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ECONOMIC EFFICIENCY OF INVESTMENTS IN FRUITS PROCESSING

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Abstract: *The aim of this paper is to find out the economic efficiency of an associative unit in fruits processing and trading field. In this order a scenario by loan is taken into consideration. Indicators such as production, incomes and expenditures, profit, also investment indicators are studied. The paper consists into the establishment of a processing fruits to prolong their life, and get products with higher value added consumer demand; establishing a network for collecting local fruits, supply of raw materials for the processing; providing storage services and marketing associative members. Technical objectives of the investment are to purchase machineries and equipments for processing apples and plums; the purchase of land for their location, building factory and deposit. The financial objectives refer to investment. The results show the relevance of associative units for producer integrating and investment feasibility.*

Key words *associative unit, fruits processing, investment, economic efficiency*

JEL classification: Q13

INTRODUCTION

The food and economic relevance of fruits to the population makes it necessary to study them in order to increase efficiency at the producer and market levels. For this, it is needed to know the characteristics of the fruit and the market, as well as the ways in which the efficiency can increase through investments. It must be borne in mind that the fruit is perishable in most of the cases and the quality differences for the same product are high. Also, fruits have rhythmicity in terms of obtaining and marketing. Fruit production is seasonal and off season, which requires its organization on geographic areas and regulatory requirements.

In Romania, many of the fruit products are obtained in large commercial farms, but also in individual farms. Commercial farms have easier access to the market and are integrated on the chain. In individual farms, yields are reduced in quantity, and they do not have quality standards, but they contribute to supply the markets with natural products. Also, fruit from small farms is marketed indirectly, using intermediaries, which affects the entire sales process, with reference to producers' losses. Therefore, it is necessary to create a short food chain to capitalize on fruit production by eliminated intermediates.

Generally, Romanian fruit products are traded on traditional markets, with access being more difficult in shopping centres due to difficulties in production, technical endowment and management. To this the lack of collection centres, storages and fruit processing factories is added, all generated by the low investment level. This has an impact on the production cost of the fruit, in the sense of its increase, and thus on the increase of the imported quantities, because the selling price of the imported fruits, the traditional ones of the Romanian consumption, is lower compared to the one practiced by domestic producers.

In view of the above, it is necessary to reconsider the fruit sector, in order to support investment and to create a framework that integrates the producers into the economic circuit of the market. As a result, the possibility of developing an associative unit in fruits processing and trading under sub-programs for the financing of the fruit sector (National Rural Development Program 2014-2020) was created.

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MATERIAL AND METHODS

Fruit processing is necessary because of the high degree of perishability, which are subject to continuous degradation processes from the time of harvesting, and seasonality, by processing extending them on harvesting period. Also, the need to make an investment in fruit processing is based on consumers' demand for fruit juice, on one hand, and because of added value, on the another hand. Due to this, the investment refers to create an associative unit in apples and plums processing and trading.

The farmers, as members of associative units, are main suppliers of fruits. The objectives refer to setting up an apples processing to extend its life, mitigate the seasonality of the supply of this and obtain higher-value products demanded by consumers; setting up a local collection centre for the raw material supply of the processing apples and plums; providing temporary storage, sales, accounting and marketing of associative units members. Also, the objectives will take into consideration an investment regarding the purchase of land for the location of the factory; the purchase of machinery and equipment for apples and plums processing; the construction of the factory and the storage. The production program which contains the quantity on month and year is below (Table 1).

Table 1 Production structure

Product	VII	VIII	IX	X	XI	Total
Apple juice pieces.BaginBox3l/year)		55386.7	53600.0	110773.3	107200.0	326960
Plum marmalade (jars/year)	4081.6	4217.7	4081.6			12381

Source: author's calculations

Taking into account the annual yields of apple juice and plum marmalade and their technological recipe, the quantity of raw materials required for the production process is 1472756 kg of apples. The average yield on apple plantations is 10 t / ha, which means that the need for material resources can be ensured on an area of 147 ha. Therefore, it is recommended that the associative form be set up in a fruit-growing area, where the surfaces will be concentrated at the level of locality. Plum marmalade production implies a 6822 kg requirement. The average plum production is 7 t / ha, which means that plums can be grown on an area of 0.97 ha.

Table 2 Revenues from operational activity and investment (lei)

Specification	Year I	Year II	Year III	Year IV	Year V
Total revenues, of which:	5484103	4312385	4312385	4312385	4312385
Apple juice	4250480	4250480	4250480	4250480	4250480
Plum marmalade	61905	61905	61905	61905	61905
Investment financing	1171718				
- Loans	709440				
- Grant from (EFARD)	462278				

Source: author's calculations

In case of investment above, if the members of the cooperative do not have the necessary financial resources and can the sum not be accessed through the NRDP is resort to a bank credit. The eligible expenditures are 924556 lei, of which 50%, amounting to 462278 lei, represents non-reimbursable public aid. The total investment is 1171718 lei, which means that for the difference of 709440 lei a credit is obtained with an interest rate of 5.01%, for which a monthly rate of 5559 lei is paid. The total amount to be reimbursed is 1003098 lei, for a period of 180 months. The total incomes are represented in Table 2.

In the first year of operation of the associative unit, the total incomes are of 5484103 lei and comprise the operating income or the production activity and the financing of the investment from external sources. As a result, the incomes from financing of the associative activity account

21% of total incomes. In terms of total expenditure, these include production costs, depreciation, contracted loans and interest, investment costs (Table 3).

Table 3 Expenditure from operational activity (lei)

Specification	Year I	Year II	Year III	Year IV	Year V
Total expenditure, of which:	5343896	4172178	4172178	4172178	4172178
Materials	3842475	3842475	3842475	3842475	3842475
Salaries	174007	174007	174007	174007	174007
Depreciation	79387	79387	79387	79387	79387
Other expenditure	9600	9600	9600	9600	9600
Loans and interest	66708	66708	66708	66708	66708
Assets acquisition	1171718				

Source: author's calculations

As the cooperative applies to a loan, the volume of total expenditures increases as the economic unit only uses its own contribution and non-reimbursable funds. In the first year the increase is 66708 lei, which means approximately 1.2%. The total expenses are 5343896 lei for the first year and 4172178 lei for the 2nd, 3rd, 4th and 5th years. Total expenditures include materials, salaries, depreciation, loans and interest on credit. The volume of material expenses is 72% in the first year (including credit), and in the years 2,3,4,5 they are in equal proportions of 92%. The depreciation of the equipment for which the investment was made was calculated in equal shares, which means that it is annually 79387 lei, 1.4% in the first year and 1.9% in the years 2,3,4,5. The salary expenditures amounting to 174007 lei per year represent 3.2% of the total expenditures in the first year and 4.1% in the next years. The amount of contracted loans and related interest is 66708 lei per year, which represents 1.2% of the total expenditures in the first year and 1.5% in the next years. Other expenditures refer to marketing and accounting expenses, amounting to 9600 lei per year.

RESULTS AND DISCUSSIONS

As a result of the calculations, there are differences in cash availability. It was calculated as a result of the unit's incomes and expenses and shows briefly the economic and financial results during the period for which the investment was made (Table 4).

Table 4 Economical and financial results of the associative unit, lei

No.	Specification	Year I	Year II	Year III	Year IV	Year V
I	Total incomes, of which:	5484103	4312385	4312385	4312385	4312385
1	Apple juice	4250480	4250480	4250480	4250480	4250480
2	Plum marmalade	61905	61905	61905	61905	61905
3	Investment	1171718				
II	Total expenditures, of which:	5343896	4172178	4172178	4172178	4172178
1	materials	3842475	3842475	3842475	3842475	3842475
2	salary	174007	174007	174007	174007	174007
3	depreciation	79387	79387	79387	79387	79387
4	other	9600	9600	9600	9600	9600
5	loan and interest loans	66708	66708	66708	66708	66708
6	FEADR	1171718				
III	Results	140207	140207	140207	140207	140207

Source: author's calculations

The data shows the economic results of the associative unit. Total incomes are 4312385 lei, total expenditures, including loan and interest loan, are 4172178 lei, which means a gross result of

140207 lei. Thus, a return rate of 3.3% and a profit margin of 3.2% are recorded, which indicates that the business is profitable.

Investment efficiency indicators

At the basis of the calculation of investment indicators are data from table 5. It was considered that the effective operating time is the standard operating time of the machines equal to 10 years. Regarding the normal production capacity expressed in terms of value, it is reported by the annual income.

Table 5 Investments' indicators

No.	Indicators	Value lei
1	Investment (I_t)	1171718
2	The annual production capacity expressed in value (Q), of which:	4312385
2.1	Apple juice	4250480
2.2	Plum marmalade	61905
3	Annual expenditures (Ch)	4172178
4	Annual profit (P_a)	140207
5	Effective operating time (D_e), years	10

Source: author's calculations

Table 6 Final investment indicators

No.	Indicators	Value lei
1	Investment per product ($I_s = I_t/Q$, lei)	0.27
1.1	Apple juice	0.27
1.2	Plum marmalade	19.23
3	Profit to recover ($P_a=I_t$)	140207
4	Total profit ($P_t = P_a \cdot D_e$)	1402070
5	Final profit ($P_f = P_t - P_r$)	1261863
6	Economic return of investment ($R = P_f/I_t$) %	108
7	Period to recover investment I_t/P_a , years	8.35

Source: author's calculations

The results of investment are presented in table 6.

As a result of the calculations, it shows that at the total level the specific investment is 0.27 lei. It is noticed that the annual profit ensures recovery of the investment in 8.35 years. The activity is feasible because the economic return of the investment exceeds the value of the investment, so the total profit recorded over the entire period of use of the machines is higher than the investment by 8%.

CONCLUSIONS

The paper shown that market for fruit products have peculiarities, which gives it a special, structural and programmed character throughout the product line, including in the field of scientific research, professional training, and managerial consultancy. The specific behaviour of the fruit market is due to the existence of a large number of producers, the seasonality of the products (inducing changes in the consumption of the population), the economic power different from consumer buying, the zoning and the existence of a trading system (which generates a high level of self-consumption, mainly in rural areas). This adds imbalances, at producers' level, from fruit storage and sale activities during the agricultural year, with a negative impact on the market.

Also, fruit products are traded on traditional markets and the access is more difficult in commercial centre. It noticed that is the lack of collection centres, storages and fruit processing factories, all generated by the low investment level. From this point of view the paper presented a case study regarding investment into an associative unit in fruits processing field created through loan and FEADR supporting. The results showed a return rate of 3.3% and a profit margin of 3.2% and a period to recover investment of 8.35 year, which indicates that the business is profitable.

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