ECONOMIC-FINANCIAL ASSESSMENT OF FULL-FAT CHEESE PRODUCTION

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Abstract: *Favorable natural conditions point out to possibility for developing a very diverse agricultural production at the territory of the Republic of Serbia, and therefore to achieve significantly better production results, primarily in the livestock sector. Meanwhile, considering the period 2012-2023., in livestock sector occurs negative trend: there have come to decrease in number of farms specialized in livestock production (for 41.54%), as well as decrease in number of cattle heads (for 20.12%), or farms engaged in milk production and processing (drop for even 62.94%). In order to encourage other profitable activities related to the farm, Serbian Ministry of Agriculture has launched the support measures for process of investing in production and processing of agri-food products at the farm level, while the commercial banks are approving the subsidized loans to farmers towards the purchase of fixed assets and financing the permanent working capital. Besides, wanting to give greater support to farms to step in the milk processing, performed research was focused to assessment of economic effectiveness of investment in production of full-fat cheese. Business idea assumes the purchase of 70 dairy heifers, investments in required facilities, or equipment and cold storage that will be used in milk processing. The economic justification of the made investment will be assessed through static and dynamic indicators, or indicators for investment evaluation under the conditions of risk and uncertainty. Gained research results indicates that the investment in full-fat cheese production at certain farm could be highly welcome business decision.*

Key words*: farm, livestock sector, economic effectiveness of investment, full-fat cow cheese production.*

INTRODUCTION

The core of sustainable development of primary agriculture in any country should be based on strong livestock sector [4]. Unfortunately, Serbia is facing the negative trends in livestock production. Despite the favorable natural conditions for intensive livestock production, specifically in all production lines, in last couple decades there come do decrease in overall number of animal heads, primarily affecting further long-term weakening of competitiveness of family farms, especially in generally underdeveloped hilly and mountainous areas [21]. Other study shows that in last decade, except slight increase in number of horses, all other domestic animal species have been went through the sharp shrinkage of available animal population, presenting the overall decrease in around 35% [3]. Some estimation shows that the contribution of livestock production to overall agricultural production in Serbia in last couple years is over 30% [4], so current ratio between the plant and livestock production is 2:1 [1]. Within the structure of livestock output, production of pigs (over 38%, mainly for meat) and cattle (almost 38%, mainly for meat and milk) is dominating [12].

Despite the global or regional increase in demand for livestock food products, mainly due to increase in population and available incomes in developing countries, as well as disposing to favorable natural conditions for animal growing, Serbia still haven't fully used the given production opportunities [15].

Among several factors that limits the development of livestock sector next could be underlined: small farm estates and climate change issues (difficult access to required volume of feed), unfavorable age and education structure of producers, inadequate organizing and low bargain power of farmers, insufficient informing and slow tech-tech transfer, expressed input - output disparities (disbalance in overall production costs and food prices), small-scale production and low economic power of farms (inducing low production intensity and low level of

competitiveness), pressure of decline in real purchasing power of population (consumers), disbalance in foreign trade exchange (agri-food products), obsolete production facilities, equipment and mechanization, impropriate physical infrastructure in rural areas, improper structure of utilized breeding types of animals and low profiled specialization of farms, domination of primary to processed food products, etc. [5, 9, 6, 14, 13, 17, 20].

Some negative trends in Serbian agriculture, specifically in livestock sector, or some part of mentioned sector, could be seen in next table (Table 1.).

Table 1.

Decrease in overall number of farms and farms involved in livestock production (period 2012-2023)

Element/year	Census of Agriculture 2012.	FSS 2018.	Census of Agriculture 2023.	2023. compared to 2012.	2023. compared to 2018.
Farms (total)	631,552	564,541	508,365	-19.51%	-9.95%
Family farms	628,552	562,895	506,323	-19.45%	-10.05%
Farms as companies and entrepreneurs	3,000	1,646	2,042	-31.93%	24.06%
Farms specialized in livestock sector	108,467	63,407	47,555^	-56.16%	-25.00%
Head of cattle	908,102	881,200	725,408	-20.12%	-17.68%
Farms involved in milk processing	44,679	37,368	16,558	-62.94%	-55.69%

Source: [24, 25, 26].

Note: ^ Authors' estimation.

According to previous data (Table 1.), in period between two censuses of agriculture (2012-2023), generally come to significant drop in overall number of farms in Serbia, what could be explained by slight trend of land concentration and farms enlargement. Meanwhile, decrease in number of grown animals is followed by sharp fall in number of farms specialized in livestock production. Similar, but even more expressed trend is linked to farms specialized in milk processing. Current market conditions, size and state of available production capacities, as well as economic and financial obstacles that are facing dairy sector, mainly small and medium family milk producers and processors have been led to disappearing of small producers and general enlargement of farms involved in milk production, i.e. concentration of producers.

In recent time, cow milk production in Serbia is not promising line of agricultural production [18]. As one of possibilities that could lead to increase in farm profitability and general competitiveness, especially for small-scale milk producers (farms that have up to 10-15 cows), is recognized as creation of value added through the milk processing (mainly cheese production), [11].

There are several opportunities as the financial support aimed to strengthen and additionally advanced development of agri-food production, specifically livestock production and milk processing (production of dairy products) at national level, i.e. EU funds, IPARD, national resources, etc. [16, 2, 19]. Available funds have to encourage the farmers to take a step into the investment processes within the mentioned segment of livestock sector in Serbia. In addition to pre-mentioned, the main paper goal is to evaluate the economic effectiveness of investments turned to livestock production and milk processing (production of full-fat cow cheese) in Serbian business ambient.

MATERIALS AND METHODS

Input data set used in research is gained through the in-depth interviews with farmers previously experienced in milk and dairy products production. Main intention is to enlarge the current production by investment in required production animals, equipment and facilities suitable for full-fat cheese production at new location. As in some previous research [22, 23, 7], economic assessment of investment efficiency implies commonly used static and dynamic methods for investments' evaluation, adjusted to general specificities of livestock production. Research results and entry data are verified by extensive scientific and professional literature research, and conversation with local professionals involved in milk production and processing. Data collection and their verification have been done during the 2023. and 2024., while expected period of investment realization is 2024-2025. Although the investment idea was previously developed for implementation at the specific farm located in the northern part of Montenegro [8], as it represents well balanced model for value added creation in livestock production, coming from similar natural and production conditions, the initial model was precomposed and adjusted to specific requirements and financing possibilities for some other livestock farm located in Serbia. Basically, production model was tailor-made to fit the current conditions of Serbian business environment. Input data and derived results are given in EU currency (EUR) in properly arranged tables, providing further comparing with similar investments.

RESEARCH RESULTS

Basic data linked to investment. Core of the investment in production of full-fat cheese reconsiders purchase of basic herd (70 hi-quality heifers), construction of facilities and equipment for cows (heifers) keeping and raw milk gaining and further processing (production of full-fat cow cheese). So, there is intention of farmer for investing in certain fixed assets and permanent working capital (PWC), both from farms' own and external sources of financing. There has to be noted that all values expressed in investment analysis are in net amounts (excluding VAT).

Table 1.

New investment in predefined fixed assets (in EUR)

No.	Element	Total
I	**Facilities**	
1.	Stables for cows	
2.	Silo trench	
3.	Barn for the feed supply (hay, alfalfa, corn, etc.)	**191,888.83**
4.	Manure dump and pond for liquid manure	
5.	Storage for lacto-freeze and milking equipment, and other supporting facilities	
6.	Processing facilities	
II	**Equipment and cooler**	
1.	Milking equipment	
2.	Equipment for cattle binding	
3.	Equipment for watering	
4.	Equipment for feed preparation	
5.	Lacto-freeze	**114,202.12**
6.	Centrifugal pump	
7.	Pump filters	
8.	Cheese maker – duplicator	
9.	Pre-press for cheese	
10.	Cooler with compressor	
III	**Basic herd**	**161,000.00**
1.	Heifers (70 heads)	
Total (I+II+III)		**467,090.95**

Source: [8].

The total investment value for planned business activity is 560,509.14 EUR. Within the structure of total investments (Tables 1. and 2.), fixed assets dominate over the PWC, with 83.33%. Proposed model of investment financing is completely different to those one previously developed [26], giving to the specific farm one more alternative how to finance, implement and further exploit the investment idea.

According to mentioned, planned investment will be financed from farms' own and external financial sources. The majority of investment will be covered from external sources (commercial bank loan with subsidized 3% annual interest rate, grace-period for 1 year, quartal annuities and 5 years of repayment period). Smaller part of investment will be covered from farmers' accumulation (Table 3.).

Table 2.

Overall investment (in EUR)

No.	Element	Overall investment	Participation in overall investment (in %)
I	**Fixed assets**	**467,090.95**	**83.33**
1.	Facilities	191,888.83	34.23
2.	Equipment and cooler	114,202.12	20.37
3.	Basic herd	161,000.00	28.72
II	**PWC**	**93,418.19**	**16.67**
Total (I+II)		**560,509.14**	**100.00**

Source: [8].

Table 3.

Financing sources (in EUR)

No.	Element	Overall investment	Participation in overall investment (in %)
I	**Farm sources**	**207,620.31**	**37.04**
1.	Fixed assets	114,202.12	20.37
2.	PWC	93,418.19	16.67
II	**External sources**	**352,888.83**	**62.96**
1.	Fixed assets	352,888.83	62.96
2.	PWC	0.00	0.00
Total (I+II)		**560,509.14**	**100.00**

Source: Authors' calculations.

Table 4.

Generating total income (in EUR)

No.	Element	Year				
		I	**II**	**III**	**IV**	**V**
1.	Sales income	286,629.00	299,009.00	299,009.00	293,507.21	303,086.21
1.1.	Full-fat cheese					
1.2.	Whey					
1.3.	Calves (male)					
1.4.	Calves (female)					
1.5.	Heifers					
1.6.	Overused cows					
1.7.	Manure					
2.	Subsidies	104,329.79	23,829.79	23,829.79	23,829.79	23,829.79
2.1.	For purchased heifers (reimbursement of 50% of investment value)					
2.2.	For milking cows (339 EUR/head/year)					
3.	Services	0.00	0.00	0.00	0.00	0.00
Total (1+2+3)		**390,958.79**	**322,838.78**	**322,838.78**	**317,337.00**	**326,916.00**

Source: Authors' calculations.

Financial plan

Forming of total income - The total income formation is based on next elements: sales value of the produced full-fat cheese; sales value of produced whey (by-product in cheese production); sales value of calves (male and female); sales value of problematic heifers and overused cows; sales value of manure (by-product in cattle growing) and used incentives (subsidies).

Formation of total incomes and costs, derived from the exploitation of investment objects in cheese production were observed for a five-year period (Tables 4. and 5.).

Overall costs – they involve material costs and intangible costs derived from exploitation of investment. They are presented per production year and for entire period (Table 5.).

Table 5.

Overall costs (in EUR)

No.	Element	Year				
		I	II	III	IV	V
I	**Material costs**	**95,340.16**	**82,789.72**	**82,789.72**	**81,776.07**	**83,540.91**
1.	Direct material	72,030.33	59,479.89	59,479.89	58,466.24	60,231.07
2.	Energy	9,775.75	9,775.75	9,775.75	9,775.75	9,775.75
3.	Other material costs	13,534.08	13,534.08	13,534.08	13,534.08	13,534.08
II	**Intangible costs**	**146,117.01**	**156,050.45**	**153,415.90**	**150,701.42**	**147,904.58**
1.	Depreciation	48,417.43	48,417.43	48,417.43	48,417.43	48,417.43
2.	Insurance	3,711.47	3,711.47	3,711.47	3,711.47	3,711.47
3.	External labor	78,522.46	78,522.46	78,522.46	78,522.46	78,522.46
4.	Interest	0.00	9,933.44	7,298.89	4,584.41	1,787.57
5.	Other intangible costs	15,465.65	15,465.65	15,465.65	15,465.65	15,465.65
Total (I+II)		**241,457.17**	**238,840.16**	**236,205.61**	**232,477.49**	**231,445.49**

Source: Authors' calculations.

Profit and loss statement – After determining the overall incomes and expenditures incurred during the exploitation of investments' object, there could be defined financial success (Table 6.) of the realization of planned processing activity.

Table 6.

Profit and loss statement (in EUR)

No.	Element	Year				
		I	II	III	IV	V
I	**Total Income**	**310,458.79**	**322,838.78**	**322,838.78**	**317,337.00**	**326,916.00**
1.	Sales income	286,629.00	299,009.00	299,009.00	293,507.21	303,086.21
2.	Subsidies	23,829.79	23,829.79	23,829.79	23,829.79	23,829.79
3.	Other incomes	0.00	0.00	0.00	0.00	0.00
II	**Total expenditures**	**241,457.17**	**238,840.16**	**236,205.61**	**232,477.49**	**231,445.49**
1.	Business expenditures	241,457.17	228,906.73	228,906.73	227,893.08	229,657.91
1.1.	Material costs	95,340.16	82,789.72	82,789.72	81,776.07	83,540.91
1.2.	Intangible costs without depreciation and interest	97,699.58	97,699.58	97,699.58	97,699.58	97,699.58
1.3.	Depreciation	48,417.43	48,417.43	48,417.43	48,417.43	48,417.43
2.	Financial costs	0.00	9,933.44	7,298.89	4,584.41	1,787.57
2.1.	Interest	0.00	9,933.44	7,298.89	4,584.41	1,787.57
III	**Gross Income (I-II)**	**69,001.62**	**83,998.62**	**86,633.17**	**84,859.51**	**95,470.51**
IV	**Income tax**	6,900.16	8,399.86	8,663.32	8,485.95	9,547.05
V	**Net income (III-IV)**	**62,101.46**	**75,598.76**	**77,969.85**	**76,373.56**	**85,923.46**

Source: Authors' calculations.

Economic assessment of investment

Economic flow – for planed investment was established the economic flow (Table 7.).

Table 7.

Economic flow (in EUR)

No.	Element	Zero moment	Years				
			I	II	III	IV	V
I	**Overall incomes (1+2)**	**0.00**	**310,459.0**	**322,839.0**	**322,839.0**	**317,337.0**	**645,338.00**
1.	Total incomes	0.00	310,459.0	322,839.0	322,839.0	317,337.0	326,916.00
2.	Salvage value	0.00	0.00	0.00	0.00	0.00	318,422.00
	2.1. Fixed assets	0.00					225,004.00
	2.2. PWC	0.00					93,418.00
II	**Total expenditures (3+4)**	**560,509.00**	**193,040.0**	**180,489.0**	**180,489.0**	**179,476.0**	**181,240.00**
3.	Investment value	560,509.00					
	3.1. In fixed assets	467,091.00					
	3.2. In PWC	93,418.00					
4.	Expenditures without depreciation and interest	0.00	193,040.0	180,489.0	180,489.0	179,476.0	181,240.00
5.	Income tax	0.00	6,900.00	8,400.00	8,663.00	8,486.00	9,547.00
III	**Net economic flow (I-II)**	**-560,509.00**	**117,419.00**	**142,349.0**	**142,349.0**	**137,861.0**	**464,097.00**

Source: Authors' calculations.

Static assessment of investment – for each year of analyzed period, selected indicators of the static assessment of investment are calculated. So, static assessment of investment effectiveness involves the following indicators: Total Output - Total Input Ratio, Net Profit Margin, Accounting Rate of Return, and Static (Simple) Payback Period.

1) Total Output - Total Input Ratio - Calculating the production efficiency (Total Output - Total Input Ratio) is based on the following formula: Ke = Ot / It > 1. The investment is economically efficient, while its implementation is economically justified, if the ratio between total incomes and overall expenditures derived from investment exploitation is above the one (Table 8.). Observed investment, in line to obtained indicator values for the representative (fifth) year, or even for the all years of investment exploitation, can be considered economically justified. It could be noted slight, but constant increase in coefficient value over the observed period.

Table 8.

Total Output - Total Input Ratio (in EUR)

Year	Ot (overall incomes from final products sale)	It (total expenditures)	Ke = Ot / It
I	286,629.00	241,457.17	1.19
II	299,009.00	238,840.16	1.25
III	299,009.00	236,205.61	1.27
IV	293,507.21	232,477.49	1.26
V	303,086.21	231,445.49	1.31

Source: Authors' calculations.

2) Net Profit Margin - could be calculated through the next formula: NPM = P / Ot x 100 > i. Net Profit Margin represents share of gained profit in overall incomes realized with investment utilization (Table 9.). If the NPM value in representative year overcomes the previously defined weighted price of capital, in this case if its higher than 3%, investment could be considered economically justified. Besides, there is present slight but constant growth of the value of observed indicator.

Table 9.

Net Profit Margin (in EUR)

Year	P (profit)	Ot (overall incomes from final products sale)	NPM = P / Ot x 100
I	62,101.46	286,629.00	21.67
II	75,598.76	299,009.00	25.28
III	77,969.85	299,009.00	26.08
IV	76,373.56	293,507.21	26.02
V	85,923.46	303,086.21	28.35

Source: Authors' calculations.

3) Accounting Rate of Return - Indicator is calculated as: ARR = P / V_i x 100 > i. This indicator shows the level of economic accumulation of investment, that arise from the relation between gained profit and previously paid investment outlay (Table 10.).

Table 10.

Accounting Rate of Return (in EUR)

Year	P (profit)	V_i (overall value of investment)	ARR = P / V_i x 100
I	62,101.46	560,509.14	11.08
II	75,598.76	560,509.14	13.49
III	77,969.85	560,509.14	13.91
IV	76,373.56	560,509.14	13.63
V	85,923.46	560,509.14	15.33

Source: Authors' calculations.

Observed investment is economically justified if the value of indicator is higher than previously defined weighted price of capital (discount rate – i, or current interest rate) in representative (fifth), or some other year of investment utilization. Similarly, to previous indicator, there come to permanent increase in its value.

4) Static (Simple) Payback Period - value for Simple payback period shows that the investment will be annul for 4.044 years, or 4 years and 0.531 months (0.044 x 12 months), what is shorter than assumed period of investment exploitation (loan expiration). So, according to observed indicator investment is also economically viable (Table 11.).

Table 11.

Static (Simple) Payback Period: T < n (in EUR)

Year	Net incomes from economic flow	Cumulative net income
0	-560,509.14	-560,509.14
I	117,419.05	-443,090.09
II	142,349.49	-300,740.60
III	142,349.49	-158,391.11
IV	137,861.36	-20,529.76
V	464,097.49	443,567.74

Note: T - Payback Period; n – loan expiration.
Source: Authors' calculations.

Dynamic assessment of investment – Available financial resources of farm has greater value today than in any future moment. From that reason, investment analysis is aligned with the principle of time value of money, introducing the dynamic indicators for assessment of economic effectiveness of investment, such are: Net Present Value, Internal Rate of Return, and Dynamic Payback Period.

1) Net Present Value (NPV) and Internal Rate of Return (IRR) - Based on obtained results (Table 12.), it is expected the rise in material base of the farm (available financial assets) by the use of investment in predefined period (brought down to initial moment of investment and assumed discount rate of 6.00%) for 252,473.00 EUR (NPV). Also, in line to gained value for

the Internal Rate of Return (IRR) investment is considered economically desirable, as its value overcomes the value of assumed discount rate (18.12% > 6.00%).

Table 12.

NPV and IRR (in EUR)

No.	Element	Zero moment	Year					*Cumulative*
			I	II	III	IV	V	
0	1	2	3	4	5	6	7	8
1.	Net income from economic flow (column 3 to 7)	-560,509	117,419	142,349	142,349	137,861	464,097	***1,004,077***
2.	Discount rate (%)	6.00	6.00	6.00	6.00	6.00	6.00	
3.	Discount factor $(1+i)^{-n}$ or $1/(1+i)^{\wedge n}$, where i = discount rate; n = years	1	0.943	0.890	0.840	0.792	0.747	
4.	Present value of net incomes (column 3 to 7)	-560,509	110,773	126,691	119,519	109,199	346,801	***812,982***
5.	**Net Present Value (column 2 to 7)**	**252,473**						
6.	**Relative Net Present Value [(column 2 to 7) / | column 2|] > i**	**0.45** [this means relative increase of accumulation over the calculative price of overall financial resources, or discount rate (*i = 6.00%*), meaning that investment use initiates covering of price of financial sources, while also makes certain earnings]						
7.	**Internal Rate of Return (IRR > i)**	**18.12%**						

Source: Authors' calculations.

2) Dynamic Payback Period - Payback period of planned investment according to dynamic method (Table 13.) is 4.272 years, or 4 years and 3.264 months (0,272 x 12 months), what is surely much shorter than observed period of investment exploitation (bank credit expiration), nominating the investment as economically justified.

Table 13.

Dynamic Payback Period (in EUR)

Year	Present value of net incomes from economic flow	Cumulative net income
0	-560,509	-560,509
I	110,773	-449,736
II	126,691	-323,046
III	119,519	-203,527
IV	109,199	-94,327
V	346,801	252,473

Note: T - Payback Period; n – loan expiration.
Source: Authors' calculations.

3) Break-even point - Performing business under the conditions of uncertainty imposes the need to carry out an additional economic assessment of planned investment, while it is based on calculation of the break-even point (Tables 14-16.).

Table 14.

Break-even point (in EUR)

No.	Element	Year				
		I	II	III	IV	V
1.	Incomes (I)	286,629.00	299,009.00	299,009.00	293,507.21	303,086.21
2.	Variable costs (VC)	173,862.62	161,312.18	161,312.18	160,298.53	162,063.36
3.	Fixed costs (FC)	19,177.12	19,177.12	19,177.12	19,177.12	19,177.12
4.	Gross margin (GM = I - VC)	112,766.38	137,696.82	137,696.82	133,208.69	141,022.85
5.	Break-even point (relative) (BEPr = (FC/GM) x 100), in %	17.01	13.93	13.93	14.40	13.60
6.	Break-even point (value) (BEPv = (I x BEPr) / 100), in EUR	48,744.30	41,643.16	41,643.16	42,254.17	41,215.45
7.	Margin of safety (relative) (Msr = ((1 - (BEPv / I)) x 100), in %	82.99	86.07	86.07	85.60	86.40
8.	Margin of safety (value) (Msv = (I x Msr) / 100), in EUR	237,884.70	257,365.84	257,365.84	251,253.04	261,870.76

Source: Authors' calculations.

Gained results point out that the highest risk is in first year of investment implementation, when the volume of production has not fall below 17.01% (or, when realized sales income has not fall below 48,744.30 EUR). The highest rate of safety (certainty) is in 5th

year of investment utilization, when the volume of production could drop by 86.40% (or, when the sale incomes can be reduced for 261,870.76 EUR).

Table 15.

Variable costs (in EUR)

No.	Element	Year				
		I	II	III	IV	V
1.	Variable costs (VC = MC + L)	173,862.62	161,312.18	161,312.18	160,298.53	162,063.36
2.	Material costs (MC)	95,340.16	82,789.72	82,789.72	81,776.07	83,540.91
3.	Labor (L)	78,522.46	78,522.46	78,522.46	78,522.46	78,522.46

Source: Authors' calculations.

Table 16.

Fixed costs (in EUR)

No.	Element	Year				
		I	II	III	IV	V
1.	Fixed costs (FC = IC - L)	19,177.12	19,177.12	19,177.12	19,177.12	19,177.12
2.	Intangible costs (IC), without depreciation and interest	97,699.58	97,699.58	97,699.58	97,699.58	97,699.58
3.	Labor (L)	78,522.46	78,522.46	78,522.46	78,522.46	78,522.46

Source: Authors' calculations.

Resume of the investment

In next table (Table 17.) is presented a summary of assumed elements of investment utilization and indicators for assessment of economic effectiveness of investment.

Table 17.

Resume of investment

No.	Element	
1.	**Economic effectiveness of investment**	
1.1.	Title	Production of full-fat cow cheese
1.2.	Investor	
1.3.	Location	
2.	**Initial outlay of investment (EUR)**	
2.1.	Total investment	560,509.14
2.2.	Investment in fixed assets	467,090.95
2.3.	Investment in PWC	93,418.19
3.	**Financing sources (EUR)**	
3.1.	Overall financial sources	560,509.14
3.2.	Own capital	467,090.95
3.3.	External sources	93,418.19
4.	**Object of crediting (investment)**	
4.1.	Purpose of credit (investment) use	Investment in fixed assets and PWC
4.2.	Moment of investment starting	2024.
4.3.	Moment of investment ending	2025.
4.4.	Economic period of investment utilization	5 (five) years
5.	**Expected effects of investment**	
5.1.	*Static methods of assessment*	
5.1.1.	Total Output - Total Input Ratio	1.31
5.1.2.	Net Profit Margin	28.35%
5.1.3.	Accounting Rate of Return	15.33%
5.1.4.	Static (Simple) Payback Period	4.044 years or 4 years and 0.531 months
5.2.	*Dynamic methods of assessment*	
5.2.1.	Net Present Value (EUR)	252,473.21
5.2.2.	Internal Rate of Return	18.12%
5.2.3.	Dynamic Payback Period	4.272 years or 4 years and 3.264 months
5.3.	*Break-event point*	
5.3.1.	Break-even point (the highest risk in 1st year of investment utilization)	17.01%
5.3.2.	Margin of safety (the highest safety is reached in 5th year of investment utilization)	86.40%

Source: Authors' calculations.

CONCLUSIONS

Livestock production is essential part of national agriculture. It should strive to create much more added value through the implementation of processing activities at the farms, what will secure its sustainability, while induce better farms' competitiveness and profitability. In paper was presented one possibility for investment in implementation of milk processing at farm level (full-fat cow cheese production).

According to performed static and dynamic methods for assessment of effectiveness of investment there are derived next results:

- Total Output - Total Input Ratio is greater than 1 over the all observed period of investment exploitation, showing that the overall incomes are above the total costs of cheese production. Accordingly, there could be considered that investment object is economic, while the investment is economically justified.
- Net Profit Margin is over 3% (assumed weighted price of capital) in all years. So, there could be stated that the investment utilization is accumulative, or during the investment exploitation the price of used capital is covered while some additional profit is gained.
- Accounting Rate of Return is also greater than 3% (assumed weighted price of capital) in entire period. According to that, there could be stated that the investment object is profitable.
- In line to static approach, investment will be returned for 4.044 years, i.e. Static Payback Period is 4 years and 0.531 months (0.044 x 12 months).

By the Dynamic approach of investment assessment, next was confirmed:

- In 5 years of investment exploitation, investment will secure to farm total profit increase, adjusted to predefined discount rate (i = 6%), calculated to initial moment of investment utilization (n = 0), in amount of 252,473.00 EUR (Net Present Value).
- Investment could be considered profitable, how derived IRR overcomes credit interest rate (18.12% > 3.00%), or higher than weighted discount rate (18,12% > 6%).
- In line to dynamic approach, investment will be returned for 4.272 years, or Dynamic Payback Period is 4 years and 3.264 months (0.272 x 12 months).

In case of investment assessment under risk and uncertainty (with accent to Break-even point), there could be seen that the highest risk is in first year of investment exploitation, when the volume of production has not fall under the 17.01% (i.e. gained sale incomes have not fall under 48,744.30 EUR). The highest Margin of safety is achieved in fifth year of investment exploitation, when is allowed the fall of overall production volume for 86,40% (i.e. gained sale incomes could be decreased for 261,870.76 EUR).

As final conclusion, it could be assumed that the proposed investment is highly profitable and economically justified for observed farm.

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