

PHD THESIS

UNIVERSITY OF KAPOSVÁR
FACULTY OF ECONOMIC SCIENCES
Institute of Economics and Management
Department of Regional Economics

Head of doctoral school:

DR. GYULA SZÉLES
Doctor of the Hungarian Scientific Academy

Head of research:

DR. GYULA SZÉLES
Doctor of the Hungarian Scientific Academy

ECONOMIC ANALYSIS OF THE HUNGARIAN INDUSTRIAL PLANT PRODUCTION FROM THE ASPECT OF THE EUROPEAN UNION

Author:

ZSUZSANNA SLEZÁK

KAPOSVÁR
2005.

1. PRELIMINARIES AND OBJECTIVES OF THE STUDY

In the Hungarian agriculture, production of industrial plants has been significant both from national economic and entrepreneur aspects, which is based on the multilateral direct and indirect advantages of the sector. However, its 10 to 15 percent share seen during many decades within the crop production is not a determining sector, but its products are used in the added value food production. As essential basic foods (sugar, cooking oil, margarine), the products of the value adding production contribute the volume of exportable and tradable goods.

During the social-economic development, the role of the industrial plant sectors changed; some of them dropped, others increased. Here should be considered the decrease of fibre plants (hemp, flax), traditional tobacco production, while oil plants increased, which is not only based on their use in the food industry (cooking oil, margarine) but is relating to the more intensive development of the detergent and chemical production. The basis of sugar production in Hungary is basically sugar beet, however, the range of the processable plants widened with grain maize.

It can be also mentioned as potential opportunity and alternative, in replacing the fossil energy resources in certain extent (e.g. bio-diesel).

The essential of the survey done in the thesis relates the sugar sector, which is explained by its national economic significance and from other side, the new challenges due to the social – economic change and the accession of Hungary. In the opinion of the author, the scientific analysis of the previously mentioned is necessary from the aspects of both the future strategy and the international competitiveness of the sector.

Consequently from the previous, despite of that the size and production share of the oil plants especially that of the sunflower is much higher; the economic questions relating its production is stressful and full with conflicts as that of the sugar beet. During the preparations of the EU harmonisation, than in the accession, the Hungarian sugar sector faced such challenges that were unseen so far (such as strict quota regulation and its economic effects, the crisis of the world sugar market and its effect on Hungary), therefore the mentioned product chain and its biological basis, the sugar beet were the main focus laid on during my researches.

The main milestones of the survey described above are the following:

- The production area of sugar beet, and the influencing macro and microeconomic factors.
- Impact of the social – economic change on raw material production and processing capacities.
- Investigations on the sector's peculiarities of the accession to the EU.
- Analysis of the factors in relation with horizontal and vertical integration, capital allocation in the sector.
- Economic analysis of the main factors influencing the incomes of sugar beet and oil.
- Detailed analysis of the sugar market regulation in the European Union.
- Economic impact of the EU regulations based on the data of sugar beet producing companies.
- Accounting and register of production quota.
- Expected future of the world market of sugar.
- Opportunities of the Hungarian sugar beet production in the future.

- Making suggestions and recommendations based on the previously mentioned surveys.

2. MATERIAL AND METHOD

In order to achieve the tasks defined in the objectives, the aim was to create the conditions for a complex survey.

Consequently from the above mentioned, the past, present and the role of factors necessary to build a future strategy of the sugar and oil product chain were analysed based on a wide economic survey.

The sources of the data were the following:

- County and regional directorate institutes of the Hungarian Statistical Office.
- Sector Product Councils.
- Agricultural Economic Research Institute.
- Research institutes of sugar beet and oil production, producers and processing plants.
- Association of Sugar Industry.
- The Hungarian Ministry of Agriculture and Rural Development.

In a way general in farm economic surveys, the factors influencing the changes in the data were aimed to reveal.

Especially attention was laid on the impact of the social – economic changes during the years 1988 to 1992. It resulted in great changes in case of both product chains. Particular change was seen in the structure of the processing capacity due to the foreign capital come inland during the privatisation; which was typical in case of both the oil and the sugar industry. Almost at the same time when the multinational processing companies turned up, the

preparation started for the introduction of the EU regulations, then its application and the assessment of the experiences.

The investigations on the effects of the sugar production quotas put into force in Hungary have to be considered as important and a directing task for the future. In order to obtain reliable results, the peculiar relations of production quota were analysed on the wide basis of data collected from the years 1999 to 2004. During this work, considering that quota regulation does not define a certain accounting method, consequently, the member states of the EU can chose different ways. Therefore, the register and accountancy of the production quota was analysed according to the objectives of the survey. The basis of the assessment is the Accounting law of year 2001; based on it, a recommendation was aimed to make on suitable practical method for the Hungarian entrepreneurs.

The data of the period involved in the survey (from 1999 to 2004) was divided into and analysed in two parts, firstly the years from 1999 to 2001, then from 2002 to 2004. This was reasonable because the quota regulation generally being in force in the EU was implemented in year 2002, thus, the first period gave information on the preparations and the assessment of the success of the EU harmonisation.

In the data processing, indicators of returns on costs and profit on market returns were calculated, which are generally used in farm economic analyses and suitable to optimise the factors influencing the profitability. The target of these analyses was to show the economic results of alternatives for different quota regulations thus advices can be given, which are useful in the decision making of the management. The results obtained were compared with the figures of the Farm Analysis Data Network created and operated by the AKII, which represents the farms operating in 19 counties of Hungary.

The economic analysis was aimed to calculate both natural and value figures.

The international assessment of the analysed product chains served also the complex approach defined in the objectives of the survey. The international analysis gave picture on the situation of the Hungarian production compared to the countries of the world or the EU; from the other side it was important to reveal the future opportunities of the sector. The knowledge on the latter relations can be especially determining in a reliable prognosis of the international competitiveness of the product chains analysed.

3. RESULTS

In Hungary between 1995 and 2005, significant changes were seen in sugar beet production, which was the most eye-catching in the following fields:

- Peculiar variation was found when analysing the volume of the production, which was especially typical for the years 1990 to 1995, and then in the next period of years 1996 to 2004, a dramatic drop was seen (60 to 65 percent compared to the production of the best years).
- Along with the previous, the concentration of the producing areas and changes in the producers' structure were also markable. In the five years before the social – economic change (from 1985 to 1989), the number of sugar beet producing farms was between 476 and 526, with a concentration of the area of 210 to 230 hectares. Between 1992 and 1995, the number of the producers went up to almost four times, while the concentration of the area dropped to one tenth. Afterwards, beginning from year 1995, the so called “forced entrepreneurs” that had been given lands in the compensation gave up production due to the lack of capital (financing and knowledge as well), and then between years 2002 and 2003 it stabilised with around 750 farms farming on considerably competitive size of land.
- The selection of the farmers in 1995 to 1996 went along with the development of the technology, where an important role was played by the strengthening integrating function of the processing plants, which influenced both the specific yields and the white sugar percentage positively. These indicators moved up from the

stagnating situation of the years 1992 to 1995, however, are still far below the yields seen in long terms in the EU states.

Beside of the increasing international competition, the macro economic relations of the Hungarian sugar product chain were negatively influenced by other factors as well. Out of these, the following are considered as ones worth emphasising: the impact of the failed GATT agreement, lack of market defence, increasing stock of unsold sugar.

The activity of the Sugar Product Board founded in 1991 moderated the above mentioned problems, its fundamental task is to promote the efficient function of the sugar sector, and the regulation put in force in 2001 on the artificial sweeteners. This already meets the theory of the EU sugar regulation, however still does not contain its all elements, is suitable to regulate the sugar market and gives guarantees for the producers and the processing plants. The law defines and allocates the sugar and iso-sugar quotas among their producers, transport right is allocated to the sugar quota and it orders about the allocation. Transport right is the fundament of the guarantee for both sides: it ensures market for the sugar beet producers and long term, calculable operation for the sugar factories.

Considering the EU accession of Hungary on the 1st of May in 2004, because of the preparations and in order to a successful harmonisation, the sugar factories and the supplying beet farmers changed over and have been functioning since according to the quota based production regulation. The impact of the coming system was seen even in seeding and the planning of the size of sugar beet producing area, because the processing plants contract their suppliers for only that amount of sugar beet that is enough to satisfy their own share of the national sugar quota.

The social – economic change restructured the producers of the Hungarian natural sweeteners. During the privatisation, the existing 12 sugar factories

of the country were bought up by multinational western European sugar companies, whose decisions on the concentration of their production led to the close of the sugar factories of Mezőhegyes, Sarkad, Ercsi and Sárvár, Selyp. In the year 2000, only 7 factories started the sugar production, which are in the major ownership of the following multinational sugar factories, and also the sugar market is divided among them:

➤ Agrana – Magyar Cukor Rt.

Hungarian sugar factories: Kaposvár, Petőháza

Izo-glucose factory: Szabadegyháza

➤ Eastern Sugar Rt.

Hungarian sugar factory: Kaba

➤ Nordzucker Rt.

Hungarian sugar factories: Hatvan, Szerencs , Szolnok

An emphasised field of the dissertation is the detailed analysis of the market regulation of the EU implemented in 1968, which is built on basically five strategic elements:

- production quota;
- prices and guaranteed prices (within quota);
- system of self-financing;
- export subsidy and import duty;
- intervention.

According to the Copenhagen Agreement signed in 2002, the analysis of the quotas “A”, “B” and “C” allocated for Hungary for the production of sugar and izo-glucose reflects on that the share of quota “B” is the opposite of the general figure of the EU states and even lower than the minimum of the new

candidates, which is for the disadvantage of the Hungarian sugar producers. Namely, quota “B” serves as a buffer in case of varying production, from the other side in case of export it is supportable in the EU. In our opinion, the reduction of the export subsidy was discriminatively defined in case of the new members, such as Hungary.

3.1. REGISTER AND PUBLIC ACCOUNTANCY OF PRODUCTION QUOTA

Relating to the above detailed, the demand raised on the analysis of the register and accountancy of production quota. This originates in the fact that the EU does not define a certain accounting method; consequently, the member states of the EU can chose and apply different ways of accounting. Thus, according to the accounting regulation implemented in year 2001, production quota is a fixed asset that serves the enterprise over one year and should be treated as a type of asset. Consequently, it can be one of the immaterial goods as it is not an ownership right, but the enterprise behaves as a queasy owner. A common feature of the immaterial goods is that their value depreciates from year to year; therefore amortisation has to be accounted as cost of the production. Legislation does not limit the maximum or minimum depreciation period, thus it can be freely chosen by the farmer. According to the interpretation of the mentioned regulation, the production quota appear as a right representing assets, because it has to be considered as a lasting right that does not belong to either real estates or intellectual property in the balance sheet. Relating to the sugar quota, the intervention fee has to be paid, which belongs to the Other expenses, thus is a factor decreasing the farm income. This amount goes to the Sugar Product Board and is used to finance the elimination of occasional market disorders. It is

essential to mention that the production quotas are negotiable, however because of the strict compulsory notification it is not a free market transaction.

3.2. SUGAR QUOTA ON THE PRODUCER SIDE

After analysing the sugar quota from the producers' side, it was found that the sugar factories allocate the annual quota among the producers based on the production of the previous year. However, in 2002, only 80 percent of the production was contracted. The system enables certain self-limitation, which means that or its overproduction, the farm gets the price of the quota "B", which is lower than that of "A"; and then in next year, price for "A" is received for the transported amount and for the difference between "A" and "B" for the rest of the quota.

From the aspect of the strategy of the Hungarian sugar sector, it is important to cover the allocated 401 thousand white sugar quotas from producer side. To achieve this, 70 to 75 thousand hectares have to be planted with sugar beet, which is 20 to 25 percent higher area than the beet production area of the years 2001 to 2003. Naturally, all of the elements of the EU sugar market regulation need to be adopted, which not only covers the implementation of the export and import regulation, but the very strict and wide data supply.

The analysis dealt with the expectable purchase price of the sugar beet adjusted for 16 percent sugar content produced above the contracted amount. In order to define it, the actual expenses and receipts of a traditional sugar beet producing company were used for economic calculations from year 1999 to 2003.

Besides the above mentioned, the sugar beet producing sector of the previously mentioned company was analysed in details. When the economic results of the produced “A” and “B” and overproduced quotas were analysed. The analysis was divided into two parts, firstly the balance sheets of the years from 1999 to 2001, then from 2002 to 2004 were analysed by using farm economic indicators, especially emphasising the effect of the quotas and the overproduced sugar beet on the economic results of the company. The differentiation of the mentioned periods was reasonable because the quota regulation generally being in force in the EU was implemented in year 2002, thus, the first period gave information on the preparations and the assessment of the success of the EU harmonisation.

In the years 1999 to 2004, despite of the relatively high amount of quota “A” (33.873-31.000 tons of beet), the sector did not produce profit and gave poor profit in 2001 either, which was in relation with the unfavourable climatic conditions (draught) and the high level of production costs, the share of different taxes.

From year 2002, despite of the lower amount of quota (25.900 tons), the profitability improved, and stabilised in 2003 and 2004. Both the returns on cost and returns were better. The increasing quota prices had great role in the improvement of the profitability; however the analysis of the alternatives and the increase of different quotas and the production over the quotas give more opportunity to improve the efficiency.

4. CONCLUSIONS

According to both the direct and indirect analysis of the advantages of the economic role of the industrial plants it was found that it play much greater role than the share of their production shows among the crops. However the size of the relating sectors changed (sunflower, rape), the emphasised issue being the object of a complex analysis of the dissertation, the sugar beet was varying. In the figures of the latter, the peculiarly high capital demand of the sector is determining, both in the allocation of the fix assets and the current assets. Above all, the special machinery (ploughing and planting) have to be mentioned which represent high value and are needed in the production; economical use of these is depending on the optimal size. These questions of the economy of size call attention to the concentration of the production in the future and relating, the development of integrations.

The social – economic change of the years 1988 to 1992 basically restructured the white sugar product chain both from the producers and the processors aspect. The number of “forced entrepreneurs” compensated increased highly than following a temporary stagnating period, from year 1995 a decrease started, thus between years 2002 and 2003 a considerably competitive size structure stabilised. In the processing sector, in the privatisation process three multinational sugar companies gained majority ownership, consequently these share the sugar market among themselves.

The current sugar market regulation of the EU, which later on was the basis for the accessing Hungary during its preparation for the harmonisation, was introduced in 1968. Despite of the fact that it was aimed to be temporary, serving the equalization of the differences of the member states it is still

functioning based on the original principles; and likely it will stay in force till 2012. The combination of the quotas, the development of the self-financing system provided differentiated stability for the sugar sector, that even the reforms of the CAP implemented meanwhile did not affect basically the sugar product chain. Based on the experiences detailed in the previous, the demand raised to order the Hungarian sugar market that had been in a chaotic situation for years; and from the other side during the harmonisation process of the EU accession of Hungary, to regulate the market of the natural sweeteners, which was carried out in year 2001. despite of that the mentioned regulation of the Hungarian Agricultural Ministry No. 88/2001 does not contain all the elements of the EU sugar market regulation, it is suitable to regulate the sugar market and it defines and allocates the sugar and iso-sugar quotas among their producers, transport right is allocated to the sugar quota; thus it gives guarantees for the producers and the processing plants.

To evaluate the production level of the product chain, the most generally used indicators are the specific sugar beet yield and white sugar yield, which compared to the average of the EU member states are much lower. It is especially eye-catching that the yields extremely vary due to the ecological factors, mainly the lack of fall in draught years. From economic aspect, the elimination of the yield variation has outstanding role. In order, the efficiency of the additional inputs such as irrigation, fertilisation and the development of the technology need emphasised attention. In this relation, the more expensive additional inputs improving the specific yields affect negatively the international competitiveness. Out of these, the economic problems relating the opportunities for irrigation have to be indicated, such as the drop in the size of the irrigable areas, high water price, increasing labour prices.

The previously mentioned high capital demand can be lowered by improving the integrations and co-operations of the producers. However, a calculable and stable sales, higher prices and income would lead to higher profit-based sources of development.

Coming from the increasing challenges of the globalisation of the world economy, the economic relations and the trade widen, with foreign capital investment multinational companies are founded, thus the companies reach over the borders in greater extent. Consequently, the involved countries are supposed to take certain steps in order to achieve a more comparable and unified data content of their accountancy informational systems and annual reports. In the member states of the EU also, directives are implemented in order to standardise the informational systems, however the accounting law is different and certain choices are given to them. Due to the introduction of the sugar quota in 2002, it is timely to adopt the agricultural companies to the accounting system, considering that the quota regulation did not define accounting tasks. Therefore, based on the theory of the accounting law of year 2001, which says that each economic event has to be booked that causes changes in the assets and funds; quota is considered as a certain right for payment of given amount, which has to be placed on the asset side. Therefore, following the assessment of the law, it is suggested to be placed among the rights representing assets, because it is a long lasting right that does not belong to either real estates or intellectual property in the balance sheet. Relating to the sugar quota, the intervention fee has to be paid, which belongs to the Other expenses, thus is a factor decreasing the farm income. If considering that sugar quota is defined for three years, than afterwards it is re-allocated, in case of sugar, the optimal period suggested is about five years while the value of the quota fully depreciates and contribute the production costs.

The amount of sugar quota allocated by the EU for Hungary with 401 thousand tons provides opportunity to increase the sugar beet production land with 20 to 25 percent, which means 70 to 75 thousand hectares of sugar beet land. Fundamental demand of the transparent, smooth and secure functioning of the sugar product chain is to fulfil the transport rights; as in opposite case, the EU Committee consequently reduces the allocated amount of quota. Therefore, it is essential to ensure the EU conformity of the interprofessional agreements regulating the relations of the sugar beet producers and the sugar factories, thus the current common regulations have to be implemented entirely.

It is reasonable to carry out farm economic calculations in order to achieve an optimal profitability due to the different quota prices (“A”, “B” and overproduction “C” sugar), with especial emphasis on the economic results of sugar beet overproduction. In this work, the indicators used in the dissertation can be applied, such as the profit on cost and profit on market returns, as the necessary figures are available from the balance sheets. As appropriate method I suggest the applied assessment, thus the economic analysis divided into two periods: years before the implementation of the quota system, then following, the use of the quota and the analysis of the economic relations. Naturally, these are part of the farm economic calculations, thus the analysis of the period before the implementation of the quota system can be built up on the balance sheet figures; while the effect of the quota system on the profitability can be simulated with different alternatives of the answers on the question “What if...?”. In our opinion, the suggested method contribute the management’s economically supported decisions.

5. NOVEL AND NEW SCIENTIFIC FINDING RESULTS

1. Changes of the production of industrial plants and within it of the sugar beet; and definition of the influencing factors.
2. Based on the complex analysis of the effect of the social – economic change in the years 1988 to 1992, the findings of the structural changes of the sugar product chain, both from the beet producers' and the processors' aspects.
3. Revealing the sugar market regulation of the EU and the Hungarian conditions of its implementation, assessment of the effect of its implementation prognosis of future perspectives with especial regard to the expectable threats.
4. The structure of the multinational capital in the sugar and plant oil product chains and its changes during the years 1990 to 2004.
5. Recommendations on the register and information system of production quotas of sugar, and on its accounting.
6. Adaptation of sugar quotas in the production, and farm economic analysis of its effects on the profitability.

6. RECOMMENDATIONS

- From economic aspect, the elimination of the yield variation needs to be considered as of outstanding role; consequently, the efficiency of the additional inputs such as irrigation, fertilisation and the development of the technology are important tasks.
- Due to the introduction of the sugar quota in 2002, it is timely to adopt the agricultural companies to the accounting system, considering that the quota regulation did not define accounting tasks.
- Following the assessment of the accounting regulation, it is suggested to be placed among the rights representing assets; because it is a long lasting right that does not belong to either real estates or intellectual property in the balance sheet.
- Relating to the sugar quota, intervention fee has to be paid, which is suggested to book in the Other expenses, which obviously is a factor decreasing the farm income.
- If considering that sugar quota is defined for three years, than afterwards it is re-allocated, in case of sugar, the optimal period suggested is about five years while the value of the quota fully depreciates and contribute the production costs.

- It is an essential task to ensure the EU conformity of the interprofessional agreements regulating the relations of the sugar beet producers and the sugar factories, thus the current common regulations have to be implemented entirely.

- It is reasonable to carry out farm economic calculations in order to achieve an optimal profitability due to the different quota prices (“A”, “B” and overproduction “C” sugar), with especial emphasis on the economic results of sugar beet overproduction.

7. PUBLICATIONS IN THE FIELD OF THE DISSERTATION

Scientific publications

Publications of foreign language

- **Zs. Slezák** - N. Fáró - GY. Széles (2003). The situation of the sunflower seed production in Hungary before the EU accession. Animal science days, Porec Croatia, 2003. szeptember 23-26.
- **Zs. Slezák** - N. Fáró - GY. Széles (2003). The situation of the sugar beet production in Hungary before the EU accession. Animal science days, Porec Croatia, 2003. szeptember 23-26.
- **Slezák, Zs.** - Dolgos, A.: Production quotas in public accountancy, 3rd International Symposium, Cluj-Napoca, Romania. 2004. október 20-23. vagy In: Buletinul Universității De Științe Agricole Și Medicină Veterinară Cluj-Napoca, Volumul 60 2004. 280-285.p.

Hungarian publications

Proceedings

- **Slezák, Zs.** – Fáró, N. – Széles, Gy. (2003). A napraforgó termelés helyzete Magyarországon az EU csatlakozás előtt. Erdei Ferenc II. Tudományos Konferencia, Kecskemét, 2003. augusztus 28-29.

- **Slezák, Zs.** – Fáró, N. – Széles, Gy. (2003). Európai Unió kilátások a magyar cukorrépa termelésben. Erdei Ferenc II. Tudományos Konferencia, Kecskemét, 2003. augusztus 28-29.
- Dolgos A. - **Slezák Zs.:** A termelési kvóta számviteli elszámolásának lehetőségei és gyakorlati megvalósulása, Nyugat-Magyarországi Egyetem, Mezőgazdaság- és Élelmiszertudományi Kar, “Within the European Unio”, Nemzetközi Konferencia Mosonmagyaróvár, 2004. május 6-7. 19. p. (CD-n teljes terjedelemben megjelent)
- **Slezák Zs.** – Dolgos A.: A kvótán felül termelt cukorrépa mennyiség értékesítésének lehetősége és eredményre gyakorolt hatása, Nyugat-Magyarországi Egyetem, Mezőgazdaság- és Élelmiszertudományi Kar, “ Within the European Unio” Nemzetközi Konferencia, Mosonmagyaróvár, 2004. május 6-7. 19. p. (CD-n teljes terjedelemben megjelent)
- **Slezák Zs.** – Dolgos A.: A cukorágazat és a hozzá kapcsolódó iparágak marketingje, Nyugat-Magyarországi Egyetem, Mezőgazdaság- és Élelmiszertudományi Kar, “ Real competition – competition in sharp” Nemzetközi Konferencia, Mosonmagyaróvár, 2005. május 5-6. 53. p. (CD-n teljes terjedelemben megjelent)
- **Slezák Zs.** – Dolgos A.: A cukorkvóta megjelenése termelői oldalon, Nyugat-Magyarországi Egyetem, Mezőgazdaság- és Élelmiszertudományi Kar, “ Real competition – competition in sharp” Nemzetközi Konferencia, Mosonmagyaróvár, 2005. május 5-6. 54. p. (CD-n teljes terjedelemben megjelent)

Proceedingben megjelent absztrakt

- **Slezák, Zs.** – Fáró, N. – Széles, Gy. (2003). A cukorrépa termelés helyzete hazánkban az Eu-csatlakozás előtt. Agrárgazdaság, vidékfejlesztés és agrárinformatika az évezred küszöbén (AVA) nemzetközi konferencia, Debrecen, 2003. április 1-2., p. 136.

