Relevance of the research topic.
Currently, in order to ensure food security, the Government of the Republic of Kazakhstan is considering various scenarios for the economy development. One of the priority areas is the formation of Kazakhstan as a global food hub. Due to the policy pursued in Kazakhstan on the issues of the country's food security, the agricultural sector is gradually moving into the status of "a new driver of economy". In accordance with the National Agro-Industrial Complex Development Project for 2021-2025 for the development of agro-industrial complex, in order to increase export potential of the country in the near future, the agricultural sector of the Republic of Kazakhstan will give priority to the production of livestock products (meat, milk) and crop products. In recent years, 17 thousand tons of meat have been exported from Kazakhstan and to increase the country's export potential in the near future in the agricultural sector of the Republic of Kazakhstan, the production of livestock products (meat, milk) and crop products will be a priority. In recent years, 17 thousand tons of meat and meat products for $38.4 million have been exported from Kazakhstan. To solve the problem of increasing the production of meat and milk, it is necessary to achieve intensive development of fodder production.

Agricultural enterprises of the country focused on breeding livestock. By the end of 2021, more than 8.6 million head of cattle and 22.6 million head of sheep and goats were registered in the country. However, the need for feed is still not fully satisfied, and in a number of farms the supply of feed is 20-30% lower than zootechnical standards. Of course, the further development of animal husbandry, along with many important factors, depends on the quality of forage base, introduction of modern technologies and innovations.

In the Republic of Kazakhstan, there are appropriate prerequisites for the development of animal husbandry. This is the presence of natural fodder lands and unused pastures, low-cost pasture technology for animal husbandry. In addition, animal husbandry is an old profession of our ancestors. All this will allow Kazakhstan to become a competitive country, occupying an important place in the world market. Therefore, it is clear that protecting the soils of natural pastures and increasing the productivity of vegetation cover is a priority.

On the territory of West Kazakhstan, especially in the southern areas of the region, there are degressive and well-established sandy fortifications, depressions that have turned into convex spaces between rows, saline, covered with various grasses and meadows. It can be noted that anthropogenic activity in this area significantly contributed to the change in the vegetation cover, its species composition and productivity. In particular, the area of erosive pastures and lands subject to degradation
and desertification has sharply increased, the pressure on pastures has increased, and
the fodder capacity and quality of livestock have deteriorated. Here pastures occupy
80% of the total area of the territory. They are the initial base and the material basis of
the main direction of animal husbandry, i.e. agriculture.

However, the pressure on pastures, which has increased in recent years, evens
out the balance in nature, and pastures become more vulnerable, prone to stress and
desertification. All this does not affect the state of pastures. These trends worsen the
state of animal husbandry, disrupt the stability in the habitat of population, cause
concern, require analysis of the state of arid pastures, identification of degradation
causes and adoption of effective measures for conscious use, taking into account the
characteristics of main types of pasture ecosystems.

Livestock grazing practices have a significant impact on pasture soils and
vegetation. However, in the conditions of West Kazakhstan region, scientific research
on the impact of grazing technology on soil and vegetation cover of pastures has not
been previously carried out; research in this area in order to identify the current state
of pastures and develop recommendations for their rational use determined the
relevance of the direction and priority of the conducted research subject.

Purpose of the research thesis.
Agrochemical assessment of soil cover of pastures based on monitoring for the
purpose of their rational use in the conditions of West Kazakhstan region.

Research objectives.
1. To identify of changes in the morphological parameters of soil cover of
pastures in West Kazakhstan region, in connection with grazing technologies;
2. On the basis of monitoring, to study the influence of animal grazing
technologies on the change in agrophysical and agrochemical indicators of soil cover
of pastures in West Kazakhstan region;
3. To identify of changes in the indicators of vegetation cover of pastures in West
Kazakhstan region under the influence of grazing technologies;
4. To determine the economic efficiency of grazing technologies and propose
recommendations for production for the rational use of pastures, in order to protect and
maintain a stable state of the soil cover and increase the yield of pastures.

Research methods.
Scientific research was carried out in 2018-2020 on the pastures of "Atamura"
farm in Taskalinsky district, "Aimeken" farm in Akshaik district and "Miras" farm in
Bukeiorda district, located in 1, 2, 3 soil and climatic zones of West Kazakhstan region.
The research objects are dark chestnut, chestnut, light dark chestnut soils, and
vegetation cover of pastures 1, 2, 3 of soil and climatic zones of West Kazakhstan
region.

To identify the current state of soil cover, monitoring was organized on pastures,
using 4 options for grazing technology.
To determine the influence of grazing technologies on agrophysical and
agrochemical parameters of soil, soil samples were taken in layers of 0-10, 10-20, 20-
30 cm in 4 replicates.

Soil samples were analyzed according to the current methods in the
agrochemical laboratory of Zhangir Khan WKATU.
The projective cover, species composition, height and yield of pastures were determined in transects of 100x50 m in size. The animals were grazed in spring, summer, and autumn.

The state of pastures due to the influence of grazing technologies was determined using physical indicators of degradation and desertification based on the order of the Ministry of Agriculture No. 185 of April 27, 2017.

The study of bioproductivity of pastures was carried out using satellite images obtained from satellites of Terra series (MODIS), and the computer program "Mapinfo" was used to interpret and decipher NDVI results.

The research results on the yield of vegetation cover were statistically processed by Dospekhov's analysis of variance, statistical analysis of soil indicators was processed based on Mann-Whitney U-test by nonparametric analysis of 2 separate samples and by regression method, construction of statistical graphs was carried out by Statistica 6.0 program.

**Main provisions submitted for the defense (proven scientific hypotheses and other conclusions that are found to be new knowledge).**

- Changes in morphology, agrophysical and agrochemical indicators of dark chestnut soils in the 1st zone of West Kazakhstan region, depending on the grazing technology;
- Changes in morphology, agrophysical and agrochemical parameters of chestnut soils in the 2nd zone of West Kazakhstan region, depending on the grazing technology;
- Changes in morphology, agrophysical and agrochemical indicators of light chestnut soils in the 3-zone of West Kazakhstan region, depending on the grazing technology;
- The current state of the vegetation cover of pastures depending on the grazing technology, the economic efficiency of grazing technologies of agricultural animals and the supply to production for the rational use of pastures.

**Description of the main research results.**

Deterioration of physical and chemical parameters of soil, emergence of degradation and desertification processes are the most common and complex problems in the management of pasture ecosystems in West Kazakhstan, which require clarifying the impact of environment, reducing the rate of production of safe livestock products, making the right decisions.

To solve the problem of high-quality and rational use of pastures, it is necessary to use a moderate grazing technology. The main principle of moderate grazing is the use of 65-75% of annual growth of pasture plants, which contribute to the improvement of physical and chemical parameters of soil. Morphological, agrophysical and agrochemical indicators of chestnut soil types have been preserved on West Kazakhstan pastures using moderate grazing technology.

Compared with intensive grazing technology, with moderate grazing technology, compaction of chestnut soil types was reduced by 1.60-3.17%, reduction of agronomically valuable aggregates in the soil composition was reduced by 3.26 - 11.85%, while the reduction of humus reserves was stopped within 5.52-11.73 t/ha, the content of mobile phosphorus, nitrate nitrogen and exchangeable sodium were...
observed at a positive level. The use of this technology will prevent soil degradation processes.

The use of moderate grazing technology improved the condition of vegetation cover of West Kazakhstan pastures, productivity of pastures in 3 zones increased to 5.39-12.64 c/ha, in terms of dry matter.

In economic relations, the use of moderate grazing technology has economic efficiency - additional income from each livestock population amounted to 31,200 tenge.

The thesis results can be used in planning operational measures to reduce the load of farm animals on pastures, carry out phytomeliorative works, stabilize ecological situation, and reduce the level of degradation of vegetation cover of pastures. Implementation of developments will help to weaken and prevent degradation processes in pastures.

**Rationale for the novelty and importance of results.**

Scientific novelty and practical significance of results. For the first time, the change in indicators of dark chestnut, chestnut, light-dark chestnut soils of pastures 1, 2, 3 of soil-climatic zones of West Kazakhstan region, depending on grazing technology, was scientifically substantiated, and valuable theoretical materials were obtained in this direction.

For the first time, along with soil cover, changes in vegetation cover of pastures of West Kazakhstan region were studied depending on the technologies of grazing agricultural animals.

To protect and maintain a stable state of soil cover of pastures in West Kazakhstan region, proposals were made for the production.

The introduction of research data into production will create conditions for maintaining a satisfactory state of soil cover of pastures and increasing productivity of vegetation cover, which leads to an increase in the efficiency of cattle breeding.

The research results were introduced into production in the conditions of "Miras" farm in West Kazakhstan region.

Offers are offered to farmers and peasant farms and agricultural enterprises engaged in animal husbandry in the conditions of 3 soil-climatic zones of the West Kazakhstan region.

**Compliance with the directions of science or state programs development.**

The thesis work was carried out within the framework of the targeted financing program BR06249365 "Creation of highly productive rangelands in the conditions of North and West Kazakhstan and their rational use", registration number GR0118RK01278 in accordance with agreement No. 21 dated September 10, 2018 with the Ministry of Agriculture of the Republic of Kazakhstan. Priority direction: "Sustainable development of agro-industrial complex and safety of agricultural products".

**Description of doctoral student’s contribution to the preparation of each publication.**

During his thesis work, the PhD student distinguished himself with great responsibility and personal contribution to the development of the program and research methodology, establishment and conduct of experiments. He completed the
tasks of research work with great interest. With the correct use of specific methods of observation, accounting, analysis in solving the assigned tasks, the intended results were achieved.

The author personally participated in the experimental research, mastered methodology for laying out field and production experiments, as well as methodological requirements for the research on agricultural science. All the results and conclusions presented in the thesis were obtained and formulated with the direct participation of the applicant in accordance with the research results. The author actively participated in the discussion and publication of the results of work in scientific publications, in the preparation and presentation of abstracts for international scientific and practical conferences.

Based on the results of scientific research, 24 scientific papers have been published, including 9 articles in scientific journals recommended by the Committee for Control in Education and Science of the Ministry of Education and Science, 3 articles in scientific journals included in the information and abstract fund of the Scopus database, 2 articles in the journals of Agris base and 1 article in Russian Science Citation Index database, 6 articles in collections of international scientific and practical conferences.

Based on the research results, 1 monograph was prepared, 1 recommendation was published, a patent for a utility model of the Republic of Kazakhstan "Method of grazing farm animals" (No. 5162 - 17.07.2020) and copyright certificate (No. 108754) were received.

**Volume and structure of the thesis.** The thesis work consists of 8 chapters containing an introduction, a review of literature, objects and research methods, research results, conclusions, recommendations for production, a list of references and 8 applications written in the state language on 174 pages.

The work contains 19 tables, 29 figures.

The list of used literature is 200 titles.