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## Benefits of subsidies to farms that have delivered fruit for processing

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# BENEFITS OF SUBSIDIES TO FARMS THAT HAVE DELIVERED FRUIT FOR PROCESSING

VIORICA GAVRILĂ<sup>1</sup>

## **Abstract**

*The objectives of subsidies for agriculture target economic, social and environmental aspects, and the value added from processing contribute to food security and income gaining, being an important method to improve livelihoods. This paper aims to identify the progress made in the fruit sector as a result of financial support through various subsidizing forms, mainly through coupled support for fruit for processing. Having in view the fact that the structure of fruit plantations in Romania reveals that more than half are aged plantations, under decline, with low productive potential, and fruit processing is at a low level, it is necessary to continue to support production intended for processing, possibly with more substantial amounts, to compensate the losses caused by the quality of fruit from less productive plantations and to boost the fruit processing sector.*

**Keywords:** farms, fruits, processing

**JEL Classification:** Q12, Q 18

## INTRODUCTION

For the period 2014-2020, the CAP maintained the two pillars. The total CAP budget was about 410 billion EUR, with 310 billion EUR allocated to direct payments and market measures (EAGF), and 100 billion EUR to investments in rural development (EAFRD). The Common Market Organization in the fruit and vegetable sector aims to provide financial support for the establishment of association forms in this sector.

Under Pillar I, the direct support system comprises seven multipurpose payments, of which three are mandatory and the rest voluntary. The first three are the following: 1) “basic area payment” - SAPS, in which the payment is exclusively based on the eligible hectares declared by farmers; 2) payment for “greening”, by which farmers are conditioned to adopt or maintain agricultural practices beneficial for the environment and climate; 3) an additional payment for young farmers. The voluntary payments consist of: 1) “redistributive payment” by which farmers can receive an extra payment for the first hectares of agricultural land; 2) additional income support in the areas with natural constraints; 3) a simplified voluntary scheme for “small farmers” and 4) coupled support for production. Producer organizations are also financed from EAGF (Pillar I). There is a low degree of organization of fruit and vegetable farmers. According to MARD data, in the year 2020, there were 23 recognized producer organizations in the fruit and vegetable sector.

Under Pillar II, the fruit farming sector benefitted from a special program aiming to reduce structural constraints in this sector (advanced age of orchards and the prevalence of the classical fruit farming system) and to develop the processing sector.

## MATERIAL AND METHOD

By consulting the specialized bibliography, the consumption trends on the global market and on the Romanian market were identified. Given the economic importance of agricultural activity through its contribution to the supply of foodstuffs, the study is a cross-sectional research that identified the relationships between subsidies to farms that received coupled support for fruit and the achievement of the objectives targeted by the coupled support. In the analysis of the fruit sector evolution, annual time series were used for the following indicators: area, production, yields, prices

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and the coefficient of variation (CV %) for measuring volatility. Fruit consumption was analyzed in fresh fruit equivalent. A comparative analysis of the evolution of fruit processed production was made, taking into consideration the most important producers in the EU.

For the evaluation of coupled support, out of the total number of SAPS eligible and subsidized farms, the farms holding fruit orchards with total SAPS area, including the orchard, were selected in the first instance. From these, we extracted the farms that received coupled support for fruit for processing. Within this group, the contribution of coupled support to fruit production for processing was evaluated.

The statistical information come from the Eurostat database, NIS data base – Food Balance Sheets and from APIA. The fruits considered for the study were those that received coupled support, namely apples, apricots, cherries and sour cherries and plums.

## RESULTS AND DISCUSSIONS

### *Areas, yields, production*

Romania ranks 7<sup>th</sup> in the EU by the area under orchards and 6<sup>th</sup> in terms of fruit production.

In the last decade, the areas under orchards in Romania decreased by more than nine thousand hectares. Among the species of interest for our study, the greatest decrease in physical terms was noticed in apple orchards, and in percentage in stone fruit orchards (Table 1). Fruit production and yields show annual fluctuations (Tables 2 and 3).

**Table 1. Evolution of area under orchards (1000 ha)**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2019/ 2010	2019/ 2010
Total	145.0	140.25	142.4	147.8	141.3	139.0	138.1	139.6	137.96	135.7	-9.32	-6%
Apples	56.37	52.72	55.37	60.28	56.13	55.88	55.53	55.6	53.94	52.74	-3.63	-6%
Apricots	2.62	2.55	2.5	2.84	2.98	2.62	2.2	2.11	1.97	2.04	-0.58	-22%
Cherry	6.93	6.85	6.83	7.08	6.45	6.31	6.13	6.02	7.06	6.09	-0.84	-12%
Plums	69.29	68.2	68.48	68.01	66.55	65.67	65.11	66.68	65.91	65.58	-3.71	-5%

Source: Eurostat: [apro\_cpsh1]

**Table 2. Production evolution (1000 t)**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2019/ 2010	2019/ 2010
Total	1,370	1,432	1,083	1,244	1,247	1,171	1,187	1,001	1,754	1,432	61.9	5%
Apples	544	611	454	503	502	465	457	340	635	493	-51.1	-9%
Apricots	22	32	28	27	42	30	29	33	34	29	7.12	32%
Cherry	68	79	68	77	80	72	71	55	87	73	5.63	8%
Plums	616	564	413	501	484	486	502	434	830	693	76.97	13%

Source: Eurostat: [apro\_cpsh1]

Compared to other analyzed member states, Romania has the lowest yields in apple orchards, ranging from 6271 kg/ha in the year 2017 to 11768 kg/ha in 2018; compared to France, the country with the highest yields, Romania's yields are lower by 70%, and represent half of Poland's yields, country on the penultimate place according to this indicator. In apricots instead, in the last two years Romania had the best yields compared to the other countries. Yields in the cherry orchards in Romania rank first, while in the plum orchards yields are modest, by the average of the period Romania ranking 7<sup>th</sup> in the ten investigated countries.

**Table 3. Evolution of average yields – tons/ha**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2019/ 2010	2019/ 2010
Apples	9.8	11.8	8.4	8.5	9.1	8.5	8.4	6.3	11.8	9.3	-0.47	-5%
Apricots	9.1	13.2	11.6	10.0	14.6	11.8	14.0	16.0	17.5	14.4	5.33	59%
Cherries	10.1	11.9	10.3	11.4	12.8	12.0	12.1	9.7	11.4	11.9	1.71	17%
Plums	9.0	8.4	6.2	7.5	7.4	7.6	7.9	6.7	12.6	10.6	1.54	17%

Source: <http://www.fao.org/faostat/en/#data/QC>

In general, yields have the greatest influence on production variability, which indicates the great influence of weather factors as well as the lack of consistent investments to mitigate their effects (Table 4).

**Table 4. Average values, standard deviation and coefficient of variation for areas, production and yields**

	Area			Production			Yield		
	2010-2019 average	Standard deviation	CV %	2010- 2019 average	Standard deviation	CV %	2010-2019 average	Standard deviation	CV %
Apples	140.7	3.6	2.6	1,292.3	215.4	16.7	9,191	1,646	17.9
Apricots	55.5	2.2	3.9	500.4	84.0	16.8	13,233	2,626	19.8
Cherries	2.4	0.3	14.2	30.7	5.3	17.2	11,366	996	8.8
Plums	66.9	1.4	2.2	552.3	128.5	23.3	8,387	1,919	22.9

Source: author's own calculations

The major impediments in the fruit sector are the advanced age of orchards and the prevalence of the classical fruit farming system. In the year 2013, depending on the productive potential, 52% were plantations under decline, 42% plantations on bearing and 6% young plantations; by the farming system, 68% were classical plantations, 30% intensive plantations and 2% superintensive plantations (Sumedrea D., et. al, 2014).

In the present period, the low storage capacity limits the availability of fruit over time, both for the large retailers and for processors. According to MARD, in the year 2018, the storage capacity for fruit and vegetables was 190.77 thousand tons.

### **Consumption**

The consumption of fruit and vegetables plays a vital role in ensuring a diversified and nutritious diet. OMS recommends a minimum consumption of fruit and vegetables of 400 g /person/day<sup>1</sup>. Assessing the global trends, a study conducted in 2019 suggests that even under optimistic socio-economic scenarios, the future supply will be insufficient to reach the levels recommended in many countries. Consequently, a systematic public policy will be needed to address the constraints to the production and consumption of fruit and vegetables (Mason-D'Croz, D. et al., 2019).

In Romania, fruit consumption is on an upward trend. In the year 2010, one person consumed on average 143.6 g/day of fruit (*in fresh fruit equivalent*), and in 2019 the consumption reached 247.0 g/zi. The greatest increase in consumption was noticed in peaches, by 231%, followed by meridional and exotic fruit, by 96%. For apples, plums and various indigenous fruits, the increase in consumption ranged from 62% to 65%, while the consumption of cherries increased by 25%.

Under the background of the increase in the consumption of fruits specific to the temperate climate and also in the consumption of southern and exotic fruits (*in fresh fruit equivalent*) the Romanian imports have doubled, while exports are decreasing. The share of exports in usable production was 8.6 % in 2010 and 4.6% in 2019. The degree of self-supply was down from 81% to 67%.

According to the European Fruit Juice Association (AIJN), in Romania there is not a strong tradition in the consumption of fruit juice and nectar, as most consumers do not consider that fruit juice is a substitute for fresh fruit in diet. The increase on the fruit juice market is mainly determined by the supply of premium juices rather than by the supply of concentrated juice. Increasing disposable income encourages consumption, and premium cold-pressed juices that offer additional functional benefits are an emerging trend. Nectar consumption increased in 2017, but faster progress is limited by the lack of producers' investments in innovation.

Globally, the consumption of fruit juices and nectar was equivalent to 36.2 billion liters in 2018. The largest consumption area is the EU-28 with 9.1 billion liters, followed by North America with 8.6 billion liters.

### **Prices**

In Romania, the average price of apples was 58.8 euros/100 kg in the period 2010-2019 and price volatility was low. For apricots, prices ranged from 87.55 euros/100 kg in 2017 to 109.58 euros/100 kg in 2018, and price volatility was also low (CV 8%). Although the productivity of cherry and sour cherry orchards in Romania increased, this is not reflected in the decrease of selling prices, which indicates an increasing demand. With an average price of 54.6 euros/100 kg, the plum market in Romania is relatively stable, with a coefficient of variation of 9.2% (Table 5).

**Table 5. Evolution of prices – price per 100 kg**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Mean	Standard deviation	CV %
Apples	51.3	61.8	60.1	63.1	61.9	60.1	59.5	60.6	57.8	51.8	58.8	4.1	7.0
Apricots	104.22	107.1	99.12	95.04	93.39	108.2	107.6	87.55	110	91.46	100.3	8.0	8.0
Cherries	134.6	134.9	167.5	147.3	158.9	140.8	161.7	162	137	185.2	153.0	16.8	11.0
Sour cherries	115.4	113	148.7	125.6	120.2	112.3	119.8	131.8	113	165	126.5	17.6	13.9
Plums	50.3	54.7	58.1	53	56.3	53.3	47.9	64.1	48.8	59	54.6	5.0	9.2

Source: Eurostat [apri\_ap\_crpouta]

Comparing prices in Romania with those from other important fruit producing countries, it results that in all other EU member states prices have annual variations of less or greater amplitude. The highest price volatility is found on the markets with the lowest average prices. With the highest prices, the Romanian fruit market is the least volatile.

### **Evolution of processed fruit production**

In the year 2019, Germany, Poland, United Kingdom, France and Spain were the top producers in the EU-28. Romania ranked 17<sup>th</sup> in EU-28, with a production value of 6344 thousand euros in 2019, accounting for 0.4% of EU-28 production, although Romania has significant resources of raw products. It is worth mentioning that the smallest production was recorded in the year 2015, and the trend increased afterwards (Table 6), this being probably the cumulated effect of the coupled support for apples and of investments in the processing sector. The coupled support attenuated production decline, but it could not recover the gaps: average production in 2014-2019 was lower by 36% than the 2010-2013 average.

**Table 6. Statistics on the production of manufactured products – apple juice (1000 euro)**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
EU-28	1234103	1461751	1577767	1537681	1462533	1412848	1552443	1505736	1641312	1523522
Romania	8349	9308	10697	9033	5727	4090	6152	5610	7932	6344
Romania/EU	0.7%	0.6%	0.7%	0.6%	0.4%	0.3%	0.4%	0.4%	0.5%	0.4%

Source: <https://ec.europa.eu/eurostat/web/prodcom/data/excel-files-nace-rev.2>, PRODCOM code 10321600

In the production of fruit jams, marmalades and jellies, the top producers are France, Germany, UK and Belgium; Romania produces 0.3% of the EU-28 value. In the year 2013, Romania's production was lower by half compared to that of 2010 (Table 7). Like in the case of apple juice, the coupled support attenuated production decline, yet it could not attenuate the losses: the average production in 2014-2019 was by 33% lower than the 2010-2013 average.

**Table 7. Statistics on the production of manufactured products – fruit jams, marmalades, jellies, fruit or nut purees and pastes, as cooked preparations, except for citrus, homogenized preparations (1000 euro)**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
EU-28	2415166	3016661	3377224	3502866	3440604	3532080	3619387	3660000	3488669	3305000
Romania	13129	17008	20278	9860	9533	11793	10314	10106	9336	9600
Romania/EU	0.5%	0.6%	0.6%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%

Source: <https://ec.europa.eu/eurostat/web/prodcom/data/excel-files-nace-rev.2>, PRODCOM code 10392290

The trends on the global market reveal that in the fruit processing industry, there is a strong focus on waste reduction, by the valorization of resulting by-products, in order to provide the food and pharmaceutical industry with valuable extracts.

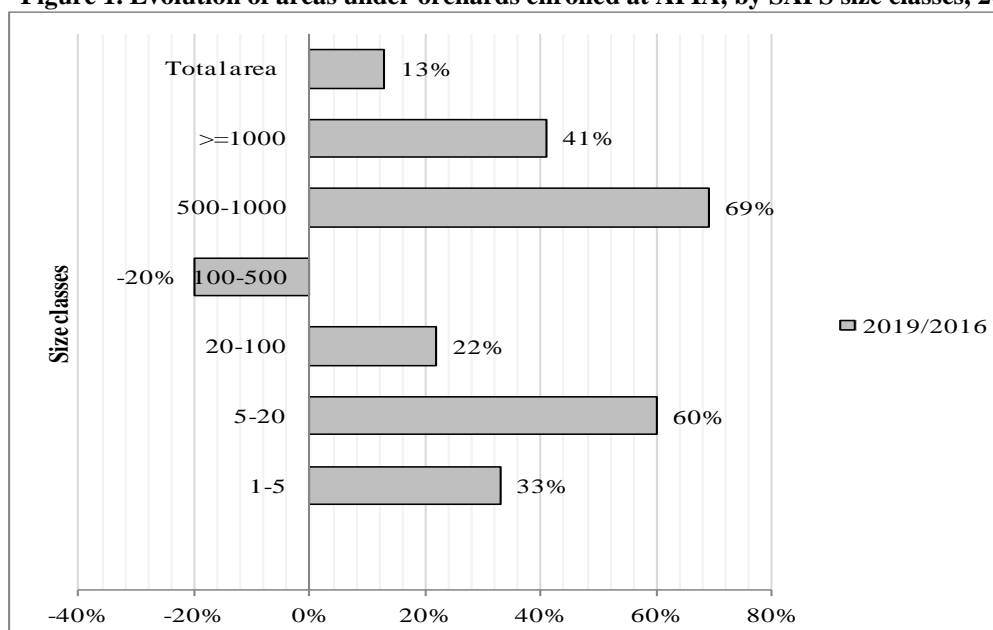
The concept of recovery of different compounds from this waste opens new ways for the development of “green” industries, which have a tremendous potential, mainly where there is plenty of fruit waste. The emphasis on frontier sciences has already attracted interest in developing and optimizing new ecological methods for the efficient use of biomass, for closing the chain by returning nutrients and organic matter to soil, when all other useful products have been recovered (Fierascu, R. C. et al, 2020).

### ***Coupled support for fruit***

Although within the CAP the link between receiving income support payments and the production of specific products has been phased out (decoupled), for some sectors in difficulty, the EU member states could continue to combine a limited amount of income support for certain sectors in difficulty or products. In Romania, according to the legislation into effect, the coupled support for fruit for processing to obtain non-alcoholic food products is granted to active farmers who comply with the following conditions:

- a) operate plum, apple, cherry and sour cherry and apricot orchards
- b) make proof of marketing a minimum production/ha, on contract basis with a processing unit registered for food safety, according to the provisions of ANSVSA Order no. 111/2008, which it presents to APIA together with the fiscal invoice or sheet/sheets from the marketing book of agricultural products, in the case of natural persons, until December 31 of the application year. The minimum marketed production for different types of fruits was established at: 7.8 tons/ha for apples, 4.7 tons/ha for apricots, 4.4 tons/ha for cherries and 5.6 tons/ha for plums.
- c) the processing units that operate areas under orchards must prove the marketing of their own production provided under letter b), until December 31 of the application year, through internal accounting documents.

**Figure 1. Evolution of areas under orchards enrolled at APIA, by SAPS size classes, 2019/2016**



Source: APIA

In the year 2016, the area under orchards registered at APIA was 2675 hectares. In 2019, the area increased by 13%, to reach 3023 hectares, accounting for 2.4% of total orchards.

In physical terms, the greatest increase was noticed in the medium-sized farms from the size class 20-100 hectares, by 187 hectares; in percentage terms, the greatest increase was in the large-sized farms, from the size class 500-1000 hectares (69%)(Figure 1). The area represents 2.1% of the total area of apple, apricot, cherry and sour cherry and plum orchards.

The coupled support to the fruit sector in Romania had the following economic objectives: providing raw material for the processing units, equilibrating the trade balance by boosting the supply of local fruits, diversifying the product range, developing efficient services for taking over, processing and marketing of production with controlled quality, at the level of European standards. One of the social objectives targeted to maintain the areas under orchards for processing, and the environmental objectives targeted to reduce the erosion risk in the hilly areas, specific to fruit farming practice in our country.

The coupled support to fruit in the programming period 2015-2020 totalled 2917.5 thousand euros, accounting for 0.027% of the national ceiling established by (EU) Regulation no. 1307/2013 of the European Parliament and Council of December 17, 2013. The largest amount was allocated to plums, i.e. 1167 thousand euros (40.0%); apples rank 2<sup>nd</sup>, with an allocated amount of 972.5 thousand euros (33.3%); for cherries and sour cherries and for apricots the allocated amounts are similar, i.e. 389 thousand euros for each group (13.3%).

In the years 2015 and 2016, the coupled support was allocated by types of fruits with different values/ha, and since 2017, under the voluntary coupled support schemes for fruit they have been unified, with undifferentiated amounts per hectare. The coupled support paid to farmers for fruits for processing ranged from 348 thousand euros in 2018 to 474 thousand euros in 2019 (Table 6).

**Table 6. Total amounts paid as coupled support for fruit for processing, euros**

	2015	2016	2017	2018	2019
Fruit (cumulated) – euros, of which:	451,309.22	434,697.63	455,066.1	347,769.9	474,427.4
Plums for processing	180,000.00	172,942.39	0.00	0.00	0.00
Apples for processing	161,604.92	143,936.55	0.00	0.00	0.00
Cherries and sour cherries for processing	49,704.30	56,658.11	0.00	0.00	0.00
Apricots for processing	60,000.00	61,160.58	0.00	0.00	0.00

Source: APIA

In the year 2019, 115 farms received coupled support, out of which 11 farms were enrolled in the small farmer scheme. The area approved for coupled support amounted to 1829.42 hectares under orchards (that is 1.4% of total area or 61 % of area under orchards enrolled at APIA).

**Table 7. Distribution of coupled support for fruit by farm size classes, 2019**

	1-5	5-20	20 - 100	100 - 500	500 - 1000	> 1000 ha	Total
Number of beneficiaries	23	39	32	11	5	5	115
% of total beneficiaries	20	34	28	10	4	4	100
Area, ha	38.3	227	657.1	407.1	337.5	162.5	1829.42
% of total area	2	12	36	22	18	9	100

*Source: APIA*

The highest percentage (36%) of the area approved for coupled support payment for fruit belongs to farms from the size class 20-100 hectares, and the number of beneficiaries account for 28% of total. The small farms, with an area of 1-5 hectares represented 20% of the total number of beneficiaries, but only 2% of the area approved for payment.

The average area/farm was 139.8 SAPS hectares, out of which the area under orchards was 15.9 hectares or 11.4% of SAPS area.

Out of the total amount of subsidies to farms that received coupled support for fruit, of more than 3.75 million euros, the largest part (42.6%) was represented by SAPS payments, almost one quarter (24.5%) was represented by payments for greening, and the coupled support for fruit represented 12.6% of the total amount. Other forms of support have low shares, for instance the support to areas with significant natural constraints accounted for 4.5%, TNA 1- Transitional National Aid for crops on arable land 3.7%, etc.

Relating the total amount paid as coupled support to the total number of beneficiary hectares, it results that the coupled support value for one hectare of orchard amounted to 259.33 euros. To calculate the impact of coupled support in the value of fruit production/ha, in the table below we used as indicators the minimum production/ha established by Order 619/2015 and the prices published in Eurostat database. The coupled support was paid for raw fruit for processing in different percentages according to the type of fruits, ranging from 3.4% for cherries and sour cherries to 7.8% for plums. The difference results from the level of price and implicitly from the value of production for one hectare. In the situation when the average yield was higher, the coupled support represents a lower percentage.

**Table 8. Impact of coupled support in the value of production /ha intended for processing, 2019**

	Apples	Apricots	Cherries and sour cherries	Plums
Coupled support per hectare	259.33	259.33	259.33	259.33
Minimum production per hectare – kg	7800	4700	4400	5600
Price per kg – euro	0.518	0.9146	1.751	0.59
Value of production per hectare – euro	4040.4	4298.6	7704.4	3304
% VCS in the value of production/ha	6.4%	6.0%	3.4%	7.8%

*Source: author's own calculations*

In the case when the entire area under orchards enrolled at APIA had benefitted from coupled support, the value per hectare would have been only 157 euros/ha, which would have led to a 39% lower support to fruit production for processing.

Assuming that in the next years the market conditions do not change (prices remain constant), the rate of increase of areas enrolled at APIA is maintained and the eligible areas continue to represent 60.5 % of the area registered at APIA, the areas eligible for coupled support would reach 2067 ha in 2022 and 2335 ha in 2025. To maintain at least the same value per hectare, the total allocations should increase to 535955 euros in 2022 and to 605629 euros in 2025.



In order to increase processed production, there are two possibilities: either a stronger increase of areas benefitting from coupled support while maintaining the value of 260 euros/ha, or maintaining the growth rate of areas but with a higher value per hectare to make the delivery of raw material to processing more attractive.

## CONCLUSIONS

Fruit processing is an important economic activity in the EU. Although Romania has important resources of raw material for processing, the processed production is extremely small.

Only a non-significant percentage of the areas under orchards were registered in APIA database, and the fact that only 60.5% of the total area under orchards enrolled at APIA benefitted from coupled support for fruit shows that this was not attractive enough to direct production to the processing industry.

Normally, the preferences of agri-food industry and of agriculture in terms of prices are quite opposite: industry wants lower prices for its raw material and agriculture higher prices for its products. Thus, the high fruit prices represent a significant constraint for the Romanian processors. From this point of view, the decision to grant coupled support for fruit is fully justified. The tension between the agro-processing industry and agriculture in terms of prices will not disappear, but certain categories of policies may improve the profitability of both sectors at the same time.

The coupled support for fruit reached one of the important economic objectives, i.e. to ensure a minimum quantity of raw material for processing. However, until 2019, the processed production has not reached a level similar to that from 2010-2013, which leads us to the conclusion that this form of support should be continued with more consistent allocations, given that the post-2020 CAP largely maintains the sectoral programs and allows member states to prepare specific interventions for the main agricultural sectors in their strategic plans.

Having in view the structural constraints on fruit production, in addition to maintaining coupled support for fruit for processing, it is necessary to continue the Fruit Sub-Program under Pillar II, primarily to meet domestic consumption needs and also to capitalize on opportunities offered by global market trends. The future investment portfolio should focus, in addition to the reconversion of aged orchards, on providing storage facilities, boosting association to increase fruit production, encouraging vertically integrated production to reduce the negative impact of high prices of raw materials for processing. At the same time, the processing component should be accompanied by the development of technologies and practices for waste reduction / recovery.

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