

**University doctoral (PhD) dissertation abstract**

**STRATEGIC ANALYSIS OF PORK SECTOR**

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# 1. Research Objectives

Hungary is traditionally a pork consuming country; in our daily nutrition, besides poultry, pork is the most popular type of meat. Besides the significant pork consumption, in the beginning of the 1980s the production and consumption were not negligible either, when the number of pigs was close to 10 million units. The per capita pork consumption was 43 kg per year (CSO, 2009). In the 1990s, the pig herd has started to decline. The total number of pigs has decreased by 2 million head since 2003. The drastic drop in pig numbers mainly occurred among sole proprietors where the number of pigs has fallen by 1.1 million head (CSO, 2008). The decrease of the pig herd is reflected also in the number of breeding sows; on December 1, 2006 the total breeding sow herd was 223 thousand head, which means it has decreased by 100 thousand since 2003. The pork consumption has also declined, it was only 27 kg per capita in 2009; poultry has taken the lead in meat consumption for some years now. While the domestic pork production used to be 360 thousand tons per year before the EU accession – while the domestic consumption remained unchanged – in recent years, it has barely exceeded 300 thousand tons. Because of the above facts, I believe it is appropriate to analyse the pig industry on the level of supply chain. My main goal has been to reveal the reasons for the decline of this sector based on my research results. It is necessary to examine the competitiveness from the production up to the trade in each stage while highlighting the problems. Only by these means was it possible to reach a clear and exact view of the verticum's situation. The prerequisite of a functional sector is that the members of the supply chain are competitive in each stage, since there is no competitive manufacturing without high-quality raw material production and there are no competitive and marketable products without a well-established meat industry (UDOVECZ et al., 2007).

## **Research tasks:**

1. Revealing the economic factors affecting the swine verticum's competitiveness while examining comprehensively the actors (stages) in the supply chain.
2. Strategic analysis of the swine verticum (SWOT, EFE-IFE Matrix, GE Matrix, Problem Tree, Objectives Tree)

### **My Hypothesis Are:**

1. Taking into account the current economic impacts and the specific characteristics of the supply chain, the Hungarian swine verticum's long-term sustainability is not ensured.
2. The producer associations linking the producers and the processors are helpful for co-operation and for the flow of information in the market. Furthermore, they play a prominent role in "whitening" the black trade. However, this can be an obstacle in their permeation.
3. The methodology of the corporate-wide strategic analysis may be extended to the sectoral level.

### **Specific Objectives and Tasks:**

1. Strategic analysis of the verticum,
2. SWOT – analysis, presentation of the swine verticum's current situation
3. compilation of external and internal factor evaluation matrices, quantification and standardisation of competitive disadvantages revealed by the supply chain level analysis,
4. structuring data in a problem tree,
5. preparation of an objectives tree for proposal of solutions and
6. making proposals for changes and tackling problems.

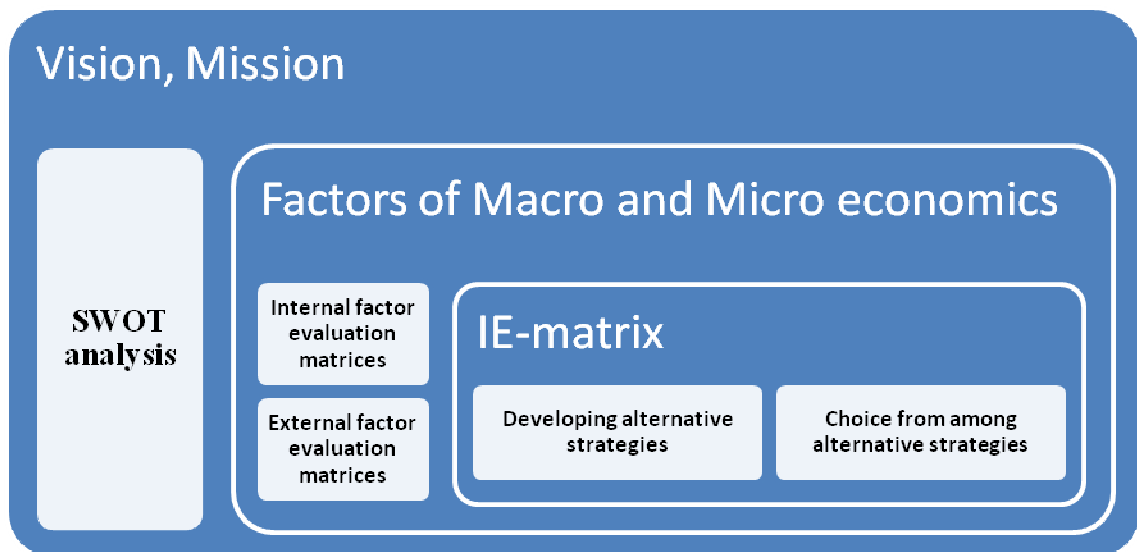
## **2. Antecedents and Applied Methods**

At the time of determining the research area of my dissertation, I took into account the studies entitled "Opportunities for Improving the Competitiveness of the Food Industry" published in 2008 and "The Situation of Major Stock-farming Sectors" published in 2009, both by the Agricultural Economics Research Institute. **I participated in the preparation of both studies as study author and assistant, being the institute's employee.** I carried out my work mainly in the chapters about the analysis of swine industry. As a result of the experience gained in these studies and of the preliminary research, I decided to make further investigations in the swine verticum. Therefore, **at**

**the beginning of 2011, I organised plant visits and I carried out deep interviews with 16 participants of the swine supply chain** in order to update the 2008-2009 research results and to add or to explore the changes that have taken place since then. Based on the experience and opinions from these interviews, I prepared my dissertation using a novel methodological approach. I collected both primary and secondary data in order to present the topic from a wide range of perspectives. At the literature analysis I used mainly secondary research data and results, and the latest available Central Statistics Office, Agricultural Economics Research Institute, Tax Administration, OECD and FAO databases. In order to make my research effective, I carried out primary research as well using secondary data, which means the series of interviews made during the visits to **swine production enterprises shown by Table 1**. During the in-depth interviews, I was using a series of guided questions (**Appendix 1**). Thus, the proper information base was available which is essential to map the situation of the swine sector. In selecting the subjects of the in-depth interviews, my aim has been to have a representative of all the stages of the supply chain. At the examination of retail trade, I visited the **Cora** hypermarket to ask questions – on the one hand – about the changes in customer demand and trends – on the other hand – about their relationship with the suppliers. I reckoned that besides the hypermarkets, the hard discount stores are also significant, so I carried out the next consultation with the **Aldi** Hungary's representative in Debrecen. The interviews with both retail chains enriched my primary research data with useful information about consumers, consumption patterns and about the negotiations with the suppliers. I expanded the retail trade circle by visiting the **Agri-Coop Ltd** because in my opinion, the domestic representatives are also important at this supply chain stage. In contrast to the previous retail chains, the Agri-Coop Ltd's peculiarity is that it is involved in the swine supply chain from the purchase of live pigs, through their slaughtering and the manufacturing process, to the sale of the products. In my view, these 3 retail stores illustrate well and show the different sides of the domestic retail trade operations. In the analysis of processors too, I aimed to examine various operating systems. That is why I visited the **Lac-meat Ltd** which is dealing with slaughtering exclusively and then an enterprise dealing with slaughtering, cutting and product manufacturing as well, for example the **Dorogmeat** limited liability company. Among the latter there are some that are selling also in their own shops, some are supplying multinational companies with private label products, but there are some that are present with their own commercial brand in a multi-company.

From the perspective of raw material supply, the situation is different too. There are such processors that get their swine supplies based on long-term contractual relationships and there are others in the sample that get it through a co-operative. When examining the producer side, the swine breeders were chosen according to the same principles. In the sample there are producers with smaller and larger sow herd, even a traditional small-scale producer. Because of the raw material production, it is important to ask the breeders as well. Therefore, I interviewed the president of the **FSE** (Pure Pig Breeders' Association) about the general opinion on Hungarian genetics and the situation of their advocacy. With his help I could get to know the work and goals of the **Pork Lobby** too. The information gathered with the help of supply chain actors supported the strategic analysis whose structure consists of six main parts. These content items can be summarised as follows (Figure 1):

- **Formulation of business mission and vision**
- **Analysis of opportunities and threats of the external economic environment**
- **Determining the internal strength and weaknesses**
- **Recording long-term objectives**
- **Developing alternative strategies**
- **Choice from among alternative strategies**



**Figure 1: Structure of strategic analysis**

Source: Own edition

**Table 1: Enterprises of primary research**

Enterprises	Discont	Hipermarket	Hungarian Retail Chain	Slaughtering	Slaughtering and product manufacturing	Breeders	Fattening	Trade Union	FSE
Agrár-Coop Ltd			X		X				
Aldi Magyarország Ltd	X								
Cora (Debrecen)		X							
Lac-hús Ltd				X					
Doroghús Ltd			X		X				
META Mg-i Ltd				X		X	X		
Hód-Mezőgazda Ltd						X	X		
Fiorács Ltd							X		
Bold-Agro Ltd							X		
Hajdúszováti Sertéstelep Hasznosító Ltd						X	X		
Dán Farm Ltd						X	X		
Agroprodukt Ltd							X		
Tedej Ltd				X			X		
Alföld Pork Trade Union								X	
Tóth László primary producer					X		X		
Fekete Balázs FSE						X			X

Sources: Own edition

The swine verticum specific factors revealed through the primary research are systemised in the SWOT table according to the goals set in the vision and mission statements. Then, the factors describing the internal and external environment are grouped in matrices, respectively. For the internal factor evaluation matrix (IFE) 45 sectoral characteristics were used and for the external factor evaluation matrix (EFE) 33 factors.

### **Vision and Mission:**

The vision expressed by me involves loyal society consuming domestic pork and prospering producer layer which is capable of restoring the pig herd involving new producers in the sector thus increasing its social significance.

Starting out from this, my mission statement is as follows: the loyalty towards domestic pork should be strengthened in the Hungarian consumer society, i.e. a consumer base purchasing Hungarian pork should be established which rightly insists on domestic quality and taste. It is justified to reduce the amount of imported pork, thus giving opportunity and space to domestic producers. As a first step, the production's income situation should be improved at all levels of the supply chain, laying the foundation for competitive production by more efficient production and lower first-cost. Next, such product assortment is to be created which fully serves the Hungarian pork consumers at home and abroad and which is – last but not least – worthy of their trust.

For the compilation of matrices the factors should be ranked according to the objectives set in the vision statement – using a method presented in the course of processing the literature – based on the fact which factor affects their implementation the most. For the grouping of factors Guilford's weighted scoring system was applied. The procedure consists of pair-wise comparisons. This should be carried out when we have to handle multiple evaluation factors and their importance and weight differ. The weighting of different evaluation factors can be distorted by subjective biases. A more reliable evaluation can be provided by applying mathematical methods. In this case, the result is reduced to preference decisions between paired up elements. By this token, the weighted score is determined by comparing the evaluation factors pair-wise and choosing our preference which we consider more important and by evaluating these decisions (KINDLER–PAPP, 1972). The method's first step is the formation of pairs. From the evaluation factors all possible pairs must be formed. In the case of the IFE

Matrix 990 pairs, in the case of the EFE Matrix 528 pairs were arranged in preference system.

*In case of Internal factors:*

$$\text{Numbers of pairs} = \frac{m(m-1)}{2} = \frac{45(45-1)}{2} = 990$$

*In case of External factors:*

$$\text{Numbers of pairs} = \frac{m(m-1)}{2} = \frac{33(33-1)}{2} = 528$$

m = factors

The evaluations are summarised in a preference-matrix (**Appendix 2**). In the rows and columns of the preference matrix the evaluation factors are included. The evaluation factors included in the rows are compared to the ones in the columns. When the factor in the row is preferred to the one in the column, 1 is assigned to it, where it is at a disadvantage, 0 is assigned to it. Thus, the number of 1's in a row means altogether how many times the given evaluation factor has been preferred. The value in the columns shows the number of disadvantages. The sum of rows and columns should be (m-1) for evaluation factor (a). As a next step a consistency test was carried out. In a consistency test the decision-maker's consistency is assessed. (The decision is transitive if  $F_1 > F_2$ ,  $F_2 > F_3$  and  $F_1 > F_3$ .) When the consistency index was calculated, the number of cyclic trio was determined (d). The grading is inconsistent if the principle of transitivity:  $F_1 > F_2$ ,  $F_2 > F_3$  and  $F_1 > F_3$  does not apply. In the matrix we compose  $a^2$  as evaluation factor than  $\sum a^2$  (KINDLER-PAPP, 1972). The (a) evaluation factor shows the number of cases when the examined factor was preferred to the others.

- We determine the number of inconsistent cyclic trios (d) based on the following relation:

*In case of Internal factors:*

$$d = \frac{m(m-1)(2m-1)}{12} - \frac{\sum a^2}{2} = \frac{45(45-1)(2(45)-1)}{12} - \frac{29370}{2} = 0$$

*In case of External factors:*

$$d = \frac{m(m-1)(2m-1)}{12} - \frac{\sum a^2}{2} = \frac{33(33-1)(2(33)-1)}{12} - \frac{11440}{2} = 0$$

Based on the formula's result during the grouping of factor no cyclic trio was formed, which means the transitive preference arrangement principle applies. The factor preference process was done consistently. Only after this can Guilford's weighted score be calculated, which can be described by the following formula:



In case of Internal factors:

$$\sum_{i=1}^{45} P_i = \frac{\alpha+0,5}{m} = 0,03 \dots 0,99$$

In case of External factors:

$$\sum_{i=1}^{33} P_i = \frac{\alpha+0,5}{m} = 0,01 \dots 0,98$$

With the help of Guilford's weighted scoring system the 45 factors could be ranked based on the generated weighted scores while keeping the transitivity principle. In order to be able to include the factors in both the external and internal factor evaluation matrices, according to the EFE and IFE matrix development rules, I numbered the factors and reassigned weights to them between 0 and 1 for the sake of adequate separation of the factors' relative significance in the following way. The most important factor was assigned number 45, while the least important one was assigned number 1. In the next step, the sum of the ranked factors' numbers (45) was determined. This method is similar to the method of using the number of years at depreciation description.

$$F_1 + F_2 + F_3 + F_4 + F_5 + F_6 + F_7 \dots + F_{45} = 1038$$

$$\sum_{i=1} F_i = F_{1038} \quad F_i \in [1;45]$$

$F_1$  = The last factor

$F_{45}$  = The first factor

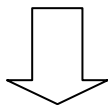
Amount of 45 factors = 1038

Calculating the distribution ratio, I divided the significance indices assigned to factors by 1,038. Thus, the given factor's value was determined, the sum of which is the total weighted score, 1!

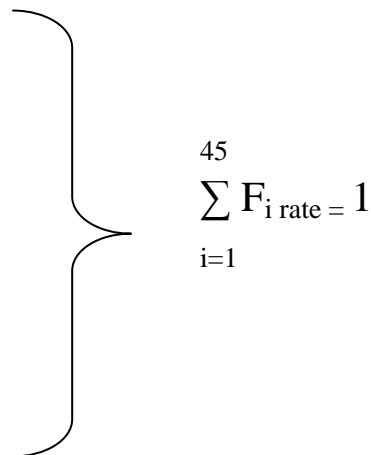
$$F_1 \text{ súly} = \frac{F_1}{F_{1038}} = 0,00096$$

$$F_2 \text{ súly} = \frac{F_2}{F_{1038}} = 0,00192$$

$$F_3 \text{ súly} = \frac{F_3}{F_{1038}} = 0,00289$$



$$F_{45} \text{ súly} = \frac{F_{45}}{F_{1038}} = 0,04335$$



In the case of the EFE Matrix a similar method was applied, involving 33 factors altogether. For 33 factors the arithmetic sum was 561, thus the above-described formula was slightly modified as following:

$$F_1+F_2+F_3+F_4+F_5+F_6+F_7\dots+F_{33}=F_{561}$$

$$\sum_{i=1} F_i = F_{561} \quad F_i \in [1;33]$$

$F_1$  = The last factor

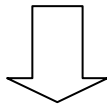
$F_{33}$  = The first factor

Amount of 33 factors = 561

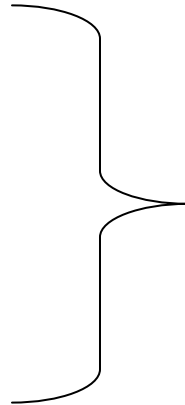
$$F_1 \text{ súly} = \frac{F_1}{F_{561}} = 0,00178$$

$$F_2 \text{ súly} = \frac{F_2}{F_{561}} = 0,00356$$

$$F_3 \text{ súly} = \frac{F_3}{F_{561}} = 0,00534$$



$$F_{33} \text{ súly} = \frac{F_{33}}{F_{561}} = 0,05882$$



$$\sum_{i=1}^{45} F_{i \text{ rate}} = 1$$

In the next step, I corrected the  $F_{1...45}$  values by the ratings assigned to each factor, thus I developed the matrix's weighted scores between 1 and 4.

By examining the weighted scores of the two matrices can it be decided what strategies may be applied. In choosing and developing the strategy, the IE Matrix (Internal-External Matrix) can be used, because this organises the two matrices' weighted scores into one. Even though, the above-described method consists of a highly complex series of steps, carrying out these steps may yield a unified and standardised result in each stage of the supply chain (excluding any conflicts of interest). The results show that due to the sector's hopeless situation, it is worthy to consider how it is possible to maintain the domestic pig industry, under the present circumstances. **The total weighted score of the Internal Factor Evaluation Matrix is 2.226, while that of the External Factor Evaluation Matrix is 1.937. Thus, according to the IE Matrix (Internal-External Matrix) with reference to strategies, the proposed strategy is slow withdrawal.** The result is thought-provoking. Therefore, we have to find solutions how to reform the

Hungarian swine industry, since sustainable production cannot be continued on the long-term with such indicators and features. That is why, after quantifying the problems SWOT analysis was performed, then in order to analyse the problems, problem tree and objectives tree assessments were applied.

### **3. Key Findings of the Dissertation**

During the SWOT analysis, I categorised the factors affecting the swine verticum according to strengths, weaknesses, opportunities and threats. These grouped factors were assigned to the examined supply chain stages (consumption, foreign market and trade, processing and production). With the help of the SWOT analysis the factors determining the verticum at present and in the future will be clearly shown. When compiling Table 2, I arranged the studied market factors in the first column and I started with examining the consumption. The next four columns demonstrate the advantages, disadvantages, opportunities and threats, respectively. The following examination point was the analysis of the situation of foreign market and trade.

Next, the situation of processing was shown, followed by that of the production. Within the production three subsections were created for the sake of traceability, one being the herd and concentration, the other genetics and the third the land situation. In each case the rules of SWOT analysis were taken into account, according to which for the advantages and disadvantages the current sectoral characteristics were collected. While in the case of opportunities and threats the external factors occurring or possibly occurring in the future were grouped. With this new methodological approach I categorised the factors affecting the verticum in each supply chain stage, thus giving clear aid for understanding and solving the problems.

The preparation of a fully comprehensive SWOT analysis of the verticum (**Table. 2**) is not an easy task, especially if the objectives defined in the vision and mission are strictly adhered to. The fact that the research is time consuming also endangers the accurate classification, since defining the present and the future may be unequivocal a given day but the future may become the present in a week or in a few months causing

incorrect classification in the SWOT analysis. Therefore, continuous surveillance was necessary because a certain change might have influenced the conclusions as well.

Apart from the **SWOT analysis and the environmental evaluation matrix**, as next the swine verticum's **problem tree** and the problem tree's inverse, the **objectives tree** were compiled. This is such an action plan which introduces a strategy applicable to the sectoral level. In our institute several research teams are dealing with sectoral analysis and project generation, as part of these, with problem tree and objectives tree analysis as well. Within the Baross, Gábor project, the problem trees and objectives trees of several sectors – among them the swine sector – were compiled by the department staff (SZŰCS, 2007). Therefore, before introducing the verticum's problem tree and objectives tree I have to refer back to the analytical method described in the methodology section.

Accordingly, the novelty of the here applied strategic analytical method lies in the fact that the factors affecting the verticum gathered during the primary research are categorised according to the objectives set out in the vision. Firstly, they are arranged into external and internal factor evaluation matrices then they are standardised and quantified using Guilford's mathematical method. From the result of these an IE Matrix was developed. Along this train of thought was the problem tree compiled (**Figure 2**) in which the factors causing the most severe competitive disadvantage are included. These factors can be accounted for the low results of both the external and internal factor evaluation matrices which mean the strategic decision of "slow withdrawal." At the lowest level four reasons were identified as the source of the problem:

- **Lack of capital,**
- **the separation of ownership of land and stock-farming,**
- **the lack of marketing**
- **the continuous changes in consumer habits.**

**Table 2: SWOT analysis**

	<b>Strength</b>	<b>Weakness</b>	<b>Opportunity</b>	<b>Treath</b>
<b>Market factors</b>	<b>PORK</b>			
<b>Consumption</b>				
	1. Tradition in the diet. 2. High quality, delicious raw material.	1. According to its current position pork is rather unhealthy, old-fashioned, strongly masculine, boring product rich in fat and cholesterol. 2. Frozen pork is not accepted at all. 3. The seasonality harms the competitiveness of processed goods. 4. Lack of marketing.	1. Product development, with appreciable innovation success could be achieved. 2. Trust can be increased by applying valuable trademarks. 3. Less processed meats and meat products can be again popular. 4. The demand for products in smaller package may increase. 5. The premium products' consumption shows continuous growth. 6. Strengthening conscious consumer behaviour. 7. Strengthening Mangalica, as "hungaricum."	1. Decline in demand caused by the proliferation of healthy diet. 2. Introduction of low-quality imported goods. 3. Apart form China, other large pig producing countries increase their production and export (the USA, Brazil, Canada).

<b>Export-Import</b>				
	<p>In the export the highly processed products have higher proportion.</p>	<ol style="list-style-type: none"> <li>1. For preparation of processed goods usually cheap and lower quality pork is imported.</li> <li>2. Transportation is complicated between producers, processors and retail trade.</li> <li>3. Continuous constriction of markets.</li> <li>4. Inflexible Hungarian meat industry.</li> <li>5. Lack of communal marketing.</li> <li>6. Lack of sectoral strategies.</li> </ol>	<ol style="list-style-type: none"> <li>1. Domestic pork prices can reach at worst up to the import prices increased by transportation costs.</li> <li>2. Restoration of the Hungarian products' reputation abroad.</li> <li>3. Establishing long-term contractual relationships abroad.</li> </ol>	<ol style="list-style-type: none"> <li>1. Epidemics, animal diseases may occur.</li> <li>2. Strong fluctuation of prices in the future.</li> <li>3. Rotation of political governance.</li> <li>4. The traditional means of market protection may be difficult to apply even in the future.</li> </ol>
<b>Trade</b>				
	<ol style="list-style-type: none"> <li>1. The product distribution is much more profitable than the sale of fresh meat.</li> <li>2. The ratio of commercial brands of meat products has reached 29% in the first half of 2008.</li> </ol>	<ol style="list-style-type: none"> <li>1. Due to the domestic meat industry's technological lag even standard consistencies have higher production cost than in the developed West.</li> <li>2. 20-25% of the carcass meat is sold illegally.</li> </ol>	<ol style="list-style-type: none"> <li>1. Customers are increasingly looking for sliced, packaged meat.</li> <li>2. About high value added products decision should not be made by the Codex Alimentarius Hungaricus.</li> </ol>	<ol style="list-style-type: none"> <li>1. The ratio of commercial brands in the supermarket chains will increase in the future. Thus, the industry will become faceless, increasingly vulnerable and will create competitors by itself.</li> </ol>

<b>Processing</b>	World famous brands. Pick, Gyulai, Hertz	<ol style="list-style-type: none"> <li>1. Lack of long-term contracts.</li> <li>2. Besides their positive features the BÉSZs (Procurement and Sale Cooperatives) are negative due to their members' individual sales.</li> <li>3. Unpredictable slaughtering raw material procurement.</li> <li>4. The slaughtering capacity utilisation is below 50%.</li> <li>5. The capacity of the slaughtering and the product manufacturing lines are not in harmony.</li> <li>6. Low technological level.</li> <li>7. Inefficient use of manpower.</li> <li>8. The processors do not represent the sector's interests.</li> <li>9. Lack of specialisation.</li> </ol>	<ol style="list-style-type: none"> <li>1. For the processors in the short term producing some of the raw materials themselves means a breakout point.</li> <li>2. Technical development.</li> <li>3. Production of functional foods.</li> <li>4. Sectoral collaboration.</li> <li>5. Ongoing research-based development.</li> <li>6. Mangalica as hungaricum.</li> </ol>	<ol style="list-style-type: none"> <li>1. The processors are increasingly turning to import raw materials due to unpredictable raw material procurement.</li> <li>2. Extra energy costs caused by climate change.</li> <li>3. Environmental protection regulations.</li> </ol>
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<b>Production</b>				
<b>1. Genetics</b>	<ul style="list-style-type: none"> <li>1. The fattening period shortened by 15 days.</li> <li>2. The specific feed intake has reduced, which means 30 kg feed saving per pork.</li> </ul>	<ul style="list-style-type: none"> <li>1. Radical drop in the breed renewal.</li> <li>2. Mainly the producers' own fattening flocks are used for restocking.</li> <li>3. The farmers do not use the breeders' work.</li> </ul>	<ul style="list-style-type: none"> <li>1. The Danish method can be a good example.</li> </ul>	
<b>2. Structure of production, slaughter animal production, meat production, animal welfare.</b>	<ul style="list-style-type: none"> <li>1. The pig herd's concentration has started.</li> <li>2. High quality animal health.</li> <li>3. Grain-producing area, forage available.</li> </ul>	<ul style="list-style-type: none"> <li>1. Smaller plants disappear, some of the breeders give back granted support of already won tenders due to lack of sufficient own resources.</li> <li>2. Low technological level.</li> <li>3. Slurry placement.</li> <li>4. High production costs.</li> <li>5. Black economy.</li> </ul>	<ul style="list-style-type: none"> <li>1. Technical development.</li> <li>2. Use of good genetics.</li> <li>3. Effective consultancy network.</li> </ul>	<ul style="list-style-type: none"> <li>1. Risk of epidemics.</li> <li>2. Disappearing small-scale farmer layer.</li> </ul>
<b>3. Land, feeding, environment</b>		<ul style="list-style-type: none"> <li>1. The national and EU environmental standards cause a major competitive disadvantage for large-scale stock-farming plants because farming and agriculture separated.</li> <li>2. Lack of owned land.</li> <li>3. Low production indicators.</li> <li>4. Lack of producers' cooperation.</li> </ul>		

Forrás: Own edition, based on primary research



The next level is the result and consequence of these reasons. From this sequential network it is easy to see that the problem is complex, each factor influences some other factor's development or occurrence. That is why it is important to see the reason for the sector's backwardness as a whole, since by handling one factor nothing will be solved yet. We have to tackle the problems one at a time thus solving the whole issue step by step. If the basic causes are examined, it can be seen through what kind of competitive disadvantage causing factors do we reach first the deterioration of international competitiveness, the central problem. The additional effect of this is that both the work and successful operation of swine verticum related sectors can be questioned, such as that of the processing industry or feed manufacturers. The loss of market resulting from competitive disadvantage may cause business closures. Moreover, it can be seen what situations generated this process. The consequences of the – over the years accumulated – lack of capital and owned land are the production's low technological level, insufficient genetics and breeding technology and the lack of production by economies of scale and that of the resulting specialisation. It directly follows that the sector's creditworthiness is weak, it is continuously struggling with liquidity and financing problems, so it does not have possibility for development, investment, product development and innovation (SZABÓ, 2003). These, however, would be essential for adherence to the Cross Compliance requirements. From its own resources no plant is capable of building the technologies necessary for standard operation. The production indices fall short in comparison to its competitors, among other reasons because we are producing on high first-cost. There is no collaboration and unified sectoral strategy. All these competitive disadvantages lead to the sector's loss of market both on domestic and foreign markets. These problems are aggravated by unfavourable macroeconomic conditions (excessive taxes and other levies, fees and charges). Official fees and compliance with animal welfare and environmental standards is also a major burden on the sector's members. All these factors combined have resulted in flourishing black economy in Hungary. This applies to both the employment and the proliferation of illegal slaughterhouses as well. According to my estimation 61 thousand tons of pork is untraceable and uncontrollable in the supply chain. Under these conditions it is very difficult to meet changing consumer habits and to satisfy the market demand, while from the retail trade's side the pressure and the developmental urge are constant. We are not always able to meet these expectations, so often the foreign suppliers take precedence in our homeland. In contrast to them, domestic suppliers are many times unable to meet the demand of larger retail chains. Adequate amount of homogeneous products and appropriate

quality are lacking. To make matters worse domestic consumers are under-informed. With the aid of marketing tools consumer loyalty towards domestic products could be strengthened and also the flow of information between stages of the supply chain could be helped. These problems cause the herd's continuous decrease, the feed industry's decline, the processing industry's uneasy operation and the decrease of the number of workplaces in the supply chain stages. The problem tree and objectives tree method is well suited for multi-level analysis of problems; therefore it has been applied by several research groups. Nevertheless, in this context and in the methodological approach of strategic analysis it has been applied for the first time.

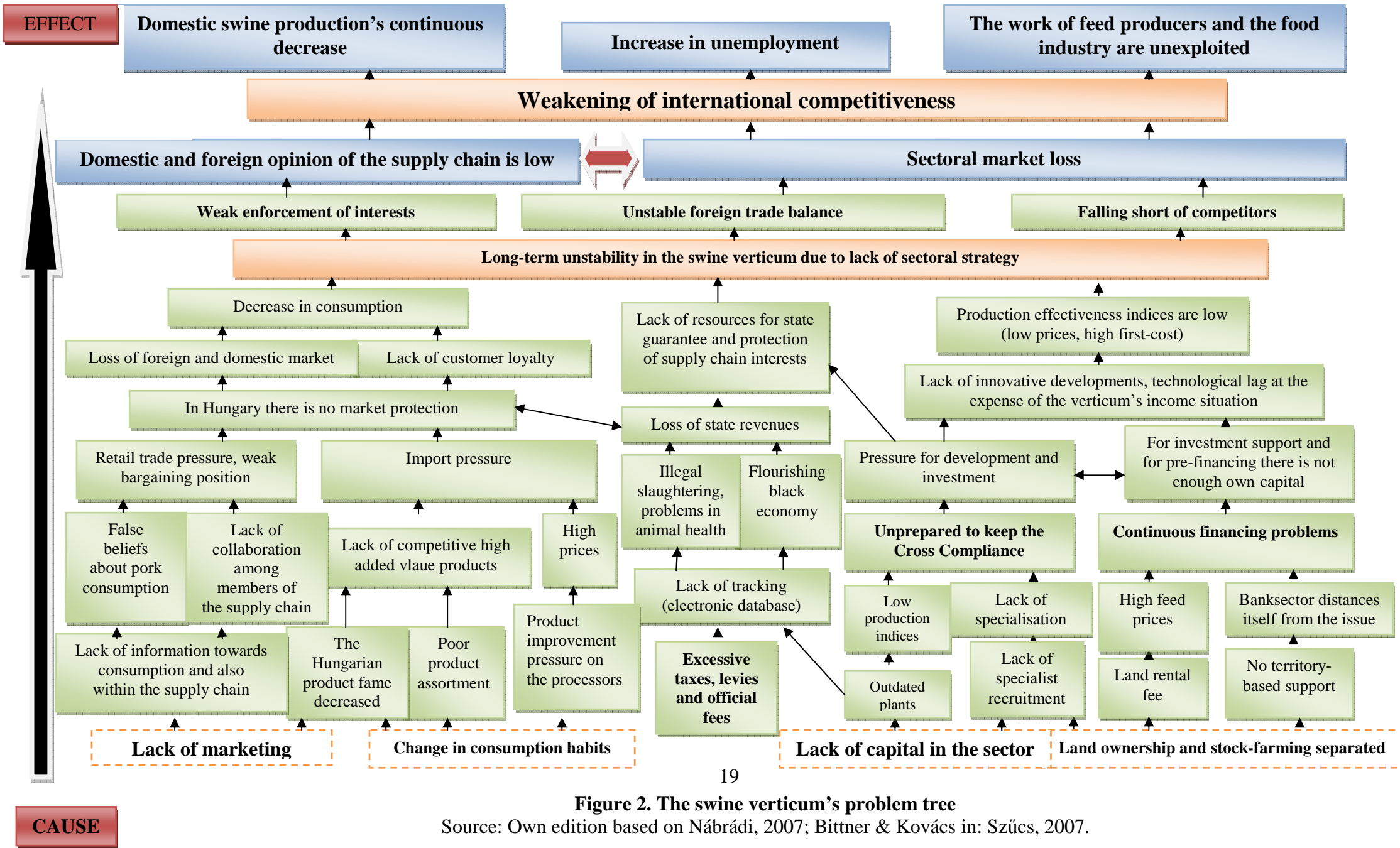
After the problem tree had been compiled and the delay-causing factors had been outlined, the verticum's objective structure was prepared (Figure 3). As strategic objective the development of a competitive swine verticum was determined, while the specific aim was defined in three target points:

**Establishing supply chain stability**

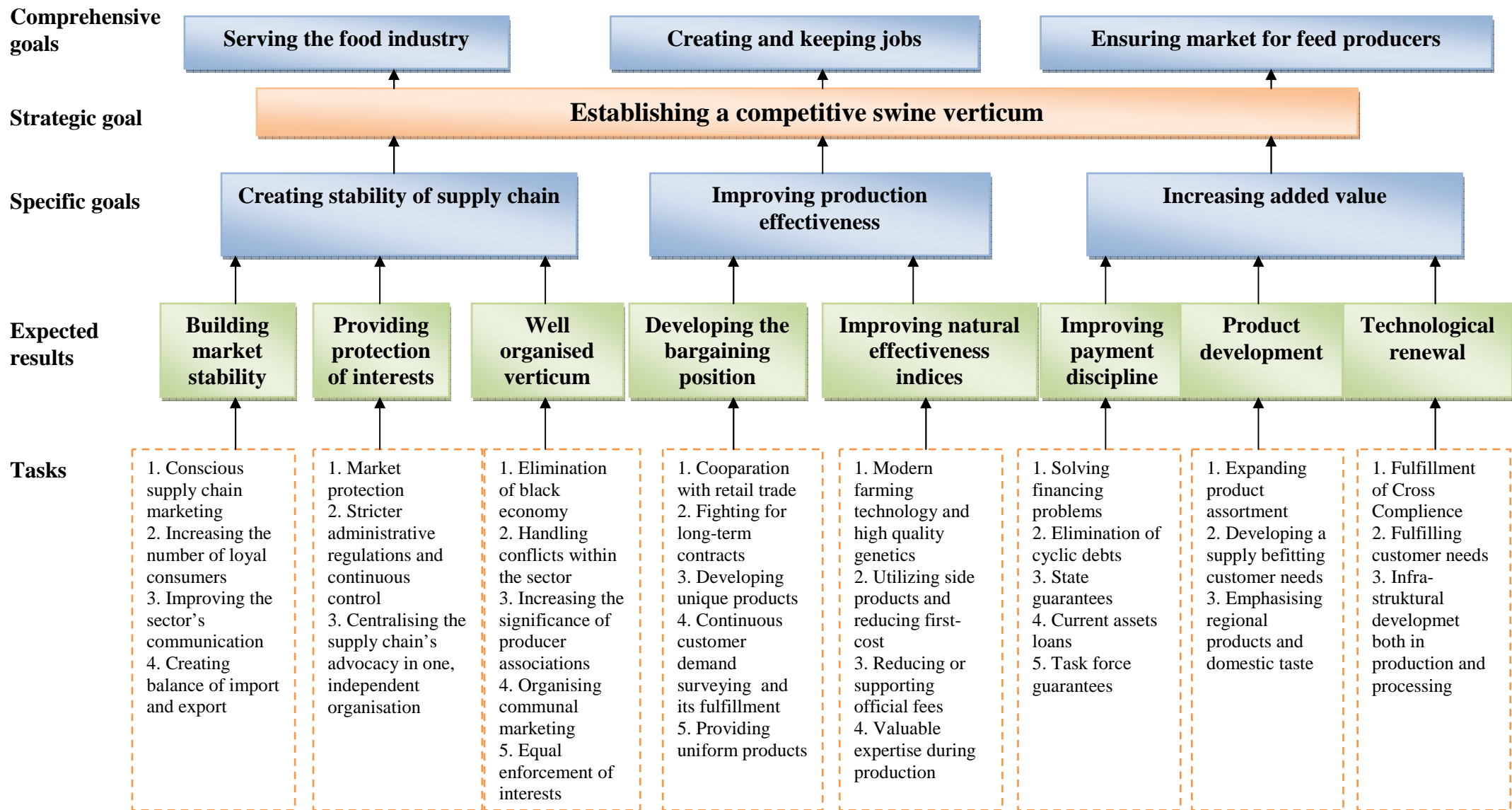
**Improving production efficiency**

**Increasing added value**

In case these set goals are achieved, there is possibility to increase the Hungarian pig herd, to enhance output and supply, to improve the added value, to create jobs, to use resources rationally and through all these to improve competitiveness. In order to create domestic and international market stability, professional advocacy and enhancing of concentration are necessary in the whole verticum. By establishing a conscious supply chain marketing the verticum's external communication can be improved and the number of customers loyal to domestic products can be increased. Also, intra-industry conflicts may be removed and integration developed. Black economy can be eliminated through closer cooperation with the authorities. The improvement of profitability can be achieved primarily through the increase of sales price and the reduction of production cost. For this it is indispensable to improve the natural efficiency indices, to reduce and to rationalise administrative fees, and by unifying interests the expansion of product assortment, the strengthening of "hungaricums" and the improvement of bargaining position are also possible. Developments and technological renewal are necessary in both the production and processing. The product line should be expanded by high-value-added products otherwise we cannot be competitive in mass production.



**Figure 2. The swine verticum's problem tree**  
 Source: Own edition based on Nábrádi, 2007; Bittner & Kovács in: Szűcs, 2007.



**Figure 3. The verticum's objective tree**

Source: Own edition based on Nábrádi, 2007; Bittner- Kovács in: Szűcs, 2007.

## 4. The New and Innovative Results of the Dissertation

- It has been proved that the hereby applied methods for strategic analysis – which had been used only on corporate level before – can be extended to the sectoral level as well. Thereby, I expanded the range of methods suitable for agricultural sector analysis and planning.
- As part of a new methodological procedure the sector's **external and internal factor evaluation matrices** have been compiled. These summarise and organise into a hierarchy the factors most affecting the sector's competitive chances and they quantify these factors. Through the matrices, the first hypothesis' validity has been proved.
- In order to be able to make comprehensive strategic proposals – using the results of the external and internal factor evaluation matrices – the analysis of the sector's problem tree was carried out. This reveals those problem triggering causes which resulted in the matrices' low value (4 factors), and it was set up in such a method which allows for lateral problem analysis.
- The **Producers Association's advantages and the obstacles in its spreading** have been explored. In the literature published so far, creation of producers associations was mentioned several times as a proposal. Nevertheless, nobody has formulated the points which are in need of improvement or reconsideration in order to make it a well-functioning system.

## 5. Practical Utilization of the Results

- In the range of domestic swine sector researches this work supplies a deficiency as it provides a comprehensive, competitive market and strategic analysis on the supply chain level. Especially, because during its preparation the sector and market members participated in it with their opinions and experience.
- The results of my dissertation contribute to getting acquainted with the swine sector's current situation, its future prospects and tasks.

- The task force which has developed the current, national level strategy for agriculture including stock-raising used some parts of this dissertation for the preparation of the new agricultural strategy under negotiation.
- It may provide guidance for the swine sector members in solving their already existing or future – yet unknown – problems, by making the emergence process of problems traceable and by allowing for intervention in some cases.
- Moreover, the dissertation's results may also be used in education: the subject entitled Strategic Management at our university is based on – among others – the here applied method. In addition, subjects dealing with economics and competitiveness may collect examples for practical illustration of the covered material.
- A new perspective on sector analysis has been introduced expanding the existing methods for sectoral analysis and planning.

## 6. Publications

### I. International Conferences

1. **A. BARTHA:** Consumers' purchasing willingness and relationship with the purchasing power in the professional literature, " International Conference on Agricultural Economics, Rural Development and Informatics, AVA Congress 3, 20-21, March 2007, Debrecen, pp. 1-7  
**download:** <http://www.avacongress.net/ava2007/presentations/mus2/6.pdf>
2. A. NÁBRÁDI – **A. BARTHA:** Marketable value of grassland products in animal husbandry, Agrarian Perspectives XVII. Challenges for the 21 Century, 16-17, September 2008, Prague, Bohemia, CD edition, Section of Marketing and Management, pp. 1-4. ISBN 987-80-213-1813-7
3. **A. BARTHA-** A. NÁBRÁDI: Economic Issues of Sustainable Hungarian Pork Production, Agrarian Perspectives XVII, Challenges for 21 st. Century, 16-17 September 2008, Prague, Bohemia, CD edition, Section of Economics, pp. 1-4. ISBN 987-80-213-1813-7
4. V. BALOGH – **A. BARTHA** – A. NÁBRÁDI: The effect of EU enlargement to the hungarian agricultural trade, 3rd Green Week Scientific Conference 2009, „Multi-level Processes of Integration and Disintegration, Poster section. 14-15 January 2009, Berlin, Germany.
5. **A. BARTHA-** A. NÁBRÁDI: Analysis of the Hungarian and competitor countries' pork production, International Conference on Applied Economics, ICOAE 15-17, May 2008 Kastoria, Greece, ISBN 978-960-89054-2-9, pp.78-82
6. **A. BARTHA** – V. BALOGH: „EU enlargement of hungarian meat market” International Congress on the Aspects and Visions of applied Economics and Informatics, AVA Congress 4, 26-27 March 2009, Debrecen. ISBN: 987-963-502-897-9, p. 104-108
7. **A. BARTHA** – V. BALOGH- A. NÁBRÁDI: The current situation of Eu's food chain, 113th EAAE SEMINAR, A resilient European food industry and food chain in a challenging world, 3-6 September, 2009. Chania, Greece.  
**download:** <http://ageconsearch.umn.edu/bitstream/57980/2/Bartha.pdf>, pp.1-10.
8. A. NÁBRÁDI – **A. BARTHA-** A NAGY: The different quality levels on food chain, especially in the pig production, (abstract) 113th EAAE SEMINAR, A resilient European food industry and food chain in a challenging world, 3-6. September 2009, Chania, Greece
9. **A. BARTHA**– A. NÁBRÁDI: The Strategic Plan of The Hungarian Pig Sector, second AGRIMB-AVA Congress 2011, 22-24 June, 2011. Wageningen University, Wageningen, the Netherlands (forthcoming)

### II. Hungarian Lecture with English Summary

10. **BARTHA, A.:** Pricing in the swine sector. Abstract issue from the XI. International Scientific Conference, 2008, March 27-28, Gyöngyös. pp142.

11. **BARTHA, A.:** Examination of the import's displacement effect in the Hungarian swine sector after the accession to the EU. CD version of the Tradition and Innovation International Conference, 3-5, December 2007, Gödöllő. pp.1-8.
12. **BARTHA, A.:** Consumer trends of pork and other meat products. Lecture notes (forthcoming) of the Hungarian Science Festival, Budapest College of Economics 10-11, November 2011.

### **III. Hungarian Scientific Journal with English Summary**

13. **BARTHA, A.:** Improving the competitiveness of the swine sector. Summary of the conference entitled "The Competitive Chances of the Swine Sector." *Gazdálkodás*, Vol 2. 53, pp. 178.
14. **BARTHA, A.:** Competitive market analysis of the domestic swine sector, with special regard to the production's situation. II. Stock-farming Science Days in Gödöllő, *Bulletin*, pp. 488-493. 16-17, October 2009, Gödöllő.
15. **BARTHA, A. :** The domestic swine sector's situation and problems. *Animal Welfare, Ethology and Housing System*, Vol. 4, issue 2, special edition. Gödöllő.

### **IV. English Scientific Journal**

16. A. NÁBRÁDI – K. PETŐ – V. BALOGH – E. SZABÓ – A. BARTHA – K. KOVÁCS: „Efficiency indicators in different dimension” *Applied Studies In Agribusiness And Commerce (APSTRACT)*, Agroinform Publishing House, Budapest Vol. 3. Numbers 1-2. 2009. pp. 7-23. HU-ISSN 1789-221X
17. **BARTHA A.:** Competiveness of The Hungarian Pig Sector, *Applied Studies In Agribusiness And Commerce (APSTRACT)*, Agroinform Publishing House, Budapest Vol. 4. Numbers 3-4. 2010. pp. 103-108. HU-ISSN 1789-221X

### **IV. Textbook Chapters**

18. NÁBRÁDI A. - PUPOS T. - MRS. TAKÁCS GY. K. (2008): The organisation and economy of pork production. Textbook chapter in *Agronomy I-II*. (Ed.). (pp. 377). Expertise Publishing House ISBN 978-963-9736-90-0-Ö.
19. NÁBRÁDI A. - NAGY A. (2007): Operating Companies in the EU. (Ed.). (pp. 200). Budapest, Expertise Publishing House. ISBN 978-963-9736-36-8.

### **V. Research Chapters Published by the Agricultural Economics Research Institute**

20. ALICZKI K. - **BARTHA A.** - FOGARASI J. - GARAY R. - KEMÉNY G. - KOVÁCS G. - KOZAK A. - KÜRTHY GY. - NYÁRS L. - POTORI N. - VARGA T. - VŐNEKI É. (2009): Risk management in the agricultural production. *Agricultural economics books*. Vol. 6.
21. ALICKY K. - **BARTHA A.** - GARAY R. - NYÁRS L. - PAPP G. - POPP J. - POTORI N. - VŐNEKI É. (2009): Situation of main stock-farming sectors. *Agricultural economics books*. Vol. 3.



## **Appendix 1**

### **Guided Questions of the In-depth Interview with Producers**

#### **1. Issues about the production of raw materials**

- What are the characteristics of production (efficiency indicators, applied genetics background) in the plant?
- What is your overall opinion of the situation of production, regarding especially the technology, capacity utilization, the performance of domestic genetics and feed supply and its price?
- What is your opinion about the official system (animal healthcare, environmental protection)?
- Do you have contractual relations with processors or cooperatives? What are their advantages, disadvantages?
- How can you enforce your will on the upper levels of the supply chain, what is the bargaining position like?
- What do you think about the domestic advocacies' operating system?
- What is your opinion about the black economy and the tax system?

#### **2. General opinion of the verticum's situation**

- In your opinion, what caused the pig stock's drastic decline?
- What do you consider to be the opportunity for improving competitiveness in both your own production and in the whole verticum?

## **Appendix 1/b**

### **Guided Questions of the In-depth Interview with Processors**

#### **1. Issues about processing**

- What is your general opinion about the production's situation, with special regard to technology, capacity utilization, the domestic producer's discipline in delivery and raw material supply?
- Do you process live pigs or pork imported from other EU or non EU countries? If yes, what is its reason?
- What is your opinion about the official system (animal healthcare, environmental protection)?
- Do you have any contractual relations with producers, cooperatives or even retail trade? What are their advantages, disadvantages?
- How can you enforce your will on the upper levels of the supply chain, what is the bargaining position like?
- What is your relationship with the multinational retail chains like?
- Do you have feedback from the retail trade about customer demand?
- Can you adjust the production and the product line to changing customer needs?
- Do you produce private label products for any multinational company and what is your opinion about private label products?
- What do you think about the domestic advocacies' operating system?
- As you see, is it feasible to spread the "Hungarian product" label – which is at the moment under negotiation – in the verticum?
- What is your opinion about the black economy and the tax system?

#### **2. General opinion about the verticum's situation**

- If the domestic raw material production and supply were satisfactory, would you still import raw materials from other countries?

## **Appendix 1/c**

### **Guided Questions of the In-depth Interview with the Retail Traders**

#### **1. Relationship with other members of the supply chain**

- What is your opinion about the Hungarian suppliers?
- Do you have long-term contractual relations with them?
- Does the information flow between the stages of the supply chain work?
- Can you adjust the product line to changing customer needs?
- Do you produce private label products? What is your opinion about private label products?
- As you see, is it feasible to spread the “Hungarian product” label – which is at the moment under negotiation – in the verticum?

#### **2. Consumption and customer habits**

- How would you describe the Hungarian consumer society?
- In your view, what changes have occurred in customer demand over the past 2-3 years?
- What kind of processed products have a future in your view?
- In your opinion can quality and the Hungarian product label justify the product price in the Hungarian consumer society?

