

ANNOTATION

**dissertation work of Smailova Madina Nurbekovna on the topic
“Influence of the intensity of growing replacement heifers of the black-and-white breed on their following milk productivity during the first lactation”
submitted for the degree of Doctor of Philosophy (PhD) in the education
program “8D08201- Technology of livestock production”**

Relevance of the research topic:

According to the analytical data of the Republican Chamber of Dairy and Combined Breeds of Cattle, today the black-and-spring breed takes the 3rd place by the number of pedigree stock of dairy cattle after Simmental (65941 heads) and Holstein (47036 heads) breeds of cattle and makes 16264 heads.

Breeding of repair cattle is one of the important aspects of observance of milk production technology. Organization and technology of breeding of repair heifers should be based on the laws of individual development and contribute to the formation of animals with strong constitution and high milk productivity.

Successful growing of heifers largely depends on the receipt of colostrum in the first days of life of animals. The necessity of feeding colostrum within 2-3 hours after birth is explained by the establishment of passive immunity in calves, and the amount of colostrum directly correlates with the prevention of diseases and loss of calves. In addition, the analysis of literature sources shows that an intensified feeding regimen with milk or milk replacer during the dairy period of rearing not only affects growth, but also promotes the development of all organs and leads to animal welfare.

To date, there is still no consensus on what should be the intensity of growth and formation of young cattle, but it is known that the level of live weight gain when growing repair heifers creates certain prerequisites for the formation of the appropriate type of animal physique. In this regard, the problem of growing repair heifers remains relevant.

Development of dairy cattle breeding in Kazakhstan is one of the important and priority directions of agriculture, the growing consumption of milk by the population confirms it. In order to increase milk production it is necessary to start with calving and getting strong healthy calves.

Repair calves determine the future productivity of the herd and profitability of milk production, therefore, in the conditions of market economy the reduction of non-productive period of animal utilization, associated with economic costs of growing repair heifers, is becoming increasingly important.

It should be noted that growing healthy, well-developed animals with strong constitution, as well as resistant to unfavorable environmental influences and long-term economic use, is possible only taking into account the peculiarities of growth and development in certain periods of ontogenesis.

Modern technologies of heifer breeding allow to reduce the age of the first fruitful insemination, as well as to increase the economic efficiency of dairy cattle breeding.

Currently, many agricultural enterprises in Kazakhstan do not observe the correct technology of heifer breeding. Thus, repair heifers reach a live weight of 380-400 kg at the age of 18 months and older, i.e. the first insemination of heifers is delayed for 5 or more months. At the same time, heifers, as a rule, are low-legged, with sagging abdomen, head is heavy, coarse, in general, the constitution of heifers is biased towards meatiness.

Naturally, such development of heifers is directly related to the technology of their feeding. At many enterprises the duration of milk and ZCM feeding to heifers is 4 months, heifers consuming a large amount of liquid feed refuse to eat other feeds. This, in turn, delays the development of the gastrointestinal tract.

Strategically important direction determining successful breeding, for farms of Kostanay region and Kazakhstan as a whole, is biologically adequate feeding, which guarantees proper development and good health of heifers, and as a consequence, maximum productivity. In this regard, identification of optimal technology of heifer breeding, which will lead to excellent development of animals and full preparation for calving in optimal terms and high milk productivity in the future - is the main objective of this study.

Given the above, there is an urgent need for experimental substantiation of the most optimal conditions and technologies of feeding and breeding of repair young stock in order to obtain healthy, harmoniously-built, highly productive, characterized by high resistance and capable of fruitful insemination at the age of 15 months, as well as subsequent high and sustainable milk productivity.

The objective of the study is determination of the influence of the scheme of breeding of repair heifers of black-breed on their reproductive qualities and milk productivity on the example of the farm of Kostanay region.

Research objectives:

- analysis of the qualitative composition of colostrum in terms of immunoglobulin content and evaluation of its influence on growth and development of repair young stock, as well as the study of protein and mineral substances in the blood of experimental heifers during the colostrum period;
- analysis of the influence of different feeding schemes on the growth and development of repair young of the studied groups in the milk and post-milk periods in JSC “Zarya” of Kostanay region for early fruitful insemination;
- analysis of reproductive ability and reproductive qualities of first-calf heifers depending on different schemes of rearing;
- analysis and research of milk productivity and qualitative indicators of milk of first heifers of the studied groups;
- Determination of economic efficiency of milk production from first heifers bred using different rearing schemes.

Methodology and research methods: The publications of domestic and foreign researchers dealing with the issues of cattle breeding served as the basis of the dissertation research. The methods of analogy, observation, modeling, comparison and other methods were used in carrying out the work. In the fulfillment of the set research tasks zootechnical experiments were carried out using generally accepted methods. The obtained digital material was processed

biometrically using the methods of Gofman-Kadoshnikov P.B. and Lartseva S.H. with the determination of statistical values and reliability of difference (P) by Student's t test.

Main provisions submitted for defense:

1. Effect of drinking of colostrum with immunoglobulin content of more than 22% on Brix scale on growth of heifers, as well as on protein and mineral values in the blood of experimental heifers during the milking period.
2. Determination of growth and development of repair young stock depending on different feeding schemes in the milking and dairy period.
3. Reproductive ability of the studied groups of heifers and reproductive qualities of first heifers depending on different schemes of rearing.
4. Milk productivity of first-calf heifers and quality indicators of milk of first-calf heifers of the studied groups.
5. economic efficiency of the use of the developed scheme of feeding of repair young stock on the productivity of first heifers.

Description of the main results of the study.

The main results of the dissertation work were presented at international and national conferences, were positively evaluated and published in international editions that meet the requirements of the Ministry of Science and Education of the Republic of Kazakhstan, CCSNVO:

8 papers were published on the subject of the dissertation, 4 of them in the editions recommended by the KKSNO; 1 article in the Brazilian Journal of Biology, included in the Scopus database (Impact factor 2022 1.5, quartile Q2, percentile 61st), 1 article in the proceedings of the international conference, 1 textbook for undergraduate and graduate students, 1 patent for utility model.

The basis of the dissertation research was the publications of domestic and foreign researchers dealing with the issues of cattle breeding. On materials of the dissertation the textbook “Modern methods of cultivation of repair young cattle in the milk period” which is approved and recommended for publication by Educational and Methodical Council of NAO “Kostanay Regional University named after Akhmet Baytursynuly” 21.06.2023, protocol № 6, ISBN978-601-356-300-8 was prepared.

On the basis of the results of researches the improved scheme of cultivation of heifers of black-spring breed in the milk period, providing reduction of expenses of forages and means for repair of herd, increase of its milk productivity and increase of milk production in Kostanay region is developed and offered. In the conditions of JSC “Zarya” of Kostanay region with positive effect the scheme of feeding of heifers of black-and-spring breed in the milk period, which allowed to achieve insemination at the age of 15 months and improve milk indicators, as well as increase profitability by 15%.

The scientific novelty and value of the results obtained lie in the fact that for the first time comprehensive studies of growth, development, reproductive qualities and milk productivity of first heifers of black and sow breed of Kostanay region were conducted. New data on the influence of breeding technology of black and sow heifers on their subsequent milk productivity during the first lactation

have been obtained. On the basis of the conducted researches the technology of breeding of repair heifers of black and sow breed is optimized and improved.

Compliance of the dissertation with state programs:

The work was carried out within the framework of the project within the framework of the PCF of the Ministry of Agriculture of the Republic of Kazakhstan BR10764965 “Development of technologies of maintenance, feeding, growing and reproduction in dairy cattle breeding on the basis of application of adapted resource-energy-saving and digital technologies for different natural-climatic zones of Kazakhstan” for 2021-2023.

Description of the doctoral student's contribution to the preparation of each publication: During the performance of the thesis work the doctoral student was distinguished by great responsibility and personal contribution to the development of the program and methodology of the research, as well as conducting experiments. The dissertant directly participated in all activities during the research work, fully statistically processed the obtained data and disclosed the results in the dissertation sections. The author personally participated in the experimental studies. All results and conclusions presented in the thesis were obtained and formulated with the direct participation of the co-researcher in accordance with the results of the conducted research. The author actively participated in the discussion and publication of the results of the work in scientific publications, in the preparation and presentation of abstracts for international scientific and practical conferences. According to the results of scientific research published 8 papers, including 4 in the publications recommended by the COCNVO; 1 article in the Brazilian Journal of Biology, included in the Scopus database (Impact factor 2022 1.5, quartile Q2, percentile 61st), 1 article in the proceedings of the international conference, 1 textbook for undergraduate and graduate students, 1 patent for utility model.

Scope and structure of the dissertation: The thesis is set out on 124 pages of computer typing and consists of an introduction, literature review, materials and methods of research, results of own research, conclusion, suggestions for production and a list of references and appendices. The work contains 139 sources of used literature, 24 tables and 19 figures and 9 appendices.