producers of pork meat in addition (as noted), are in the long term declining. Despite achieving optimal parameters of fattening, so worth the total cost of live weight slaughter pig at those rising prices of cereals over possible realization price of slaughter pigs.

DISCUSSION

In the costs calculation of fattening hogs is essential, whether the cost item of the feeds becomes from own production or if is purchased. Other cost items are spent on medicines and disinfectants, the cost of other direct material (eg. material consumption for maintenance of animal housing), other direct costs and services (eg. energy and water consumption), labour costs (ie. All direct labour costs and compensation for vacation), depreciation, cost of ancillary activities (eg. the repair and maintenance) and production overheads (eg. payroll overhead) and administrative expenses (eg. income tax). Although a decisive influence on the total expense of production are feed costs, to achieve maximum production efficiency must be rational use of funds in all operational areas. Decreased supply of Czech pork meat producers can not be explained by fall in demand on the Czech market. Demand for the pork meat on the Czech market is stable and pork remains still the most popular type of meat (up to 50% of total consumption of meat. Decreasing pigmeat production resulted in a dramatic reduction in self-sufficiency on the Czech market. While in the year 2004 the Czech Republic was in this commodity self-sufficiency on the level of 96.9%, in the year 2013 self-sufficiency dropped to 54%. Negative development in the industry is reflected in other actors involving in this commodity chain.

Market of pork meat becomes among the markets with a high degree of price fluctuations during the year. The fluctuation in the range of 10–20% can be in this sector considered as completely normal. For entrepreneurs is the unpredictability of possible price changes often fatal. After the Czech Republic joined the EU, these prices were largely stabilized, but also occurs significant decrease in individual price levels within this commodity chain. Different development was registered in the year 2012, due to lack of pork meat on the EU market the prices of pork meat has increased. Analysis of agriculture processors prices according to classes highlighted the fact, that farmers are not motivated to produce hogs for slaughter in the highest business class S (lean meat in carcass weight > 60% and more). The main reason is realization prices, which are amounts nearly to the quality class E (lean meat in the carcass 55–59.9%). There are also considerable differentiations in response to seasonal fluctuations. Almost constant development of consumer prices confirms the strong influence of retail chains to

reduce input prices. Profitability of fattening reflects the total costs incurred for hogs fattening, taking into account the costs arising from the herd turnover (cost of a piglets pre-fattening) and the realization prices. From the analyzes of the structure and development of cost categories of fattening, pre-fattening and sows breeding is clear, that total expense of production is greatly influenced by the level of prices of compound feeds (grain). Very high proportion of purchased feeds suggests an unfavorable situation, where a number of companies specializing in hog breeding farms with small amount of agricultural land (or even without agriculture land), which greatly impairs the economics of their production. Another disadvantage of these farms is that they are not beneficiaries of any direct payments (SAPS, TOP-UP). The fact, that the entire monitored period of the years 2002–2012 was founded negative profitability of production, suggests that the realized prices do not reflect enough on changing cost conditions.

CONCLUSION

The objective of this paper was to evaluate the changes in the cost structure for fattening of hogs and indicate how these changes are reflected in the competitiveness of Czech agriculture enterprises. The actual costs of hog breeding were collected from annual data of the years 2002–2012 according to the methodology of Institute of Agricultural Economics and Information (IAEI). In the conditions of globalizing markets the issue of decreasing production of pork meat on the Czech market getting completely different dimension, than just mastering the technical and technological knowledge. At the current stage of economic development is demand defined not only by quantity and quality of agricultural products, but also by affordable cost conditions on the market. A key position is on favour of the final actors in the commodity chain, which promote their interests even in pre-production stages and sectoral inputs. This leads to a weakening of the position of farmers in terms of choice of production program restricts, freedom of choice of business partners in both horizontal and vertical linkages of the commodity chains. The entire complex of food production gets a new dimension, different from the traditional and long-accepted model completely independent sector inputs, primary production, manufacturing and trade. The current trend of agriculture affected the demand-oriented model, among others reinforces the need for vertical integration. One of the disadvantage of Czech breeders of slaughter pigs is a lower degree of vertical integration with successive phases of the commodity chain and the industry as a whole. From the perspective of management and organization of labour can be pig breeding splited into two relatively independent sectors, which are: sows breeding and fattening of pigs. In the context of modern pig breeding is recommended to follow a closed herd turnover, when acting within the enterprise, both categories of pigs and pig categorization, which is a prerequisite for all-out operation. However, this model is in the Czech Republic still applied in a lesser extent. Shortage of pigs for further complementary foods is topping piglets imports, mainly from Denmark, the Netherlands and Germany. Above mentioned is clear from the price development of compound feeds for pigs in pre-fattening. In the year 2012 was a ton of compound feed on an average of 6 771 CZK/per ton and the average price for the first seven months of the year 2013 amounted 7 816 CZK/t of feed mixtures. Choice of optimal strategy of breeding and hog feeding already affects not only the requirements of food security, requirements of quality and affordability, but also the requirements for animal welfare and environmental protection with an emphasis on the sustainability of production, high hygiene standards etc. All these measures require high capital and operational costs are reflected in the worsening economy of pork meat production.

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