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Sustainable Development of a Dairy and Grocery Sub Complex in Novosibirsk Region

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ABSTRACT

The research reviews the promising directions of sustainable development of a dairy and grocery sub complex of agribusiness in the region. As a result of the analysis and generalization of theoretical research by the scientists, the theoretical basis for sustainable development of a dairy and grocery sub complex of the region was refined, which is considered in the context of the processes of globalization and integration of the Russian economy into the world space in terms of labor productivity growth. The methods of calculation of parameters of milk production in the region were developed, taking into account the growth of labor productivity, as well as the mechanism of distribution of profits from the sale of dairy products. The proposed distribution mechanism will allow raising additional funds in the field of milk production, which currently does not participate in the distribution of profits from milk processing and sale of dairy products. Proposals on updating the departmental target program "Development of dairy cattle breeding in Novosibirsk region for 2014-2020" were submitted in order to ensure the necessary funding for the modernization of livestock farms and their equipment with modern machinery. The introduction of advanced technology and equipment will allow increasing milk production, improving its quality, and reducing the influence of the human factor due to growth in labor productivity. A milk production forecast through to 2020 in Novosibirsk region was developed.

Keywords: Dairy Industry, Milk Production, Labor Productivity, Distribution of Profits, Government Support
JEL Classifications: M11, O13, Q10, Q12, Q19

1. INTRODUCTION

Agricultural producers and milk processors in modern conditions have entered a new stage of development associated with the agricultural market globalization and, as a result, increased competition for markets. In the context of the establishment of the Customs Union and Russia's accession to the World Trade Organization, the demands to the quality of the produced raw milk and its products have increased.

In order to protect the national interests of the Russian Federation, it is necessary to create conditions for the country's food security through increased supply of domestic manufacturers to provide the population with milk and dairy products in accordance with the recommended level of consumption.

In this regard, research aimed at improving the efficiency of the dairy and grocery sub complex, creating conditions for its sustainable development in the region based on the study and implementation of best practices, increased supply of domestic producers of milk and dairy products, study of opportunities to enhance labor productivity in dairy cattle breeding, improvement of the material and technical base, a system of highly efficient interaction between dairy and processing industries, at the development and adjustment of programs of development and support of production, processing and marketing of milk at the

regional level all determine the relevance of the chosen topic of the thesis work.

The works of T. V. Belova, V. A. Bilkov, S.N. Butorin, Kh. N. Hasanova, V. D. Goncharov, D. N. Kirdischev, V. I. Kotarev, V. A. Kundius, A. N. Magomedov, A. P. Maltsev, V. V. Miloserdov, N. M. Morozov, L. A. Ovsyanko, V. M. Pizengolts, T. I. Rybalova, E.I. Semenova, A. T. Stadnik, V. F. Stukach, E. P. Chirkov [1-19] are devoted to the issues of milk production.

At the same time, many of the unresolved issues of sustainable development of the dairy and grocery sub complex predetermined the selection of the topic of the work and the key areas of research.

2. METHODS

The aim of the research is to develop theoretical provisions and practical recommendations for the sustainable development of the dairy and grocery sub complex of agribusiness in the region in order to produce competitive dairy products to meet the needs of the population.

The object of the study is organizational and economic relations arising between the subjects of the dairy and grocery sub complex of the region. The subject of research is principles, conditions and factors that contribute to the sustainable development of the dairy and grocery sub complex.

The objects of observation were agricultural organizations, milk processing factories, small businesses, agricultural cooperatives and rural households of Novosibirsk region.

Information basis of the study is the official materials of the Russian Federal Service of State Statistics; the territorial body of the Federal Service of State Statistics in Novosibirsk region; operational information from the Ministry of Agriculture of Novosibirsk region; statistical and accounting data of agricultural and processing organizations; regulatory and legal acts of the Russian Federation, the executive and the legislative authorities of the regions; scientific publications on the problem under study and other sources.

The theoretical and methodological basis of the study was scientific works of Russian agrarian economists, developments and recommendations of research institutes and universities, regulatory and methodological materials.

A variety of methods of economic research were used in the work: Abstract and logical, statistical and economic, balance, computational and constructive, dialectical, monographic, etc.

3. RESULTS

1. The theoretical basis for sustainable development of the dairy and grocery sub complex of the region was refined. In contrast to existing approaches, the sustainable development of the dairy and grocery sub complex of the region is considered in the context of the processes of globalization and integration of the Russian economy into the world space in terms of labor productivity growth. The sustainable development of the dairy and grocery sub complex of the region must be understood as a continuous targeted process of control of the production factors on the basis of labor productivity growth in order to ensure the production of milk and dairy products at the recommended consumption level both domestically and for export, competitive with the products of leading world producers represented in domestic and foreign markets.
2. The effective milk production indices were defined in relation to the conditions of the region under which wages can reach the regional average: Reduction in direct labor costs must be at least 3.4 times, down to 0.8 man-hours; the load on the operator of machine milking should not be <111 heads with a high level of mechanization; the load on the operator engaged in the maintenance of dairy cattle should not be <234 heads, and the load on the tractor driver should not be <455 heads; cows productivity should be 4500 kg of milk per year; the level of wages in the cost of milk production should not be more than 19%, the level of overhead costs should not be higher than 31.3%. A distinctive feature of the method of calculating the effective milk production indicators is the introduction of the ratio of workers in terms of rates (with respect to the load of cows per one milking machine operator).
3. Proposals for the development of dairy cattle breeding in Novosibirsk region for 2014-2020 were developed. Labor productivity growth is directly linked to the modernization of livestock farms and equipment with modern machinery. The modernization requires about 2.036 bln rub., the need for the missing machinery (tractors, combine harvesters) is about 24.979 bln rub. In order to ensure the necessary funding, it is appropriate to make adjustments to the departmental target program "Development of dairy cattle breeding in Novosibirsk region for 2014-2020" and set aside additional funds in the amount of 4.018 bln rub. Milk production forecast, designed on the basis of the identified trend in labor productivity growth and the population of the region, showed that Novosibirsk region will achieve the sustainable development of the dairy and grocery sub complex and ensure the production of milk in accordance with the recommended level of consumption by 2020.
4. The mechanism of distribution of profits from the dairy products production and sales as an additional source of investment for labor productivity growth. In contrast to the existing mechanisms, this one is based on the distribution of profit resulting from the production and sale of dairy products across the areas depending on the turnover of raw materials by product types. Agricultural organizations producing milk use a wide range of material resources as inventories. Milk in them is mainly used to feed calves in small quantities and for the needs of cafeterias. For industrial companies producing dairy products, milk is the main raw material. For commercial organizations, the main product is already finished, processed dairy products. Profit from the sale of various types of dairy products is advisable to distribute in accordance with the obtained volume by its types. It is advisable to forward 53% from the profits obtained in the production, processing and

sale of pasteurized milk, rennet cheese, and cottage cheese to agriculture development and 37% to the development of processing industries.

4. DISCUSSION

4.1. Theoretical Basis for Sustainable Development of the Dairy and Grocery Sub Complex

The development of the dairy and grocery sub complex of the region should be considered in the context of the processes of globalization and integration of the Russian economy into the world space. In the current context of globalization, there are certain transformation and reinterpretation of the previously known risk factors, as well as the emergence of new specific factors related to changes in the socio-economic conditions.

According to scientists, the sustainable development of dairy cattle breeding requires innovations in the major areas of the industry: Biological, scientific, technological, organizational, economic and human. This will ensure labor productivity growth, lead to lower production costs and increase its competitiveness. Active implementation of innovation requires major investment, which is currently difficult due to the high capital intensity of the sector of dairy farming and its low payback.

One of the conditions for sustainable development of the dairy and grocery sub complex is the production of competitive dairy products tolerant to falling prices. This requires the formation of factors of sustainable development at all stages: Production of raw milk, its processing and marketing of dairy products.

Generalizing the theoretical and practical scientific developments, it is proposed to clarify the concept of sustainable development of the dairy and grocery sub complex of the region and to consider it in the context of the processes of globalization and integration of the Russian economy into the world space.

The sustainable development of the dairy and grocery sub complex of the region must be understood as a continuous targeted process of control of the production factors on the basis of labor productivity growth in order to ensure the production of milk and dairy products at the recommended consumption level both domestically and for export, competitive with the products of leading world producers represented in domestic and foreign markets.

Introduction of advanced technology to agricultural production of Novosibirsk region contributes to the formation of positive trends in dairy cattle breeding. During the period from 2000 to 2013, growth of animal productivity in the agricultural organizations totaled 58.5%, feed consumption for production of 1 dt of milk decreased by 18.3%, which helped contain the cost of dairy products.

The slower return on funds invested in dairy cattle breeding in the region, compared with other sectors of the economy, did not allow increasing the milk production in a relatively short period of time with noted positive trends, but helped curb the rate of decline. During the mentioned period, a decrease in milk production in the region totaled to 29%, while in agricultural organizations this figure is lower - 1.2%.

4.2. Indicators of Efficient Milk Production in the Region

Labor productivity growth will be one of the conditions for higher wages in the industry. The methodology of calculation of the parameters is the following: (a) Calculation of the structure of employees engaged in the production of milk, depending on the mode of production organization; (b) introduction of the index of the workers ratio expressed in terms of rates relative to the load of cows per one milking machine operator; (c) calculation of wages of employees engaged in the production of milk, taking into account the average wage in the region; (g) calculation of the milk production indicators across the options, based on the labor productivity; (d) assessment of options.

Several options of the organization of production with productivity 4000-5000 kg/year were considered in order to determine the milk production parameters.

In the first option, the load of milking machine operators, operators involved in the maintenance of dairy herds and tractor drivers expressed in terms of rates (relative to the load of cows per one milking machine operator) is 1/0.27/0.13.

In the second option, the headcount is served by two categories of employees: Operators of milking machines and the operators involved in the maintenance of the dairy herd. Load ratio for the marked categories of employees expressed in terms of the rates (relative to the load of cows per one milking machine operator) is 1/0.52.

The third option is more high-tech: Milking platforms are used. Cows load ratio expressed in terms of the rates (relative to the load of cows per one milking machine operator) is 1/0.64/0.33.

With an annual productivity of 45 dt of milk production per shift for the first option is defined as 45 dt/300 days 42 heads = 7 dt, for the second option as 45 dt/300 days 26 heads = 4.3 dt, for the third option as 45 dt/300 days 111 heads. The wages for the first two options do not correspond to labor productivity and considerably exceed the value of the third option.

Labor productivity in the region in 2013 for the production of 1 dt of milk was 2.65 man-hours, it is close to the parameters of the second option calculated by us in the amount of 2.7 man-hours and indicates a low level of milk production technology in the region and, as a consequence, low wages.

As a result of our calculation, the indicators of milk production in the region are obtained in relation to the conditions of the region under which the wages can reach the regional average.

In this case, the load on the operator of machine milking should not be <111 heads with a high level of mechanization. The load on the operator engaged in the maintenance of dairy herds should be at least 234 heads, on the tractor driver-not <455 heads, cows

productivity-4500 kg of milk/year, with loose year-round cows stabling, the level of wages in milk production costs not exceeding 19%, and overhead level not exceeding 31.3% (Table 1).

One of the conditions for higher wages in the region will be an increase in labor productivity. Reduction of direct labor costs must be at least 3.4 times, down to 0.8 man-hours. Extrapolating the values of the trend equation obtained by us for the future = $a + a_1 t = 4.84 - 0.32893t$, this level of labor productivity is likely to be achieved by 2020.

4.3. Proposals for the Development of Dairy Cattle Breeding in Novosibirsk Region through to 2020

Reduction in production values for crop and livestock sectors, reduction in acreages and livestock and low production profitability all cause a lack of financial resources in the agricultural organizations, which, in turn, has an impact on the performance of agricultural machinery provision.

For the sustainable development of the dairy and grocery sub complex, the trend of reducing milk production should be stopped and its growth in the conditions of increase of labor productivity should be ensured. Realization of this direction requires appropriate high-performance modern technology and modernization of dairy farms.

Currently, provision of agricultural organizations with agricultural machinery is reduced (Table 2).

Provision with milking machines and units per 100 heads for the analyzed period decreased by 16.2%, provision with tractors per 100 ha of arable land decreased from 0.82 to 0.48, or by 41.5%, and provision with harvesters decreased by 42.5%.

The need for funding for the purchase of milking equipment, tractors and combine harvesters is 26.031 bln rub. (Table 3).

The departmental target program "Development of dairy cattle breeding in Novosibirsk region for 2014-2020" provides funding in the amount of 10.5 bln rub. If agricultural producers are compensated 50% of the purchase price of the equipment and machines, 13.015 bln rub. will be required. Thus, the shortage of funds compared with the need for funding is about 3 bln rub.

Both imported and domestic machinery is available in the market of agricultural machinery and equipment in the region. Purchase of combine harvesters of domestic producers "Vector," "KZS-950," "Don-1500B," "Acros 530" and others, and modernization of existing equipment are the most efficient for Novosibirsk region.

Reconstruction of farms can be conducted on several fronts: Technical re-equipment and repair of industrial premises; conversion of livestock buildings; construction of auxiliary and ancillary facilities. Costs for renewal of 1 cattle stall in 2013 prices will be from 12,009 to 14,760 rub.

Taking into account the compensation of 50% of the purchase price of equipment and machinery to agricultural producers, in accordance with the departmental target program "Development of dairy cattle breeding in Novosibirsk region for 2014-2020," the shortage of funds compared with the need for funding is about 3 bln rub.

The reorganization of livestock farms will require another 2.036 bln rub. (Table 4), or 1.018 bln rub. if we take compensation into account.

Table 1: Calculation of indicators of milk production in the region

Indicator	Option		
	1	2	3
Load per one operator of machine milking, heads	42	26	111
Annual productivity of cows, dt	45	45	45
Milk production per shift, dt	6.3	3.9	16.6
Number of rates, ea	1.4	1.52	1.97
Direct labor costs for milk production, man-hours	11.2	12.2	15.8
Direct labor costs for production of 1 dt of milk, man-hours	1.5	2.7	0.8
Wages for milk production per month, rubots	46,889.6	50,908.7	65,980.5
Wages per day (20 days) rubots	2344.5	2545.4	3299.0
Wages with insurance contributions per 1 dt of milk, rubots	372.1	652.7	198.7

Table 2: Provision of agricultural organizations of Novosibirsk region with machinery

Indicators	2001	2012	2013	2013 in % to	
				2001	2012
Number of tractors per 100 ha of arable land, ea	0.82	0.51	0.48	58.5	94.1
Per 100 tractors, ea. Plows	32	29	28	87.5	96.6
Sowers	56	52	50	89.3	96.2
Mowers	15	15	16	106.7	106.7
Cultivators	27	28	28	103.7	100.0
Harrows	415	422	402	96.9	95.3
Combine harvesters per 1000 ha of grain crops, ea	4	2.7	2.3	57.5	85.2
Seasonal load per 1 combine harvester, ha	251	376	430	171.3	114.4
Milking machines and units per 100 cows, ea	1.36	1.16	1.14	83.8	98.3

Table 3: Calculation of the needs of the agricultural organizations of the region in financial resources for the purchase of milking equipment, tractors and combine harvesters

Equipment	Need, ea.	Estimated price for 1 price thousand rubots	Price, mln rubots
Milking machines and units	886	166.7	147.7
Tractors	7726	2470.8	19,089.6
Combine harvesters	1644	4132.4	6793.7
Total			26,031.0

Total shortage of funds will be 4.018 bln rub. It is necessary to make adjustments to the departmental target program "Development of dairy cattle breeding in Novosibirsk region for 2014-2020" and provide for additional funding in the amount of 4.018 bln rub.

The noted measures will lead to an increase in milk production in accordance with the recommended level of consumption (312-315 kg/person per year).

The population of Novosibirsk region amounted to 2746.8 thousand people as of January 01, 2015. At this level of consumption, milk production should reach 865.2 thousand tons (2746.8×315). There is a trend of population growth in the region, so the population growth trend equation $y_t = a + a1t = 2678.3 + 14.679t$ was made, and values were extrapolated for the period through to 2020. "Forecast of long-term socio-economic development of the Russian Federation through to 2030" provides that milk production will grow by 1.2-1.4 times by 2030 relative to 2011. Labor productivity growth will allow achieving the necessary level of consumption of dairy products by 2020, if equipment manufacturers are provided with high-performance machinery (Table 5).

Shortage of milk production in the region amounted to 206.1 thousand tons in 2013. Forecast of the milk production, compiled on the basis of the identified trend in labor productivity growth and the region's population showed that Novosibirsk region will achieve the sustainable development of dairy and grocery sub complex by 2020 and ensure the production of milk in accordance with the recommended levels of consumption.

4.4. Factors that Influence the Profit Generations in the Fields of Industrial Processing of Milk and Dairy Products Trade

Prices for dairy products in the dairy and grocery sub complex are formed in three fields: Milk production, its processing and sale of dairy products. Distribution of profits is one of the most important aspects of financial management of the organization. The suggested mechanism is based on the distribution of profits derived from milk production, processing and sale of dairy products across the fields of production, depending on the turnover of raw materials in the field of milk processing and finished products turnover in retail trade across its types (Tsoi, Shelkovnikov and Fedorov, 2014).

Agricultural organizations producing milk use a wide range of material resources as inventories. Milk in them is mainly used to feed calves in small quantities and for the needs of cafeterias. For industrial companies producing dairy products, milk is the main raw material. For commercial organizations, the main product is already finished, processed dairy products (Table 6).

Distribution of profits includes the following stages: Study of the dynamics and identification of the structure of trends in retail prices for basic dairy products; analysis of the change in profitability ratio on the stages of milk production, its processing and sale of dairy products in which the general trends were identified; determining

Table 4: Calculation of the need for financial resources for the reconstruction of dairy farms, mln rubots

Headcount of dairy farms, heads	Headcount	Option				Total
		1	2	3	Robots	
up to 100 and 100	91,321	222.8	-	269.6	1243.0	1735.4
200	10,904	28.2	27.7	29.1	-	85.0
400 and more	34,075	113.5	-	102.3	-	215.8
Total	136,300	364.5	27.7	401.0	1,243.0	2036.2

Table 5: Forecast of milk production in Novosibirsk region, thousand tons

Indicator	2013	2014	2015	2016	2017	2018	2019	2020	2020 in % to 2013
Population, thousand people	2731	2745	2759	2774	2789	2803	2818	2833	103.7
Need for milk	860.3	864.7	869.1	873.8	878.5	882.9	887.7	892.4	103.7
Milk production in agricultural enterprises	468.1	491.1	515.3	540.7	567.3	595.3	624.6	655.3	140.0
Milk production in personal subsidiary plots	175.1	183.7	192.8	202.3	212.2	222.7	233.6	245.1	140.0
Milk production in peasant farm enterprises	11.0	11.5	12.1	12.7	13.3	14.0	14.7	15.4	140.0
Total milk production	654.2	686.4	720.2	755.7	792.9	831.9	872.9	915.9	140.0
Milk shortage	−206.1	−178.3	−148.9	−118.1	−85.6	−51.0	−14.8	23.5	-

Table 6: Structure of costs across the fields of dairy production

Milk production	Share	Milk processing	Share	Dairy products trade	Share
Raw materials and basic supplies		Fixed raw materials		Raw materials and basic supplies	
Wages and social security contributions	19.8	Raw milk	67.3	Ready-made dairy products	80.0
Fodder, total	39.4	Wages and contributions	22.5	Wages and contributions	14.2
Including fodder of own production	32.0	Electric power	3.0	Electric power	1.5
Electric power	3.7	Petrochemicals	2.1	Petrochemicals	0.5
Petrochemicals	4.6	Fixed assets maintenance	1.1	Fixed assets maintenance	1.2
Fixed assets maintenance	13.9	Other	4.0	Other	2.6
Other	18.6				
Costs, total	100.0		100.0		100.0

profits from 1 kg of milk production expressed as milk, depending on the product type; calculation of the mass of profits at all stages of the production of dairy products, taking into account inventory turnover; distribution of profits.

In result of the retail price structure analysis, it was found that the dynamics of the structure of prices for dairy products sees a trend of the increase of the share of materials sector in low transportable products-pasteurized milk, and its decline in high transportable products-butter, sour cream, cottage cheese. Rennet cheese is a high transportable product, but the share of raw materials in its price increases. The structure of the retail prices of all types of dairy products analyzed for the period from 2000 to 2013 sees an increase in the share of profits of industrial companies (field of milk processing) and trade (field of circulation). The maximum increase in the share of profits in the field of milk processing can be noted in the structure of the prices of butter - 13.3%. The highest level of income in this field is obtained from the production of low-fat cottage cheese - 6.4%. In the field of circulation, the highest profit share in the amount of 7.1% was ensured by the sale of rennet cheeses. The field of the milk production, with the lowest inventory turnover, does not profit from refining and marketing. The exceptions are agricultural organizations which have organized workshops for own milk processing or which are included in integrated formations.

The analysis of the dynamics of profitability at the stages of milk production, it's processing and sale of dairy products was conducted. The desired values are calculated for the products in which the uniform trend took shape. From low transportable products, the pasteurized milk was included in the calculation; rennet cheese and low-fat cottage cheese from high transportable products were included in the calculation. Profits derived from sales in 2013 exceeded profits from the processing of milk in the price of 1 kg of pasteurized milk by 6.6 times, cheese - by 5.0 times, cottage cheese - by 3.9 times.

Indicators of absolute profit values in relation to costs show the effectiveness of the invested costs. For a more complete characterization of the profits derived, inventory turnover indicators were considered. Taking into account the turnover, the mass of profits from milk production, its processing and sale of dairy production was found:

$$T = \frac{V}{Sav'}$$

Where T is inventory turnover; V is cost of sales; Sav is average stock.

Inventory turnover in the agricultural organizations amounted to 1.4 times a year. Inventory turnover is much higher in the industrial and commercial organizations. Milk is a perishable raw material, so it cannot be stored for a long time in processing plants and in retail stores.

Turnover of milk in stocks in production of pure pasteurized milk in processing plants is 360, cottage - 270, cheeses - 3.

4.5. Mechanism of Distribution of Profits Derived from the Fields of Industrial Milk Processing and Dairy Products Trade

Retail organizations plan their assortment depending on the chosen strategy and the level of service. Dairy products are a commodity group consisting of essential goods and aimed at meeting the daily demand.

Safety stock for pasteurized milk is not planned in modern conditions. By studying the demand for milk, store management determines the required amount of milk on the basis of its potential sale over the trading day. Therefore, turnover of the pasteurized milk stocks in retail outlets is 360/year. Let's set stocks turnover for cottage cheese as 72, for cheese-as 51.

Processing plants received 36 rub. of profit from processing of raw milk into pasteurized at year-end due to the turnover of 1 l, while trade organization received 237.6 rub., or 6.6 times more (Table 7).

Production of rennet cheese at a low rate of return and the turnover adopted by us according to the size of the profits obtained was almost on par with agriculture, so this kind of dairy products has not yet received the mass distribution in the region. But this type of product is more profitable for trade organizations, where profit exceeded the field of processing by 85 times. Regarding the production of low-fat cottage cheese, it may be noted that both fields, processing and trade, receive almost the same profit - 45.9 and 48.24 rub., respectively.

Profit from milk production, its processing and sale of various types of dairy products is advisable to distribute according to the received volume by types of dairy products: It is advisable to forward 53% from the profits obtained in the production, processing and sale of pasteurized milk, rennet cheese, and cottage cheese to agriculture development and 37% to the development of processing industries (Table 8).

Let's present the mechanism of distribution of profits as a formula:

$$P_{arg.\ i} = \sum P_{mi} - k_{pi}\frac{V_{pi}}{S_{pi}}P_{ed\ pi} - k_{ri}\frac{V_{ri}}{S_{ri}}P_{ed\ ri}$$

Where $P_{agr.\ i}$ - amount of profit intended for the development of agricultural producers that produce raw milk from the production, processing and sales of the i^{th} type of product, rub/kg;

$\sum P_{mi}$ - Mass of profits resulting from the production, processing and sales of the i^{th} type of products rub/kg;

V_{pi} - Cost of sales of the i^{th} type of products by the processing organization (subdivision), rub.;

V_{ri} - cost of sales of the i^{th} type of products by retail organization (subdivision), rub.;

S_{pi} - Average milk trading stock for the production of the i^{th} type of products by the processing organization (subdivision), rub.;

S_{ri} - Average milk trading stock for the sale of the i^{th} type of products by the retail organization (subdivision), rub.;

P_{edpi} - Profits derived from the production and sale of the unit of the

Table 7: Calculation of profit derived from milk processing and sales of dairy products in 2013, rubots

Indicator	Pasteurized milk		Rennet cheese		Low-fat cottage cheese	
	Processing	Trade	Processing	Trade	Processing	Trade
Size of profit per 1 kg of product	0.10	0.66	0.15	0.75	0.17	0.67
Stocks turnover, number per year	360	360	3	51	270	72
Estimated profits, due to turnover per year	36.0	237.6	0.45	38.25	45.9	48.24
Total profits from processing and sale	273.6		38.7		94.14	

Table 8: Proposals for the distribution of profits obtained from the production and sales of milk and dairy products per 1 kg (according to 2013)

Indicator	Pasteurized milk			Rennet cheese			Cottage cheese		
	Agriculture	Processing	Trade	Agriculture	Processing	Trade	Agriculture	Processing	Trade
Profits due to the turnover in the fields of production of dairy products, rubots	0.52	36.0	237.6	0.50	0.45	38.25	0.52	45.9	48.24
Mass of profits due to the turnover in the production of dairy products per year, rubots	274.12			39.20			94.66		
Distribution of the mass of profits, %	53	37	10	53	37	10	53	37	10
The amount of profit by fields after distribution, rubots	145.28	101.4	27.41	20.78	14.50	3.92	50.2	35.0	9.5

i^{th} type of products by processing organization (subdivision), rub.;

P_{edri} - Profits derived from the sale of the unit of the i^{th} type of products by retail organization (subdivision), rub.;

K_{pi} - Coefficient of distribution of profits obtained from milk processing;

K_{ri} - Coefficient of distribution of profits obtained from the sale of dairy products.

The proposed coefficients of distribution for the analyzed products are K_{pi} - 0.37; K_{ri} - 0.10.

Consequently, 53% of profits obtained at all stages of production of dairy products should be forwarded to agriculture. Distribution mechanism at the level of the region will allow adjusting the subsidies forwarded to the dairy and grocery sub complex by the fields of production of dairy products and raise additional funds in the field of milk production, which is currently not involved in the distribution of profits from milk processing and sale of dairy products.

5. CONCLUSION

1. Sustainable development of the dairy and grocery sub complex of the region should be considered in the context of the processes of globalization and integration of the Russian economy into the world space. The sustainable development of the dairy and grocery sub complex of the region must be understood as a continuous targeted process of control of the production factors on the basis of labor productivity growth in order to ensure the production of milk and dairy products at the recommended consumption level both domestically and for export, competitive with the products of leading world producers represented in domestic and foreign markets.
2. Introduction of advanced technology to agricultural production of Novosibirsk region contributes to the formation of positive trends in dairy cattle breeding. During the period from 2000 to 2013, growth of animal productivity in the agricultural organizations totaled 58.5%, feed consumption for production of 1 dt of milk grew only by 3.4%, which helped contain the cost of dairy products.
3. The slower return on funds invested in dairy cattle breeding in the region, compared with other sectors of the economy, did not allow increasing the milk production in a relatively short period of time with noted positive trends, but helped curb the rate of decline. During the mentioned period, a decrease in milk production in the region totaled to 29%, while in agricultural organizations this figure is lower - 1.2%.
4. Labor productivity in the region in 2013 for the production of 1 dt of milk was 2.65 man-hours, which indicates a low level of milk production technology in the region and, as a consequence, low wages.
5. The indicators for the sustainable development of dairy cattle breeding in the agricultural organizations of the region for milk production are defined as follows: The load on the operator of machine milking should not be <111 heads with a high level of mechanization; the load on the operator engaged in the maintenance of dairy cattle should not be <234 heads, and the load on the tractor driver should not be <455 heads; cows productivity should be 4500 kg of milk per year, with loose year-round cows stabling; the level of wages in the cost of milk production should not be more than 19%, the level of overhead costs should not be higher than 31.3%. The growth of labor productivity will be one of the conditions for higher wages in the region. Reduction in direct labor costs must be at least 3.4 times, down to 0.8 man-hours. This level of productivity can be achieved by 2020.
6. Insufficient provision of modern high-performance agricultural machinery was noted in dairy cattle breeding. The introduction of advanced technology and equipment will allow increasing milk production, improving its quality,

and reducing the influence of the human factor due to growth in labor productivity. At present, new high-performance technology in the production of milk is being introduced more slowly than required by modern society. The need for funding the purchase of milking equipment, tractors and combine harvesters is 26.031 bln rub. To speed up the modernization and growth of technology security, it is necessary to make adjustments to the departmental target program "Development of dairy cattle breeding in Novosibirsk region for 2014-2020" and provide for additional funding in the amount of 4.018 bln rub.

7. Shortage of milk production in the region in 2013 amounted to 207.1 thousand tons. Forecast of milk production compiled on the basis of the identified trends in labor productivity growth and the region's population showed that Novosibirsk region will achieve the sustainable development of milk and grocery sub complex by 2020 and ensure milk production above the recommended amount of consumption by 23.5 thousand tons.
8. The mechanism of redistribution of profits to increase the economic interest from agricultural producers in the fields of milk production, processing and sale lies in the distribution of profits from the sale of certain types of dairy products in accordance with its volume by type of dairy products based on inventory turnover.

Profit from the milk production, processing and sale of various types of dairy products is advisable to distribute in accordance with its volume by the types of dairy products: It is advisable to forward 53% from the profits obtained in the production, processing and sale of pasteurized milk, rennet cheese, and cottage cheese to agriculture development and 37% to the development of processing industries.

The proposed allocation mechanism will allow raising additional funds in the field of milk production, which is currently not involved in the distribution of profits from milk processing and sale of dairy products.

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