

PhD THESIS

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ECONOMICAL ANALYSIS OF THE HUNGARIAN BREEDING PIG MARKET OF THE 1990s

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1. PRELIMINARIES AND OBJECTIVES OF THE STUDY

Recently a significant shift of point of view can be detected of the methodology of the Hungarian agricultural research. Instead of examining separated sectors the participants of the food industry suggest approaching the whole production chain. The breeding pig market – the objective of this study – is only a small segment of the pork production chain (Figure 1.). The slaughter pig meat and carcass quality will be due to health, nutrition and other environmental effects beside the genetic background of the parents. While the cost of feeding is about 70% of the total expenditure of pork production, the cost of the breeding stock is quite often regarded as an insignificant expense. The literature of Hungarian agricultural economics is hardly concerned about the breeding pig production and marketing.

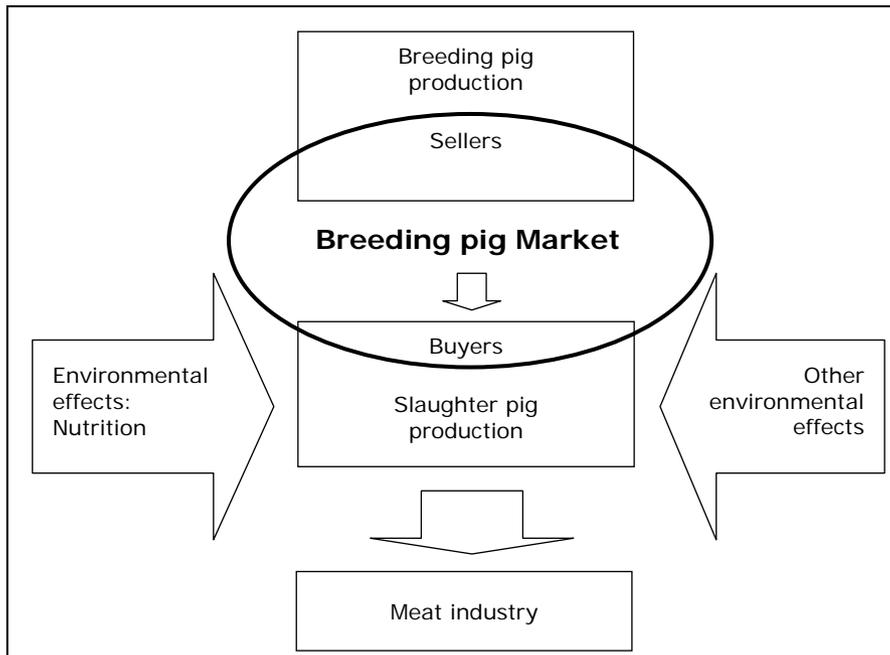


Figure 1. The breeding pig market and the pork production chain

The examination of the breeding pig sector contributes also to the research of the whole pork production chain.

A considerable transformation of the pork production sector was experienced in the last fifteen years. Besides the decreasing domestic meat consumption the pork/total meat ratio dropped significantly. The volume of the Hungarian pork exports is far less than earlier. The consumers' expectations changed considerably as well.

The product development of the breeding pig market also followed the customer demand. Significant improvement has been made in almost all the qualities. Stress negative breeding stock has become available. New breeds have been introduced to the market by new breeders and the economical environment has been changed into market economy.

The appearance of the foreign pig breeding companies on the Hungarian breeding pig market made every buyer and seller realize that the underdeveloped marketing management will present a serious problem in the short time. The Hungarian breeding pig producers also have to face to the difficulties caused by joining the EU.

The pork production sector – along with the cattle and poultry sector – is one of the most important sectors of the Hungarian animal husbandry.

The objective of my dissertation is to explore the Hungarian breeding pig market. The crises of the pig sector in the last two years stress the importance of the research work. Beside that 2003 was the last year of the life cycle of the Kahyb hybrid pig which construction began at the Agricultural University in 1962 with the leadership of Alfonz Anker.

To explore the Hungarian breeding pig market the research work should focus on the following areas:

- Analysis of the external macro-environment
- Identifying the product of the breeding pig market and applying Kotler's five-level product model
- Examine the other marketing-mix elements: the price, the marketing channels and the promotion
- Marketing trends
- Marketing strategies
- SWOT analysis of the breeding pig market
- Possibilities of the expansion of the breeding pig market

The period in question which is included in the title of the dissertation will be extended from 1990 to 2003 in order to examine the events of the recent past.

2. MATERIAL AND METHOD

Sources of the secondary database were the OMMI yearbooks of swine breeding, the KSH publications, interviews published by others that are applicable to the research area of the dissertation and the legal environment.

My study is primarily based on qualitative research. In order to collect the primary database 33 in-depth interviews took place. Among the interviewees there were 11 breeders, 11 customers and 11 professionals of related areas. Except of the DumecoBreeding Kft all the important breeding organization can be found among the interviewees.

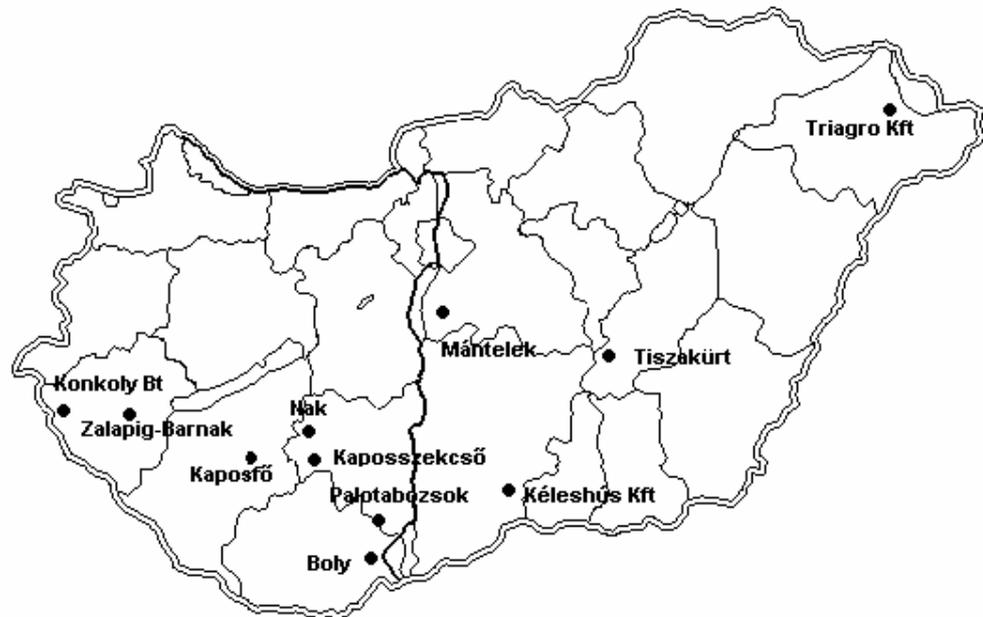


Figure 2. Geographical positions of customers of the breeding pig market selected as interviewee

While the seller side is almost covered completely the purchaser side is not complete neither representative.

Further characteristics of the purchaser side:

- Geographically covers the country (figure 2.).
- All the seller interviewees can be paired with a buyer interviewee.
- Both the purchase of replacement and the local gilt production were practice among the interviewees.
- Total replacement happened at some herds after evaluating the available breeds and sellers.
- New herd was populated with careful selection of the provider.
- The average lean meat percentage ranges from moderate to high
- Wide range of sow populations (120-2300-sow herds) – from the lower limit of production for the slaughter pig market

The macro-environment of the breeding pig market was analyzed through its social, technological, economical, ecological and political factors. The acronym STEEP is used to describe the framework. The 4P model of the marketing mix (**p**roduct, **p**rice, **p**lace, **p**romotion) and Kotler's five level product models was used to analyze the database of the in-depth interviews. Finally SWOT analysis was carried out to serve as a basis of the breeding pig marketing plans.

3. RESULTS

3.1. The macro-environment of the breeding pig market

Meat and meat-product consumption has decreased considerably since 1989. Further disadvantage of the pig sector is the decreasing proportion of pork in meat consumption. The decreasing domestic pork consumption and the reduced volume of exportation resulted in a pig population which is only the half of its earlier size. The structure of the ownership changed, the efficient integrations of the earlier periods of the Hungarian pork production have become mostly disorganized.

The product mix of the breeding pig producers is determined by the requirements of the whole pork production chain, the pig slaughterers and meat processors. One of the most important requirements is the homogeneity of lean meat percentage and live weight within and between herds. Only industrialized slaughter pig producers are able to meet the requirement of homogeneity. Since the introduction of the qualification of the carcass and the lean meat percentage dependent pricing schema the average lean meat percentage has increased by 9%. The significant increase is the result of replacing the breeding stock and improving the feeds. The profitability of the slaughter pig producer determined by the input costs – mainly cost of feed – and the premium paid for the leanness.

3.2. Products, brands and marketing mix

Kotler's five level product model (figure 3.) – after some modification – can be applied to the product of the breeding pig market. The **core benefit**

is the fundamental service that the customer is really buying. The pork producing company is buying the promise of the economically produced pork.

The **generic product** on the market we focused on is the gilt and the young boar. The generic product of the breeding pig market may not carry the core benefit in contrast to the original model of Kotler. The purchased boar may fail to settle the sows; the gilt may fail to come in heat, etc.

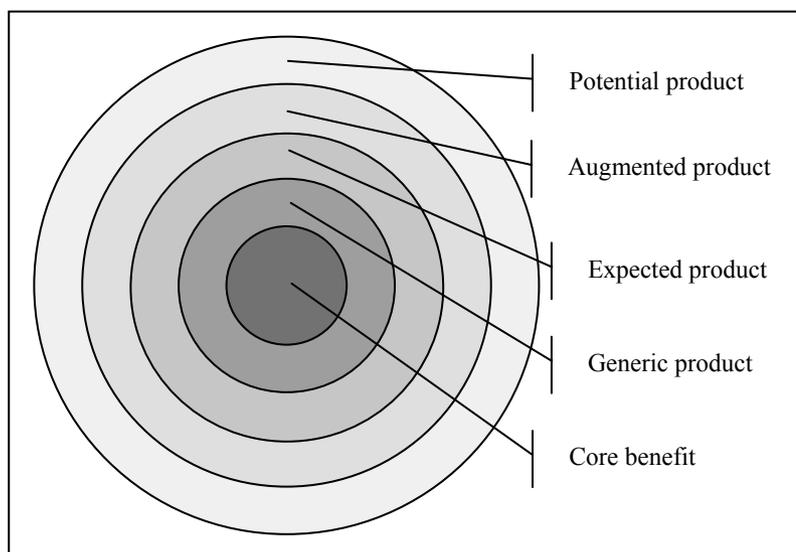


Figure 3. The five level product model (Kotler 1998)

The **expected product** is the set of attributes and conditions the buyers normally expect and agree to buy. The most important characteristics are the genuine herd book records, replacement guarantee of the non-breeder animals, free of certain diseases, sufficiently high performance indexes, appearance, etc.

The level of **augmentation** depends on the activity of the producer. One of the most effective methods for augmentation is the hybridization. The successful hybrid program should provide high repeatability values of

offspring performance. One should note that the population sizes of certain lines of the Hungarian hybrids are far below the accepted minimum. Further attributes of the augmented product may be: selling bred sows, gilt offered at larger quantity, individual blood test, SPF pig, fertility, etc. The characteristics of the augmented product soon become expected benefits, for example the stress insensitive female side.

The **potential product** stands for all the augmentations and transformation that the product might undergo in the future. The breeders are not willing to tell much about their plans. The literature can be referred. For example breeds suitable for young boar fattening or extensive housing.

The mangalica is a unique product of the market. It is not competitive on the market for the meat type pigs, the population is limited and both the breeding and the slaughter pig production need to be subsidized.

Branding applied by the bigger breeding companies in the pig sector primarily the hybrid swine producers. The efforts to initiate branded pork programmes covering the whole pork production chain usually end in failure because of the unstable economical environment.

Pricing. The buyer expects that the gilts or young boars carry increased piglet production, enhanced efficiency of feed use and growth rate, improved carcass yield and quality. The producer of the breeding pig can identify many extra cost compared to the slaughter pig. Among the extra costs of the breeding pig production are the strict health requirements, losses at pre-selections, progeny tests and extra staff. Price competition can be observed in the low-price segment of the breeding pig market but not in the segment of the more expensive, more differentiated pigs.

The common attribute in the **place (distribution)** and **promotion** is the importance of the personal contact between seller and buyer.

3.3. Turnover on the breeding pig market

The annual replacement rate for females reached its worst value of 2.49% in 1993. Even the highest value of 11% in 1998 is far less than the desirable 40%. The annual replacement rate for females has been decreasing since 1998. Less and less males are sold year after year indicating the growing number of the unregistered working boars. These undesirable turnover figures indicate the ineffectiveness of the subsidy both of the purchasing of the gilts and producing young boars.

The sold gilts per registered sows ratio reached its highest value in 1998 with 1.2 gilts/sow. This ratio is decreasing since 1998, although the ideal value is about 4 gilts/sow. Since 1998 the number of the registered sows increased from 37527 to 47008 by 2003. The herd book keeping requires a considerable amount of subsidy provided by the government.

The most important reasons of the low demand for breeding pigs:

- Fear of diseases from outer sources.
- For bigger pig producers – herds of more than 4-500 sows – the replacement gilt production is more profitable than the purchase.
- The earlier successful integrations dissolved. The breeding pyramid is a non-existent phenomenon in the Hungarian pig breeding sector.
- Traditions. The Hungarian farmers used to and like to “breed” the parent and even the grandparent generation.
- Lack of working capital. Most often buying a new boar creates financing difficulties. Replacing the whole breeding stock is unaffordable for most enterprises.

- It is not worth buying valuable high performance breeding stock into an inadequate environment.
- The unstable market for slaughter pigs holds back the demand of the smaller enterprises for breeding stock.
- The costs of the more expensive breeding stock, feed, technology is not covered by the price of the quality slaughter pig.

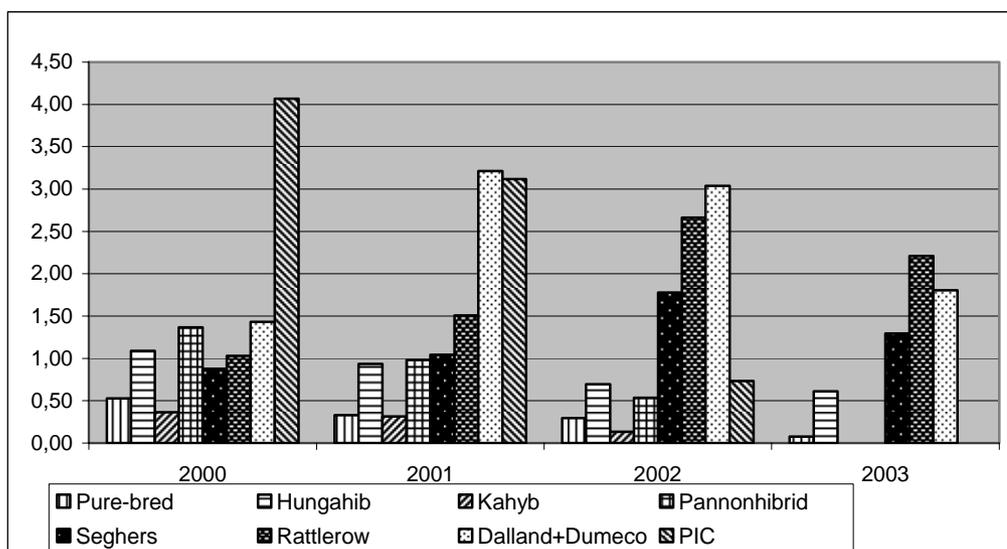


Figure 4. Number of sold gilt per registered sow by breeding organizations
(Source: NIAQC¹)

The ratio of the sold gilts and the registered sows decreases steadily regarding the Hungarian breeding organizations (figure 4.). All the foreign companies were able to increase or hold this value except the PIC.

The share of the foreign breeding companies has been steadily increasing on the market for both the gilt and the young boars since 1998. (Figure 5. and 6.) In 2002 the Hungarian share was only 40% on the market for the gilts. Furthermore the continuously decreasing market share of the

¹ National Institute for Agricultural Quality Control

Hungarian enterprises has been separated into artificial segments by the sharply divided lobbies persuading the breeders into hybrid programmes at the end of 1998. In 2003-2004 the Hungarian hybrid programmes given up reuniting the pure-bred breeding pig market.

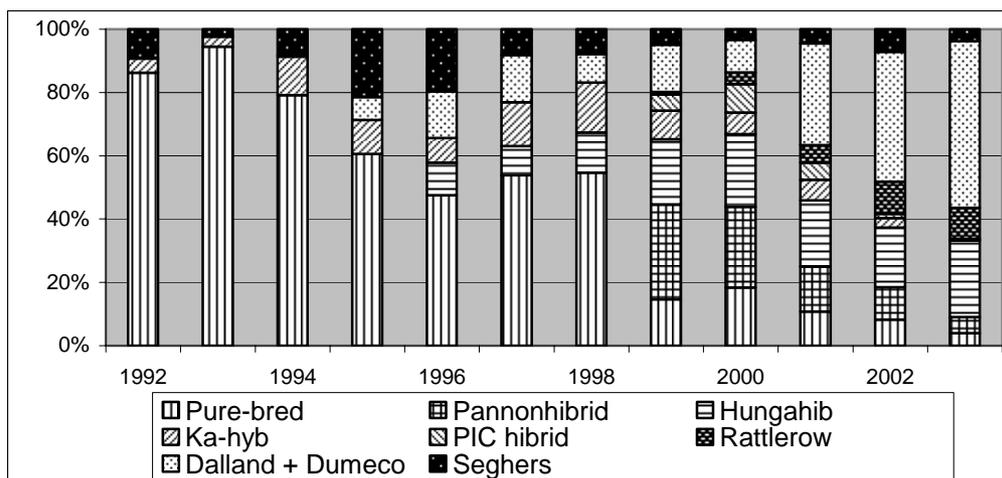


Figure 5. Market shares in the market for gilts (Source: NIAQC)

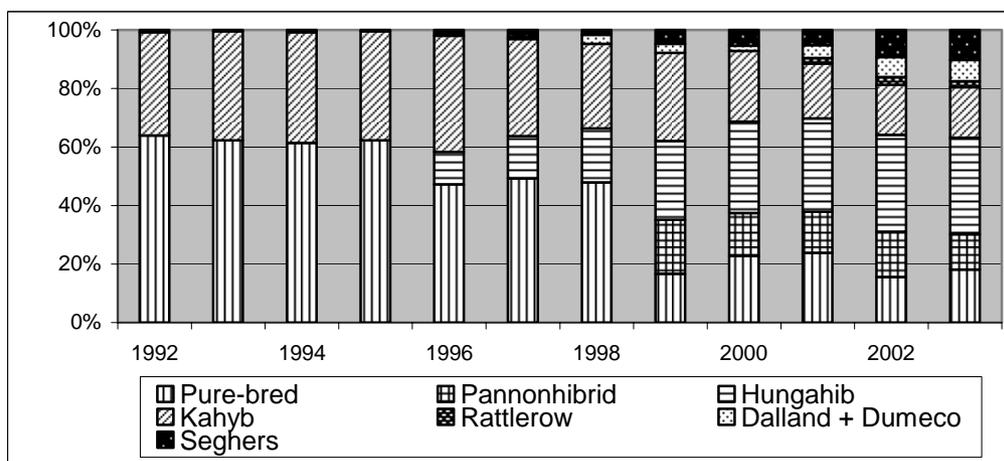


Figure 6. Market shares in the market for young boars (Source: NIAQC)

3.4. SWOT analysis of the breeding pig sector

The SWOT analysis provides information that is helpful in strategy formulation and selection. Tables 1. and 2. are the result of the SWOT analysis of the Hungarian breeding pig sector.

Table 1 Strengths and weaknesses of the breeding pig sector

Strengths	Weaknesses
Among the breeding pig customers the number of the larger enterprises interested in long term activity is considerable.	The integration in the production and marketing of swine is quite modest. The full-scope integration and the pig-breeding pyramid appear to be totally lacking..
Most of the foreign hybrid pig companies are present. Due to the intensive competition the PIC has been driven out from the Hungarian market.	The profitability of swine production is fluctuating, and the efficiency is unacceptable in several terms compared to international values.
The integration in the pig production has a strong tradition.	The pig breeders often produce the replacement themselves
The pork is traditional food and considerable amount is consumed.	The breeding pig producing capacity is oversized by 3-4 times.
All the important breeds can be found in national breeding. The native mangalica also has economical value.	The size of the pig sector halved in the last fifteen years and that resulted in the contraction of the breeding pig market.
The large population of the breeding stock enables sufficient number of replacement even at rapid market growth.	Most of the customers have no access to sufficient capital. Even the swine quarantine is a mean of deposit of working capital.
The pig production is a traditional sector of the Hungarian agriculture. Large number of educated professionals.	The breeding pig market was cut into tightly controlled segments for years by the Hungarian hybrid pig programmes
The breed registration and the breeding database are under the supervision of the breeding authority.	Due to the small populations maintaining the Hungarian hybrid pig programmes is questionable.
The genetics of pig makes reaching various breeding purposes possible.	The volume of breeding pig exportation is insignificant. The imported breeding stock is not utilized efficiently.
EU-conform, trustworthy herd books and breeding database.	The pig breeders are divided, their organizations subsided.
Carcass grading is based on the lean meat percentage with moderate to good heritability.	The breeding pig market is influenced by the amplified fluctuations of the slaughter pig market

Table 2 Opportunities and threats of the breeding pig sector

Opportunities	Threats
The decreasing self-sufficiency is gradually replaced by slaughter pig producer enterprises. The enterprises become customers of the breeding pig market.	Due to the changes in consumption patterns less and less pork is eaten.
The demand in traditional pork products is expected to be increasing.	The poultry sector is more integrated and expected to be growing at the expense of the pig sector.
The earlier balance between the pork and grain production can be restored by the increased production level of the pig sector.	The purebred pig breeders are disorganized. Without any integration the large breeding companies will not be successfully competed against.
Although a great deal can be done to reach progress in the efficiency of the pork production by improving the nutritional and other environmental factors, achieving better results requires further improvement of the breeding stock.	The required high capital investment is not available to increase the level of concentration in the pig production. If the self-sufficiency decreases the size of the Hungarian pig sector can be halved.
The potential extent of the Hungarian breeding pig market is determined by the earlier size of the swine sector – 10 million pigs.	The pig cycle has become more apparent since the beginning of the nineties and has strong effect on the breeding pig market.
The demand in quality breeding pig is to be increased by the quality assurance systems which are expected to be introduced in the pig sector in the near future.	One pig breeding programme is able to produce 5-10 million slaughter pigs. That programme can be provided by a hybrid pig breeding company without any competitors, forming a monopoly.
Strengthening the integration results in the separation of the different phases of the pork production is resulting in an increased breeding pig market.	Replacing the breeding stock without significant improvement of the environmental conditions usually leads to a failure and has unfavorable consequences to the breeding pig market.

4. CONCLUSIONS AND SUGGESTIONS

The following conclusions can be drawn after evaluating the primary and secondary database:

- The breeding pig producers suffered from the same negative tendencies as the whole pork production sector itself in the period of question.
- The breeding pig is a strongly differentiated product. The breeding companies aggressively search new ways to augment their product.
- Between 1992 and 1998 the number of the sold gilts increased considerably due to the subsidy provided by the government. Despite the subsidy offered to the purchasers the figures of the distributed gilts has been decreasing since 1998. The number of sold young boars has a declining trend during the period of question.
- Some restructuring could be experienced on the Hungarian breeding pig market. The Dumeco Breeding Kft has the advantages of participating in successful integration and continuously increases its market share. Due to the intensive competition the PIC has been driven out from the market and the Geno-kahyb Kft merged into the ISV Rt.
- The oversized population of the registered breeding stock is a considerable disadvantage of the Hungarian breeders
- The Hungarian swine producers are sharply divided between lobbies and that concluded in a segmented breeding pig market, decreasing both the genetic and financial efficiency.

Possible sources of the expansion of the breeding pig market

About 30-40 thousand gilts and 4-5 thousand young boars distributed on the Hungarian market a year. The expansion may originate from three sources. The first one is the future growth of the swine sector with the potential size of 10 million animals. The second one is that the pig breeders may give up the habit of raising the replacement and join to an integration. The third source of the expansion is the decreasing size of self-sufficiency.

Genetic potential of the breeding stock cannot be fully expressed when limited by inadequacies in aspects of health, environment and nutrition. The farms subjected to unfavorable conditions usually produce the replacement themselves. The profitability of the pork producers cannot be maintained unless the poor values of the feed per weight gain, the weight gain, the lean meat percentage, etc. are improved considerably. If the farms improve the environmental conditions then in addition to the higher profitability they may become buyers of breeding pigs with higher performance.

Along with the changes of the Hungarian villages, the animal keeping is slowly driven out of the rural settlements. The profit gained by one slaughter pig is less and less. It is predictable that the self-sufficiency will be decreasing gradually and the abandoned slaughter pig market positions are expected to be taken over by farms with 20-50 sows and their progeny. F1 gilts are usually not produced in these farms due to their limited capacity. These farms are potential buyers of the breeding pig market.

The future expansion of the market requires predictable and profitable slaughter pig market. The successful breeding pig producer must recognize the importance of the participation in an integrated pork production structure. If the level of integration increases, the expansion of the market for the more expensive good quality breeding pigs is expected.

5. NEW SCIENTIFIC RESULTS

Based on the literature discussed and the primary and secondary database I obtained the following new scientific results:

1. A comprehensive analysis of the Hungarian breeding pig market from the point of view of the agricultural marketing. The research work is primarily based on qualitative methods.
2. Exploration of the special economical context of the breeding pig market by the approach of product modeling.
3. Description of the possibilities of the breeding pig market for optimal expansion in the future, especially the area of the breeding organizations and the increasing level of the integration in the pig production sector.

6. RECOMMENDATIONS

Due to the lack of capital the pig production sector has been unable to replace the breeding stock and significantly improve the environmental conditions for the last fifteen years. The successful breeding pig producer must recognize the importance of the participation in an integrated pork production chain. The integration may be successful only if it covers the area of the breeding stock, the nutrition, the animal health, the technology, the quality assurance, the slaughter pig marketing and the financing.

The successful breeding pig producer is able to convince the pork producers that it is not worth to deal with self-supporting, raising replacement with the slaughter pigs. The pig breeders already realized that it is vital relying on the technical service provided by the manufacturers of compounded feed, supplements and premixes.

The two bigger Hungarian enterprises the ISV RT and the Hungapig Kft are able and do organize comprehensive integration. The Dumeco-Breeding Kft already takes part in successful integration. The SeghersGenetics Kft is still to join to integration.

As the Hungarian hybrid swine programs were given up in 2003-2004 and the breeding stock was re-qualified as pure-bred the level of integration further decreased. The pure-bred breeding pig market should be restructured in the near future since the coordination of the breeding and the breeding pig distribution is to be reorganized.

7. PUBLICATIONS ON THE FIELD OF THE DISSERTATION

7.1. Publications in English

Kövér Gy. – J. Paál J. – Radnóczy L. – Sári L. (1997): Analysis and improvement of a proposed pig breeding information system: Acta Agraria Kaposvariensis, Vol 1 No 1, 59-65

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Kövér Gy. – Paál J. – Radnóczy L. – Sári L. (1997): Analysis of a pig breeding information system using the DBMM method. 27. International Congress on Work Science. Kaposvár, 1997. p. 373-377

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7.4. Proceedings in Hungarian

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7.5. Lectures

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