

DOCTORAL (PhD) THESIS

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SOME ASPECTS OF THE INTERNATIONAL COMPETITIVENESS OF THE HUNGARIAN COW-CALF PRODUCTION

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KAPOSVÁR
2009

1. PRELIMINARIES AND OBJECTIVES OF THE RESEARCH

Today, modern agriculture not only produces goods, but increasing emphasis is laid on sustainable development, conservation of environment and protection of rural areas. From this aspect as well, beef production, primarily pasture based cow-calf production is given a highlighted role.

In Hungary, beef production has century old traditions. The actors of the sector had started declining in the 1990ies had great anticipations regarding the EU accession, hence beef farming is one of the most subventioned sector in the EU.

Producers and managers of the beef sector made huge effort to effectively prepare the sector for the EU accession of Hungary, in order to enable the availability of as high subsidies as possible for the farms having been suffering from capital deficit and thus to improve the international competitiveness of the sector, as well. These efforts, however, have not succeeded in many cases. By these days the farm structure had morselled so intensively that a significant amount of the subsidies was used up by economically unviable farms. From the aspect of the future of beef production it is obviously important to clearly map up the current farm structure and the structure of farms entitled for subsidies.

Since the 1990ies, the beef sector has been typically cow-calf production. The Hungarian farms sell weaned calves as their final products on foreign markets. On the basis of that, it is inevitable to analyse the international competitiveness of the Hungarian cow-calf farms.

Information on the Hungarian cow-calf production is limitedly available in spite of that weaning calf has become the primary profile of production contrary to beef fattening.

Therefore, the objective of the dissertation is to investigate the current situation of cow-calf production in Hungary and the changes in it occurred due to the EU accession, to find the challenges and bottle-necks of the production and to reveal the unused potential of the sector. It is important to provide both the producers and supplying organisations (law-makers, breeding associations) with information, and to examine the current position and international competitiveness of the Hungarian cow-calf production.

In order to achieve the above set objectives the following task to be solved were defined:

1. To reveal the current farm structure, livestock size, subvention opportunities and the role of beef production in the Hungarian agriculture.
2. Choosing appropriate methodology to analyse the competitiveness of cow-calf production.
3. To determine the international competitiveness of Hungarian cow-calf farming on the basis of yields, production value, government payments, costs and income position.

2. MATERIAL AND METHOD

In the course of the data analyses of the PhD work both primary and secondary sources were used. First the secondary, after that the primary sources of information will be described in the following.

Secondary data sources

In order to get reliable information on the Hungarian cow-calf production, the situation of cow-calf farming and Hungarian and EU regulations as well as the subsidising system were reviewed.

The databases of the Agricultural and Rural Development Authority, the Federation of Hungarian Beef Cattle Breeders and Producers, the Slaughter and Meat Product Board, the Hungarian Central Statistical Office and various breeding organisations were used as secondary sources of data.

Besides the analysis of statistics, I have reviewed and discussed relating Hungarian and international literature (books, periodicals, conference papers and other publications).

Primary data sources

The primary surveys covered the analyses of two Hungarian cow-calf farms, which are part of the researches of Beef and Cow-Calf section of the agri benchmark extended across 19 countries.

The basis of the economic analyses was provided by the method of the agri benchmark the so called Typical farms, as well as the used and further developed software, TIPI-CAL was used to model the production and management of the farms.

Data of year 2006 were collected and recorded in 2007. Data collection was based on questionnaire used by the agri benchmark in the course of deep interviews with producers. The standard questionnaire used by the benchmark is

based on Microsoft Excel software. The collection of necessary economic data was ensured by personal interviews carried out with the managers of the chosen farms, where the farm manager and the economic manager helped data recording in all of the cases.

Selecting the farms was based on the beef cow herd database of the HCSO and the database of Agricultural and Rural Development Authority on farms entitled for cow-calf premium in 2005.

TIPI-CAL software is a recursive, dynamic production-simulating and book-keeping model that was developed for farm level modelling. It prepares balance sheet, profit and loss account and cash-flow at the end of the business year; while there is an opportunity for the calculation of the profit after tax and share of profit as well.

The model input consists of two parts. On one hand, the INP sheet that is generated from the data of given farms, on the other hand the Nation sheet, which contains the economic conditions of given countries.

3. RESULTS

3.1 Effect of EU accession on cow-calf production

The subsidising system of the EU and buoyant market conditions – young and fattened bull – further fastened the sectoral production. By year 2006, the herd of beef cattle increased to some 60 thousand. This livestock herd reaching 80 thousand in number together with heifers can be the basis of quality beef production in the future (Wagenhoffer, 2006).

In 2005, the second year of the applications, the number of applications for cow-calf payments arrived to the Agricultural and Rural Development Authority exceeded the national limit, as opposed to the anticipations, and over numbered the beef herd registered by the HCSO (Table 1).

As more farmers applied for the available payments (maximum 117 000 in number), the quota was re-allocated, thus the farmers were given lower amount of payment than it had been previously defined.

The analysis of the data of farms applied for payments indicated that it was the first year when a real picture was drawn up on the number of beef-purpose cattle herd in Hungary. Of course, considering that cows of double purpose breeds were also subsidised. Although even these numbers cannot indicate the number of beef purpose cow herd, I believe in that still these numbers stand the closest to the reality.

On the basis of the applications of year 2005 it was found that the Hungarian cattle herd further diversified after the EU accession. It can be seen well that the farm structure of beef production formed in the 1970ies and based on the infrastructure of large farms has changed. Besides the large farms, many smaller, part-time farms have been formed (Stefler, 2005).

Table 1: Farms entitled for suckler cow premium (2005-2007)

Livestock of cows year	Number of farms		Number of cows	
	2005	2007	2005	2007
Under 5	5 096	2 646	18 917	9926
6-20	3 184	2 260	30 937	22 762
21-50	611	555	19 151	17 457
51-100	154	196	11 439	13 551
101-200	108	111	14 740	15 519
201-300	15	20	3 931	4 666
301-500	21	23	7 490	8 613
501-1000	13	14	9 722	8 898
Over 1000	7	7	8 383	8 359
Total	9 209	5 832	124 710	109 751

Source: Own construction based on MVH data

The above table shows the distribution of farms entitled for premium. 55% of the farms keep less than 5 cows that are obviously double-purpose animals and not beef cows. 55% of the cows entitled for subsidy are kept on farms with 50 or less cows. On the basis of the work of Szabó et al. (2005) it can be stated that a farm with less than 50 cows can not be considered as a viable, competitive form of production.

Although, the proportion of farms with 20 or less cows decreased by 15% in the next two years; it still comprises 84% of the farms; while these farms keep some 30% of the herd. The comparison of the data of years 2005 and 2007 indicated that the number of farms applied for payments significantly decreased; only 63% of the farms applied for subsidy in 2007. The out-falling farms belonged to those with 50 or less cows, in accordance with the anticipations and economic calculations. The number of livestock kept in this farm-size declined by 17 000. In my opinion, these farms kept double purpose milking cows, which applied although for suckler cow premium in the first years still can have not survive.

This is proven by the data of the Federation of Hungarian Beef Cattle Breeders and Producers; which shows a continuous increase of the herd in number during the relating period. According to the registered data of breeding associations, the number of pure breed and cross-breed cattle was 26 387 in 2003, and 34 715 in 2007 (Table 2).

Table 1: Livestock of beef cattle

	31. December 2003		31. December 2007	
Hungarian gray	4 135	387	6 926	1 527
Simmental	2 567	215	4 364	-
Hereford	1 107	2 837	1 539	3 178
Aberdeen Angus	1 054	2 446	1 553	4 741
Galloway	44	-	144	-
Charolais	1 019	4 678	1 891	-
Limousin	1 255	4 232	2 028	6 330
Blonde d'Aguitaine	65	346	175	319
Total	11 246	15 141	18 620	16 095
Subtotal	26 387		34 715	

Source: Own construction based on the closing of herd-books of breeding associations

It can be stated that a significant part of the amount of suckler cow premium paid in the last period had not promoted the income position and the fundamentals of development of the sector, but it flowed to small and part-time farms as sort of social income-supplementation. In the future, that number of farms and the low number of livestock per farm shown above will not be viable; although the SPS subsidising system being introduced from year 2009 contributes to this tendency. Therefore, I consider very important to introduce such measures – considering the EU regulations - which faster the formation of cow-calf farms with optimal number of cows.

3.2 Competitiveness of cow-calf farms

The analysis included cow-calf farms of 12 countries, primarily of those determining the cow-calf production of the world (Austria, Germany, France, Ireland, the United Kingdom, USA, Argentina, Brazil, South-Africa, Australia, China) and Hungary (Figure 1).

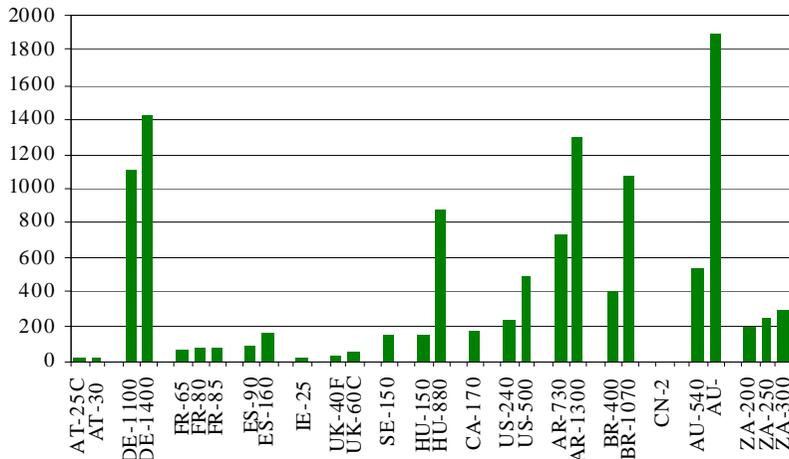


Figure 1: Number of cows ¹

Source: Own construction based on the *agri benchmark*

In terms of farm size, the farms can be grouped in three main groups. To one of them, the Western European farms belong, which are basically built on one single family's workforce. Only two German farms are exceptions that are situated on the Eastern part of Germany and are based on large pastures and on the infrastructure of former socialist large farms. Farms with cow number between 85 and 300 belong to the second group, as well as the smaller Hungarian farm do. Farms with more than 500 cows are typical of rather overseas countries. American countries and Australia are characterised by large extensive farms. The two Hungarian farms represent different typical production systems in Hungary: one of them is based on the production factors of former

¹ The two first letter indicate the country where the farm is found and the numbers following it show the number of cows kept on the farm.

large farms and is producing on state owned lands (HU-880); other is a family farm that have been formed after the change of regime (HU-150).

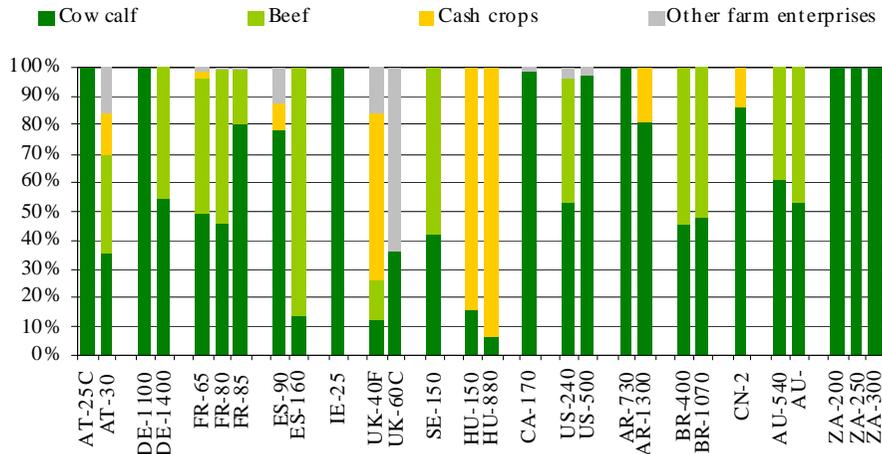


Figure 2: Composition of total returns

Source: Own construction based on the *agri benchmark*

The analysis of the revenue of the farms shows eye-catching differences in the structure of the beef sector of various countries (Figure 2). A significant part of the 28 farms is specialised for cow-calf production, while other farms both produce cow-calf and fatten beef, as well. This is true only with the exception of the Hungarian farms, where the realised revenue originates in mostly (more than 75% of it) crop production and not in beef production. Oppositely to a high specialisation seen in the rest of the world; cow-calf production is not a separated profile of the Hungarian farms, but is the complementary activity beside crop production.

The analysis of the age at first calving – which is one of the most important factors determining the replacement costs – shows that calving at 24-27 months age is general. The mortality rate of cows and calves is lower than 5% on the majority of the farms, which allows the conclusion that huge difference can not be seen among the farms despite the different breeds and technologies. The number of weaned calves per cow exceeds the 80%

considered as minimum requirement, on the majority of the farms, which forecasts a rentable farming.

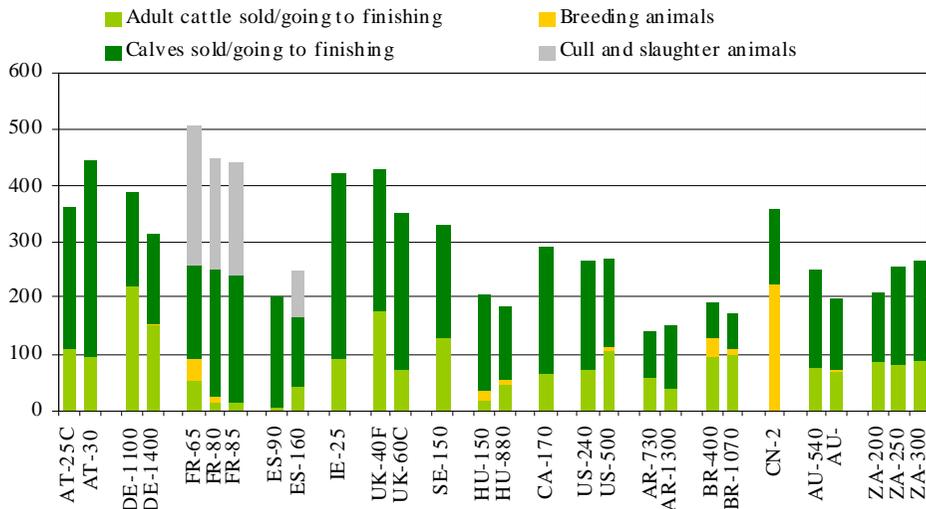


Figure 3: Composition of total live weight sold
Source: Own construction based on the *agri benchmark*

The amount and composition of total live weight sold per cow determine the efficiency of factor-use. On all of the farms analysed the market receipts after weaned calves representing the main profile is the determining component (Figure 3). The highest weaned calf weight was realised on the three smallest farms (Irish and Austrian farms with 25-30 cows) due to the applied intensive technology and geographic conditions. Lower cost of live weight sold per cow can be seen in case of the Hungarian and the South American farms keeping extensive cattle breeds. Higher cow culling rate is seen in case of large farms, where heifers remained empty are immediately sent for culling. On all of the three French farms the receipts from sold cows is high, due to the specific market demand on beef of calved cows.

The most important source of receipts of cow-calf farming is the selling of weaned calves. This is followed by cull animals and slaughters receipts. In case of a few farms higher proportion of receipts from sold breeding livestock (mainly heifers) is seen. In European countries, besides these revenues, various

subsidies play important role amounting to an average of 25% of the total farm receipts (Figure 4).

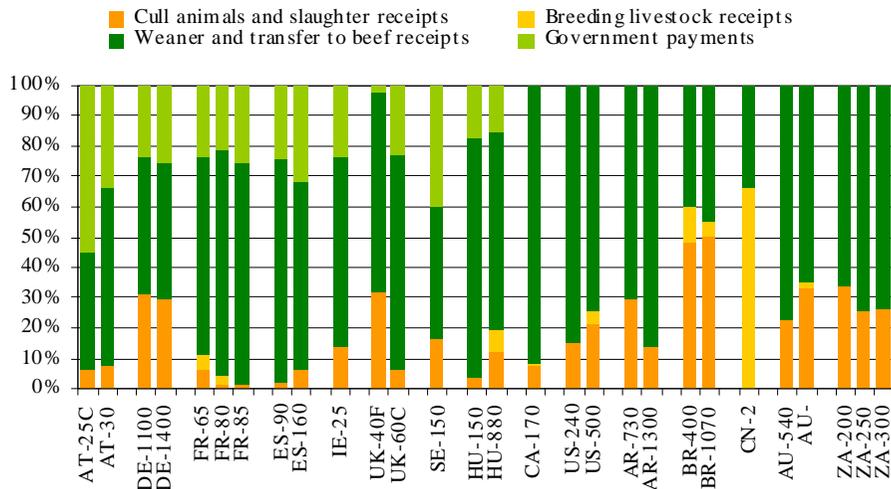


Figure 4: Total returns of the cow calf enterprise
Source: Own construction based on the *agri benchmark*

In 2006, government payments were available for cow-calf farms in various forms. In France, Spain, Austria and Hungary government payments are linked to production as cow premiums, while in rest of the European countries these are paid within the SPS subsidising system. These subventions are complemented by organic and environment payments, as well. In overseas countries – similarly to other sectors of agriculture – cow-calf farms are not subsidies in any ways at all; their revenues come exclusively from sold calves, cull animals and breeding livestock receipts.

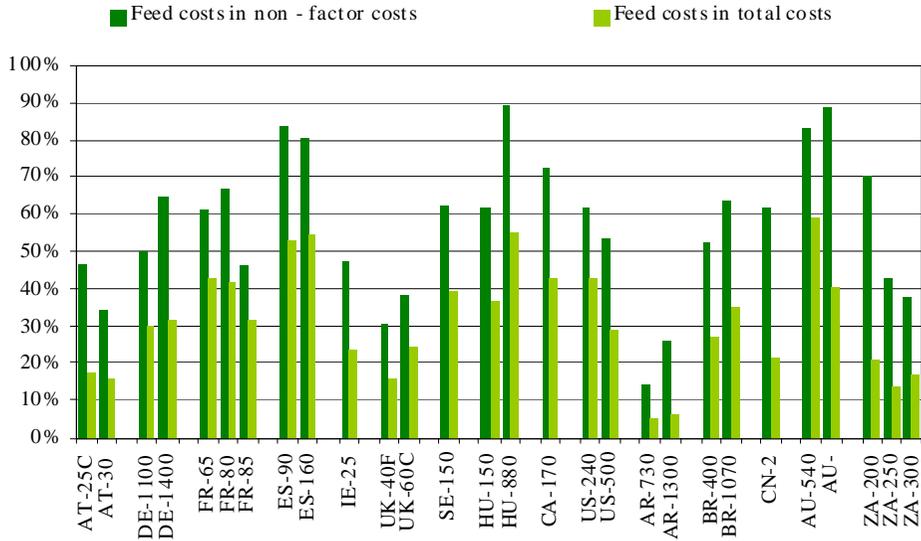
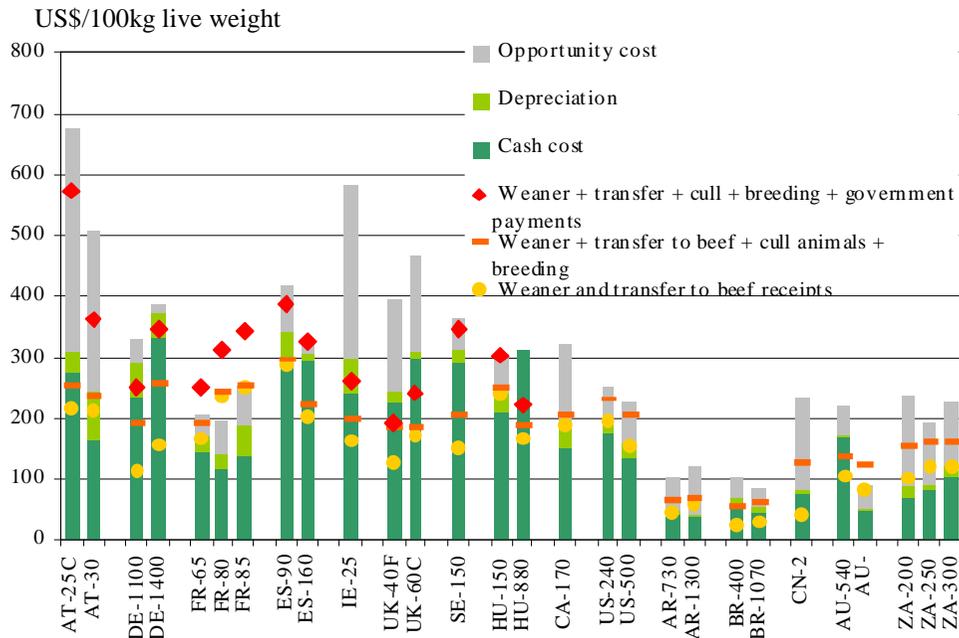


Figure 5: Feed costs in non – factor and total costs
Source: own construction based on the *agri benchmark*

A determining part of the costs of cow-calf production is feed cost (Figure 5). On a significant part of the farms, feed costs represent very high proportion of the non-factor costs – in case of the larger Hungarian farm it is 90%; while it shares more than 40% of the total production costs. Farms representing exceptions can be divided into two groups. Those farms belong one of the groups where the cost of production factors (primarily the opportunity labour cost) is high, such as in Austria or Ireland. Another group comprises those Argentine farms, where the level of feed cost is so low that it represents only 5-6% of the total production costs.



Fig

Figure 6: Total returns and costs by cash and non – cash costs
 Source: Own construction based on the *agri benchmark*

The analyses of the expenses and revenues showed that out of 28 farms there was only one that could cover its total expenses by weaned calf receipts; it was FR-80 farm (Figure 6). In decisive case of the farms, receipts from calves sold could not even cover the direct costs (in many cases neither even if complementing with breeding livestock receipts). In the EU countries, market receipts complemented with government payments covered the expenses and depreciation and part of the opportunity costs in most of the cases. In non-European countries, market receipts cover the direct costs in case of almost all farms, but not the opportunity costs.

4. CONCLUSIONS AND RECOMENDATIONS

After the political changes the cow-calf production of Hungary decreased as never seen before, therefore farmers and manegers of the beef sector hoped for an outgoing way from the EU accession. Because the EU since foundation of the CAP helped beef producers first with price guarantee then with comensation subsidies.

This positive effect hoped by the producers started and the number of cattles increased year by year. That was helped by Hungarian govermental subsidies before the accession and on the other hand farmer were invested more capital in development their own farms.

It was found that the Hungarian cow-calf herd increased significantly by the millennium in hope of a better income position expected due to the EU accession of Hungary. The farm structure however has been highly morselled. After the EU accession, 55% of the cow-calf farms kept less than 5 cows; while 55% of the cow herd is kept by subsidised farms keeping 50 or less cows. I believe that this herd is primarily double-purpose cattle and not classic beef cows. This fact may reflect that a great part of the subsidies available after the EU accession improved not particularly the position of the cow-calf production.

In the international comparison of the two Hungarian farms, it was found as Hungarian peculiarity that the cow-calf production is attached to other agricultural production, such as primarily to crop production within a single farm.

It was found that the size of the smaller Hungarian farm (HU-150) is in accordance with that of the Western European farms of medium size; while the larger one (HU-880) belongs to the large farms of the comparison.

Concerning the breeding performance, the Hungarian farms fairly follow the international trends. The analyses here covered the indicators 'age at first

calving', 'mortality rates', 'number of calves weaned per 100 cows' and the 'weaning age' and weaning weight' of the calves.

The labour productivity of both Hungarian farms lags behind in the comparison. They were listed in the group of farms with the worst parameters concerning the produced live weight per an hour. Their position was only slightly better when the land productivity was compared.

The comparative analysis of the farm gate price of weaned calves has shown that the Hungarian prices are slightly lower than those in Western Europe, but are significantly higher than those realisable in the rest of the world.

The analysis of the revenue of cow-calf production has shown that similarly to the other European farms, the Hungarian farms gain dominant proportion of their receipts from the sale of weaned calves, and it is complemented by various subsidies.

The analysis of the expenses has revealed that the highest proportion of the production costs is direct costs on the Hungarian farms, contrary to the Western European countries, where high opportunity costs - due to higher labour and land costs - represent very great proportion of the total production cost. It was found that feed cost is the most determining component among the non-factor costs on the Hungarian farms; which is due to the high amount of capital necessarily allocated for the production of winter forages.

The comparison of the costs and farm receipts proved that the market receipts from weaned calves did not cover even the direct costs on the Hungarian farms; while in case of the smaller Hungarian farm, market receipts complemented with subsidies covers even the sum of direct costs, opportunity costs and depreciation.

7. NEW AND PROSPECTIVE SCIENTIFIC RESULTS

1. I have created typical cow-calf farms first in Hungary on the basis of the method of the *agri benchmark* and analysed the economic results of beef production with the production simulation software TIPI-CAL, when the factors setting back the competitiveness of the sector were defined.
2. In the course of the cost analysis of cow-calf production, firstly in Hungary I have used the terminology of ‘factor costs’ (cost of capital, land cost and labour costs) in farm economic analyses and analysed their role played in farming.
3. I have reflected that on the majority of the Hungarian farms cow-calf production is not a separated profile, but a complementary activity of crop production – as opposed to high specialisation seen in the rest of the world.
4. I have found that the performance of Hungarian beef sector – number of weaned calves per 100 cow and weaning weight – are poorer than those of the USA and European countries.
5. I have pointed out that in a decisive part of the European and overseas beef farms, market receipts from weaned calves sold complemented with sold breeding animals cover the direct costs and depreciation, although it cannot cover opportunity costs.

6. LIST OF PUBLICATIONS IN THE FIELD OF THE DISSERTATION

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- **SZABÓ K.** – SZABÓ F. – BORBÉLY CS. (2008): Különböző üzemméretű anyatehén – tartó gazdaságok versenyképességének elemzése. XI. Nemzetközi Agrárökonómiai Tudományos Napok, Gyöngyös, 2008. március 27-28. (CD kiadvány)
- **SZABÓ K.** – SZABÓ F. (2007): Hazai anyatehén tartó gazdaságok az *agri benchmark* hálózatában. Erdei Ferenc IV. Tudományos Konferencia, Kecskemét, 2007. augusztus 27-28. pp. 827-830
- **SZABÓ K.** - TÓTH K. – SZABÓ F. (2006): A húshasznú anyatehén-tartás helyzete Magyarországon. X. Nemzetközi Agrárökonómiai Tudományos Napok, Gyöngyös, 2006. március 30-31. (CD kiadvány)
- **SZABÓ K.** – CSORDÁS E. (2006): Miért meglepetés az anyatehén támogatás kvótájának túligénylése? XII. Ifjúsági Tudományos Fórum, Keszthely, 2006. április 20. (CD kiadvány)
- **SZABÓ K.** (2006): Hogyan hat az anyatehén – tartásra a támogatási szint és a kvótaelosztás mai rendszere? DOSZ Tavasziszlét Konferencia, 2006. május 5-6., Kaposvár. (CD kiadvány)
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- **SZABÓ K.:** The story of a Hungarian cow-calf farm. 5th *agri benchmark* Beef Conference, Braunschweig, 2007. június 19