

THESES OF THE PHD DISSERTATION

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**THE EFFECT OF FEED CONSUMPTION ON
PROFITABILITY IN MILK PRODUCTION**

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1. INTRODUCTION

Cattle farming outputs about $\frac{1}{4}$ of animal products in Hungary. Its importance can be traced especially in relations to the other branches of agriculture as well as in its connexions with the environmental issues, employment policy, etc.. It is called also as the „Heavy Industry” of agriculture. Compared to the other sectors, it is beneficial that cattle farming can utilize the agricultural by-products, too.

Cattle is capable of producing food-substances of full value from fodder crops that can be grown in large volumes, as well as from the by-products of different plants and issued also by the agricultural/industrial processing. Milk cows, consuming exclusively vegetable protein, can produce animal protein with a high efficiency ratio of 30-40%.

There are huge potentialities of improvement in feed management. Wastefulness is general, as a consequence of unconformity between animal production and feeding.

Feed requirement is altering seasonally, and this is the main reason of the superfluous feeding up. According to this, over- and under feedings are often, considerably - sometimes of starch, other times of the digestible protein.

Feedstuff-wasting needs more land to produce enough, hence the possibility of growing plants (crops for sale) is restricted, as well.

The incorrect feed management results – through the increased expenditures – also into the higher production cost of milk.

1.2. Research Objectives and Reasoning of the Investigations

During the past decades in Hungary, there have been no other sectors of animal husbandry so much in the limelight as a cattle breeding was. The importance of this branch within our agriculture has been merely one of the main reasons. The other was the special attention payed to milk-supply (including its products) - by the government, prior to the change of political regime.

The slow adaptability, because of the biological (natural) endowments of cattle breeding, used also to be a reason for this stressed and considerable attention before.

Consumption of milk and of its products decreased in the recent past, and the present situation can be characterized by “stagnation” and/or by a little bit of increase.

The decreasing tendencies are consequences of the diminished demand caused by the raised consumer’s prices.

The speedy price rise is attributable to the cost-changes of large dimensions in production.

As a consequence of these, the targets of research are already raised and focussed on the issues of cost-increase, connections between the cost-categories/types as well as of openings for the reduction of costs. Information and data – needed for the investigations and analysis – were collected from 21 agricultural companies (factory farms) of five counties in the Transdanubia Region, for the period of 1996-2000.

In the cause of finding solutions/accomplishments, the following issues were substantially investigated:

- The development of the yield- cost- income- and profit in milk production.
- Analysis of the cost-structure (components and composition) from the points of view of feeding costs.
- Connexions between the types of cost influencing the unit of output-cost.
- Compounding optimal feed(stuff) composition to decrease unit of output (through feeding) costs.

1.3. Research Hypothesis

Considering the comprehensiveness of problem, research assumptions are rather complex also. It is necessary to study many factors for answering the raised questions correctly.

The most important hypothesis are the followings:

- Production on dairy farm is – in many cases – unprofitable, reasons of this must be revealed.
- Revision of feeding costs – to eliminate the reasons mentioned before – is inevitable.
- Results of examining the “unit of output-cost-structure”, including the related implications, could also be useful in making milk production more profitable.

Optimisation of feeding is inevitable to make costs reduced and hence the profitability improved.

2. DATABASES AND METHODOLOGY

The appointed target of the thesis is the economic analysis of dairy farming and milk production, to demonstrate positions/conditions as well as to reveal possibilities of profitability improvement.

Data, necessary for this research, were collected in five counties of the Transdanubia Region, during the years from 1996- to 2000, visiting 21 agricultural companies together.

The two basic forms of data collection have been utilized. I have pursued first the so-called secondary fact-finding, and gained information available from the statistical records and divided them into groups according to certain new points of view. To have additional data, the research activity was followed by the primarily method of collection.

The basics of data have been established on the statistics of the investigated companies and their operating/producing units, such as from the balance sheets and ledgers, etc.

At pursuing these investigations, the attentions were focussed on the examination of the connections between different factors influencing profitability in milk production.

I have examined the changes in data concerning the main factors determining the income-level such as volume, quality and the average market price of milk. I have also analysed the extend of the production costs, the changes in the different types of cost with especial regard to the feeding expenditures. Furthermore, the effects of the fodder producing forms on the feeding cost and profit have also been examined. My

intention was to compound a feed or forage ration, considering not only animals' biological needs, but the production costs, as well.

Data were processed using the EXCEL 7.0 for Windows 98 chart operating program, supplemented by „self-made” MACROS. The SPSS Statistical Program assisted me in determining connexions between data.

3. SUMMARY

After the factory farming reorganisation of the 1960's the cattle number in Hungary has been declining continuously. One reason of it was that the stabling expansion in factory farms could not compensate the stock decrease in the farmer's sector, and on the other hand the high increase of the specific (per cow) milk-production allowed to husband with smaller livestock. Due to the shop price increase of the dairy products and of the meat products in the last years the consumption decreased and dropped back greatly, which also affected the cattle stock reduction.

In my essay I have attempted to present the dairy farming production of 21 factory farms, located in 5 counties of Western Hungary, in the period of 1996-2000. I have also compared the collected numbers to the whole country tendencies. After processing the details my aim was to establish and deduce conclusions and to draw up recommendations which could help making the production more effective and solving the emerged problems.

Similarly to the countrywide tendencies, the average cattle numbers of the examined counties of Hungary have decreased in the mentioned

period, or even this drop was greater than that of the countrywide numbers. Except 7 places, the livestock number of the factory farms showed a declining tendency, but it was more moderate than that of the countrywide data. Except some particular years, the specific milk production has been increasing continuously in the examined period. In these factory farms the average milk production per cow was highly over the country average. Additional output increase can be expected through reduction of culling and calving intervals.

Examining the production costs an increasing tendency can be seen, the average increase was 15,47 %. The production costs went up in the highest degree in 1997 and 1998. The increase of the production costs in the examined factory farms was under the country's average. Examining the cost construction it can be seen that the purchased fodder price shows the greatest increase.

Beyond examining the produce and costs, I have also analysed the change of the income structure. The annual average increase of the delivery milk price was 15,91%, which is higher than that of the production costs. The specific delivery price is determined by the milk quality. The increase of quality milk production can be a way of getting greater income. The quality improvement is important due to the forthcoming joining of Hungary to EU, as only extra quality milk is allowed to use for human consumption.

The aim of milk production is to get the greatest possible proceeds. The above mentioned milk quality shall be realised in the profit through better

prices. The milk production was profitable in each of the examined factory farms, but proceeds calculated per one litre milk increased parallel to producing at higher levels. The milk yield and the development of proceeds show very close relation ($r=0,9065$).

Profitability of cattle breeding is not only conditioned and determined by milk production because the cost- and income relations of calf breeding, heifer breeding and fattening of cattle are also influencing the efficiency. The analysis of the data shows that in the field of animal husbandry department, the production is unprofitable in farms producing milk at low level, i.e. the profit from the milk production can not cover the costs of calf and heifer breeding and of cow fattening, although these activities also make some returns from sales or income. So it is very important to have a high-level milk production because the cattle husbandry department can only be profitable on this way.

Not only the extent of the returns from sales or incomes shall determine the profitability relations of milk production, but also the costs - as reducing them the proceeds of production can be increased. The half of the costs is the price of the fodder, so this is an important factor of the productivity. Analysing the data I drew the conclusion that the own growing fodder can reduce the forage costs, even if they are produced in hired areas.

The used types of fodder have also great influence to the costs, i.e. bulk forages can make milk production's costs lower than provender.

Beyond the physiological demands of the animals, the cost reduction opportunities shall also be considered at making up the optimal fodder rations. Using a sample factory farm I have demonstrated the effect of the various fodder rations to the production costs. The proposed ones are cheaper, than that of used at present in the factory farm, so the proceeds can be higher. The cost reduction effect of the fodder rations determined with optimizing method can be realised only when the financial condition of the factory farm allows to use own growing foddors, without being compelled to sell them on the market.

With the data analysing and evaluating I tried to turn the attention to the most important, mainly economic points, the solution of which could improve the results of the dairy cattle husbandry. All investigation proves that in our present economic situation, in these narrow capabilities there are certain reserves, the discovery and establishment of which could promote the development and contribute to make the production more profitable

4. NEW AND ORIGINAL SCIENTIFIC RESULTS

The economic history of countries having highly developed agriculture with great potentials shows that agriculture sustainable for long term, the advanced environmental culture as well as the intentions among increased added value and employment rate are almost impossible to be realized and existing without modern animal husbandry.

Dairy cattle are an especially important and promoted branch of agriculture.

As a consequence of the transition in Hungary's agriculture during the nineties, the livestock decreased sharply and unfavourable conditions have been developed that also influenced specific yield and profitability. Types of farming have been changed. Cooperatives are declining while the corporate sector and private entrepreneurs are more and more competitive. The narrowing international market outlets with diminishing domestic consumption and culling supported by the government furthered the cattle stock decrease, as well.

In the investigated factory farms (in the period of 1996-2000) livestock reduction – similarly to the tendencies in the country - can be traced, contrary to the specific yield that increased.

- The most important goal should be, first of all, the fully utilization of cattle farm capacities that could induce an increase of about 20-25% in livestock.
- It is possible and expectable that domestic milk consumption will reach (within the following 5-6 years) the level of the highest measured previously, closing up – at the same time – to the standards of the EU. If these tendencies would be realized, the demand of milk production will be about 2,5-3,0 million litre per year, in Hungary.
- The improvement of calving interval should be a target of high priority, taking physiological (biological) specifics of the animals into consideration, too. Beside the veterinary service, intentions

of this character should also be supported by a balanced mineral/micro-element and vitamin supply.

- As it was mentioned before, the improvement of calving interval is an actual task to be fulfilled, because it is beneficial to the development of calf crop and milk production.
- Yields can be increased by diminished number of culls, hence by keeping animals for longer in milking. The recommended optimal ratio of culling is between 25-30%.

While increasing yields by all means, it is necessary to consider purchasing and solvency capacities of both the consumer and processing plants.

Although the specific yields have been increased in the investigated farms lately, there are still considerable potentials waiting to be utilized more effectively.

This can be implemented through the followings.

- Crowding should be eliminated because of causing stress and decreasing milk production at the same time. New cow stables as well as reconstruction (modernization) of the existing ones are necessary.
- Feeding needs more attention, since doing it with fodders of better quality according to demands, yields could be increased.

Beside livestock- and yield increasing, costs should also be reduced considerably. Feeding amounts to the largest part of total cost, about 50% in the factory farms under survey.

Costs might be reduced through:

- feeding with more fodders of the farm's own production,
- optimising feeding rations

Forage must be of good quality, satisfying animal's demands in proper quantities, which has a great influence on milk yield and calf crop. The unprofitable farming is often caused by over- and underfeeding of cows with weak and strong milk producing capacities.

- The amount of milk produced per cow – in the case of feeding in-group - should be measured more often, to improve profitability through excluding the possibility of under- or overfeeding.

Competence is the key word of the improvement in animal nutrition for the future. Compared to any other artificial method, ruminal microbes are able to transform chemically the feed into a form that animals can utilize much more efficiently. It is necessary to mention and highlight here – first of all - the industrial by-products not suitable for other (non-ruminant)species or purposes.

The feeding method adjusted to the different phases of lactation is also one of the undeveloped potentialities, to which the various fodders can be adapted through improving technology.

The basics of the “good quality with proper price” of animal products are rooted and established in plant cultivation, or to be more precise, in feedstuff production.

The low technological and managerial standards of the branch producing feed and delivering its output calculated on a primary cost basis, influences the profitability of animal husbandry unfavourably.

- It is advisable that farms (having dairy cattle branch) produce – beside coarse fodder – provender by themselves.
- In the case of farms without ownership of land, the cultivation based on land tenancy – even if rental increases the expenditures – means a cost saving method compared to fodders purchased on the market.

The development of returns from sales is an other key factor of profitability. Its volume depends on sales quantities and on the average (market) price. Besides increasing milk-yields, the intentions must be focussed on sales at the highest possible price, which depends on quality of milk, too. Examining the procurement price, it is conspicuous that price-differences between the quality-categories are considerable; hence milk production yielding profit is possible only by increasing the ratio of the so-called “extra” qualified product. This is especially important considering the fact that milk-processing plants are ready to buy up mostly (sometimes exclusively) the excellent quality. Being a member of the EU, only the “extra” qualified milk is allowed to be utilized for human nutrition.

- The goal is to achieve improvement in product quality, i.e. increased volume of the “extra” qualified milk. Through optimising animal keeping and feeding conditions with a regular

hygiene and milk quality control this process can be influenced beneficially.

There is an other opening for more profitable milk production notably by decreasing the costs. The role of the feeding costs is – in this case – considerable. Results of my investigations proved that the development of feeding costs exercise a great influence on profit.

- Concerning the composition of fodder rations, the ratio of forages (coarse/green fodder) has an importance because of their beneficial influence on profitability through increasing milk yields without significant cost raising.
- At making various types of fodder ration, beside the viewpoints related to the physiological (biological) demand of animals, it is necessary to reduce costs, as well.
- To diminish feeding costs a better management is needed, especially at stockpiling.
- Costs/expenditures of feeding can be reduced and forecasted properly only in the case if companies (farms) have the appropriate reserves of both the purchased and home grown fodders.
- To meet these requirements, the liquidity of the milk producing units and/or companies should also be improved, although doing this depends on many factors. Uncertainties and delays at paying for the sold milk influences financing at the companies extremely unfavourably, causing enormous solvency problems i.e. disorders at buying fodder in the market.

5. SCIENTIFIC PUBLICATIONS FROM THE TOPICS OF THE THESIS

Publications foreign languages

Szalka É.: Cost Structure Examination of Milk Production by Factor Analysis Acta Agronomica Ovariensis 2002. (megjelenés alatt)

Szalka É. – Salamon L.: Die Rolle der Massenfutter in der rentablen Milchproduction. Acta Agronomica Ovariensis 2002. (megjelenés alatt)

Publications Hungarian language

Szalka É. - Schmidt R. (1996): A kukorica tenyészidejének meghatározását szolgáló paraméterek összehasonlítása. Növénytermelés Tom. 45. No. 5-6. 509-518.

Szalka É. (1996): Az NP-műtrágyázás hatása a kukorica szemtermésére Duna öntéstalajon. Növénytermelés, Tom. 45. 5-6. 553-561

Gulyás L.- Szalka É .- Kovács T. – Bednarik R. (1998): A tejtermelés ökonómiai értékelése a bogyoszlói „Kisalföld” MgSz-ben. tükrében Acta Agronomica Óváriensis Vol. 40. No. 2. 189-201

Csatai R. – Szalka É. (1998): Győr-Moson-Sopron megye növénytermesztésének változása a 90'-es években Acta Agronomica óváriensis Vol. 40. No. 2. 173-189

Reke B. – Szalka É. (1998): A WÉS tejipari Rt. Gazdálkodása Acta Agronomica óváriensis Vol. 40. No. 2265-275

Szalka Éva – Salamon Lajos (2001): A tejtermelés gazdasági elemzése néhány dunántúli gazdaságban. Acta Agronomica Óváriensis Vol 43. No. 2. 143-154.

Dissertation

Szalka É. (1998): A szarvasmarha-ágazat takarmányozásának gazdasági elemzése a komáromi SOLUM Rt-ben. Szakmérnöki diplomadolgozat, Mosonmagyaróvár

Revised journal publications

Szalka É.- Csatai R. – Tell I. (1998): Perspectives of the livestock farming in the county of Győr-Moson-Sopron (Present status and opportunities of development) VI. Nemzetközi Agrárökonómiai tudományos Napok, Gyöngyös Vol. 4. 143-148.

Szalka É. – Salamon L.: (1998): A versenyképesség fokozásának lehetősége a tejtermelésben Georgikon napok 40. XL. 1998 szept. 24-25. Keszthely

Salamon L. –Szalka É.: (1998): A versenyképesség javításának lehetőségei Győr-Moson-Sopron megyében Georgikon napok 40. XL. 1998 szept. 24-25. Keszthely

Salamon L. – Szalka É. (1998): Alkalmazkodási lehetőségek a mezőgazdasági vállalkozások számára. XXVII. Óvári Tudományos Napok. 1998. Szept. 29-30. Mosonmagyaróvár, 576-580.

Szalka É. – Salamon L. (1998): A takarmány-felhasználás ökonómiai kihívásai. XXVII. Óvári Tudományos Napok. 1998. Szept. 29-30. Mosonmagyaróvár, 605-610.

Gulyás L. – Szalka É. (2000.): A fejési technológia és a tejminőség hatása a gazdaságos tejtermelésre) VII. Nemzetközi Agrárökonómiai tudományos Napok, Gyöngyös, 2. kötet 54-59

Szalka É . – Gulyás L. (2000.): A tartási- és takarmányozási technológia hatása a gazdaságos tejtermelésre VII. Nemzetközi Agrárökonómiai tudományos Napok, Gyöngyös, IV. kötet. 145-151