THESES OF DOCTORAL (PhD) DISSERTATION

UNIVERSITY OF WEST-HUNGARY
FACULTY OF AGRICULTURAL AND FOOD SCIENCES
MOSONMAGYARÓVÁR
INSTITUTE OF ECONOMIC SCIENCE

Chairman of the PhD School:
Dr. Schmidt János
university professor
correspondent member of Hungarian Academy of Sciences

Program leader:
Dr. Tenk Antal
university professor, candidate of agricultural sciences

Supervisor:
Dr. habil. Salamon Lajos
university professor, candidate of agricultural sciences

CHANGES AND TENDENCIES IN SIZE OF CATTLE FARM IN WEST TRANSDANUBIA

WRITTEN BY:

JUDIT HEGYI

MOSONMAGYARÓVÁR
2005

1. MAIN OBJECTIVES OF INVESTIGATIONS, RESEARCH HYPOTHESES

After the political and economic system transformation the importance of agriculture in Hungary's economy constantly declined. Ownership and farm circumstances changed radically; the disorder in farming-organisational circumstances, the level of production sources and efficiency problems, income conditions are such areas of agricultural economic research that should be dealt with – irrespective of our EU accession but also considering its effects.

Considering agricultural production the production value of the animal breeding sector changed the most significantly.

The present situation is characterized by the decline of animal stocks and the production of animal products to a level that threatens self-sufficiency. The reasons of this decline are the low profitability of production of animal products, the reduction of domestic and foreign markets, the out of date state of production capacities, the constant capital withdrawal from the animal breeding sector, the forming ownership circumstances that were unfavourable for the sector and the general decline of the economic environment.

The decrease of cattle stock became steady between 1990 and 2005. The crisis of the milk production sector was even worsened by the changes in ownership circumstances, the structural transformation, the low profitability and the lack of integration in the production-processing chain.

The dissertation – covering the period of political-economic system transformation until the last year before the EU accession – seeks for the answer to the question of how degradation processes that are characteristic to milk production influenced the animal breeding sector of the West Transdanubia region (Győr-Moson-Sopron, Vas, and Zala counties), considering that cattle breeding plays an important role:

- What structural transformation and in what direction took place in the farming system of milk production (size of stock, forms of farming, fodder producing areas).
- How the investigated farms reacted to the economic changes – primarily regarding efficiency indices.
- What sort of future picture could be drawn for the sector that faced the most drastic decline in the nineties?

On basis of the regional investigations the following results were expected:

1. Milk production units that were successful in the beginning of the ‘90s – irrespective from the size of the stock – carry on production, and they even have a future imagination of improving their competitiveness.
2. Concentration processes in Hungary were similar to the countries with developed cattle breeding sector.
3. Large-scale and small-scale production cannot be differentiated as characteristically as in the ’70s and ‘80s.
4. **The possible advantages of EU accession (CMO of milk production, support possibilities) influence the efficiency imaginations of the management of milk production units in a positive way.**

2. MATERIAL AND METHOD

The ***first part*** of the investigations is based on secondary data collected by the Central Statistical Office, using the results of the General Agricultural Census (GAC 2000) that covered the **whole area** of the country, and using the data base of the **wide-ranging** Economic Organisation Census (2003). These information facilitate the determination of the role of Trans-Danubian region in milk production, and to support the structural changes with statistical indices.

The ***second phase*** is based on the data-base of the county offices of the Ministry of Agriculture and Rural Development. Regional data from 2002 indicate the share and frequency of farming forms being present in the investigated sector; data also show the size of stock characteristic to the certain legal forms. Data collected by the Research Institute of Agricultural Economics (RIAE) and the Milk Product Council were used to highlight the economic circumstances of the sector.

The ***third unit*** of the own research is based on primer data originating from personal questionnaires and interviews. The questionnaire has been elaborated in a way to gain long-term operational data from milk production units in Győr-Moson-Sopron, Vas and Zala counties; received data should facilitate the evaluation of the correlation between the most significant factors affecting the size of cattle husbandry (volume of milk production).

The questionnaires were not uniform in content: small-scale production units with low level of administration and data-providing intention were asked to answer less and less detailed questions; questions that were put forward to large-scale milk production facilities (mainly working in joined company forms) were elaborated to facilitate deeper farm-economic evaluation and analysis.

On basis of bibliographical discussion and the methodology used by the Central Statistical Office those farms should be considered to be large-scale production units that had more than 100 animals on the average in one of the investigated years (1990, 1995, 2000, 2003) and operated in joint company forms.

Questionnaires were sent to all such large scale-production units (90), of which 10 filled in and workable questionnaires have been returned.

Small-scale farms have been investigated on basis of sampling; sampling base covered production units with less than 100 animals and operating in private farming form (private entrepreneur, family farm). 150 questionnaires have been mailed to small-scale farms, of which 10 filled in and workable questionnaires have been returned. The total number of animals in these two sampling groups facilitates the statistical proportional sampling method; as only some farmers have intended to answer the questions, sampling cannot be considered to be random selection.

3. RESUTS, CONCLUSIONS

1. On basis of statistical data it can be stated that there are 24,5 animal heads per 100 ha agricultural area in the West Transdanubia region (GAC 2000); with this index the region takes the first place compared to the other 6 regions in Hungary. Animal density is with 6 animal heads higher than the national average. Economic organisations keep 72 % of the total stock; this number is also higher than the national average distribution ratio. The size of average stock kept in private farms is similar to the national average; the size of stock of economic organisations is almost with 100 animal heads higher than the national average.

Comparing building capacity and average stock size a smaller level of capacity utilisation could be experienced, compared to the national average. This situation is characteristic to both farming categories and it refers to larger stock decrease in the region.

2. Comparing the structure of cattle breeding units between 2000 and 2003, certain concentration processes can be observed. Concerning private farms the decrease of number of such farms is higher that the decrease of stock kept on private farms; the average 5,8 animal head/production unit changes to 8,5 animal head/farm.

Talking about economic organisations the decrease of stock size is similar to the decrease of number of farms; stocks have been fold up parallel to the winding up of the production units.

3. Focusing on cattle breeding for milk production purposes it can be stated that 66 % of economic organisations deal exclusively with milk production in 2003; the proportion in each county is very different. This value is 38 % concerning small-scale farms; compared to smaller statistical units this index shows a more uniform picture.

On basis of MARD data altogether 39553 milking cows were kept in 924 production units in 2002 in the region.

32 % of milking cows were kept on farms with 201-500 animal heads; this rate is the highest compared to other size categories. Farms with 501-1000 animal heads count for 27 % of the stock.

It should be emphasized that 85 % of the whole stock has been kept on farms with more than 100 animals.

4. Milking cows are primarily kept in the following farming forms (the order refers to the number of farming forms, in decreasing order): part-time small-scale farmer, family farm, full-time small-scale farmer, economic organisation with legal entity, co-operative, full-time private entrepreneur.

Comparing legal forms of farming with the characteristic stock size it can be stated that

- Farmers with 1-5 animals primarily work as **part-time small-scale** farmers; possibly pensioners and old farmers supplement their income with animal keeping;
- **Family farms** are characterized with 10 animals on the average, but it is varying considerably within the category;

- **Co-operatives** are characterized with an average animal number of 270, with the least relative dispersion concerning all the forms of operation;
- **Economic organisations with legal entity** keep 308 animals on the average, with a very high rate of variation within the category;
- There are only 20 **full-time private entrepreneurs** working with very different stock size.

On basis of the investigation results family farming is the most promising form of farming concerning milking cow husbandry, but from the viewpoint of viability – and expected income – the size of stock should be increased.
Among the joint organisational forms co-operatives and economic organisations with legal entity are characteristic to the sector in the future, too.

5. Investigating the relative yields of milk production it can be stated that yield indices characteristic to private and joint forms of farming do not approach each other; the difference is still around 700 litres to the advantage of joint companies. It is a very unfavourable fact that during the investigated time period relative income fell to half, due to the stagnation of purchase price and continuous increase of milk production cost. Small-scale production units react faster and better to these changes and are able to produce higher income – primarily with cutting back production cost and making use of direct sales possibilities.

6. The volume of procured milk also shows an unfavourable change, as milk processing industry procures a declining volume since 2001. The reason for this negative tendency is that joint companies supply 40 million litres less. Private

farmers only produce 9 % of the procured milk volume; that value is far less than the national average (15 %).

7 In **large-scale farms** the average stock size fell with 24 % between 1990 and 2003; although between 1995 and 2000 – when procurement prices increased – stagnation or even some increase could be experienced. Between 2000 and 2003 when income circumstances of milk production worsened, stock sizes decreased. However, relative yield indices increased and milk quality was improved in the investigated large-scale farms; this increase was used to compensate production losses originating from the decrease of stock size, and also to compensate its financial effects.

Parallel to the increase of relative yield indices the work efficiency indices also improved.

Considering longer periods large-scale production units react to the changes of the market environment, an in some cases the increase of natural efficiency is used to improve profitability.

Besides the favourable facts the following processes are also worth our attention:

- Relative income per one litre of milk was very low between 2000 and 2003; it even decreases continuously during this period.
- The level of utilisation of animal stables declines parallel to the decrease of milking cow stock size; stable investments are not performed referring to the fact that a significant increase of stock size is not planned.

- Agricultural land available for fodder production decreases; fodder producing are per animal stagnates; the size of pastures (in contrast to the pasture capacity of the region) is extremely small.
- Investment value per milking cow is very low.
- Concerning the future imaginations more than half of the farms set the objective of survival. When talking about developments – where environment protection and animal wealth issues should get priority – the primer tasks are renovation and establishment of informatics systems.

On basis of the above-written results the lining up of the sector should be supported to prevent the closing of well-operating large-scale farms that are producing quality milk.

Some important elements of such tool system can be the followings:

- A suitable support system elaborated to stop the declining tendency of stock size;
- Properly arranged price circumstances;
- Measurements to increase fodder producing areas (primarily to increase the pasture land and to organise grazing);
- Sources that are available for every participant should be guaranteed – except the EU sources – through national financial ways and structures.

8. Concerning **small-scale production units** several milk farmers – primarily operating in family farming form – who understood the challenges of the European Union have a suitable management and positive future imagination; these farmers could increase the stock size even manifold.

Further increase of stock size is also supported by the fact that these farms indicated the increase of stable capacities as the main investment objective in the investigated period.

The increase of fodder producing area – connected to milk production – is a very favourable process, especially the change in area size per milking cow. Employment also increased parallel to the increase of stock size; but also work efficiency indices show a favourable change.

Family farms have more development and investment possibilities; this fact is illustrated by the amount of money used for investments; this amount is almost the same in small-scale and large-scale farms in 2000 and 2003. To support this fact even stronger it should be emphasized that the relative index – volume of investment per animal – is manifold higher in small-scale farms than in large scale production units. The reasons hide in family farming operation; this legal form received far more possibilities from 2001 through the agricultural investment state support system.

The following processes are unfavourable:

- Relative milk yield indices show an increasing tendency, but in a slower ratio than in large-scale farms.
- The improvement of milk quality is not so spectacular, although most farmers use a closed and high quality milking parlour system. The definite increase of milk yield and quality improvement is obligatory tasks in order to reach the suitable profitability level.
- Absolute size of fodder producing area is increasing; however as stock size increases faster, the relative index of fodder area is not higher than in large-scale units.

- Concerning integration relations the horizontal connections are still missing.
- Only half of the farms have registered stock. The registration of all stocks is an urging and unavoidable task, primarily with the tools of agricultural policy.

On basis of the investigation results it cannot be evidently stated that – among the present economic-political circumstances – small- or large scale production should be considered to be more effective, profitable, more viable or competitive. The establishment of a favourable economic climate – irrespective from farm size but considering the economic characteristics originating from the different farm size – cannot be postponed any longer in order to support milk producing units on the EU common market. Further decline of cattle stock and milking cow stock is unacceptable, as with the expected increase of milk consumption the self-sufficiency with milk and milk products is endangered.

4. NEW AND NOVEL RESEARCH RESULTS

1. The dissertation highlights the changes of milk production in the West-Transdanubian region in a **complex way**:

- It presents a general picture on the structure of the cattle breeding sector with using statistical data from full-scale (2000) and widespread (2003) data collection;
- On basis of data originating from agricultural registration (2002) it defines the economic forms that are characteristic to milk production;
- Analysing primer data it compares the present situation of small-scale and large-scale milk production, **pointing out four strategically important years (1990, 1995, 2000**, **2003)**.

2. On basis of primer data collection those **production factors** are highlighted that are the most characteristic related to small-scale and large-scale production volumes. Besides the comparison of these two farming sizes the **long-term changes** of the investigated factors become more perceptible.

3. It is proved that parallel to the decline of stock size in large-scale farms the relative income from milk production also decreases. Large-scale farms are trying to bridge this critical period over with the **increase of** natural **efficiency**.

4. Investigation results show that small-scale farmers – who understood the challenges of the European Union, have a suitable management and positive future imagination – could **increase the stock size** even manifold, and **also enlarge the fodder producing areas**. At the same time the improvement of milk yield and milk quality is an obligatory and unavoidable task in order to increase the expected income level.

5. Primarily **small-scale milk production units are able to use more state support** for investments and development; on basis of relative indices small-scale units use considerably more support than large-scale farms. Definite government measurements are needed to change the future picture of large-scale farms from "survival" into development and the improvement of competitiveness.

The following answers are given to the research hypotheses listed in the first paragraph of the theses:

1. Those milk production units that operated well in the beginning of the '90s are still operating; but large-scale units do not have a well-drawn future picture that shows the direction of development.
2. Strong concentration processes are characteristic to small-scale farms in the region.
3. Technological aspects of large-and small-scale production units do not show a significant difference as in the '70s and '80s.
4. Farm unit management reacts on the EU milk production regulations with the increase of effectiveness of milk production and improvement of milk quality.

5. LIST OF PRESENTATIONS AND SCIENTIFIC PAPERS IN THE TOPIC OF THE DISSERTATION

Scientific paper published in Hungarian language in supervised professional periodical:

Hegyi J. (2004): Két eltérő környezetben működő tejtermelő nagyüzem összehasonlító vizsgálata hatékonysági mutatóik alapján, Acta Agronomica Óváriensis. 46.1. 85-91 p.

Kacz K. – Hegyi J. (2004): A Nyugat-Dunántúli régió mezőgazdaságának földhasználati és gazdaságszerkezeti jellemzői. Gazdálkodás. XLVIII. 5. 81-89 p.

Scientific paper published in foreign language in supervised professional periodical:

Hegyi, J. – Salamon, L.(2004): The effect of restructuring in agriculture on milk production in the West-Transdanubia. Acta Agronomica Kaposváriensis, megjelenés alatt

Scientific study in Hungarian language:

Kacz, K. – Hegyi, J.(2000): A magángazdaságok helyzete és szerepe, fejlődésük perspektívái a Nyugat-Dunántúli régióban, VEAB Pályázat. III.díj

Published conference presentation in Hungarian language:

Hegyi, J. (2000): A mezőgazdasági összeírások története és a 2000 ÁMÖ aktualitása, XXVIII. Óvári Tudományos Napok, Mosonmagyaróvár, előadás konferencia kiadványban 48-54 p.

Hegyi, J. – Kacz, K.(2001): A nyugat-dunántúli régió szarvasmarha állománya az általános mezőgazdasági összeírás tükrében, VII. Ifjúsági Tudományos Fórum, Veszprémi Egyetem, Keszthely, előadás CD kiadványon, Ágazati Ökonómia, 14.

Hegyi, J. (2002): A Nyugat-Dunántúli régió szarvasmarha tartásának helyzete az állatállomány és épületkapacitás mutatók alapján a 2000. évben
VIII. Ifjúsági Tudományos Fórum, Veszprémi Egyetem, 2002. március 28. előadás CD kiadványon, 402.

Csatai R. - Hegyi J. (2003): Mezőgazdasági foglalkoztatottság változása a Nyugat-Dunántúlon 1990-2000 között. AVA (Agrárgazdaság, vidékfejlesztés és agrárinformatika az évezred küszöbén) Konferencia, proceedings 317 p.,teljes előadás CD kiadványon, lektorált

Hegyi, J. – Csatai, R. (2003): A Nyugat-Dunántúl egyéni gazdaságainak vizsgálata munkaerő felhasználás szempontjából. AVA Konferencia, Debrecen, 2003. ápr.1-2. előadás, proceedings 119 p., teljes előadás CD kiadványon, lektorált.

Hegyi, J. (2003): Az üzemméret és hatékonyság összefüggésének vizsgálata két eltérő földrajzi és gazdasági környezetben működő tejtermelő üzemben, XLV. Georgikon Napok, Új stratégiák az agrárgazdaságban, 2003. szept. 25-26. proceedings 127 p., teljes előadás CD kiadványon. Mezőgazdasági Ágazatok Ökonómiája Szekció, 4.

Hegyi, J. (2005): Nyugat-Dunántúl tejtermelése a mezőgazdaság strukturális változásainak tükrében. AVA Konferencia, Debrecen. előadás, teljes előadás CD kiadványon

Published conference presentation in foreign language:

Kacz, K. – Hegyi, J. (2004): Characteristics of land use and farming structure in the the West.Pannonian Euregion. Sustain Life Secure Survavival II., Prága. 2004.szeptember 22-25., poszter, proceedings 53 p., teljes előadás CD kiadványon

Published abstract, summary in foreign language:

R. Csatai – J. Hegyi (2001): Die Ungarische landwirtschaft nach der Systemveränderung im Beispiel der Region von West-Transdanubien, Leben und Überleben Internationaler Kongress, BOKU Wien, 2001.nov. 18-21., poszter és kiadvány 183 p.

Published abstract, summary in Hungarian language:

Csatai, R. – Hegyi, J.- Réder, O. (2002): Állati termék-termelés változása a Nyugat-Dunántúli régióban (1990-2000 között). Wellmann Oszkár Tudományos Tanácskozás, SZTE MFK, Hódmezővásárhely, 2002. ápr. 27. poszter és kiadvány 182-188 p.