ABSTRACT

of dissertation work of Bakhyt Zhanaidarovna Kubekova "Exterior-constitutional features, milk productivity and autarcesis of holsteinized cows in conditions of the Northern Kazakhstan" submitted for the degree of Doctor of Philosophy (PhD) on specialty 6D080200 - Production technology of livestock products

General description of the work.

The dissertation work was carried out in accordance with the provisions of the bioethics committee. Extract from the minutes No. 1 of the meeting of the local commission on bioethics of the NJSC «Kostanay Regional University named after Akhmet Baitursynuly», Kostanay, January 08, 2024.

The work was carried out within the framework of the grant project of the Ministry of Education and Science of the Republic of Kazakhstan «Development and implementation of a comprehensive program for increasing the productive longevity of high-yielding cows of domestic selection» (reg. No. 0118PK00398) and within the framework of program-targeted financing under budget program 267 «Increasing the availability of knowledge and scientific research» BR10764965 Development of technologies for housing, feeding, rearing and reproduction in dairy cattle breeding based on the use of adapted resource-energy-saving and digital technologies for various natural and climatic zones of Kazakhstan and the study was conducted in Northern Kazakhstan in JSC «Zarya» of the Mendykarinsky district and LLP «Viktorovskoye» of the Beimbet Mailina district of the Kostanay region.

The data obtained will significantly expand and deepen the application in practice, playing a large scientifically significant role in the selection of dairy cattle, in particular the Holsteinized black-and-white breed, bred in the continental climate of the northern region of the country and the study of housing technology depending on this region.

Relevance of the topic.

In connection with the globalization of the world economy, the agro-industrial complex of the Republic of Kazakhstan is faced with the tasks of increasing production volumes, improving the quality and especially the competitiveness of manufactured products to ensure domestic producers a dominant position in the domestic food market.

In this regard, the most important direction in the development of livestock farming in the republic is the intensification of its production, based on modern scientific achievements, the latest technological solutions, ensuring high productivity and competitiveness.

In modern dairy cattle breeding of our country, the main task of zootechnical science and practice is the further intensification of the industry, aimed at increasing the genetic potential of the productive qualities of animals of domestic breeds and the degree of its implementation.

Intensive dairy farming in the extreme conditions of Northern Kazakhstan requires the selection of highly productive and highly resistant animals that are able to more fully realize their genetic productivity potential and maintain it over several lactations. Selection for indicators of natural resistance contributes to the normal reproduction of animals within a type without significant elimination as a result of both natural selection and ranking according to selection indicators.

The process of improving Holsteinized cows involves, on farms with traditional housing and feeding technology, obtaining animals with a productivity level of 5500 -6500 kg of milk, maintaining health and reproductive ability. Therefore, the problem of increasing productive qualities in the conditions of Northern Kazakhstan remains insufficiently developed and requires in-depth study.

In the Republic of Kazakhstan, priority has been given to indicators of the competitiveness of Russian selection and the compliance of dairy cattle with their quality to international requirements, which should ensure the efficiency of the industry in an open global trading system.

Therefore, the urgent task is to obtain the most competitive and high-quality products at low costs. In this matter, new intrabreed types should play a certain role, especially the breeding of Holstein cows, which are characterized by genetically determined high milk productivity.

In the context of targeted investment in dairy farming, it is necessary to form highly productive herds of dairy cattle of the desired type, which, with modern technology, most successfully combines: optimal growth and live weight with high milk yield, is adapted to machine milking, and is also resistant to adverse environmental influences.

Proper rearing of heifers largely determines the optimal manifestation of the genetic productivity of animals. The purpose of this study was to identify the optimal technology for raising black-and-white heifers during the dairy period to realize their genetic potential in the conditions of the northern region of the Republic of Kazakhstan, namely the Kostanay region.

In this regard, studying the indicators of natural resistance in the studied cows in conjunction with milk productivity is relevant and will be practically useful for breeders involved in dairy cattle breeding.

Dairy cattle breeding in the Kostanay region is one of the leading branches of livestock farming. Its successful development is determined by many factors, the most significant of which are the value of the breeds being bred, the conditions for keeping and using animals, their health, the quality of the products, etc.

The main task of cattle breeders in Kazakhstan is to increase the milk productivity of cows and obtain from them a large number of healthy calves per 100 queens. To do this, along with selection and preparation of cows for calving, targeted work is needed to raise replacement young dairy cattle.

At the initial stage, the main method of improving the herd will be selection by phenotype, i.e. according to actually demonstrated productivity and the associated exterior-constitutional characteristics, i.e. mass selection of the desired type. It is based on the conclusions of the outstanding breeder M.F. Ivanov: «The best genotypes are among the best phenotypes».

Northern Kazakhstan is a large agricultural region, including four regions with a total area of 565.5 thousand km2 with a population of about 3 million people, which is 17% of the total population of the Republic. However, over the past decades, the level of livestock production has remained low and dairy productivity needs to be significantly increased. Dairy resources can be increased not only by increasing the number of specialized livestock and strengthening the feed base.

This can simultaneously be achieved by breeding new, more productive breeds of livestock, increasing the proportion of cows in the herd, and improving the quality of milk.

The process of improving breeds has now significantly accelerated due to changes in the entire breeding system. The requirements for dairy cattle have been increased, since investments made in the construction of large dairy complexes, reconstruction and modernization of existing livestock farms are justified only if the overall economic effect is achieved due to the high milk productivity of cows.

Currently, work continues in the Republic of Kazakhstan to qualitatively improve local dairy cattle with more productive foreign breeds.

For black-and-white cattle, this is the Holstein breed. The import of Dutch cattle into our country from the USA and Canada took on a wide scale in the eighties of the last century.

Currently, in dairy cattle breeding they use a linear method of assessing the exterior, which makes it possible to carry out corrective selection to eliminate deficiencies in the exterior of animals and thus influence their body type.

This assessment of dairy cows' productivity is of scientific and practical interest, since when developing breeding work plans, scientists and practitioners pay insufficient attention to comprehensive studies of physiological and biochemical parameters in the body of highly productive cows of different body types, and their connection with reproductive and productive qualities.

Further work on improving the most common black-and-white cattle in the region, in particular, and well adapted to local climatic conditions, is possible on the basis of generalization of experience and a comprehensive assessment of the prospects for using the new Holsteinized black-and-white breed by breeding highly valuable sire bulls of our own selection, with high genetic potential productivity, maximally adapted to zonal characteristics, and improvement of technological methods for the production of milk and beef, which determines the relevance of the research conducted.

Scientific novelty.

For the first time in the conditions of Northern Kazakhstan, milk productivity, reproductive qualities and natural resistance of the Holsteinized black-and-white breed from individual bulls of Russian and foreign selection were studied.

The economic efficiency of increasing milk productivity has been determined.

Theoretical significance of the work.

Research work on the cultivation and development of Holsteinized young animals of the black-and-white breed in JSC «Zarya»   located in the Mendikarinsky district of the Kostanay region and LLP «Viktorovskoye» located

in the Beimbet-Maili district, exterior and constitutional features, morphofunctional indicators of the udder, physical and chemical composition milk and natural resistance of first-calf heifers of the Holsteinized black-and-white breed.

To achieve the goal of the study, the following tasks were set:

- growth and development of Holsteinized black-and-white young stock;

- study of the reproductive qualities of heifers of the Holstein black-and white breed;

- study of the exterior and constitutional characteristics of cows of the holstein black-and-white breed using the linear assessment method;

- study of morphofunctional indicators of the udder of cows of the holstein black-and-white breed;

- study of milk productivity indicators and the physico-chemical composition of milk from cows of the holstein black-and-white breed;

- study of hematological and biochemical blood parameters of cows of the holstein black-and-white breed;

- study of the economic efficiency of milk production from cows of the holstein black-and-white breed.

Approbation of work.

When performing the work, general biological methods were used and the research results were processed on a personal computer using the Microsoft Excel program. The reliability of the indicators was assessed using the Student's test.

The main results of the dissertation work were presented at international and national conferences, received a positive assessment and published in international publications that meet the requirements of the Ministry of Science and Education of the Republic of Kazakhstan, KKSON:

11 works have been published on the topic of the dissertation, 4 of them in publications recommended by KOKSNVO; 2 articles articles in international peer-reviewed scientific journals «Veterinary World» and «Brazilian Journal of Biology», included in the Scopus database, having an impact factor according to the Journal Citation Reports (JCR) with a CiteScore percentile in the Scopus database of the 80th and 61st respectively, 1 publication in a journal recommended by the RSCI; 3 works in materials of international conferences.

The main provisions submitted for the defense of the dissertation:

- growth and development of holsteinized black-and-white young stock;

- study of the exterior and constitutional characteristics of cows of the holstein black-and-white breed using the linear assessment method;

- study of morphofunctional indicators of the udder of cows of the holstein black-and-white breed;

- study of milk productivity indicators and the physico-chemical composition of milk from cows of the holstein black-and-white breed;

- natural resistance of cows of the holstein black-and-white breed;

- study of the economic efficiency of milk production from cows of the holstein black-and-white breed.

Scope and structure of the dissertation.

The dissertation is presented on 134 pages of computer typesetting and consists of an introduction, literature review, materials and research methods, results of own research, conclusion, proposals for production and a list of references and applications. Contains 38 tables, 6 figures and 12 appendices. The bibliography includes 134 sources, including 46 in foreign languages.