

**Anna Sytchevnik<sup>1</sup>**  
**Iosif Degtyarevich**  
**Nellia Degtyarevich**  
Chair of Organization  
Economic Faculty  
Grodno State Agrarian University  
Grodno, Byelorussia

## **Efficiency of reconstruction and construction of dairy farms**

**Abstract.** Production of milk is economically inefficient in many agricultural enterprises in Belarus. It is connected with the fact that buildings, constructions and the equipment has become outdated. Therefore it is necessary to construct new dairy farms. We shall consider the experience of calculation of efficiency of construction of a dairy farm in the Grodno region.

**Key words:** efficiency, reconstruction, business-plan

### **Introduction**

Traditional ways of milk production have already for a long time proved their inefficiency in our country. Agriculture requires innovations. There is no necessity to invent something now. The dairy farms of industrial type abroad operate on the basis of intensive technologies. They have good management experience of this process as well. Financial resources in possession of Byelorussian dairy and cattle breeding farms are obviously not sufficient. Many agricultural enterprises hope to get bank credit for the purpose of their modernization. There are some other problems in this sector. A business-plan of the investment project is necessary to get a bank credit. This business-plan must have been examined in corresponding state control organs. One of the indispensable conditions of crediting is the presence of own financial means for realization of the project. It should be at least 70% of its value. Banks finance only 30% of the cost of investment project to avoid risks. The maximum term of the credit money return is five years. It is difficult to achieve good results and to pay off the debts in such a short term. The government only partially compensates the credit interest (it is 50% of the rate of the refinancing established by the National Bank). Is it necessary to search the means for reconstruction and construction of dairy farms? When the spent means will return? We shall consider an experience of calculation of efficiency of construction of a dairy farm in the Grodno region.

Basically in the calculations of a business-plan of an investment project a methodology approved by the Ministry of Economics of Belarus should be applied. Project budgeting documentation has been used during calculations of the business-plan in our case study. This documentation defines the production capacity of farm and the costs of construction, installations and adjusting of buildings and equipment. We have taken advantage of the experience in business-planning of leading economists in the country

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<sup>1</sup>Email: annvlad@rambler.ru

when calculating the separate sections of the plan as well [Дегтяревич 2006; Правила... 2006; Соколовская 2006-2007]

## Research results

The Ministry of Economics adopted on the 31.08.2005 the act no. 158 'About the statement and the rules of development of business-plans of investment projects'. Many economists remark that rules are certainly detailed enough. However some calculations demand specification and further explanation. It regards the calculation of production program and volumes of realization of production in the agricultural enterprises, the account of rates of taxation and the calculation of economic efficiency as well as project sensitivity to a variation in parameters. Problems often arise about the defining the time horizon of calculations. Our experience from calculating a business-plan for construction of a dairy farm in 'Protasovschina' has pointed out to these problems more precisely and it has allowed us to find the ways of their solution.

Calculations of a business-plan assume processing a plenty of different information, which is logically interconnected. For this reason automation of calculations is required. There are some automatized systems of business-planning: the computer model COMFAR, the automatized system of planning and examination of investment projects Project Expert, the methodical complex 'Alt-Invest'. Nowadays new systems are developed on the basis of widely used program '1C Accounts department'. However these programs can not consider the specific features of agricultural enterprises and the system of their taxation. We used potentialities of a standard program 'MS Excel' in our calculations. It has allowed to adopt calculations of a business-plan for an agricultural organization. The program allows to coordinate calculations together and to consider many variants of calculation and sensitivity of the project.

According to the ministerial rules, the horizon of calculation is equaled to the term of return of the capital invested plus one year. Experience shows that investments in agriculture pay back much slower than it occurs in industry or in the sphere of services. Therefore the time of recovery of outlays exceeds term of return of borrowed capital sometimes considerably. That is why a problem with the determination of calculations horizon appears. To determine this term roughly we need at least one year revenue and expenses data of farm business project realization. For example:

- volume of milk produced is 4800 tons a year
- revenue of farm business is 2880 million rubles
- provisional expenses are 1780 million rubles for milk production (according to our calculations)
- total profit will make up to 1100 million rubles a year.

So if general investment expenses are 14000 million rubles, they will be paid back almost in 13 years ( $14000/1100=12.72$ ). Thus, the horizon of calculation should be established as at least 14 years. Certainly, it can appear that the horizon of calculation is less or more than this provisional figure. But there will be no necessity for carrying out of additional calculations as we have already cautiously put in a longer period into the program.

The business-plan was provided for construction of a dairy farm in village Kamenka of Schuchin region in 2008-2009. Existing production is using traditional technology for the agricultural farm enterprises. It functions inefficiently and therefore it needs modernization: construction of a new farm, installation of new equipment, introduction of modern technology. Purchases are planned of domestic and imported equipment for milk production. There is an agreement signed with manufacturers of the equipment. There is a technical design and project budget documentation. 600 cows will be kept on the farm. Annual produced milk volume will reach 4800 tons and slaughter cattle weight production will be 146.59 tons. The general investment expenses will make up 17056.691 million rubles. Source of financing is a soft loan from a Byelorussian bank and farm owners' equity capital (3000 million rubles and 14056.691 million rubles respectively). Credit resources will be used for a purchase of the milk processing equipment modernization and construction of industrial premises. The grace period for capital repayment is 18 months. Credit line on demand was opened on January 2008. The interest rates will be paid according to a schedule, at a rate equal to 0.5 of the National Bank rate of refinancing + 3 %. The state participation assumes an indemnification of a part of interest rate equal to 0.5 of the mentioned rate of refinancing.

Table 1. Summary parameters of the project

Indicator	Value
Cost of the investment project, thousand ruble	17056691
Total need for investments, thousand ruble	14006054
Sources of financing of the project, thousand rubles	
- Own means, thousand ruble	9000000
- Extra borrowed means, thousand ruble	3000000
State participation, thousand ruble	480994
Share of own capital in volume of investments, %	68.8
Year of attainment of the designed capacity	2010
Proceeds from production sales, million ruble	20982
Proceeds from production sales net of VAT, million ruble	19933
Average number of working personnel, person	178
Number of modernized workplaces	27
Proceeds from production sales net of VAT per one employee, thousand ruble	111984
Indices of efficiency of the project:	
Dynamic time of recovery of outlay of investments, years	6.01
Dynamic time of recovery of outlay of the state support, years	1.00
The pure discounted income, thousand ruble	1245125
Internal norm of profitableness, %	13.28
Index of profitability	1.20
Level of break-even, %	15.80
Factor of repayment of debts	3.4
Factor of current liquidity	0.70
Factor of security own current assets	-0.21
Profitability of sales, %	60.01
Profitability of production, %	111.31

Sours: own calculation

The milking machine 'Parallel 2x16' is delivered by 'WESTFALIA' company (Germany) with all necessary equipment. Construction of the farm and its modernization will allow for increasing the milk production from 2341 tons in 2006 up to 4800 tons in 2010. The enterprise will receive profit of nearly 1.0 billion rubles in 2009. This figure increases up to 1.8 billion ruble in the next years. Accruing result will make up 9 755.9 million rubles in 2014. Efficiency indices are simple and discounted. They are the following: a time of recovery of outlays on the project (pay-back period), the pure discounted income (net present value), an index of profitability, internal norm of profitableness (internal rate of return).

It is necessary to calculate a net cash-flow of current operation and investment flows and from financial activities. It is necessary to calculate differences between inflows and outflows of money resources in the whole enterprise and in the project. Then it is necessary to discount them. We shall receive the pure discounted income as a result. In the ministerial rules it is required to calculate a recipient of the project in view of activity of the organization as a whole, but as many authors remark it is senseless and we should agree with it. Such calculation can lead to a situation when the recipient can be received either a long time interval or too short interval. That deforms results.

Efficiency of the project has been proved on the basis of the received data.

Calculation of the sensitivity of project performance to the parameters variability is the last what it would be desirable to mention. The matter is that rules require finding of critical values of parameters. It is understood as a lot of parameters. We consider that such calculations are unreasonable. The purpose is to take advantage of the opportunity of reassessment and entering of updated parameters into the business-plan. It is much more expedient to define how much indices of efficiency of the project will change if an initial value of a parameter changes by 1 %.

The presented investment project should be considered as effective. It is sparse in production expenses and leads to an increase of profitability.

## Conclusions

Thus, the calculations allow for the following conclusions:

- the existing methodology of business-planning demands improvement
- the existing technology of milk production has become outdated;
- buildings, constructions and the equipment have worn out; They are not suitable for further use and therefore it is necessary to construct new dairy farms
- significant financial assets are necessary to construction of a new dairy farm; their sources are bank credits and enterprise own means acquired from current activity
- both volume of milk production and its efficiency will increase as a result of the project
- the investment project is effective and therefore investing in development of dairy farms makes sense.

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