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OPTIMIZATION OF ECONOMIC AND BREEDING-TECHNOLOGICAL PARAMETERS OF THE BEEF CATTLE HERD

ЕТТІ БАҒЫТТАҒЫ ІҚМ ТАБЫНЫНЫҢ ЭКОНОМИКАЛЫҚ ЖӘНЕ СЕЛЕКЦИЯЛЫҚ-ТЕХНОЛОГИЯЛЫҚ ПАРАМЕТРЛЕРІН ОҢТАЙЛАНДЫРУ

ОПТИМИЗАЦИЯ ЭКОНОМИЧЕСКИХ И СЕЛЕКЦИОННО-ТЕХНОЛОГИЧЕСКИХ ПАРАМЕТРОВ СТАДА КРС МЯСНОГО НАПРАВЛЕНИЯ

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Abstract. In recent years, Kazakhstan and Russia have adopted a number of government programs aimed at developing beef cattle breeding. This issue is relevant at present, since the republic has a unique set of resource potential for the development of this industry and potential sales markets. The aim of the study is to find optimal solutions for creating beef cattle herds associated with various lending options for these projects and maintaining the high genetic status of farmed animals. The article discusses the current status of the implementation of existing programs on development of beef cattle breeding. Planned indicators of the formation of beef cattle herd with expanded reproduction are presented. A schedule of repaying credit debt has been calculated, taking into account the possible sales volumes of breeding and commodity livestock. It has been determined that in the existing terms for loan funds repayment, enterprises are forced to send most of the received young stock to the market. The authors believe that it is necessary to control not only investment and economic, but also breeding and technological parameters. For the effective development of beef cattle breeding, the necessity of forming a loan portfolio with a long repayment period is justified. This will reduce the need for loan provision and generate an incentive for business entities to expand the reproduction of meat livestock herds.

Аңдатпа. Соңғы жылдары Қазақстан мен Ресейде етті мал шаруашылығын дамытуға бағытталған бірқатар мемлекеттік бағдарламалар қабылданды. Бұл мәселе қазіргі уақытта өзекті, өйткені республика осы саланы дамыту үшін ресурстық әлеуеттің бірегей жиынтығына және әлеуетті өткізу нарықтарына ие. Зерттеудің мақсаты осы жобаларды несиелеудің әртүрлі нұсқаларымен және өсірілетін жануарлардың жоғары генетикалық мәртебесін ұстап тұрумен байланысты ет малының табындарын құру кезінде оңтайлы

шешімдерді іздеу болып табылады. Мақалада етті мал шаруашылығын дамыту бойынша қолданыстағы бағдарламаларды орындаудың ағымдағы жағдайы қарастырылған. Кеңейтілген ұдайы өндіріс кезінде етті мал табынын қалыптастырудың жоспарлы көрсеткіштері келтірілген. Асыл тұқымды және тауарлық малды өткізудің ықтимал көлемін ескере отырып, несиелік берешекті өтеу кестесі есептелген. Несие қаражатын өтеу мерзімі бар кезде кәсіпорындар алынған төлдердің көп бөлігін нарыққа жіберуге мәжбүр екені анықталған. Авторлар инвестициялық-экономикалық қана емес, селекциялық-технологиялық параметрлерді де бақылау керек деп санайды. Етті мал шаруашылығын тиімді дамыту үшін қайтарым мерзімі көп несиелік ресурстар қоржынын құру қажеттілігі негізделген. Бұл несиелік қамтамасыз ету қажеттілігін азайтуға және шаруашылық жүргізуші субъектілердің ет өнімділігі бағытындағы мал табындарын кеңейтіп, ұдайы өндірісті ынталандыруын қалыптастыруға мүмкіндік береді.

Аннотация. В последние годы в Казахстане и России принят ряд государственных программ, направленных на развитие мясного скотоводства. Этот вопрос актуальный в настоящее время, поскольку республика обладает уникальным набором ресурсного потенциала для развития данной отрасли и потенциальными рынками сбыта. Целью исследования является поиск оптимальных решений при создании стад мясного скота, связанных с различными вариантами кредитования данных проектов и поддержанием высокого генетического статуса разводимых животных. В статье рассматривается текущее состояние выполнения действующих программ по развитию мясного скотоводства. Приведены плановые показатели формирования стада мясного скота при расширенном воспроизводстве. Рассчитан график погашения кредитной задолженности, с учетом возможных объемов реализации племенного и товарного скота. Установлено, что при существующих сроках возмещения кредитных средств предприятия вынуждены большую часть полученного молодняка направлять на рынок. Авторы считают, что следует контролировать не только инвестиционно-экономические, но и селекционно-технологические параметры. Для эффективного развития мясного скотоводства обоснована необходимость образования портфеля кредитных ресурсов с большим сроком возврата. Это позволит уменьшить потребность в кредитном обеспечении и сгенерировать стимул у хозяйствующих субъектов к расширенному воспроизводству стад скота мясного направления продуктивности.

Keywords: agriculture, lending, beef cattle, expanded reproduction, agribusinesses, investment and economic, breeding and technological parameters, resource potential, food.

Түйінді сөздер: агроөнеркәсіптік кешен, несиелендіру, ет малы, кеңейтілген ұдайы өндіріс, агроқұрылымдар, инвестициялық-экономикалық, селекциялық-технологиялық параметрлер, ресурстық әлеует, азық-түлік.

Ключевые слова: агропромышленный комплекс, кредитование, мясной скот, расширенное воспроизводство, агроформирования, инвестиционно-экономические, селекционно-технологические параметры, ресурсный потенциал, продовольствие.

Introduction. Kazakhstan's beef cattle have sufficient amount of unused reserves, which have already been discussed many times. They include the presence of 180 million hectares of natural pastures, the high potential of the domestic and foreign market for high-quality beef, the share of labor resources of more than 40% lives in rural areas, the presence of domestic breeds of cattle meat productivity “Kazakh white-headed”, “Auliekolskaya”, etc. It allows to develop the industry not only through intensification, but also to make wider use of extensive methods.

The Government of the Republic of Kazakhstan is being implementing several programs aimed at the development of beef cattle in the country. They are the following: the Program of “Development of the export potential of cattle meat in the Republic of Kazakhstan for 2011-2020” [1], the Program for crediting the Agro-Industrial Complex Subjects for acquisition of stock cattle and breeding bulls for the reproduction of young meat breed (“Sybaga”) [2]. Its main targets are to increase the number of animals of meat breeds to 61% of the total cattle population in the country and to export up to 180 thousand tons of beef. During the years of these programs' implementation, the large livestock volumes of meat animals were delivered and the supply of beef abroad in 2018 amounted up to 19.4 thousand tons. Therefore, it is necessary to significantly increase the dynamics of export indicators for the implementation of these programs [3].

The existing government programs are aimed only at creating new farms of beef cattle, and do not take into account the possibilities for their further development. At this stage, it is necessary to consider how to stimulate enterprises to further increase of meat producing after the first stage consisting in the delivery and acclimatization of beef cattle has been successfully implemented. The priority in the future must be given to the enterprises where the development path associated with the expanded reproduction of the herd is chosen.

Material and methods of research. Omarova A.T., Emelina N.K. and Kurmanalina A.K. consider that one of the main tasks of agro-industrial production sustainable development in Kazakhstan is its financial support. The authors believe that strategic importance and specific features of the agricultural sector require further development of specific investment approaches at the regional level [4].

A.K. Dzhusibalieva and G.Zh. Abdykerova paying attention to the problems of unemployment in agricultural sector believe that the efficient use of labor resources at the stage of industrial-innovative development of the national economy and diversification of the agro-industrial complex of the Republic of Kazakhstan is the main factor in increasing employment of the rural population [5].

In accordance with the scientific position of Esengalieva S.M. the organizational and economic measures and tools for the effective functioning of cooperative structures in the agrarian sector are to be understandable for business. The necessity of state and regional programs for the development of agricultural cooperation, taking into account the specific regional features, is substantiated [6].

Kantarbaeva Sh.M. and Tlesova A.B. consider the scoring capacities under subsiding the AIC-producers in the Republic of Kazakhstan. The authors believe that the creation of organizational schemes for the allocation and evaluation of the subsidies' use effectiveness with the active participation of the local executive bodies will contribute to the optimal use of budget funds [7].

Results and their discussion. The draft program of beef cattle development in the Republic of Kazakhstan is associated with the presence of many risks. Their structure and degree of influence can be identified by comparative analysis on the principles of benchmarking. As an object for comparison the similar programs, adopted in the Russian Federation, may be considered. The first of them was adopted for the period of 2009-2012, and the second is for 2013-2020 [8].

The success of its implementation can be judged in accordance with the data of beef production in Russia over the past few years, provided by the «Experimental and Analytical Center for Agribusiness».

These data confirm that the final indicator expressing effectiveness of these programs (namely, beef production) decreased. Thus, if in 2008, 1 769 thousand tons of beef were produced, then in 2016, 150 thousand tons less. The increase of gross meat production was provided by poultry and pig breeding [9].

The total investments in Russian programs amounted up to 84.6 billion rubles. The effectiveness of these public investments still shows negative result.

The opportunities for the development of beef cattle in Kazakhstan can be considered on a specific example (table 1).

If the setting process of beef cattle herd begins with the delivery of 200 heifers or pregnant heifers and 6 manufacturing bulls, then in the second year of the project it is planned to receive 170 calves from them and 193 first time giving birth cows will be transferred to cows. The output of calves per 100 pregnant heifers will be 86 heads.

When forming the herd by delivering heifers, because of their rejection during the insemination stage, the output of calves and the number of heifers will be slightly lower. Also, the risks of the project at this stage include the safety of imported livestock and received young stock due to acclimatization. All this leads to the decrease of the project effectiveness and requires the development of measures to neutralize these risks. To such measures authors refer purchasing the pregnant heifers, the importation of livestock from regions with similar agro-climatic conditions, the creation of optimal conditions for feeding and housing for the imported cattle.

The increase in livestock amount in the herd during the first 4 years will be due to the production of young stock. In the fourth year, the first sale of the grown bulls is possible in the amount of 80 heads and 20 super-repaired heifers culled as a result of assessment for exterior and development. The best 60 heads of the repaired heifers will be inseminated and transferred to the group of pregnant heifers. According to the evaluation of repaired bulls, 2 heads will be selected for use in their own herd. The size of the selection pressure of 97.5% will allow selecting animals with high exterior parameters and their own productivity. Such parameters can be daily average growing gains, early ripeness and payment for feed, as well as external forms reflecting high meat productivity. As for the re-

pair heifers, here the selection pressure will be low (approximately within 25%). There is a danger of entering into a herd the low-productive animals, but this risk is justified by the need for expanded reproduction of the main herd of cows.

Table 1 – The plan of beef cattle herd turnover with expanded reproduction

Year of the project implementation	Technological groups of animals	Livestock, heads						
		Beginning of the year	Animal litter	Transfer from other groups	Transfer to other groups	Livestock sale and slaughter	Livestock fall	End of the year
1	Pregnant heifer	-	-	200	-	-	4	196
	Bulls (producers)	-	-	6	-	-	-	6
	Totals	-	-	206	-	-	4	202
2	Cows	-	-	193	-	-	-	193
	Bulls (producers)	6	-	-	-	-	-	6
	Pregnant heifer	196	-	-	193	-	3	-
	Young stock up to 1 year	-	170	-	-	-	4	166
	Totals	365	164	166	166	1	10	518
…	…	…	…	…	…	…	…	…
11	Cows	400	-	85	-	80	5	400
	Bulls (producers)	13	-	4	-	4	-	13
	Pregnant heifer	87	-	90	85	-	5	87
	Young stock up to 1 year	368	410	-	362	-	16	400
	Heifers over 1 year old	161	-	181	90	68	8	176
	Bulls over 1 year old	161	-	181	4	154	8	176
	Totals	1 190	410	541	541	306	42	1 252

Only in the fifth year of the project, 55 heifers of their own reproduction will be transferred to the group of cows. Its number to the total amount of heifers born 3 years ago will be 55/83 (or 66.3%), that is, almost 3 of them born into the main herd with extended reproduction transferred 2 heads. This will increase the livestock of the main herd by 27.6%.

The ratio of the stock of first time giving birth cows to cows with two or more calves will be 29.3%. In the future, the growth rate of the livestock in the main herd is planned to be reduced to 15.4% in the sixth year, 13.3% in the seventh year, 9.9% in the eighth year, 8.9% in the ninth year and 6.3% in the tenth year of implementation project. In the eleventh year, the number of cows under such circumstances will double and reach the planned figure of 400 animals.

If they provide a high growth rate of livestock of cows, then this number can be achieved 2 years earlier. But this is not the best way to affect the quality of breeding stock and reduce sales, and hence it may negatively effect to the cash receipts.

The structure of the herd and all quantitative indicators will be stabilized to the 11th year. The share of cows in the herd will be within 32%, its annual rejection is 15-20%. In order to provide qualitative repair of the main herd of cows, the share of pregnant heifers in the overall structure should be 6.5-7.0%. The value of the selection pressure during the repair of breeding herd will be established within 50%, i.e. every second heifer from the total number of births will be transferred to the main herd. Here it is necessary to strictly control the rate of calves output per 100 cows, since as it decreases, breeding pressure will also decrease and it does not allow performing an effective selective-breeding work. As for the repair of the father's livestock, the annual entry into the herd of 3-5 bulls-producers allows to select from the repair bulls high-qualitative animals for the parameters of their own productivity, productivity of parents and side relatives. In conjunction with the assessment of the quality of the breeding, this will provide basic share of the breeding progress in the herd.

When the project reaches the estimated parameters, annual sales will reach 300 units or more, including the culled cows and bulls of the main herd (80-85 heads), super-repair heifers (65-70 heads) and bulls with fattening and growing (150-160 heads).

Considering the level of current market prices for beef cattle products, namely breeding and marketable young stock, sales can be in the range of 85-90 million tenge, and the amount of required borrowed funds for the purchase of breeding heifers and manufacturing bulls will be in the range of 140-150 million tenge (table 2).

The enterprise with expanded reproduction will be able to reach these volumes of sales only to the 10th-11th year of the project. Further on, in order to be able to pay basic debt and interest on time, it is necessary to maintain the project's profitability level in the range of at least 40-45%. In this case, as shown by the results of economic calculations, production costs will be in the range of 27 million tenge.

Table 2 – Planning beef cattle sales with extended reproduction of the herd

Project year	Type of products sold												Total	
	Rejected cows		Rejected bulls		Breeding bulls		Bulls from fattening		Tribal bulls and female heifers		Feeding heifers and culled heifers			
	number	mln. tons	number	mln. tons	number	mln. tons	number	mln. tons	number	mln. tons	number	mln. tons	number	mln. tons
3	-	-	1	0.41	-	-	-	-	-	-	-	-	1	0.41
4	-	-	-	-	16	7.92	64	14.78	10	4.40	10	2.09	100	29.19
5	-	-	1	0.41	15	7.40	60	13.90	10	4.40	14	3.04	100	29.15
6	10	5,03	1	0.41	15	7.40	60	13.90	8	3.50	13	2.85	107	31.10
7	15	4.50	1	0.41	20	9.90	74	17.10	12	5.30	16	3.40	138	40.60
8	30	9.07	1	0.41	22	10.90	91	21.00	22	9.70	26	5.50	192	56.60
9	30	9.07	2	0.80	25	12.40	101	23.30	25	11.00	27	5.67	210	62.24
10	41	12.40	3	1.20	29	14.40	116	26.80	30	13.20	35	7.50	254	75.50
11	80	24.20	4	1.60	30	14.80	124	28.60	34	15.00	34	7.10	306	91.30

Consequently, in order to meet all needs for current production costs, the gross income from the sale of products must be at least 30 million tenge per year. The volumes of the planned gross income, sufficient for this, will be achieved only for the 7th year of the project's implementation. Consequently, under extended reproduction the farm will be able to pay the basic debt only for 8 years. Therefore, it is necessary to revise the loan repayment terms.

Also one problem still remains. It is connected with the search for financial resources to satisfy the need in turn-over capital during first 2-3 years, since during this period the sale of breeding and commercial young stock is impossible.

The results of calculating the payment schedule of borrowed funds indicate that a company under extended reproduction can pay its loan obligations only to the 15th year of the project (table 3).

Table 3 – Credit debt payment schedule, thousand tenge

Year of the project implementation	Amount of the basic debt to the beginning of the year	Payment of the basic debt	Calculated interests' amounts for the credit	Paid interests' amounts for the credit	Total amount of payments	Amount of the basic debt to the end of the year
1	150 000.0	-	900	-	-	150 900.0
2	150 900.0	-	905.4	-	-	151 805.4
3	151 805.4	-	910.8	-	-	152 716.2
4	152 716.2	-	916.3	916.3	916.3	152 716.2
5	152 716.2	-	916.3	916.3	916.3	152 716.2
6	152 716.2	-	916.3	916.3	916.3	152 716.2
7	152 716.2	5 000	916.3	916.3	5 916.3	147 716.2
8	147 716.2	5 000	886.3	886.3	5 886.3	142 716.2
9	142 716.2	10 000	856.3	856.3	10 856.3	132 716.2
10	132 716.2	20 000	796.3	796.3	20 796.3	112 716.2
11	112 716.2	30 000	676.3	676.3	30 676.3	82 716.2
12	82 716.2	30 000	496.3	496.3	30 496.3	52 716.2
13	52 716.2	30 000	316.3	316.3	30 316.3	22 716.2
14	22 716.2	22 716.2	136.3	136.3	22 852.5	-
Итого	-	152 716.2	10 545.5	7 829.3	160 545.5	-

However, this lengthening of the project period allows increasing the livestock twice in the herd. If the additional livestock would have to be increased by implementing a new project, then this would take 5 years more and spend additional 150 million tenge of funds.

Conclusion.

Summarizing and generalizing the abovementioned we conclude the following:

- the creation of a "long money" precedent can play a positive role in the implementation of the state project on the development of meat cattle breeding. This concept of financial support is already reflected in the draft of the new program for the development of beef cattle until 2027 [10]. It is also based on the principles of expanded reproduction, which will increase the number of cattle from 7 to 15 million heads, but may reduce the possible sales volumes at enterprises during the first years of the project or lead to the decrease in breeding qualities of the breeding stock;
- it is also necessary to determine the terms to start payment of the interest for the loan and the payment of the basic debt. Here is important to develop clear pricing mechanism at all stages of beef production and processing. Otherwise, the disparity of prices can lead to the inefficient work of individual structural links of the state programs and business initiations;
- according to the implementing practice of the state programs related to the development of beef cattle, the return of investment has not yet yielded the expected results;
- the results of herd turnover planning under extended reproduction require an increase of terms to satisfy credit obligations and requirements;
- herd's repair under existing credit conditions may lead to the decrease of the quality of young stock and deterioration of the genetic potential of the herd;
- calculation of credit parameters suggests that the term of the credit holidays should be increased from 3 to 6 years;
- in order implement state programs for the development of beef cattle more effectively, it is necessary to increase the loan repayment period, that is, to make money "more longer".

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