

**Is Self-reliance possible?
An Investigation into the Romanian Sugar Industry's
Ability to cover domestic Consumption**

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Abstract

This study investigates the degree to which Romania is able to produce the quantity of sugar necessary for domestic consumption. The results of our research can be used to improve the situation of the sugar industry of Romania, which is difficult at the moment: Romania has become the largest sugar importer of South-Eastern Europe, while it used to be an exporter. We have shown that Romania is fully able to meet its domestic consumption requirements, provided that sugar beet cultivators are encouraged to produce this plant, that the modernization of Romanian factories is completed and that there are no negative effects of EU policies on beet producers and on the Romanian sugar industry. The study was carried out by using a variety of sources, like specialized publications, EU and Romanian regulations, research studies and internet sources, as well as our own calculations.

Keywords: sugar industry, domestic consumption, scenarios, costs

Introduction

The aim of this study is to evaluate the degree to which Romania is able to meet the needs of its domestic consumption by its domestic production, with a view to producing recommendations that could be

used to improve the present situation. Currently, Romania is the largest sugar importer in its region, although it used to export sugar. The overall sugar beet-cultivated area, the sugar production and the number of sugar factories have decreased.

Our claim is that Romania is fully able to cover its domestic consumption needs, provided that certain conditions are fulfilled, which are outlined in our article.

The reference value for the necessary quantity of sugar was estimated at an annual 20 kilogram's per capita, which means an overall 450,000 tone per year. The former value, 20 kilogram's, is the average sugar quantity consumed by the Romanians in the last years (cf. *Statistic Year Book of Romania*), which was multiplied by the average number of Romanians in the same period.

Material and Methods

The study is based on evidence provided by other research studies, EU and Romanian regulations, specialized publications, as well as by internet sites. In order to answer the research question, we have consulted and analyzed published sources and we also did our own calculations. In doing so, we have encountered difficulties related to differences in data published by various sources.

Literature review

One of the raw materials for sugar production, sugar beet, is cultivated in Romania. Sugar is obtained from three sources: date palms, sugar cane and sugar beet (www.food-info.net¹). The latter is cultivated in some Romanian regions; therefore we can assert that our country does have the raw material for sugar production.

However, one could wonder whether Romania does possess the natural conditions necessary for sugar beet cultivation. This is important because, if it does not, beet would be cultivated only in small quantities, probably just for individual farmers' use, and crops would not be of the highest quality, as they would not benefit from the best pedo-climatic conditions.

The latter regard two aspects: soil and climate. According to the information published on the Romanian agricultural portal, www.agra.ro, soils should be fertile, rich in humus, deep and well-

¹ www.food-info.net is managed by the Wageningen University in the Netherlands.

structured; also, they should have high water retainment capability. As for the climate, the temperate continental one is the best for sugar beet cultivation².

Romania has four regions where beet is cultivated: the center and Eastern parts, the Western one and the Southern one. The former three meet the beet cultivation requirements, while the latter does so only under certain conditions. Thus, the center and Eastern areas have a temperate continental climate, as well as chernozem and brown-red soils, which have the above-mentioned characteristics. The Western region has a warmer climate, but still within satisfactory limits, and its soils belong to the chernozem and clay-sand groups. On the other hand, as mentioned above, the Southern part needs to be subjected to certain conditions, because it does not fulfill the above-mentioned requirements to a satisfying degree. Firstly, temperatures can vary highly from year to year and from day to night. Secondly, they are higher than in the other regions, which can be detrimental, as sugar is no longer accumulated in beet roots if the temperature exceeds 26°C. Finally, rainfall can sometimes be very low; there have been years with 180-230 days without rain. Lack of moisture can lead to biological and biochemical transformations of the plant, which has negative consequences on sugar beet quality. Therefore, the Southern region is considered a beet cultivation area only with the following reservations: there should not be high temperature variations, the land should be thoroughly irrigated and only areas with chernozem soils should be used.

The second problem that needs to be discussed is Romania's ability to process the sugar beet crops and produce the sugar needed for domestic consumption.

At first sight, the situation does not appear very promising. In 1991, there were 33 sugar factories in Romania, but in 2011 only 8 still functioned. They were: S.C. AGRANA România, S.C. Zahărul Liești (Lemarco), S.C. Zahărul Corabia, S.C. Zahăr Oradea, S.C. Zahăr Luduș, S.C. Zahăr Bod, S.C. Zahărul Călărași, S.C. Marr Sugar Urziceni. However, taking into account their production capacities, which you will find in Table 1 below, it is clear that they could cover and even exceed the quantity Romania needs, i.e. 450,000 tonnes. Thus, their total daily capacity is 27,000 tonnes a day, which would mean almost 10m tonnes a year (360 working days).

² www.agra.ro is a project of IBD/GTZ and the "Haralamb Vasiliu" Agricultural High School in Podu Iloae, Iasi County. IBD/GTZ is a programme of the German Ministry for Economic Cooperation and Development, meant to support Romania's economic conformity with the EU. It is carried out together with the Romanian Chamber of Commerce and Industry and the German Society for Technical Cooperation (GTZ).

Table 1: Romanian sugar factories functioning in 2011

No.	Name	Production capacity (tones/24 hs)
1	ZAHĂRUL BOD	2,000
2	ZAHĂR CORABIA SA	3,000
3	ZAHĂRUL LIEȘTI SA	1,000
4	ZAHĂRUL ORADEA SA	3,000
5	MARR SUGAR URZICENI	4,000
6	ZAHĂRUL LUDUȘ	3,000
7	AGRANA ROMÂNIA - ROMAN	8,000
8	S.C. ZAHĂRUL CĂLĂRAȘI	3,000

Source: Romanian Ministry for Agriculture and Rural Development

There is yet another problem related to Romanian factories: the quality of the production equipment they use. The factories that were set up after 1970 had been provided with equipment produced in Romania, which in our days has become outworn and technologically outdated. Moreover, the average extraction capacity of the equipment used by Romanian factories is four times lower than the European average.

This situation has changed, to a certain degree. Thus, the eight factories mentioned above have been privatized and new equipment has been installed. As an example, we can cite a statement by Petru Gavriș, a counselor with the Romanian Ministry for Agriculture. The statement was made in March 2005 to Rompres and cited by Jurnalul de Botoșani și Dorohi (www.jurnalulbtd.ro). Gavriș declared that the beet-processing factories at Oradea, Luduș, Bod and Roman had made significant investment in the modernization of the technology they used. Moreover, between 2004 and 2006 more than 10m euros were available for investment in the sugar producing industry; this funding was provided by the European Union, by means of the SAPARD Program, according to information published on www.finantare.ro. A further possible encouragement for the replacing of old technology is represented by the changes brought about by the previously mentioned state subvention for beet cultivators and pre-contracting system. If cultivators are more interested in producing and factories increase their production, then there is a high probability that these businesses become more interested in and able to modernize their equipment.

To conclude on this point, Romania does have the production capacities necessary to process sugar beet, although further

improvements need to be made in the modernization of the technology used, especially to increase sugar extraction efficiency. Steps have already been taken in that direction, but the process needs to be completed.

The sugar production necessary for domestic consumption benefits from EU subsidies, in the production quota system. Robu et al. (2006) explain that, according to this system, the EU grants subsidies for a certain quantity of sugar, which is calculated function of the sugar production in the last five years before EU accession. Although, in Romania's case, those five years were very weak, the quota was higher than expected, i.e. almost 440,000 tones. The authors mentioned above also state that this is explained by the choice of the reference period, which was 1998-2002, when the sugar industry performed better. If we remember that the necessary quantity for Romanian consumption is estimated at 450,000 tones, it can be seen that a very large part of this quantity will be produced with EU subsidies, which may be beneficial for our concern.

Further research needs to be made, however, into two directions. First of all, the 440,000 tones which are subsidized are not all for beet sugar. Instead, according to data published on the Ministry of Agriculture site, the quota for white sugar obtained from beet is only 109,164 tones, whereas 329,636 tones will come from raw cane sugar, imported in a preferential system (the rest is for a sweetener made out of corn). Consequently, research is needed into how this will affect local beet producers and ultimately, the entire industry.

The second direction or problem is that the EU has initiated, in 2006, a reform of the sugar industry which is meant to ensure it long-term prospects. Among its consequences, though, there is the decrease of the price beet cultivators receive for their crops. This information is provided by Robu et al., who state that the decrease was from 34 euros to 32.9 euros in 2006-2007, while starting with 2009/2010, the price is 26.3 euros.

The problem of local beet producers is important because, as it will be shown in the next section, Romania is able to ensure the necessary quantity for domestic consumption out of its own beet crops, provided that certain conditions are met.

Common practices (Crețu R.F. and Crețu R.C., 2011) of the ecologic agriculture comprise the following: crops rotation as a requirement for the efficient use of the farm's resources; extremely

strict limits regarding the use of chemical synthesis pesticides and chemical fertilizers, antibiotics for animals, food additives and other auxiliary substances used for processing agricultural products; forbidding the use of genetically modified bodies; capitalizing the existing resources, such as using the muck from animals and the roughage produced on the farm as fertilizer.

Results and Discussion

We have constructed several scenarios to examine what ways there may be to ensure the quantity of sugar necessary for consumption in Romania, by processing the sugar beet produced here. In this section we have included a brief description of the methods used in developing them, the hypotheses upon which we have based them, the scenarios themselves, together with an evaluation of the costs involved in domestic consumption coverage, as well as a prediction on what consequences there will be for various stakeholders.

These scenarios have been based on an analysis of the dynamics of the beet-cultivated areas, of overall production, of per-hectare and regional production, as well as of the 2010-2011 sugar production. We have also taken into account the investment and equipment modernization done in the sugar industry in the last years after 2000, as well the specialists in this field.

Our claim, that the necessary quantity can be domestically produced, is based on the following hypotheses:

1. All the commercial agreements signed by Romania will be reconsidered;
2. The beet and sugar price will be guaranteed, so as to encourage farmers and beet processors to cultivate and process it;
3. Average sugar production per hectare is the average of the last 10 years;
4. The extraction efficiency of sugar from beet is the maximum value of the average annual efficiency;
5. Consumer price of sugar will not increase.
6. Annual consumption for all scenarios is 450,000 tones, which ensures 20 kilogram's per capita.

Here are the scenarios, which describe three possible situations: domestic consumption requirements are met in a percentage of 50%, 75% and 100 %. As can be seen from Table 2, for each of them, the

cultivated area and overall production increase according to the degree of domestic consumption coverage.

Table 2: Suggested scenarios

	Scenario I (50%)	Scenario II (75%)	Scenario III (100%)
Cultivated area (thousands of hectares)	102	186	248
Average production (kg/ha)	20	20	20
Overall production (thousands of tones)	2045	3713	4950
Extraction efficiency (%)	11	11	11
Sugar processed in Romania (thousands of tones)	373	411.5	450
- beet sugar (thousands of tones)	225	337.5	450
- raw sugar processed in Romania (thousands of tones)	148	74	0
Imported refined sugar (thousands of tones)	77	38.5	0
Domestic consumption (thousands of tones)	450	450	450
Coverage of domestic consumption need (%)	50	75	100

Source: Own calculations

We have also estimated the costs involved in meeting the requirements of domestic consumption. In doing this, we have taken into account, on the one hand, the prices offered by the factories for the sugar beet and the costs of producing the beet; on the other, the prices of imported refined sugar and the prices of beet, domestically-produced, sugar.

From Table 3 it can be seen that the costs of subsidizing the sugar beet and the sugar production increase with the growth of the coverage of the domestic consumption need. In addition, the subsidizing costs for beet cultivation have the largest portion of the costs for this

coverage. Finally, overall costs go up from 95m euros in the first scenario to 215m euros in the third one.

Table 3: Costs of domestic consumption coverage

		Scenario I	Scenario II	Scenario III
Sugar beet production cost	euro/tonne	49	49	49
Ex-works sugar beet price	euro/tonne	21	21	21
Sugar beet cultivation subsidizing costs	euros (thousands)	57,273	103,950	138,600
Sugar price (domestic)	euro/tonne	423	423	423
Imported sugar price (CIF)	euro/tonne	252	252	252
Sugar subsidizing costs	euros (thousands)	38,475	57,713	76,950
Total costs of domestic consumption coverage	euros (thousands)	95,748	161,663	215,550

Source: Own calculations

The three scenarios may have consequences on the following categories of stakeholders: farmers, sugar factories, traders, consumers and tax payers. Thus, we predict that farmers' revenues will increase in all the three cases, because the sugar beet price will rise practically by 100%; thus, they will be interested in investing in its cultivation. As for sugar factories, the sugar price will be guaranteed for them, too, but, at the same time, they will lose the revenues resulting from processing imported raw sugar. Traders' profit from dealing in sugar will decrease

in all three cases. Consumers, on the other hand, will not be affected, because the consumer price of sugar will not change.

Conclusions

In this study, we have shown that Romania is fully able to produce the quantity of sugar needed for domestic consumption, provided that certain conditions are fulfilled. Thus, our country has the raw material, sugar beet, as well as the pedo-climatic conditions necessary for the cultivation of the latter.

In addition, Romania has enough sugar producing units, able to produce the necessary quantity. Although production equipment used to be too old, modernization has begun. It is necessary, however, that this process be completed. Romania also benefits from EU subsidies for the production of a quantity of sugar covering the one we need to a large degree.

The findings of this study can be used to improve the current situation of the sugar industry in Romania. They may also serve as an argument against the EU decision to grant a higher subsidized quota for preferentially imported raw sugar.

To facilitate this, further research is necessary in the following directions: (a) assessing the effect of EU policies (quota distribution and sugar industry reform) on beet producers and on the entire industry; (b) evaluating the degree to which it is preferable to rely mainly on either domestic beet production or on imported raw sugar for the production of white sugar.

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