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GOMBKÖTŐ NÓRA

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UNIVERSITY OF WEST-HUNGARY
Faculty of Agricultural- and Food Sciences
Mosonmagyaróvár
Institute of Economic Sciences

Ujhelyi Imre Doctoral School of Animal Sciences

Chairman of the Doctoral School:

Dr. Benedek Pál DSc
University Professor, Doctor of Hungarian Academy of Sciences

Programme for the economic issues of producing, processing and distribution of animal products

Program Leader:

Dr. Tenk Antal CSc
University Professor, Candidate of Agricultural Sciences

Supervisor:

Dr. habil. Csatai Rózsa CSc
Associate Professor, Candidate of Economic Sciences

ECONOMIC ANALYSIS OF PRODUCTION CHAIN STAGES OF NATIVE HUNGARIAN GREY CATTLE

Written by:
Gombkötő Nóra

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1. INTRODUCTION, THE AIMS AND THE HYPOTHESES OF THE DISSERTATION

Since the middle of the last century on the field of animal breeding, the newly bred, intensely kept farm animal breeds with a fast bring up time and high output has become popular. Simultaneously the native animal breeds (like the Hungarian Grey Cattle) which have lower outputs but have several beneficial attributes and require extensive animal keeping technology, have been crowded out from the public breeding.

After year 2000 some members of the society realized environmental, feeding and hygienic problems in connection with the application of the intensive breeding technology, respectively the feeding and the lifestyle habits have changed significantly (demand for the healthy and quality products is increasing). Therefore on the field of animal breeding the extensive keeping technology has come to the front, which is in accord with sustainable agricultural production. To realize this, by means of some attributes the Hungarian native animal breeds (like the Hungarian Grey Cattle) are the most capable, because they adapted to the local environmental circumstances for centuries. Keeping them on a poor quality pastures doesn't cause any decrease in production. In addition the products produced from these breeds have high quality and therefore the growers in the EU (and also in our country) produce competitive products and they could acquire comparative advantages. Furthermore the breeds have an important role in the producing of the special-taste national products. Nowadays the cultural-historical value and the importance in tourism of these animals are increasing.

The number of the Hungarian Grey Cattle has dynamically increased lately, due to the intensive breeding work. Although the raisers still have reservations about the extensive breeds with lower outputs. At the present time, the keeping of the Hungarian Grey Cattle is not a profitable activity at first sight. That's why the economic-purpose utilization hasn't got a determining rate so far. There are a lot of questions in connection with the whole product path of the Hungarian Grey Cattle keeping, which are still waiting for to be answered. It is an important task to reveal the economic features and coherences and to analyse the economic references of the breed.

The main aims of the dissertation

- To reveal the most significant farm types of this sector by analyzing the secondary data **in the production section**. To reveal a contingent livestock concentration, the main utilization way and determine the livestock size of the country.
- To determine that which raisers are viable or not according the **farm size**, or rather they have sufficient livestock to exploit the meadow. To develop a method for defining the optimal number of grazing livestock for a given pasture size.
- To define the **cost/income ratio** of the Hungarian Grey Cattle keeping technology. To establish that it is profitable or loss making by calculating the gross margin.
- To review the potential **marketing channels** of the Hungarian Grey Cattle and to compare their advantages, disadvantages, efficiency in the aspect of the different performers of the product path. To determine the most current and the optimal marketing method in case of the Hungarian Grey Cattle.
- To determine certain, in the **vertical level evolved prices**, inside the different marketing channels of the Hungarian Grey Cattle, to define the coherence between them and to confirm or refuse the existence of the co-integration between the prices.

Hypotheses in connection with aims

- Most of all the individual farmers and the national parks are dealing with the keeping of the Hungarian Grey Cattle. By the national parks a strong livestock concentration can be noticed, that raises the keeping of the stock used for marketing purpose. At the present time, the main utilization way is gene conservation and breeding stock production. At the same time, in our country a sufficient number of livestock is available to be sold in the interest of processing.
- In our country, farms raising the Hungarian Grey Cattle are viable, although the number of the livestock of the individual farmers is less then the animal keeping ability of the pastures. Efficiency could be raised by enlarging the size of the livestock.

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- The raising of Hungarian Grey Cattle requires a low cost technology. It could be kept well under moderate circumstances too, therefore the cost of its keeping technology is lower than the intensive keeping, alike the output part. Even a profit could be realized.
- In case of the products of Hungarian Grey Cattle are more distribution channels. From the simplest direct marketing from the farmer, until selling through the retail trade chain stores to the consumers (affected all stages of the product path). Nowadays the latter is the most common distribution way in this sector, even though that this reduces the profile of the performers in the last stages of the product path significantly and endangers their subsistence in the market. The ideal marketing way in case of the Hungarian Grey Cattle, is selling within the confines of integration.
- The Hungarian Grey Cattle have a great value because of its inherent quality, so its price on the market is higher theoretically. However the processing industry buy up the animals from the farmers under the market price because of the low procurement prices of the retail trade chain stores. In case of a production within the confines of integration, the prices that evolved in the different stages of the product path could harmonize and could move together to assure the necessary profit for all members of the market.

2. MATERIALS AND METHODS

The data collection and the evaluation were made for the three different stages of the product path (production, processing, selling) separately.

The **primary data** was used as a basis for evaluating the three stages, while the **secondary data** was used during the **analysis of the farmers**. For the secondary data, the data base was provided by the report of year 2006, 2007 and 2008 about registered breeding livestock, published by the Union of Hungarian Grey Cattle Breeders, respectively by the data of the professional publication about Hungarian Grey Cattle. In addition data from KSH (Central Statistical Office) in connection with cattle, especially about the number of cow livestock was used as a secondary data. For the further investigation the primary database of the production stage of the Hungarian Grey's product path was compiled based on **questionnaires and deep interviews**.

In the course of the research 240 pieces of **questionnaires** were sent to the farmers who are dealing with keeping or breeding Hungarian Grey Cattle, 65 pieces around 27% arrived back in a valuable form. The structure of the questionnaire consists of eight main group of questions like farming, livestock, production, keeping, feeding, breeding, marketing, subventions, efficiency, in this way my own investigations were made in accord with this issues too.

By the general description of the farm among others the location, farming as a main or side-activity, way of farming and the age of the farm were asked. In connection with production, the further questions were given: It is a conventional or a bio-farm, What is the main utilization way, Are you dealing with secondary products, Do you make any other income-purpose activities, Do you keep another farm animal? In connection with marketing it was asked that, to whom, in which way, what kind of product is sold.

The **deep interview** was based on the issues which in the questionnaire were not involved, like implements, outgoings, yield production value etc. and as complementary, issues like activity diversification, marketing, labour, payment, investments.

Investigation of the **processing stage** of the product path was based on the primary data, what was compiled by the help of the answers, which were given by the farmers, processors and dealers in the course of the interviews. Identification of the processors was based on individual quest. Data collection of the last stages of the Hungarian Grey's product path was complicated, on the one hand because of the low number of the market performers of this stage, on the other hand because of the lack of the economic way of supplying of data by the side of the performers. That's why the research is based on only those data what were given by the few performers which were disposed to answer the questions.

From **the dealer's side** nobody was tend to supply data, therefore the necessary data in this stage was revealed by personal visiting and individual data collection as a real consumer.

Because of the feature of the data, in course of the research the processor, the dealers and the retail trade stages of the product path were analysed and evaluated by the normative - while in the production stage by both normative and positive - tools of economics.

In this study the analysis was made by the help of the following methods, terms and formulas: Statistical analysis of the data: test in reference to distribution, ratio, scattering, variable coefficient, Box-and-whiskers diagram, Box-plot procedure, analytical trend analysis, regression analysis, multiple correlation analysis.

Analysis of the data of agricultural economy: animal density, standard gross margin (SGM), gross margin (GM), European size unit (ESU), fixed and variable costs, personal income and outgoings.

3. RESULTS OF THE OWN INVESTIGATIONS

The first part of the research is a review about the present status and the future possibilities of this sector based on the secondary data.

Thereafter by using primary data, the production, the processing, and the selling stage were analysed to reveal problems and deficiencies and to give optimal solutions for the whole product path.

In course of the investigation it was stated that the number of the Hungarian Grey Cattle **has risen lately**, but it is concentrated in the national parks, which pushes economic importance of this breed in to the background. The most of the farmers have reservations about the native breeds with lower outputs too, on the one hand because of the lack of the information about the economic background, on the other hand because of the immature marketing methods in connection with the Hungarian Grey Cattle products.

The problem of the **production stage** is the low number of livestock in the farms. The average is 3-20 animals. This phenomena cause problems in connection with farm size and viability. One fifth of the farms are **not viable**, even though that they keep other farm animals too. The low number of livestock causes **low usage of the pasture** what is unfavourable in the aspect of the efficiency. The formula determined in this dissertation could give a hand to the farmers by determining the optimal size of the livestock.

In connection with the keeping of the Hungarian Grey, there are good possibilities for **activity diversification** in vertical, or in horizontal level too, but it's not common used in our country yet. Only a small part of the farmers is dealing with rural tourism utilization.

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The professional background is available, on the one hand **the Union of Breeders** gives a hand to the farmers, on the other hand most of the farmers worked as a cattle keeper before they started to deal with the keeping of the Hungarian Grey Cattle or they already have the necessary professional qualification.

In course of the farming **four main elements of uncertainty** – the number of grazing days, sale market, buying price, subventions - cause difficulties for the farmers because they can't predict or influence them. These factors have an effect on profitability.

In case of the Hungarian Grey Cattle the costs are lower than the large-scale breeds, the cost of feeding (the most significant cost) is considerably reducible - because of the feed from the pasture - in course of extensive keeping technology and the cost of the labour is not significant.

By this animal breed the keeping technology with **the lowest expenditure** (without building, without extra feed in winter time, etc.) **could be effective**, besides in course of the half-intensive keeping, the output increment that get into the cost increment unit, is not higher than in the completely extensive technology. The other factor of the **income** is the value of the production or rather its effectively realized size, the revenues. Its variation depends, on the one hand on buying price that is not influenced by the farmer on the other hand depends on type of the sold product (the age and the sex of the animal) and depend on its weight.

This study gives a review about the **marketable products** of the Hungarian Grey Cattle keeping farms.

The farmers **don't have contractual customers** mostly, so the unpredictability of the market means uncertainty for the sector.

The Hungarian Grey Cattle keeping offers several **possibilities for obtaining income** above the result of the basic activity (result I.), these are the following: income from the processed meat products (result II.), income from rural hospitality (result III.), - the results of the keeping of other native breeds - the other results of the sector (result IV.), and the received subventions (result V.). The most **conspicuous problems** of the sector appears in the marketing stage. The farmers **sell their products not primary for the processors**, because of the long transporting distances and the low buying prices, but for further breeders or for own processors.

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In a formal way, the most significant distribution channel of selling the meat product as a raw material is the transmission to the retailer trough the processor to the final consumers. All marketing possibilities, their way and the relations between them are given in detail in this study.

The retail direct selling and the selling trough the processor or dealers and selling trough the following retail trade units assumes deficiencies in this sector. The direct selling could cancel the contact-man between the producer and the end-user and results a positive income for the producer, but the related decree and its territorial and quantitative limitation and the related collateral tasks cause difficulties.

On the one hand the location of the **processors and the dealers** is very far from the previous and the following performers of the market (which results high transporting costs), on the other hand only **a few members are available** on the market so they can't cover the whole selling market.

The **unused capacity** by the processors appears by the dealer's side too, because of these two problems. As a result, the negotiable and the retail trade marketable Hungarian Grey Cattle meat amount is decreasing. In addition the marketing channel of the dealers isn't worked out enough. There are only a few numbers of our stores and chain stores - similarly to the dealer's side - that's why they are not available for all consumers. Only a few ratio of the bio-stores deal with meat products because of the high costs of refrigeration or rather because of the lack of effective demand for this product. The bio-stores are new performers of the product path. Because of them, the cost of the end-product could raise or the profile of the other performers could fall-off. The products are not available for the consumers in the whole country. By the help of the multinational chain stores the products could be available in the whole country, but the transportation to their centre is often unfavourable because of their **exploiter strategy**.

4. CONCLUSIONS AND SUGGESTIONS

The number of the Hungarian Grey Cattle is increasing lately, but because of the big ratio of the national parks, the Hungarian Grey Cattle don't have a direct economic significance. It is unfavourable, because the producers of our country - and Hungary too – could loose markets which mean export

possibilities to the EU. Therefore it would be expedient to provide the farmers with the necessary knowledge about the economic position of the breed.

It is suggested to **increase the low number of livestock**, till the usage of one more unit of animal doesn't cause a decrease in efficiency.

The incomes of the farmers could be raised by connecting the Hungarian Grey Cattle keeping to **other profitable activities** (keeping of other native breeds, rural tourism, etc.). A significant income could be available by utilizing the above mentioned possibilities. The **conformation of the costs** - could be influenced by the human factor – could form the incomes favourably. By selecting the suitable keeping technology, significant cost reduction could be realized, because of the flexibility of the breed to the modest circumstances or rather because of the minimal labour needs. The half-intensive keeping technology is not more effective than the extensive so the latter method is not suitable for this breed. It's not necessary to eliminate the activity if the farm is loss making. On the one hand it is suggested to analyse the gross margin, because if it's zero or positive then the fixed costs are covered by the incomes. On the other hand the Hungarian Grey Cattle keeper could gain not only the results of the basic activity but other results too, by recognizing and exploiting them.

The right solutions for the low usage of the capacity - caused by the selling problems to the processors-, are the slaughtering of the Hungarian Grey Cattle in nearby meat processing-works and the selling of the products in a higher price. The solutions for the low volume of the Hungarian Grey Cattle retail trade marketable meat amount - caused by low usage of the dealer's capacity - are, on the one hand **increasing the number of the dealers** (close to the meat processing-works), on the other hand establishing and **operating own meat processing-works**.

The optimal way is the collective work of the dealers. Together with the farmers they could buy up the livestock in the neighbourhood and after slaughtering they could sell the products in their own stores. The number of the necessary dealer is commensurable to the whole animal stock of the country. A higher rate could cause low usage of capacity. Because of their **low number correlated to the animal stock**, only a small part of the farmers latch on to the integration, the greater part is crowded out. Another solution for the Hungarian Grey Cattle sector is the total **vertical integration** of the product path. In this case the costs of the transaction would decrease, procurement and selling

would be easier for the performers of the market. In addition the prices that evolved in the different stages of the product path would be in harmony, they would move together, the market would become co-integrated.

The Hungarian Grey Cattle keeping could be a profitable sector by solving the problems in the different stages. The farmers have to use the optimal keeping technology, the suitable personal organisation and they have to determine the optimal size of the livestock. They have to connect the Hungarian Grey Cattle keeping organization to another profitable activities (keeping another native animal breed, rural tourism, etc.), and together with the other performers of the market they have to establish the optimal distribution system themselves.

5. NEW AND NOVEL SCIENTIFIC RESULTS

1. **Hungarian Grey Cattle** (the native cattle breed of our country) has increased lately, it doesn't have an important role in the economy and its **contribution to the gross domestic product is not important**. By the greater part of the animal stock the main utilization way is not the production of the meat as a raw material, but increasing the size of the breeding stock, gene conservation and environmental protection.
   The Standard Gross Margin (SGM) and the European Size Unit (ESU) of the Hungarian Grey Cattle keeping farmers were determined. Based on these investigations **the one fifth of the farms are not viable in our country**, even though that they keep other farm animals or serve as a tourism attraction, too.

2. The result of the multiple correlation analysis - what shows, that there is no connection between the realized factors of production - lights upon the fact, **that many keeping technologies are adaptable in case of the Hungarian Grey Cattle keeping**, from the most extensive to the half-intensive. In this study an extensive and a half-intensive keeping technology were analysed in the aspect of income conditions. The investigation shows that there is a **minimal** (could be incidental or caused by a fault) **difference between the two keeping technologies in the aspect of cost efficiency**. The resource expenditure is increasing in vain in course of the production, the output that get into the unit cost won't be higher, so it's the same in case of both technologies.

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3. In case of the Hungarian Grey keeping, instead of 1,4 animal unit/ha (maximum allowable in our country) the farmers keep 0,8 animal unit per hectare on the average. This means a very low usage and it is unfavourable in the aspect of economy. It is determined that the higher number of the animals kept in a unit pasture size, effects a higher cost efficiency. The efficiency could be increased until then it reaches the maximum allowable value (1,4 animal unit/ha). In case of a higher value, it could be a decrease in efficiency because of the trampling damage, dominance inside the group, etc. In this dissertation a formula **could be found, that gives a hand to the farmers by determining the optimal size of the livestock**.

4. In course of the Hungarian Grey keeping as a basic activity, because of its multifarious vertical and horizontal diversification possibilities, **five result category could be determined** depending on that the which additional income is taken into the production. After grading the results according to their connection, depending on the used additional activity, from one to five, new result categories could be determined for the production stage of Hungarian Grey keeping.

5. This research has revealed the distribution channels of the Hungarian Grey Cattle as a raw meat and meat product in Hungary. The marketing channels of the Hungarian Grey are immature and not worked out enough, there is a minimal coordination and business connection between the vertical performers of the market. In course of the investigation the **different marketing possibilities were compared to each other**. The result is, that the most effective and the most favourable solution would be the vertical integration for this sector. Furthermore it could be determined - based on the analysis of the prices that evolved on the vertical level – that while the price scissors between the processor and consumer prices is opening significantly because of the lack of integration (a strong exponential connection exists), till then a co-integrated market exists in case of integration (by a strong linear connection).

6. LIST OF PUBLICATIONS IN THE TOPIC OF THE DISSERTATION

Scientific study published in hungarian language in supervised periodical:

Gombkötő N. – Kettinger A. – Salamon I. (2008): A magyar szürke szarvasmarha ökológiai gazdálkodásban betöltött szerepe. Animal Welfare, etológia és tartástechnológia elektronikus folyóirat 2008. Vol 4. Különszám. Gödöllő

Gombkötő N. – Teschner G. – Csatai R. (2009): A magyar szürke szarvasmarhatartók gazdálkodásának jellemzői hazánkban. Gazdálkodás Agrárökonómiai Tudományos Folyóirat, 54. évfolyam 2010/5

Scientific study published in foreign language in supervised periodical:

Gombkötő, N. – Kettinger, A. – Kacz, K. (2009): Livestock production of hungarian grey cattle in our days. Animal Welfare, etológia és tartástechnológia elektronikus folyóirat. Megjelenés alatt.

Presentation published in full length:

Gombkötő N. – Csatai R. – Kettinger A. (2008): Az ökológiai állattartás megvalósításának üzemi lehetőségei. XI. Nemzetközi Agrárökonómiai Tudományos Napok, Gyöngyös, 2008. március 27-28. Konferencia kiadvány

Gombkötő N. – Kettinger A. – Salamon I. (2008): A magyar szürke szarvasmarha ökológiai gazdálkodásban betöltött szerepe. I. Gödöllői Állattenyésztési Tudományos Napok, Gödöllő, 2008. április 11-12. CD kiadvány

Gombkötő N. – Kettinger A. – Csatai R. (2009): A mangalicatartás hatékonyság növelésének lehetőségei. XXXII. Óvári Tudományos Nap, Mosonmagyaróvár, 2009. október 9. CD kiadvány

Gombkötő N. – Kettinger A. – Csatai R. (2009): A magyar szürke szarvasmarhatartás helyzete napjainkban. Mezőgazdaság és a vidék jövőképe Tudományos Konferencia, Mosonmagyaróvár, 2009. április 17-18. Konferencia kiadvány

Gombkötő, N. – Kettinger, A. – Csatai, R. (2009): Die Möglichkeiten der Verwirklichung von der Bio-Schweinhaltung. Mezőgazdaság és a vidék jövőképe Tudományos Konferencia, Mosonmagyaróvár, 2009. április 17-18. Konferencia kiadvány

Gombkötő, N. – Kettinger, A. – Kacz, K. (2009): Livestock production of hungarian grey cattle in our days. II. Gödöllői Állattenyésztési Tudományos Napok, Gödöllő, 2009. október 16-17. CD kiadvány

Gombkötő N. – Teschner G. – Csatai R. (2009): A magyar szürke szarvasmarhatartók gazdálkodásának jellemzői hazánkban. PhD hallgatók és doktorok a gazdálkodásban II. Tudományos Konforenciája, Mosonmagyaróvár, 2009. október 16.