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VALUATION OF THE SMALL AND MEDIUM ENTERPRISE'S PORK PRODUCTION IN THE WEST-TRANSDANUBIAN REGION

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1. THE FIELDS OF THE RESEARCH

The reason of my research work which is the base of my thesis is to show the pig population in the West-Transdanubian region, the conditions of pig-breeding by the help of the main pig-frequency and economic indices, and to show via computer simulation the plant characteristics of pig-breeding, its profitableness and the factors having an influence on it. During my research first I discussed the world market tendencies, then the important characteristics of the EU pig-sector. Showing the Hungarian relations I discussed in detailed the effects of the economic and political changes after the change of regime, the changes in the country's pig population and meat processing, the situation of processing plants, the tendencies of meat consumption, the possibilities and dangers in foreign trade, the quality of pig for slaughter and the development of marketing- and fodder prices.

Examining the West-Transdanubian region I laid stress upon the possibility how to create the optimal farm size. I paid significant attention to the study of the structure of land concentration and the pig population distribution according to farm size. Moreover I examined the factors forming the region's agroecological potential and the size and the division of the processing capacity respectively. During my research I tried to find advantages which utilizing the conditions of pig-breeding can be improved.

The examination of the profitableness of pig-breeding and the effect of natural indices on a pig farm in Győr-Moson-Sopron county and on an

other farm in Zala county relating to the 2002, 2003 and 2004 years I made by the help of a computer model and analytical program made by me.

2. MATERIAL AND METHOD

During the economic analysis I examined the following factors:

- the observation of the pig for slaughter regulation in the EU, the adaptation possibilities of the experiences in our country,
- the economic environment development, marketing prospects and marketing possibilities of the sector,
- the development of the most important indices typical to the economic
- plant conditions of the pig-breeding in the West-Transdanubian region comparing with the national data,
- the receipts, costs and income components of pig for slaughter production and processing and the development of them,
- the development of natural indices typical to the pig-breeding,
- I developed a computer economic analytical program and simulation model which can be put into practice as well and by the help of it the economic effects of the change of each natural index can be estimated.

My research work which is the base of my thesis was made at the Mosonmagyaróvár Economical Department of the West-Hungarian University Agricultural and Food Sciences Faculty, and at the West-Transdanubian agricultural co-operatives, companies, enterprises examined by me. In compliance with the topic chosen by me the data were collected from small businesses and medium-size enterprises. (0-40 EUME).

To solve the envisaged tasks I applied two fundamental forms of the data collection. The primary research based on the independent collection of data and the secondary one based on the classification of the existing information with text and of the numerical, objective data according to new aspects.

The **regional data** necessary for the economic analysis of the pig for slaughter-breeding companies were given by the Győr-Moson-Sopron county Ministry of Agriculture and Regional Development Office, the economic structural registration of Central Statistical Office, the Pig for Slaughter and Meat Product Council, the Meat Society and the Agroeconomical Research Institute pilot plant system, on **enterprise (plant) level** the data were given by several agricultural co-operatives, economic companies,and agricultural small businessmen (primary producers). The **database** of the research comes from the books, annually records, statistic reports, business plans of companies and their returns, analysis made for internal use resp. and the notes, records of small businesses.

During my research I examined the connections, relations between the factors forming the profit of meat production. I scrutinized the data of marketing weight, marketing average price (living weight, quality etc.) which give the size of the receipts. Moreover I paid attention to the development of the pig for slaughter basic material costs and the weight fattened on it (subsistence, meat-productive) costs having an influence on the production costs. During my research I paid attention to the national and international publications, economic models of calculation relating to the topic which were

used in my thesis. The data-processing was prepared by the help of my own computer financial registering and analytical program written for Microsoft Excel 2003 Professional for Windows XP spreadsheet program.

During my own research after having collected the primary and secondary items of information, I tried to model the conditions of the pig farms in the region. Fixing the average data of a chosen model farm, my target was to carry out the so-called **spread-sheet analysis** and by changing the value of each of the data – to examine its effect on the profitableness relations of the farm I made an **analytical program** which includes the most important connections, gives a good model of the pig-breeding practice and automatically calculates the fundamental natural and economic data. The program has been tried out in practice in sevaral farms. In my study I demonstrated it with the data of Dunakiliti Agricultural Joint Stock Company and with the data of Tibor Peszlen's pig farm in Zalaszentlászló, because these farms of 300 and 77 sows in their more important indices represent well the average farm relations of the small and medium-size farms in the West-Transdanubian region both in the fields of reproduction indices, technology and economic indices. According to the experts of the plants the program works well, and in practice it can help a lot to establish the more important economic decisions.

3. RESULTS

3.1. THE DESCRIPTION OF THE WEST-TRANSDANUBIAN REGION

One of the biggest problems of the Hungarian agriculture and so of the pig sector is the dominance of the farms under the optimal farm size. So during examining the West-Transdanubian region first of all I examined the development of the land concentration and the division of the pig population according to the farm size, and I compared the data of the region and the counties with the national values by the help of different pig population indices. During my research I came to the following results:

The sizes of the lands typical to the region slightly exceed in number the national average. The observed farms grow several sorts of cereals on the significant parts of their arable areas. I experienced considerable reorganisations between the cathegories examined by me: The number of the farms and the land size of the economic organizations decrease, the average land size of the individual farmers increases. Many of the losing breeders of animals gave up their activities, they also sold or leased their lands which mainly came into the use of the cultivation farms. These changes increase the areas of the farms being up, approaching with it the optimal farm size where it is possible to make effective farming. The disadvantage of this process is the fact that the cultivation farms also on the newly obtained areas grow mainly corn which they on a larger and larger scale must sell - because of the decreasing number of animals - in the corn market having overproduction problems. Otherwise the division of the region’s agricultural lands according

to the size absolutely similar to the national one, only some minimal differences can be mentioned. If we examine the land structure on the counties' level, we can see that the typical land structure in Győr-Moson-Sopron county is bigger than, in Vas county the land structure is similar to, while in Zala county the land structure is more subdivided than the national average.

Examining the climatic elements in the region I came to the conclusion that in this respect the region has no advantage against the other parts of the country at least for the time being. But to the effect of global warming and the increasing aridity indices in some decades the fewer sunny hours and the fact respectively that the region is the rainiest area in the country can be advantageous.

Examining the processing capacity I came to the conclusion that in the West-Hungarian region the increase of small plants, the steady decrease of the slaughter capacity can be called typical, while in the other regions of the country I experienced significant capacity increase. As in our country one of the biggest problems of the meat packing is exactly the huge overcapacity which keeps the permanent costs on a high level so the capacity reduction in the region can't be definitely considered as a disadvantageous phenomenon.

In the region pigs are bred in 7-8% of the economic corporations, in 42% of the private farms, in 84% of the livestock keeping farms, in 88% of the mixed farms. In the economic corporations the average pig population is considerably lower than the national average, their brood sow population is smaller than the national value. As for the individual farmers the situation is

the opposite: mainly in Győr-Moson-Sopron county many farmers keep one or two sows the progeny of which partly is fattened, partly as separate young pigs is sold. The pig population of the individual farmers is around the national average. The economic corporations of the region because of the significant land sizes and the relatively low population concentration keep considerably fewer pigs per hectare than the national average. But the average data conceal the extremities of the population combination. It is typical to the pig population of the region that about 30% of the animals can be found on farms having the suitable farm size, about 10% in medium-size farms, while the remaining 60% can be found in farms having uneconomical farm sizes and perhaps some sows. While 43% of Hungary's pig population can be found in farms having more than 5000 animals, in the region the same index is only 25% so the proportion of the big farms is considerably smaller.

In Győr-Moson-Sopron county the concentration of the agricultural areas is the biggest. The land sizes in each cathegory exceed in number the national average. The same statement is true in respect of the arable areas, the corn-growing and the fodder-growing areas as well. In respect of the pig population per 1 hectare agricultural land again the individual farmers in Győr-Moson-Sopron county are the first ones. The pig-frequency index in this cathegory well exceeds in number the national datum. The economic corporations of the region, although they have the biggest farm sizes in the region, are far behind the national average number. The dominance of the medium-size farms and the predomination of the individual farmers are typical to the region.

In Vas county the average size of the agricultural and arable areas is similar to the national one, but the proportion of the corn-growing areas is lower than both the regional and the national average. The size and the proportion of the fodder-growing areas exceed in number the national values as well. It is typical to the land sizes that their distribution is more extreme than it is in Győr-Moson-Sopron county. There are fewer medium-size areas or we can find either areas over 1000 hectares or areas of only some hectares. The size of the average pig population is far lower than the national one, it is typical to its division that the 60% of the population can be found in farms breeding fewer than 50 pigs. The pig population relating to the corn-growing and the fodder-growing areas is the lowest one in the county, it is far behind both the regional and the national average.

The agricultural and arable area per farm in Zala county is the smallest in the region, but this being the case in respect of the fodder-growing area as well. Corn is grown on more than 75% of the arable areas. Beside the subdivided land structure we can find the pig population extremely divided. 74% of the farms keep 1-2 pigs, 21% have 3-9 pigs and only the remaining 5% (650 farms) keep 10 or more pigs. In the county 34 farms keeping more than 5000 animals can be found. There are 40 farms like this in the region so almost all of them can be found in Zala county and they have the 27% of the county's pig population.

Consequently the areas and the pig population are extremely divided in the region. These factors determine basically the conditions of the pig-breeding as well, because now in Hungary only the pig-breeders who having the appropriate farm size build the fattening on the fodder grown by them and

who buy only the fodder complements can be competetive. Because of the uncertain profitableness of pig-breeding mainly the mixed farms can count on safer income in the region. The technical state of the plant places for pig is heterogeneous. There are only a few up-to-date farms complying with all the requirements. Generally the most urgent tasks are the followings: to modernize the fodder storage and the fodder apportionment, to improve the farm infrastructure (heating, disposal of precipitation and sewage, water-system, etc.), to solve the manure disposal and manure allocation. The state of the individual farmers' places for pig and the state of the buildings and the breeding technology are more unfavourable. But the incalculable and permanently low profitableness of the sector leads to risk-avoiding behaviour, leaving the investments off, the deterioration of the breeding stock, at last efficiency deterioration which continues increasing the competitive disadvantage of the Hungarian pig-breeders. More and more of them must give up cultivation, the pig population continues decreasing, which both on regional and national level results in the upset of the balance of the corn and meat verticality, increasing the pig import and corn surplus.

3.2. THE APPLICATION OF THE ANALYTICAL PROGRAM

On the base of my research carried out by the help of the computer model and analytical program I came to the following conclusion: in the Dunakiliti pig farm beside the pig for slaughter – fodder price-proportion in 2002-2004 and the well-known parameters of the farm the production of the porker basic material was profitable but the fattening period was losing. If the farm sells only fattened pigs, its operating without exception is losing. To have a production over the break-even point is possible only if the significant

part of the porker basic material is sold as piglets. During the research carried out by the help of the analytical program I came to the conclusion that in the farm the fattening period can be made profitable by the help of a heating – ventilation investment. The costs of the investment even in case of a slightly (1-2%) decreasing pig for slaughter – fodder price-proportion would be refunded.

During examining the operating of the farm in Zalaszentlászló by the simulation model I came to the conclusion that in the farm first of all by an investment decreasing the value of the death of young pigs a result can be reached which would ensure the refund of the investment and the long-term profitable operating.

On the base of my research carried out by the simulation model it can be concluded that the model is suitable to examine the effects and the refund of the cost-known investments which can be carried out in the farms, it is suitable to make easier to choose among the investment alternatives and to show where it is worth intervening in the productive process in the farm in question and what are the measures which can make the biggest profit.

On the base of my examining and the experiences in the farms I came to the conclusion that to reach the maximum profitableness it is necessary to minimalize the changing costs and to raise the specific receipts/sow. The latter is on one hand in close relation with the number of the separated pigs/sow on the other hand with the sorting out receipts. Mostly examining the profitableness the receipts of sorting out the sows are ignored but it can significantly have an influence on the profitableness of the sector. Keeping

the strict basic principles of organization without any significant costs the frequency of farrowing, the size of litter can be raised and the death of young pigs can be kept low. The progeny indices of the examined farms were good in spite of the fact that the brood sow-piglets were chosen out every time from the porkers. The value of the death of young pigs and piglets must be improved.

During the period of fattening the way to improve the profitableness is to raise the number of porkers sold yearly and to raise the number of fattening cycles, to shorten each cycle because in this way the permanent costs/unit of output can be reduced to a significant level. It is the fodder costs which amount to the considerable part of the changing costs so it is vital to improve the fodder sales by stopping wastage and by creating the optimal environment. I found out-of-date fodder apportionment system in each of the examined farms, which significantly reduced the animals' fodder utilization. The considerable part of the other changing costs is the animal hygienic costs so a great emphasis must be put on the hygienic management and preventing other diseases. It is a bad practice in Hungary that they generally try to increase letting out of porkers by increasing the number of sows, but this means only an extensive increase, the efficiency generally deteriorates. The good solution is to improve the progeny and growing indices. The prime cost of the separated young pigs is in close relation with the number of separated young pigs/sow, because their prime costs are mainly determined by the sow-fodder/separated young pig and the other permanent costs of the dropping box. During the period of fattening the effectiveness of fattening can be valued quite simply on the basis of the prime cost needed to reach a kilo of gain in weight which is mainly determined by the fodder costs of the gain in

weight. And these fodder costs are in connection with the development of fodder sales and fodder prices. As fodder utilization in the final stage of fattening is worse and worse it is very important to determine the optimal size of the end-weight when the animal is fattened and the body-weight when the animal is set to be a porker. The other significant factor is the costs of stock replacement whose specific measure can be decreased by improving the reproduction indices. To decrease the permanent costs/ pig for slaughter of 1 kg can be reached by increasing the growth force so decreasing the time needed to be ready.

The suggested changes, the improvement of the values of the death of young pigs, the fodder utilization, the final product/sow need investments of significant costs in the technologically out-of date, amortized farms. The costs of the investments are known without exception, but their effects on the profitableness of the farm and the surplus profits that can be reached by them need extremely involved calculations. The program made by me can help the pig-breeders in this case because using this program these effects can be estimated quite exactly.

4. NEW SCIENTIFIC RESULTS

- Examining in many dimension the marketing persons of pig for slaughter production and the conditions of pig-breeding I came to the conclusion that the Hungarian pig-breeders have competitive disadvantage against the pig-breeders in the 15 EU countries. The reasons for this are the differences in the measure of corn-growing intensity and subsidization and the differences in the breeding technology. To increase the competitiveness investments aimed at improving the natural indices are needed, and these investments because of the sector's scarcity of capital must be carried out well-aimed, separately examining the possibility of the most effective intervention in each pig farm.

- Considering the above mentioned I made a simulation model which in my opinion is suitable to help the choice among the investments alternatives, to determine the intervention points, to make cost and income calculations.

- Examining the conditions of pig-breeding in the West-Transdanubain region I came to the conclusion that the region in respect of agroecological potential has no significant advantage at least for the time being. But to the effect of global warming, aridity, intensifying of climatic extremities the region's rainy, relatively balanced weather can mean a serious advantage in some decades.

- Examining the region's land structure, the pig population divison according to farm size, the pig population concentration by applying Lorenz- curves I came to the conclusion that the plant structure in the region is more subdivided than the national average. In respect of the examined parameters Győr-Moson-Sopron county has better conditions than the country. The proportion of medium- and large-size farms and pigs bred in farms like this is well higher than the national one. But in the other two counties of the region the dominance of the subdivided land structure and farms keeping only some pigs is typical and the medium-size farms are almost entirely missing.

- I demonstrated by applying the simulation model that the operating of the pig farms examined by me can be made profitable if some intervention happens at the above mentioned points and their profitableness can be significantly increased even in case of the most different pig for slaughter-fodder price-proportion. By the help of the model I could demonstrate how the most important natural indices and the change of pig for slaughter-fodder price-proportion have an influence on the profitableness of the farms.

PUBLICATIONS

1. Kovács Tamás, Józsa Máté József, Várallyai Erika:
   Egy hűtőipari vállalat értékesítési tevékenységének vizsgálata
   VII. Nemzetközi Agrárökonómiai Tudományos Napok, Gyöngyös, 2000.

2. Kovács Tamás, Józsa Máté József
   Egy élelmiszer-feldolgozó vállalat gazdálkodásának vizsgálata
   VII. Ifjúsági Tudományos Fórum, 2001. Keszthely.

3. Józsa Máté József, Kovács Tamás
   A sertéstartás fontosabb mutatóinak vizsgálata Magyarországon és Győr-M-S megyében
   VII. Ifjúsági Tudományos Fórum, 2001. Keszthely.

4. Kovács Tamás, Józsa Máté József:
   Egy Győr-Moson-Sopron megyei mintagazdaság gazdasági elemzése
   VI. Ifjúsági Tudományos Fórum, 2002. Keszthely.

5. Kovács Tamás, Józsa Máté József:
   A Nagyrédei „Szőlőskert" Mezőgazdasági, Élelmiszeripari és Szolgáltató Szövetkezet gazdálkodásának pénzügyi, ökonómiai elemzése 1997-2000 évek között
   VIII. Nemzetközi Agrárökonómiai Tudományos Napok, 2002. Gyöngyös.

6. Józsa Máté József, Kovács Tamás:
   A Dunakiliti Mezőgazdasági Termelő és Szolgáltató Szövetkezet ökonómiai, pénzügyi elemzése 1995-1999 évek között
   VIII. Nemzetközi Agrárökonómiai Tudományos Napok, 2002. Gyöngyös.

7. Józsa Máté József, Kovács Tamás:
   A sertéstartás helyzetének ökonómiai vizsgálata Magyarországon és Győr-Moson-Sopron megyében
   XLIV. Georgikon Napok, 2002. Keszthely.

8. Józsa Máté József, Kovács Tamás, Tell Imre:
   A sertéságazat versenyképességének vizsgálata Magyarország Európai Uniós csatlakozása tükrében
   XLV. Georgikon Napok, 2003. Keszthely.

9. Tell Imre, Kovács Tamás, Józsa Máté József:
   A költségek, a termelői-, a felvásárlási-, a fogyasztói árak alakulása, hatásuk a versenyképességre a tej és tejtermékek piacán
   XLV. Georgikon Napok, 2003. Keszthely.

10. Kovács Tamás, Józsa Máté József:
    Az „AD" Kft. sertéstenyésztésének ökonómiai vizsgálata
    IX. Nemzetközi Agrárökonómiai Tudományos Napok, 2004. Gyöngyös.

11. Józsa Máté József, Kovács Tamás:
    A sertéságazat versenyképességének vizsgálata Magyarország Európai Uniós csatlakozásának tükrében
    IX. Nemzetközi Agrárökonómiai Tudományos Napok, 2004. Gyöngyös.

12. Kovács Tamás, Józsa Máté József:
    Egy Győr-Moson-Sopron megyei vállalkozás sertéstenyésztésének jövedelmezőségi vizsgálata
    XXX. Óvári Tudományos Napok, 2004. Mosonmagyaróvár.

13. Józsa Máté József, Kovács Tamás:
    A sertéságazat versenyképességének vizsgálata Magyarország Európai Uniós csatlakozását követően
    XXX. Óvári Tudományos Napok, 2004. Mosonmagyaróvár.

14. Kovács Tamás, Józsa Máté József:
    Az „A"-Kft. sertéstenyésztésének ökonómiai vizsgálata
    XXX. Óvári Tudományos Napok, 2004. Mosonmagyaróvár.

15. Józsa Máté József – Radnics Zsuzsanna – Iváncsics János:
    A sertéságazat versenyképességének, a sertéstartás jövedelmezőségének vizsgálata a Nyugat-Magyarországi Régióban
    Gazdálkodás, XLIX. évf. 14. sz. 2005.

16. Józsa Máté József – Dr. habil. Salamon Lajos:
A sertéstartás gazdasági hatékonyságát meghatározó tényezők vizsgálata számítógépes program segítségével
Gazdálkodás, 2006. megjelenés alatt

17. Dr. Kovács Tamás-Józsa Máté József-Mazán Márió
A magyar mezőgazdaság, azon belül a műtrágya piac részletes elemzése Agrolinz Gmbh (Ausztria) valamint BOKU WIEN részére
Magyar és német nyelven egyaránt, 2003.

18. Józsa Máté József – Radnics Zsuzsanna – Iváncsics János:
Examination of the competitiveness in the pig sector by the help of a computer program
Gazdálkodás, XLIX. évf. 14. sz. 2005.

19. Radnics Zsuzsanna – Józsa Máté József – Kacz Károly
Risks and risk management in the plant production
Gazdálkodás, XLIX. évf. 14. sz. 2005.