



## DEVELOPMENT OF FRUIT PROCESSING AS A MEASURE OF IMPROVING THE LEVEL OF COMPETITION IN THE AREA OF AGRIBUSINESS IN BOTH DOMESTIC AND INTERNATIONAL MARKET

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### Abstract:

In this paper we will be considering the situation in Serbian agribusiness, especially in the area of fruit which have in the past always achieved a significant production results. However, the field of agriculture is still being dominated by numerous small agribusiness firms and unregulated family farms whose products (fruits) are mainly raw materials in manufacturing food industry. The largest part, as such, unprocessed, was also an export potential of our agriculture. Also, the capacity of manufacturing were not adequately utilized. A particular example is the plum that is, as a rule, only exported as raw material for further processing. As traditional producers of quality plums we must resort to the processing of the same, which would have created a range of newly-finished products, hired a new workforce that would result in increased financial performance and better position in markets around the world.

### Key words:

agribusiness,  
plum,  
fruit,  
processing.

## 1. INTRODUCTION

Fruits and fruit products are important both in terms of their importance on a healthy human diet, and for their participation in the total agricultural production, trade, consumption. For development of (agricultural) economy of our country, fruit growing is of great importance. Fruit production according to its importance and value is equal to the one relating to livestock breeding, farming, and vegetable crops, especially taking into account the existence of excellent natural conditions for growing almost all kinds of fruit [1]. Unfortunately, the facilities for fruit processing are technologically modest and as such were used only about 50%.

The largest quantities of agricultural products, especially in fruit growing, are exported as a raw material for further processing, so the financial impact of exports is significantly reduced. The future of Serbian agriculture is in intensifying production or development and processing, i.e., completion of production with its own competing product. A number of local companies (Nektar, Vino Župa, Foodland) is already known for its export products which are competitive on both domestic and international markets. The conditions for the food processing industry in Serbia are reflected in the good quality of raw materials of all fruit species, a large number of refrigerators, the existence of a sufficient number of agronomists and managers. However, it is always resorting to the traditionally established practice of the production and marketing of consume fruits and fruit as raw material for further processing.

## 2. THE IMPORTANCE OF FRUIT GROWING FOR SERBIAN AGRO-ECONOMY

Serbia is the agrarian country, with comparative advantages for the development of agro-industry. Serbia has relatively significant land resources for development of crop and animal production. These and other advantages have not been turned into a competitive advantage. Transitional reforms, which should be continued, did not give the expected results. Serbia, still, does

not invest enough in this strategic economic activity. Many indicators confirm that. On the other hand, foreign trade surplus in agricultural products shows untapped opportunities of the Serbian agro-economy.

In the structure of agricultural production in Serbia, crop production (agriculture, fruit growing and viticulture) has a high share of almost 70%, while livestock production accounts for only 32%, while in the EU, the situation is reverse. In addition to the unfavorable structure of agricultural production, Serbia, despite the positive balance in the export of food, has also unfavorable structure of the exports, because raw materials and products with a low degree of processing dominate it.

Fruit growing is an especially important branch of agriculture, which successfully unify the market requirements for the production of organic food, on one side of, and on the other the environmental protection [2]. Thus, it becomes an important factor for improving the production of healthy food and quality control of food production.

Fruit growing accounts for 9% of the total agricultural production, which is a great success. However, given the potential, i.e. the natural conditions that have existed for centuries, the tradition in the fruit production and processing, and growing interest of farmers in this highly profitable branch of agriculture, we have the right to expect the future fruit production and processing to be multiplied. Especially taking into account the fact that no branch of agriculture brings such a profit, especially in mountainous regions. It is important to note that great progress has been made in the fruit growing, above all, using new scientific and technical advances, and thanks to the large presence of the profession in this area, which contributed that already educated manufacturers accept and apply new technologies.

According to data from the Statistical Office of the Republic of Serbia (RZS), area under orchards includes approximately 244,000 hectares, constituting 4.68% of total agricultural land, or 5.63% of the arable land in the Republic of Serbia. The largest percentage of the area on which there are fruit plantations belongs to a plum - 50%, followed by apple - 18%, and a cherry - 7% of the total number of fruit trees of all kinds in the Republic of Serbia.



The total fruit production in the period 2000 – 2013, ranged from 600,000 tons in 2002 and to a record 1.523 million tonnes in 2013. The most exported are frozen fruits: raspberries, cherries and blackberries, but a significant increase in exports of fresh fruits, such as apples, plums, cherries and other fruit species are visible. Yields, as a rule, are very variable. Such a variation in yield from year to year, low winter temperatures had the great influence, especially the late spring frosts, but also many other factors: the hail, the attack of pests and diseases, drought, high temperatures [3]. Demand for the fruits and fruit products from Serbia is growing. Exports record growth, both quantitatively and regarding the increase of the number of countries importing our products. The largest portion is exported to EU countries. Bearing in mind the fact that standards related to food safety becoming stricter in the EU, exporters of fruits and fruit products are required to implement the standards such as HACCP, Eurep GAP, BRC, ISO 22000. High quality products from healthy raw materials, find its customers all over the world.

Development of fruit growing contributes to the development of many other industries - manufacturing, chemical, pharmaceutical, etc., as well as service industries, such as transport, trade and tourism. Fruit growing enables the rational usage of agricultural land, because it is high-accumulative agricultural activity. Larger areas under the fruit trees positively affect the microclimate of the city, and on steep slopes prevent soil erosion and landslides. Fruit growing requires the involvement of a large number of workers, engineers in the field of agro-economics, which contributes to the employment of the local population [4].

### 3. DEVELOPMENT OF PROCESSING FRUITS - CREATING COMPETITIVE PRODUCTS

Facilities for fruit processing already exist and they are quite large, up to 700,000 tons/year, but are underutilized, which is not associated with the amount of raw materials for processing. Generally, the same facilities are used for processing of fruits and vegetables. Capacity utilization for hot processing of fruits and vegetables is only 50%, while the capacity for cold procession is used by 75% (Table 1). The annual vegetable production in Serbia is on average more than 2 million tons and over 1 million tons of fruits. It is important to note that the technical and technological equipment of manufacturing capacities is far below the required standards for export. Quality of the products, primarily due to unevenness, does not always meet European and international standards, the assortment is modest and the products are often not adequately prepared for the market in terms of packing, sorting and presentation. It is important to note that the fruit processing to semi-finished products, adequately conserved, enables continuous production of finished products throughout the year and therefore regular market supply.

Fruit and vegetables processing	Capacities	Utilization %
Warm processing	565 000 t	50
Cold processing	550 000 t	75

Table 1: The available capacities in the food industry in Serbia [Source: NSO, 2011.]

Processing the large quantities of raw materials to the final product certainly is the main prerequisite for the future development of fruit growing and agro-economy as a whole. Our agro companies, though not a large number, have shown and proven that they can participate equally with its competitors on most markets around the world. The products of our agro-economy are respected. It is important that the products are

characterized by quality and have a trusted name - brand, because only then the chances of success are greater. In addition, demand for indigenous products with special (accented) quality increase. Due to rich supply and choices, consumers buy products identified by the label and quality which product offers [5].

#### 3.1. The positive economic effects of the fruit processing

The food industry, i.e. food processing industry in Serbia has a huge capacity and they are from year to year, more modern and suitable for larger production. Cold storage and processing factory are distributed mainly in the manufacturing areas where fruits and vegetables grow. It is estimated that the range of finished products comprises over 1200 items, finished products of freezing, warm processing in jars, cans, bottles and other packaging, drying and other processing procedures that are applied [6]. Fruit products are produced according to "The Regulation on the quality of fruit, vegetables and mushrooms and pectin preparations." However, at the request of a foreign buyer, it is possible to organize production (so called, The manufacturer's specification) that deviates from what the Ordinance provides by its quality and composition. The Regulation stipulates the minimum requirements that products must meet in production and trade, as well as minimum requirements for the provision and maintenance of quality and hygienic safety.

Based on research that involved the processing of three types of frozen fruit - plums, apricots and blackberries - with identical quantity of 1000 kg, into high quality sweetened jam, the following data were provided (Table 2): the amount of the finished products obtained, in this case the jars of jam - 330 g net mass ranked and accepted on the market by customers, varies. Plum jam about 2000 pieces (yield 53.40%), followed by blackberries about 2500 pieces (yield 56.15%) and apricot 3200 pieces (yield 71.50%).

	Stoned plums	Apricots	Blackberries
Frozen Fruit (kg)	1.000	1.000	1.000
Fruit pulp (kg)			1.095
Sugar (kg)	285	540	450
Citric acid (kg)	0,50	1,0	0,56
Vitamin C (kg)		1,25	
The raw material (kg)	1.290	1.543	1.546
Jam 60% dm (kg)	688,52	1.103	868,50
Proceeds (%)	53,40	71,50	56,15
Jars of 330 g/pc	2.000	3.200	2.539

Table 2: Jam production and proceeds on 1000 kg of consumed frozen fruits - plums, apricots and blackberries

[Source: Internal data, enterprise Frigobel- Belanovica, Republic of Serbia, 2013.]

All three used fruit varieties have different yields (fruit quality, dry matter, etc. are affecting factors) which directly determines the amount of the finished product. The value of finished products (jam) in market conditions is increased compared to the initial value of the raw materials (fruit), which is required for a given production as well as added materials, labor, energy,

packaging, etc. 2-4 times more, depending on the fruit. All this points to the immense profitability and positive financial effect of the final processing and creating finished products. In addition,

1 Official Gazette of the Socialist Federal Republic of Yugoslavia no.: 1/79, Official Gazette of the Republic of Serbia 43/2013.



tion, the finished product cramp its way to markets in Europe and worldwide, receives recognition, especially by its quality, design, origin, and price, of course. After all, good value expressed the competitiveness of a product, above all. The higher ratio - the product is more competitive [7].

A multitude of products can be made out of the fruits: fruit juice, fruit syrup, compote, jam, fruit jelly, fruit cheese, candied fruits, dried fruit, fruit juice powder, frozen fruit, pasteurized fruit, frozen puree fruit, citrus base and other fruit products. In addition to existing possibilities to produce fruit for fresh consumption, particularly in the manufacturing industry, much more fruit can be processed for the domestic market but also for export, thus a surplus in foreign trade of agro-economy could be even greater and the processing capacities significantly utilized.

In the production of fruit, fruit quality is of major importance. Only fruits with adequate nutritional value, spotless and without any signs of deterioration can be used. It is important that the fruit be picked in an appropriate manner at the appropriate time. Only the ripe, but not overripe fruit with the right taste and odor can be used in production. Fruit of poor quality and with signs of deterioration is not appropriate. Only premium quality raw materials are processed, obtained by intensive production using irrigation systems, anti-hail nets, anti-frost system, etc. Thus, the risks to yield are brought to a minimum.

The basic thing for all fruit products is to obtain high-quality products by processing and revenues increased by several times. Of course, it is necessary that manufacturing (processing) should always be planned and organized ("Practice must always be founded on sound theory," Leonardo da Vinci), to have pre-analyzed and researched markets should, the implementation of scientific achievements in production, qualified and professional management team, suitable infrastructure, good logistics, etc. The application of all applicable standards required for product placement in European and world markets are necessary.

#### 4. CONCLUSIONS

Serbia is traditionally a large producer of all kinds of fruit. Our country has excellent agro-ecological conditions for fruit production and good prospects for its exports. Bearing in mind that agriculture, and the food industry also, is traditionally the

most important economic branch in Serbia, there are a number of production facilities staffed by trained professionals and highly competitive workforce. In such conditions, with fertile soil and the high quality of fruit species, fruit should be a major industrial development potential. Economic effects of the planned processing of fruits are positive.

The primary tasks for fruit processing industry are (1) dedicated processing of fruit production, and surpluses too up to intermediate and high-quality products; (2) providing competitive products on the market throughout the year; (3) providing a high-quality diet of the population even in unfavorable years for fruit production; (4) increased employment and development of rural areas; (5) increase in exports, and thus the inflow of foreign funds.

Investing in the modernization and expansion of existing and construction of new modern processing capacities, an extraordinary opportunity for domestic and foreign investors is provided.

#### REFERENCES

- [1] Blagojević R., *Voćarstvo*, Univerzitet u Prištini, Poljoprivredni fakultet, Kruševac, 2000. pp. 11
- [2] Stevanović S., *Razvoj tržišne proizvodnje u poljoprivredi Republike Srbije*, DAES, Poljoprivredni fakultet Univerziteta u Beogradu, Beograd, 2009, pp. 79
- [3] Keserović Z., *Magazin.N., Voćarstvo Srbije-stanje i perspektive*, (pristup: 17.10.2014.), [dostupno na: <http://media.pospoljoprivrede.stat.rs/2014/Dokumenta/Radovi/03%20Vocarstvo%20Srbije%20E2%80%93%20stanje%20i%20perspektive.pdf>]
- [4] Nikolić, D., i Sar.: *Stanje i perspektive razvoja voćarstva u Srbiji*, Zbornik radova i apstrakata, Univerzitet u Beogradu, Poljoprivredni fakultet, Vrnjačka Banja, 9-12.10.2012. pp. 3-23
- [5] Zarić, V., Nedić, N. i Vasiljević Z.: *Unapređenje konkurentnosti kroz stvaranje robnih marki i brendova-izazovi za male poljoprivredne proizvođače*. Tematski zbornik: Agroeconomika nauka i struka u tranziciji obrazovanja i agroprivrede, Poljoprivredni fakultet Univerziteta u Beogradu, Beograd, 2008.
- [6] Ljubisavljević M., *Voće, povrće, pečurke i prerađevine*, Privredni pregled-Beograd, 1989, pp. 229-299
- [7] Đekić S., Jovanović S., *Orijentacija poljoprivrede Srbije ka konkurentnosti kvalitetom*, Škola biznisa br. 4/2010, pp. 24-31

### RAZVOJ PRERADE VOĆA KAO MERA POBOLJŠANJA NIVOA KONKURENTNOSTI AGROPRIVREDE NA DOMAĆEM I INOSTRANOM TRŽIŠTU

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#### Apstrakt:

U ovom radu biće razmatrano stanje u srpskom agrobiznisu, naročito u oblasti voćarstva gde su u proteklom periodu postignuti veoma značajni proizvodni rezultati. Međutim, u oblasti agrara i dalje dominiraju mnogobrojne male agrobiznis firme kao i neuređena porodična gazdinstva, čiji proizvodi (voćne vrste) uglavnom predstavljaju sirovinu u prerađivačkoj prehrambenoj industriji. Najveći neprerađeni deo, kao takav, predstavljao je i izvozni potencijal našeg agrara. Takođe, kapaciteti prerađivačke industrije nisu bili adekvatno iskorišćeni. Naročit primer je šljiva koja se, gotovo po pravilu, izvozi samo kao sirovina za dalju prerađu. Kao tradicionalni proizvođači kvalitetne šljive, mi moramo pribеći prerađi iste, čime bismo stvorili lepezu novih-gotovih proizvoda, uposlili novu radnu snagu, što bi rezultiralo povećanim finansijskim rezultatom i boljom pozicijom na tržištima širom sveta.

#### Ključne reči:

agrobiznis,  
šljiva,  
voćarstvo,  
prerada.