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DEVELOPMENT OF A NAVIGATION SPACE FOR AGRO FIRM

Abstract. The paper shows that the Agro-industrial Complex is almost entirely composed of spatial-temporal data. Consequently, the digitalization of the Agro-industrial Complex is associated with the formation of spatial-temporal data using information from navigation systems. Therefore, the 51 points of the Implementation Action Program "Digital Kazakhstan" provides for the country to create a National Spatial Data Infrastructure. The National Spatial Data Infrastructure of the Republic of Kazakhstan is designed to solve the problems of digitization of space-temporal data at the Government to Government, Government to Business and Government to Citizen levels. The solution of issues of digitalization at the Business to Business level is practically left to the Agro firms themselves. One of the problems of this process is the development of reliable navigation spaces. The goal of our research is the development of a navigation field for conducting Precision Agriculture throughout the territory of a particular Agro firm. The research tasks included the study of the specific features of the territories of the Agro firm and the proposal of a High-precision Satellite Navigation System suitable for conducting Precision Agriculture in any part of the territories of the economic entity with an accuracy of 3 cm. For this, the technology of creating the High-precision Satellite Navigation System of the Republic of Kazakhstan was used. To assess the accuracy of the navigation field, the studies were conducted in three modes: DGPS service; RTK service; PP service. For the experiments, the Mobile Differential Station of the High-precision Satellite Navigation System of the Republic of Kazakhstan and a network of its Differential Stations with the center of Differential Correction and Monitoring in Astana were used. Studies have shown that the territory of the Agro firm is not located in a single array of agricultural land, the relief of the territories is rather complicated, and the network of the High-precision Satellite Navigation System of the Republic of Kazakhstan does not provide sufficient accuracy for maintaining a Precision Agriculture system in the studied array. The observations also showed that, due to the elevation differences and remoteness of the objects, in most parts of the Agro firm there is no reliable GSM connection. Considering the above features of the territories in terms of the relief and remoteness of the plots, we proposed a scheme with the additional placement of 4 Base Stations of Differential Correction and the Center of Differential Correction and Monitoring on the territory of the Agro firm. Calculations showed that this arrangement of the Base Stations can provide 2.5-3 cm accuracy of the navigation field throughout the territory of the Agro firm, allowing you to carry out the full range of Precision Agriculture, which consists of Precision farming and Precision animal husbandry. It should be noted that this kind of research in the country was conducted for the first time.

Keywords: digitalization, spatial data, national spatial data infrastructure, navigation, high navigation satellite system, precision agriculture, agro firm.

Introduction. The creation, formation, and development of the National Spatial Data Infrastructure (NSDI) are one of the major steps in increasing the competitiveness of any country on the world market [1-3]. Kazakhstan is still among those countries that have not created their own NSDI. At the same time, the state program "Digital Kazakhstan" was adopted in the country [4]. As part of this program, it is necessary to digitize the Republic of Kazakhstan. The Agro-industrial complex (AIC) is almost entirely composed of spatial-temporal data or geo-data. Consequently, the digitalization of the AIC is associated with the creation, formation and development of spatial-temporal data. Therefore, 51 paragraphs of the Activities on the implementation of the Digital Kazakhstan Program provides for the establishment by the

country of the NSDI of the Republic of Kazakhstan (NSDI RK). This underlines the importance of our research.

The main problems and ways of solving the NSDI RK were outlined earlier by us [6]. The NSDI RK is designed to solve the problems of digitization of spatial-temporal data at the levels Government to Government (G2G), Government to Business (G2B) and Government to Citizen (G2C). The solution of issues of digitalization at the level of Business to Business (B2B) practically remains with the agro formations of the Agro-industrial complex. Digitization of Agro firms in the Agro-industrial complex in the republic requires some detailing of this process.

So, if a National SDI is created, then Agrarian SDI (Agro SDI) should be one of its branch components. The structure of Agro SDI provides for the creation and formation of all basic spatial data of the Agro-industrial complex. However, the basic information of Agro SDI is generally difficult to use without its subsequent refinement (detail) for solving the production problems of Agro formations. For example, Precision agriculture (PA) includes Precision farming, Precision livestock farming, Precision pork, Precision poultry farming etc. and product processing, using agricultural machines, tractors, trailed equipment, etc. For the introduction of PA in the activities of Agro firms, it is required to create, generate and constantly update a huge amount of additional thematic data, lists, registries, etc. [7] using the potential of "Geo Industry 4.0". However, such studies in the republic are only at the level of initiations and the development of small “polygons” [8]. They are being implemented so far without developing adequate navigation space, which allow them to be used for reliable management of PA throughout the entire territory of a particular Agro formation, which makes our research relevant.

The goal of the research is the development of a navigation space for conducting Precision agriculture throughout the territory of a specific Agro firm.

Research objectives are the study of the characteristics of the territory of the Agro firm and the proposal of a High-precision satellite navigation system suitable for farming throughout the territory of an economic entity with an accuracy of about 3 cm.

Methods. To ensure the required accuracy of the navigation space, the network and technology of creating the High-precision Satellite Navigation System of the Republic of Kazakhstan (HSNS RK) with the center of differential correction and monitoring of the HSNS RK in Astana [9] is applied.

To assess the accuracy of the navigation space (farm, agro landscape, field, object) and improve the accuracy of the electronic map binding, studies were conducted in three modes: DGPS service - for navigation with an accuracy of 0.5 to 3 m in the planned coordinates and 0.7-6 m in height, depending on the equipment used by the user; RTK service - for accurate positioning in real time with an accuracy of 0.02-0.5 m in the planned coordinates and 0.06-0.7 m in height; PP service - final data (post) processing in cameral conditions in order to obtain the coordinates of points with an error of less than 1 cm.

The experiments were carried out using the Mobile Differential Station (MDS) of the HSNS RK [9], a network of differential stations with a center for differential correction and monitoring of the HSNS RK in Astana.

If necessary, we use the information available in the public domain, for example from Google Earth.

Results. Figure 1 shows the location of the territory of interest on Google Earth relative to the city of Astana in the form of vector data, and figure 2 is based on a raster substrate from Landsat 8 TM. On the left, the main grounds are located close to the central manor and the departments, on the right are distant lands (code name - Zhaken 1). I.e., the territory of the Agro firm is not located in a single array of agricultural land, which requires some effort to create a single navigation space in order to collect digital information to represent them in the spatial data infrastructure in particular, and to form a system of Precision agriculture in general.

As can be seen from figure 3, the system of High-precision satellite navigation system of the Republic of Kazakhstan does not provide the necessary accuracy for maintaining a system of Precision agriculture throughout the country.

The study area (figure 4 - a label in the form of a car) still remains outside the coverage area of the HSNS RK with the required accuracy. The relief of the Agro firm's territory also plays a significant role (figure 5), especially the location of the base area. The central manor and branches of the Agro firm are located on the bank or relatively close to the river bank (in the figure is the red zone). Then, the relief has a long rise (from pink and light brown to a rich green zone) with a subsequent decrease. Behind the

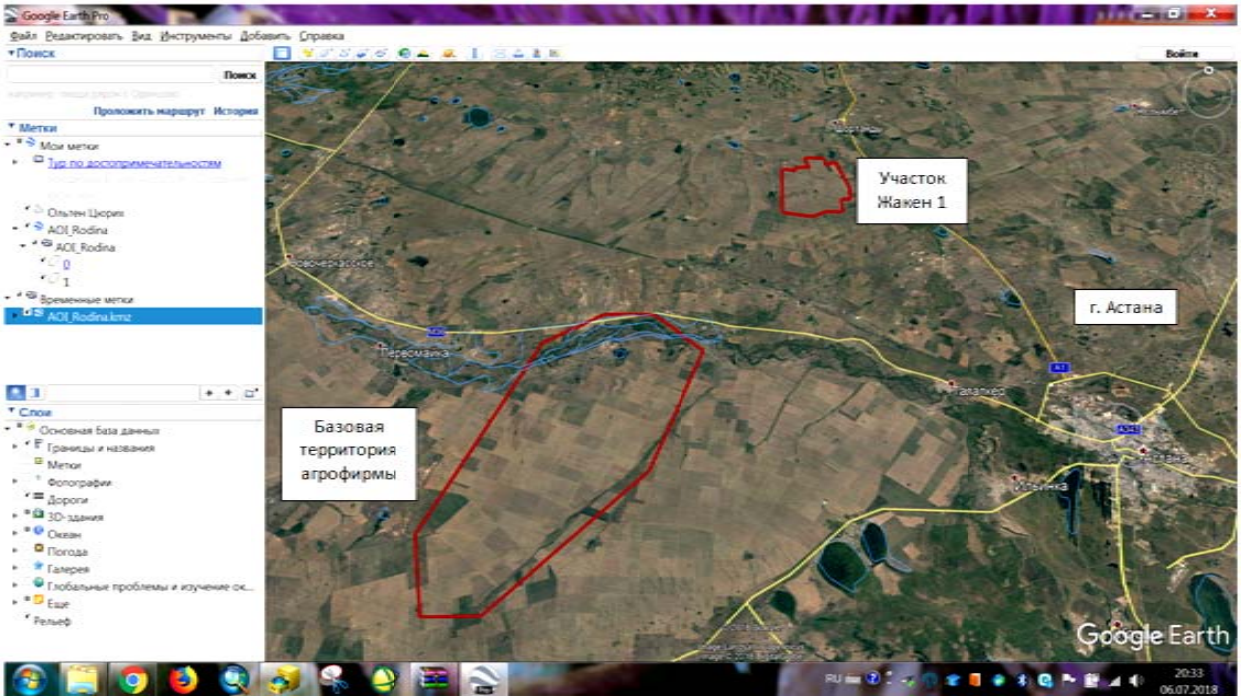


Figure 1 – Location of the territory of the Agro firm
on Google Earth relative to the city of Astana (vector)

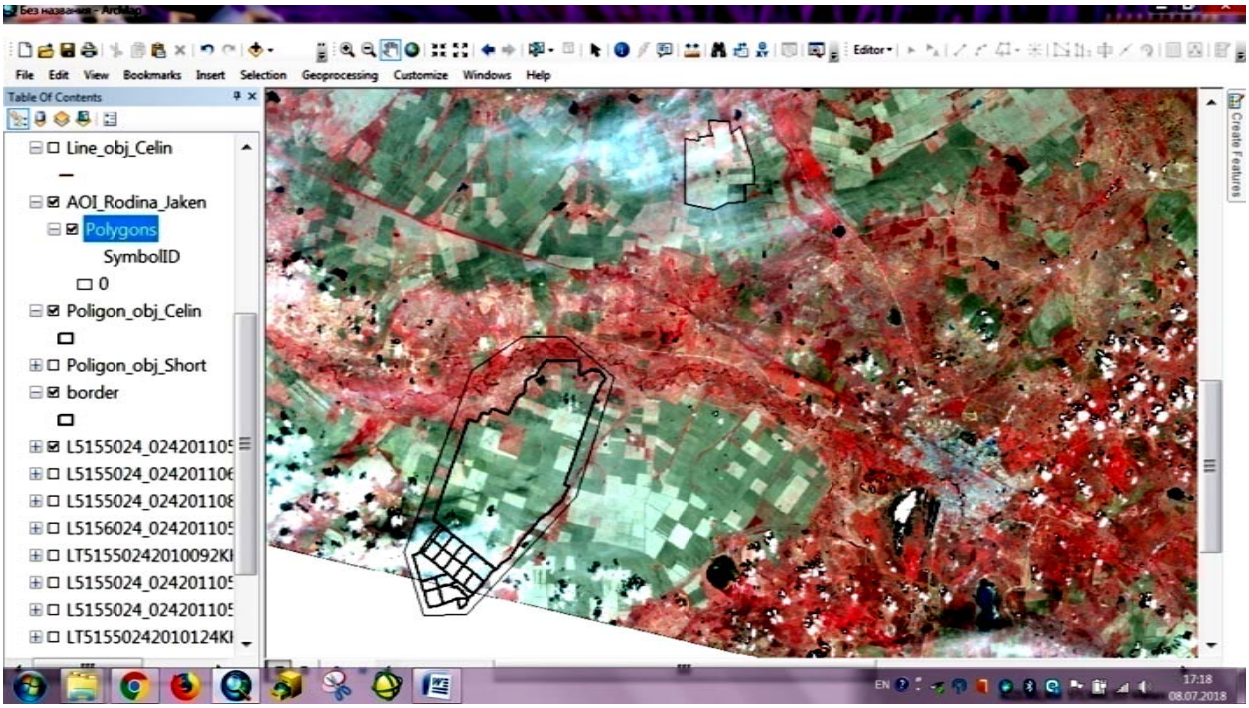


Figure 2 – Location of the Agro firm on a raster substrate (Landsat 8 TM)

highest zone there is a tract, where a sharp lowering of the relief occurs and a watercourse forms towards the main river. At the same time, the territory of Zhaken 1 (figure 5b) is almost a flat territory, without noticeable differences in relief.

Observations also showed that due to the heterogeneity of the territory over the relief, most of the Agro firm is not covered by a reliable GSM connection and the Internet.

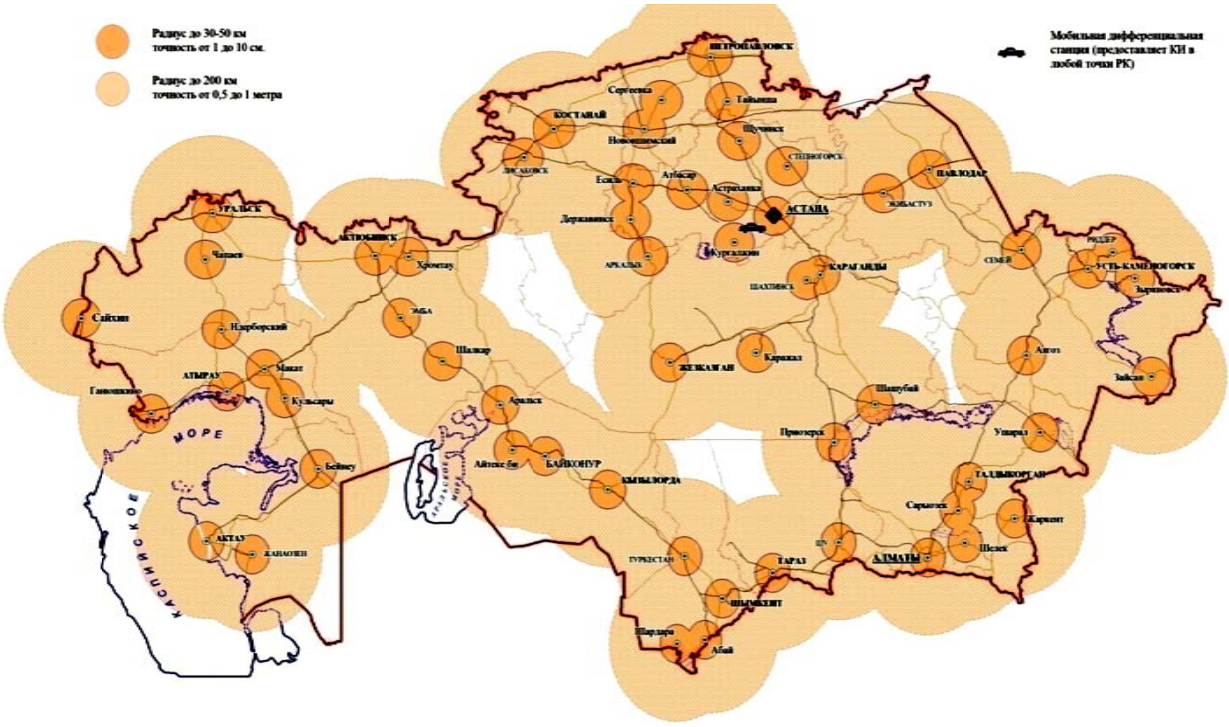
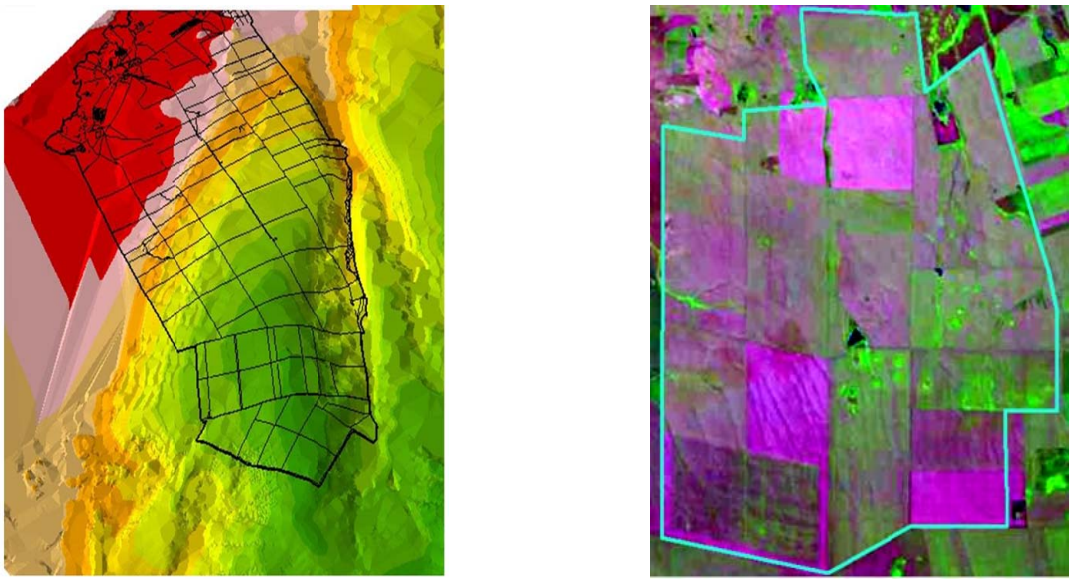


Figure 3 – Coverage of High-precision navigation satellite system the territory of the Republic of Kazakhstan

Figure 4 –
Scheme of coverage of the territory of interest
with an accuracy of 1-10 cm



a b

Figure 5 – 3D model of the territory of an Agro firm with superimposed field layout
(a - is the base territory, b - is the Zhaken 1)

Figure 6 – Layout of BS of differential correction and the CDCM on the territory of the Agro firm

Considering the above features of the territory according to the relief and remoteness of the plots, we have proposed the following scheme for placing additional base stations of differential correction (BS) and the center of differential correction and monitoring (CDCM) on the territory of the Agro firm (figure 6).

As shown by calculations based on preliminary experience of creating and putting into operation of the HSNS RK, this BS location scheme can provide 2.5-3 cm accuracy of the navigation field throughout the Agro firm, allowing you to carry out the entire complex of Precision agriculture. It should be noted that this kind of research using the HSNS RK technology in the country was conducted for the first time and should be considered as agrarian innovation [10].

Discussion. In principle, Global navigation satellite systems such as NAVSTAR (GPS), GLONASS, GALILEO and BEIDOU [11-14] can be used to develop a single navigation space of the study area using the appropriate ground-based navigation equipment.

In addition, such high-tech firms as Trimble [15] Leica Geosystems [16] have their own commercial network of navigation installations.

Besides, at present, most agricultural machinery (machinery, tractors, combines, etc.) are equipped with built-in navigation devices for conducting precision work in agricultural fields and facilities [17–20]. However, without additional serious financial costs, direct use of the above navigation systems and equipment is often quite difficult. Therefore, we have taken as a basis for the development of high-precision navigation space for the studied Agro firm, repeatedly tested, officially commissioned, domestic HSNS RK [9].

Conclusion. Thus, as a result of studying the particular location of certain areas, terrain and radio communications, we have proposed a highly accurate satellite navigation system for a particular Agro firm, which was developed by analogy with the HSNS RK and can be used to maintain a Precision agriculture system with an accuracy of 2.5-3,0 cm. It should be noted that this kind of research using the HSNS RK technology in the country was conducted for the first time and should be considered as agrarian innovation.

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АГРОФИРМАНЫҢ НАВИГАЦИЯЛЫҚ КЕҢІСТІГІН ДАЙЫНДАУ

Аннотация. Еңбекте агроөнеркәсіптік кешен дерлік кеңістіктік-уақыттық деректерден тұратыны нақтыланған. Демек, агроөнеркәсіптік кешенді цифрландыру, навигациялық жүйелерден алынған ақпаратты кеңістіктік-уақыттық деректердің қалыптастырумен байланысты. Сол себептен «Цифрлы Қазақстан» бағдарламасы шараларының 51 бабы елге ұлттық кеңістіктік деректер инфрақұрылымын құруды межелеген. Қазақстан Республикасының ұлттық кеңістіктік деректер инфрақұрылымы негізінен Government to Government, Government to Business и Government to Citizen деңгейлерінде кеңістіктік-уақыттық деректерді цифрландыру мәселелерін шешуге бағытталған. Business to Business деңгейінде цифрландыру мәселелерін шешу іс жүзінде агроқұрылымдардың өздері қарастыру керек. Бұл үрдістің маңызды мәселелерінің бірі сенімді навигациялық кеңістік құру және оны дамыту болып табылады. Зерттеудің мақсаты - белгілі бір агрофирма аумағында дәл ауыл шаруашылығын жүргізу үшін навигациялық өрісті дайындау. Зерттеу міндеттері агрофирма аумағының ерекшеліктерін зерттеу және 2,5-3,0 см дәлдікпен шаруашылық субъектісінің территориясының кез келген бөлігінде дәл ауыл шаруашылығын жүргізу үшін жарамды жоғары дәлдіктегі жерсеріктік навигациялық жүйені құру. Мұндай мақсатқа жету үшін Қазақстан Республикасының жоғары дәлдіктегі жерсеріктік навигациялық жүйені құру технологиясы пайдаланылды. Навигациялық кеңістіктің дәлдігін бағалау үшін зерттеулер үш режимде жүргізілді: DGPS қызметі; RTK қызметі; PP қызметі. Эксперименттер жүргізу үшін Қазақстан Республикасының жоғары дәлдіктегі жерсеріктік навигациялық жүйесінің жылжымалы дифференциалдық станциясы әрі Астана қаласында орналасқан дифференциалды түзету және мониторинг орталығы және оның дифференциалды станциялар желісі пайдаланылды. Зерттеулер нәтижесінде, агрофирма аумағы бірбүтін ауылшаруашылық жерлерінде орналаспағаны, аумақтардың рельефі өте күрделі екені, ал Қазақстан Республикасының жоғары дәлдіктегі жерсеріктік навигациялық жүйе желісі нақты проблеманы шешу үшін жеткілікті дәлдік бере алмайтыны анықталды. Байқаулар сондай-ақ, агрофирмнің көптеген бөліктерінде объектілердің биіктігі мен қашықтығына байланысты сенімді GSM байланысы жоқ екенін көрсетті. Аймақтардың жоғарыда аталған жер учаскелерінің ерекшеліктерін ескере отырып, біз дифференциалды түзетудің 4 базалық станциясын қосымша орналастыруды және агрофирма аумағында дифференциалды түзету және мониторинг орталығын құруды ұсындық. Біткен еңбектің нәтижесі бойынша, базалық станциялардың орналасуы агрофирма аумағында 2,5-3 см навигациялық кеңістік бере алатыны анықталды. Бұл жетістік дәл ауыл шаруашылығының (дәл егіншілік пен дәл малшарушылығы) толық спектрін жүзеге асыруға мүмкіндік береді. Келтірілген зерттеулердің республикада алғаш рет жүргізілгенін атап өту керек.

Түйін сөздер: цифрландыру, кеңістіктік деректер, ұлттық кеңістіктік деректер инфрақұрылымы, навигация, жоғарғы дәлдіктегі навигациялық жүйе, дәл ауылшаруашылығы, агрофирма.

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РАЗРАБОТКА НАВИГАЦИОННОГО ПРОСТРАНСТВА ДЛЯ АГРОФИРМЫ

Аннотация. В работе показано, агропромышленный комплекс практически полностью состоит из пространственно-временных данных. Следовательно, цифровизация агропромышленный комплекс, связана с формированием пространственно-временных данных с использованием сведений навигационных систем. Поэтому, 51 пункт Мероприятия по реализации Программа «Цифровой Казахстан» предусматривает создание страной национальной инфраструктуры пространственных данных. Национальной инфраструктуры пространственных данных Республики Казахстан призвана решать проблемы цифровизации пространственно-временных данных на уровнях Government to Government, Government to Business и Government to Citizen. Решение вопросов цифровизации на уровне Business to Business практически остается за самими агроформированиями. Одной из проблем этого процесса является разработка надежных навигационных полей. Цель наших исследований - разработка навигационного поля для ведения точного сельского хозяйства на всей территории конкретной агрофирмы. Задачи исследований входило изучение особенности территорий агрофирмы и предложение системы высокоточной спутниковой навигации, пригодной для ведения точного сельского хозяйства в любой части территории хозяйствующего субъекта с точностью до 3 см. Для этого использована технология создания национальной инфраструктуры пространственных данных. Для

оценки точности навигационного поля исследования проведены в трех режимах: DGPS сервис; RTK сервис; PP сервис. Для проведения экспериментов использованы мобильная дифференциальная станция системы высокоточной спутниковой навигации Республики Казахстан, сеть её дифференциальных станций с центром дифференциальной коррекции и мониторинга в г. Астана. Исследования показали, что территория агрофирмы расположена не в одном массиве сельскохозяйственных угодий, рельеф территорий достаточно сложный, а сеть Системы высокоточной спутниковой навигации Республики Казахстан не обеспечивает достаточную точность для ведения системы точного сельского хозяйства на изучаемом массиве. Наблюдения так же показали, что в силу перепадов высот и удаленности объектов, на большей части территорий агрофирмы нет надежной связи GSM. Учитывая вышеприведенные особенности территорий по рельефу и отдаленности участков, нами предложена схема с дополнительным размещением 4 базовых станций дифференциальной коррекции и центра дифференциальной коррекции и мониторинга на территории агрофирмы. Расчеты показали, что данная схема расположение базовых станций может обеспечить 2,5-3 см точность навигационного поля по всей территории агрофирмы, позволяя вести весь комплекс точного сельского хозяйства, которая состоит из точного земледелия и точного животноводства. Следует отметить, что такого рода исследования в стране проведено впервые.

Ключевые слова: цифровизация, навигация, система высокоточной спутниковой навигации, пространственные данные, инфраструктура пространственных данных, точное сельское хозяйство, агрофирма.

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HIGH-PRODUCTIVE MILK AND MEAT CATTLE IN "BAYSERKE-AGRO" LLP

Abstract. As a result of fruitful joint research of scientists in livestock breeding with the management and specialists of LLP "Bayserke-Agro" Almaty region, groups of high-yield milk and meat breeds have been created.

Key words: milk, meat, breeding, breeding, breeding, staging, fertility, reproduction, youngster, productivity.

"Bayserke-Agro" LLP is a diversified livestock breeding entity, in which the dairy and beef cattle industries occupy one of the leading positions.

The successful development of these industries is ensured by the use of innovative technologies that allow us to achieve high rates of both livestock productivity and gross milk and beef production.

In "Bayserke-Agro" LLP, it is assumed that the intensification of dairy and beef cattle breeding sectors, at this stage of development, should be based on the full realization of the productive potential of domestic and world gene pool cattle on a scientific basis.

For this purpose, a set of research and innovation measures is carried out, the essence of which boils down to the development of: keeping livestock in appropriate zoohygienic conditions; creating a strong food base, allowing animals to provide balanced rations for 23-28 detailed controlled indicators, taking into account the physiological state of their body and the level of genetically determined productivity; directional rearing of young stock for the full formation of a highly productive herd; veterinary and sanitary measures for the prevention of livestock diseases; production of milk and meat in hygienic conditions.

The implementation of these research results and activities allowed to fully reveal the genetic productive potential of cattle farming.

The dairy herd of the farm today has 1478 heads of black-and-white Holstein-Friesian cattle.

The formation of a highly productive dairy herd that meets the requirements of modern production technology of environmentally friendly and high-quality products is associated with scientific research, the maximum combination of biological, ethological features of imported cattle imported from Canada, with new natural and fodder conditions and combination with the most economical ways of leading the industry. The efforts of the management of the economy, specialists and scientists were directed towards solving this problem. At the same time, the aim was to introduce urgently the research results into the production of not only this farm, but also the dissemination of best practices and acquired knowledge in the southeast of Kazakhstan among holders of dairy and beef cattle. To do this, at the suggestion of the management of "Bayserke-Agro" LLP and personally Dosmukhambetova T.M. with the support of this idea by scientists of the Southeast region and in accordance with the decision of the Ministry of Agriculture of the Republic of Kazakhstan, an educational and research and production center, "Bayserke-Agro", was organized in the administrative building of the dairy complex.

Currently it is functioning successfully. Theoretical and practical classes on weekly courses with students (farmers, specialists of economic organizations and agricultural departments of different levels) are conducted by scientists from the Kazakh Research Institute of Animal Growing and Feed Production, the Kazakh Research Institute of Agriculture and Plant Growing, the Kazakh Research Institute of Veterinary Medicine and the Kazakh National Agrarian University.

The dairy herd monitoring conducted at the beginning of the research (2013) at "Bayerke-Agro" LLP showed that there were 435 livestock in the farm, of which 185 cows or 23.5%, 31 heifers, 185 heads of young animals 2011-2013. birth and 34 fattening bulls. In the same year, 381 heads of black and motley Holstein-Friesian Canadian breeds were imported.

Selection work with the herd, the formation of its genealogical structure were focused on the bulls of the Canadian selection Shore-mark James, Carol Prelude, Mototo Meat, Ha-Ho Cuby Manfred-Meat.

In the structure of the dairy herd in October 2015, "Bayserke-Agro" LLP had 641 head of cattle (100%), of which 279 milk cows (43.5%), 76 dry cows, 76 goals. (11.9%), heifers 2013, 2014 birth 120 goals. (18.7%), heifer age 39 goals. (6.1%), the remaining 127 calves born in 2015 (19.8%), of which 85 are calves and 42 gobies. The figures show that the number of livestock on the farm increased by 32.8%, cows by 33.7% and heifers by 72.3%, which is evidence of the normal movement of dairy herd turnover in accordance with zootechnical requirements. Currently, the number of dairy cows in the farm has reached 440 heads.

Because of preventive measures carried out by scientists and specialists of "Bayserke-Agro" LLP in reproducing a herd of Holstein cattle, the number of heifers more than tripled. This intensification of breeding stock growth is associated with studies of reproductive functions in animals, the elimination of identified obstetric and gynecological diseases, and the use of the sexed same-sex bullseed.

Studies on the use of hormonal drugs and other aids, according to the classical schemes of stimulation of the sexual hunt, allowed us to receive one calf each year from each breeding stock.

Based on the study of the actual chemical composition and nutritional value of feed on the farm, variants of feed rations have been developed that have been tested and adjusted, helped to identify the productive potential of first heifers and adult cows. On average, 50–55% of the required nutrients were highly productive cows (milk yield more than 35 kg per day) was obtained due to concentrates and 45–50% of the composition of succulent and coarse feeds. Full feeding of dairy cattle became possible when creating a feed base, in which the merit of scientists Kazakh Research Institute of Agriculture and Plant Growingand Kazakh Institute of Plant Protection and Quarantine, who cultivated high-yielding forage crops for innovative technology, is significant.

The development of scientists for intensive and directional growing of young stock allowed forming a rather voluminous digestive apparatus in repair heifers for successful digestion of juicy and coarse nutrients, reaching them at the time of first insemination (14-16 months) of body weight 390-420 kg. The first heifers were mostly uncomplicated and brought healthy calves with a live weight of 42-45 kg. Recommendations for the use of whole milk replacers (milk replacer) in feeding calves allowed to increase the marketability of herd milk and save on each of them in the milk growing period from 160 to 240 l of whole milk with an efficiency of 5.0-7.7 thousand tenge.

Experiments on the preparation of heifers for calving and future lactation using the developed technologies for training milking machines, qualified care and massage of the udder contributed to the development of a stable reflex to milk yield. Massage of the udder of the breast of the heifers made it possible to increase its girth from 72.7 to 96.3 cm, the conditional value of the udder from 1236 cm^2 to 2099 cm^2, and in heifers, respectively, to 127 cm and 3564 cm^2.

The study of the composition of milk and its bacterial contamination shows that it is benign, suitable for processing and consumption as a whole. The smallest number of somatic cells was observed in first-calf cows (107.6 thousand/cm^3), in cows of the second and third calves it was 217.8 thousand/cm^3. The production of high-quality milk, in the whole complex, was facilitated by the introduction and installation of robotized technology (6 milking robots for milking 420 cows).

Studies of hematological parameters of blood and its serum in heifers, cows and newborn calves showed that they were mostly within the physiological norm. Some elevated levels of leukocytes and lymphocytes (by 1.2 and 0.5%) indicated a manifestation of the protective reaction of the organism of Holstein cattle in the new habitat.

Conducting the above comprehensive research was made possible with a benevolent attitude towards this management and specialists of “Bayserke-Agro” LLP. The end result of the joint efforts of scientists and specialists of the economy was the creation of a highly productive dairy herd of Holstein black-and-white breed of Canadian origin of 440 head of dairy cows. The average annual milk yield from a single milk cow is 9100 kg of milk, and the annual gross milk production of the herd is up to 4.1 thousand tons.

The combination of scientific research and practical techniques allowed growing record cows in the dairy herd of “Bayserke-Argo” LLP with an average annual milk yield of 8.5–9.2 thousand kg of milk. The republic has set a record for daily milk yield. This figure is 76 kg.

The meat herd of “Bayserke-Agro” LLP is represented by 2,042 heads of the Kazakh white-headed and auliekolsky breeds of domestic cattle, as well as Aberdeen Angus and Herefords of Canadian selection. On a variety of breeds of beef cattle, concentrated in one large herd, the farm is unique.

The average mass of a full-aged cow of the Kazakh white-headed breed in the herd of the farm is 465–5500 kg, bulls 800–900 kg, calves with weaning from mothers (7–8 months) 180–200 kg, auliekolsky breed, respectively 480–540 kg, bulls 900–950 kg, calves 200–220 kg. Approximately the same indicators are typical for beef imported cattle.

The content of beef cattle of all breeding breeds is pasture-stall, which makes it possible to rationally identify the productive potential of animals without large material costs and to produce cheap beef. The farm uses Canadian technology, without the construction of bulky and expensive livestock facilities for beef cattle.

The reproductive qualities of the breeding stock are very high and the yield of offspring per 100 females ranges between 82–90 calves' heads.

Youngsters on pasture daily add 780–840 g of weight gain per day without additional feeding with concentrated feed.

The average annual production of beef is 100 tons, for 5 years (2013–2018) more than 500 tons have been supplied to the state.

One of the most effective ways of influence of “Bayserke-Agro” LLP on the intensification of the development of dairy and beef cattle breeding in the republic is the implementation of breeding animals.

For 5 years, the farm has implemented more than 800 heads of pedigree cattle in the economic, agricultural and industrial development of Almaty, Zhambyl and East Kazakhstan regions.

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"БАЙСЕРКЕ АГРО" ЖШС ЖОҒАРЫ ӨНІМДІ СҮТ ЖӘНЕ ЕТ МАЛ ШАРУАШЫЛЫҒЫ

Аннотация. Мал шаруашылығы саласындағы ғалымдар Алматы облысы «Байсерке-Агро» ЖШС басшылығы және мамандарымен бірлескен шығармашылық жемісті ізденістер нәтижесінде сүтті және етті бағыттағы ірі қараның асыл тұқымды жоғары өнімді топтары құрылды.

Ключевые слова: сүт, ет, мал шаруашылығы, тұқым, селекция, табын, азықтандыру, ұдайы өндіріс, төл, өнімділік.

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ВЫСОКОПРОДУКТИВНОЕ МОЛОЧНОЕ И МЯСНОЕ СКОТОВОДСТВО ТОО «БАЙСЕРКЕ-АГРО»

Аннотация. В результате исследований и совместной творческой деятельности ученых-аграриев, руководства и специалистов хозяйства в ТОО «Байсерке-Агро» Алматинской области созданы племенные высокопродуктивные стада молочного и мясного крупного рогатого скота.

Ключевые слова: молочное, мясное, скотоводство, порода, селекция, стадо, кормление, воспроизводство, молодняк, продуктивность.

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IMPROVING THE EFFICIENCY OF VETERINARY AND SANITARY MEASURES ON LIVESTOCK FARMS LLP «BAYSERKE-AGRO»

Abstract. The article presents the results of air analysis on sanitary and bacteriological indicators of newborn calves and improving the efficiency of veterinary and sanitary measures on livestock farms. Currently, a lot of work is being done to create optimal conditions for the maintenance and cultivation of newborn calves and the search for new solutions aimed at improving the efficiency of veterinary and sanitary measures in livestock farms of «Bayserke-Agro»LLP, as well as maintaining health through the implementation of veterinary and sanitary rules for the cultivation of newborn calves. Quantitative indicators of deterioration of air quality in individual houses for keeping newborn calves in this livestock farms are given. In order to describe in more detail the effectiveness of veterinary and sanitary measures on livestock farms were determined before disinfection and after disinfection from the following objects: buckets with a valve and a nipple for watering calves; plastic bucket for watering calves; fixing buckets; the inner wall of the individual house; plastic fence. The correct selection and competent use of this disinfectant «GAN» which affects all known pathogens, a wide range of bactericidal, virulicidal and fungicidal actions, is low-risk for personnel and animals, is active in the conditions of organic pollution, does not destroy metals, plastic, rubber and other materials.

Key words: quantitative and qualitative composition of microorganisms, individual houses, newborn calves, before and after disinfection.

Introduction. The head of state pays special attention to the development of the drivers of the economy - the agricultural sector, namely livestock. In the next five years, the production and processing of agricultural products should become the main source of diversification and a driver of economic growth, and also instructed to increase the efficiency of animal husbandry by 40 % [1].

The most important task of modern animal husbandry is the cultivation of strong viable calves. Active adaptation to adverse environmental factors, their growth, development and safety depends on the health of calves. Of particular importance in the prevention of diseases of calves at early age have a veterinary-sanitary and sanitary measures, therefore, the conditions of detention, care, feeding, veterinary-sanitary and sanitary requirements must interacted with unified technology of rearing calves of early age [2-4].

Diseases of newborn young cattle reduce the efficiency of the livestock industry, as they are the cause of waste, and animals that have been ill at an early age, can not further fully realize their genetic potential, as a result of the economy suffers significant losses [5-7].

The microclimate in individual houses depends on the climatic conditions, the type and quality of construction materials used for their construction and the way of keeping animals. The formation of the microclimate is influenced by the amount of water vapor formed during the life of the organism, the products of metabolism and decomposition of organic substances [8-10].

The main diseases that reduce the productivity of young animals are violations of sanitary and hygienic regimes of newborn calves lead to the accumulation in individual houses of conditionally-pathogenic and pathogenic microorganisms, when only the emerging qualitative and quantitative composition of lactic microflora is not able to prevent the colonization of the intestine by pathogenic and conditionally-pathogenic microorganisms that secrete in the process of life a large number of toxins unsafe for the life of the newborn [11-13].

According to J. B. Myrzabekov, V. I. Gershun, S. B. Myrzabekova, (2001, 2009) on the state of non-specific resistance of newborn calves, greatly influenced not only the mode and frequency of feeding, but also the conditions of detention, as well as environmental factors [14, 15].

According to V. I. Gershun, the value of preventive disinfection of premises for cattle (2001, 2005, 2009). The effect of these measures was taken into account by bacteriological examination. (V. I. Gershun, J. B. Myrzabekov, S. B. Myrzabekova 2001, 2007, 2009) found that total microbial count of the air is reduced by 95,57 % with manure, and then disinfected with 3 % - s ' solution of sodium hydroxide - 98,73 %, the number of staphylococci is reduced by 78.5%, and hemolytic streptococci - 68.7 %. Disinfection ensures the destruction of both types of microbes. Different methods are used for air purification and neutralization of livestock premises [16, 17].

The rearing of newborn calves is organized according to a certain method, based on the specific purpose of breeding and the conditions that can be provided by the research and production center «Baiserke-Agro». The content of calves in each method involves its own characteristics, advantages and disadvantages [18-20].

The purpose and objectives of research. The main purpose of the research was the scientific and theoretical substantiation of microclimate indicators for keeping newborn calves in individual houses in the conditions of livestock farms of «Bayserke-Agro» LLP and to obtain cost - effective and competitive livestock products.

Materials and methods. Sanitary-hygienic and bacteriological examination was carried out by conventional methods. The research was conducted in livestock farms of «Baiserke – Agro»LLP. Individual houses for keeping young cattle were investigated in the conditions of production. Flushes with sterile cotton swabs were taken before disinfection and after disinfection from the following objects: 1. Buckets with valve and nipple for calves. 2. Plastic bucket for calves. 3. Fixing for fixing buckets; 4. Inner wall. 5. Plastic fence. For flushes, each tube contained 5 ml of sterile saline. For sowing, 1.0 ml of the initial wash was taken, introduced into sterile Petri dishes and poured, slightly opening the lid by 15 ml MPA, the contents of the cups were gently mixed and placed at room temperature until solidification. Cups frozen agar were placed upside down in an incubator at 37 °C for 24 h. For crops used the following nutrient medium: MPA (meat infusion agar), Saburo, Endo, staphylococcal and streptococcal environment [16].

Cups with crops on the environment Saburo were incubated in a thermostat at a temperature of 25 °C in order to be able to form a mycelium within 7 days, and the rest were incubated at the temperature 37 °C and accounting was performed after 48 h on medium Saburo - molds and yeasts (also saw growth in this environment, some of the bacilli), on Wednesday Endo - took into account the growth of the intestinal microflora of enterobacteria, which gave colonies of different size and color from light pink to dark red. In the staphylococcal environment, in addition to different types of staphylococci, some types of bacilli give growth, not only streptococci also grow on a dense streptococcal environment.

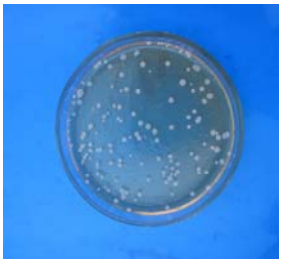
For disinfection in limited areas used 20-liter veterinary hydrolic spray (figure 1). Veterinary hydrolic sprayfilled with a disinfectant solution of GAN (figure 2) with a wide range of antimicrobial activity against pathogens of infectious diseases of bacterial, viral and fungal etiology. Working solutions of the drug do not have a locally irritating and sensitizing effect, do not cause corrosion of metals, and do not destroy plastics, rubber and other materials.

Results and their discussion. During the assessment of air quality in individual houses, the concentration of microbial contamination is extremely important. You should pay attention to the fact that the average indicators of microbial contamination of air in individual houses 3-4 times exceeded the permissible limits on the average amounted to 7,0 thousand CFU /m^2.

Figures 3, 4 show Petri dishes growth of microorganisms before and after disinfection in individual houses on the livestock farm of LLP «Bayserke – Agro».

Figure 1 – Veterinary hydrobolt

Figure 2 – GAN Disinfectant



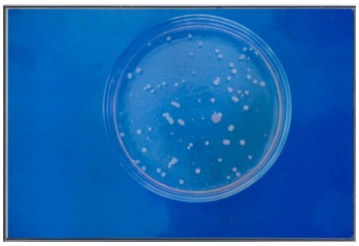
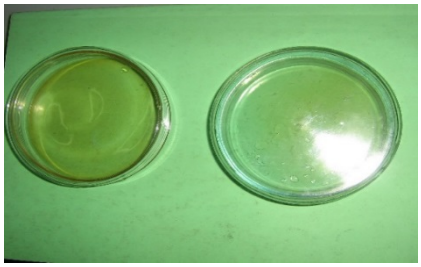


Figure 3 – Petri Dishes with grown microorganisms before disinfection



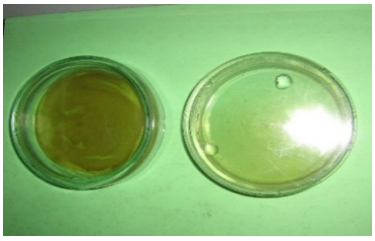
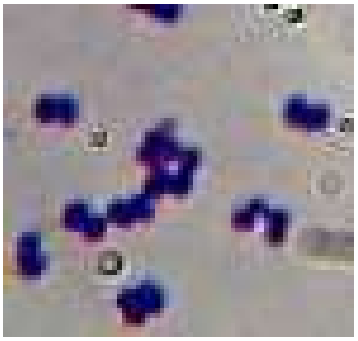
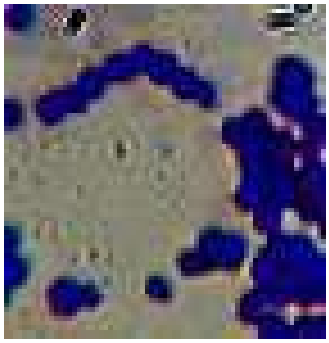


Figure 4 – Petri Dishes with grown microorganisms after disinfection

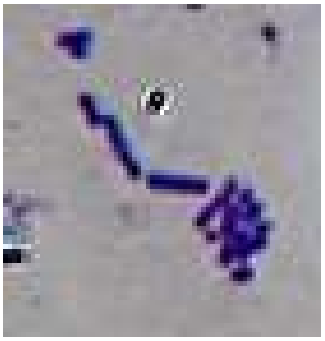
As can be seen from figure 3, after 2 hours after disinfection, a small amount of microflora remains in the washouts from the wall of the individual house. The same pattern is observed on the crops from the washouts of all other objects: a plastic bucket for watering calves and mounts for fixing buckets. The preparation of smears from grown colonies and viewing them with a microscope showed that on objects, although in small quantities, there is a significant variety of microorganisms. For clarity, they are shown in figure 5.



Staphylococcus



Streptococcus



Escherichia coli

Figure 5 – Morphological forms of bacteria growing from the washouts from the individual house taken before disinfection under the photos indicated nutrient media

From figure 5 it is clear that disinfection disinfectant washings detected staphylococci, sarcina and a non-sporulating Bacillus. After disinfection with disinfectant GaN remain single individual senterobacteria and streptococcus.

Conclusion. Our research allows us to make the following conclusion:

1. As a result of the conducted researches it is established that the General microbial pollution in individual lodges not corresponds to biological requirements of calves of early age and negatively influences growth and development of calves.

2. The use of a disinfectant solution of GAN contributed to the reduction of the total amount of microbial contamination in the air of individual houses and contributed to the increase of the natural resistance of the body of calves.

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«БАЙСЕРКЕ-АГРО» ЖШС МАЛ ШАРУАШЫЛЫҒЫ ФЕРМАЛАРЫНДА ВЕТЕРИНАРИЯЛЫҚ-САНИТАРИЯЛЫҚ ІС-ШАРАЛАРДЫҢ ТИІМДІЛІГІН АРТТЫРУ»

Аннотация. Бұл мақалада жаңа туған бұзауларды ұстаудың санитариялық-бактериологиялық көрсеткіштері бойынша ауаны талдау нәтижелері және мал шаруашылығы фермаларындағы ветеринариялық-санитариялық шаралардың тиімділігін арттыру келтіріледі. Қазіргі уақытта «Байсерке-Агро» ЖШС мал шаруашылығы фермаларында ветеринариялық-санитариялық іс-шаралардың тиімділігін арттыруға бағытталған жаңа шешімдерді іздеу және жаңа туған бұзауларды өсірудің ветеринариялық-санитариялық ережелерін орындау жолымен денсаулықты сақтау бойынша үлкен жұмыс жүргізілуде. Осы мал шаруашылығы фермаларында жаңа туған бұзауларды ұстау үшін жеке үйшіктерде ауаның сапалық құрамының нашарлауының сандық көрсеткіштері келтірілген. Мал шаруашылығы фермаларындағы ветеринариялық-санитариялық іс-шаралардың тиімділігін егжей-тегжейлі сипаттау үшін дезинфекцияланғанға дейін және дезинфекцияланғаннан кейін келесі объектілерден анықталды: бұзауларды суаруға арналған қақпақшасы және шырыны бар шелектер; бұзауларды суаруға арналған пластикалық шелектерді; шелектерді бекітуге арналған бекіткіш; жеке үйдің ішкі қабырғасы; пластикалық қоршау. Аталған «ГАН» дезинфекциялық құралын дұрыс таңдау және сауатты пайдалану ұсынылды, ол барлық белгілі патогендерге, бактерицидті, вирусты және фунгицидтік әсерлердің кең спектріне әсер етеді, персонал мен жануарлар үшін аз қауіпті, органикалық ластану жағдайында белсенді, металл, пластмасса, резеңке және т.б. материалдарды бұзбайды.

Түйін сөздер: дезинфекцияға дейін және одан кейін, жаңа туған бұзаулар, жеке үйлер, микроорганизмдердің сандық және сапалық құрамы.

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ПОВЫШЕНИЕ ЭФФЕКТИВНОСТИ ВЕТЕРИНАРНО-САНИТАРНЫХ МЕРОПРИЯТИЙ НА ЖИВОТНОВОДЧЕСКИХ ФЕРМАХ ТОО «БАЙСЕРКЕ-АГРО»

Аннотация. В статье приводятся результаты анализа воздуха по санитарно-бактериологическим показателям содержания новорожденных телят и повышение эффективности ветеринарно-санитарных мероприятий на животноводческих фермах.

В настоящие время проводится большая работа по созданию оптимальных условий содержания и выращивания новорожденных телят и поиск новых решений, направленных на повышение эффективности ветеринарно-санитарных мероприятий в животноводческих фермах ТОО «Байсерке-Агро», а также сохранения

здоровья путем выполнения ветеринарно-санитарных правил выращивания новорожденных телят. Приведены количественные показатели ухудшения качественного состава воздуха в индивидуальных домиках для содержания новорожденных телят в данном животноводческом фермах. Для того чтобы более подробно охарактеризовать эффективность ветеринарно-санитарных мероприятий на животноводческих фермахбыли определены до дезинфекции и после дезинфекции со следующих объектов: ведра с клапаном и соской для поения телят; пластиковое ведро для поения телят; крепление для фиксации ведер; внутренняя стенка индивидуального домика; пластиковое ограждение. Предложена правильный подбор и грамотное использование данного дезинфицирующего средства «ГАН» который воздействует на все известные патогены, широкий спектр бактерицидного, вирулицидного и фунгицидного действия, малоопасен для персонала иживотных, активен в условиях органических загрязнений, не разрушаетметаллы, пластмассу, резину и др. материалы.

Ключевые слова: количественный и качественный состав микроорганизмов, индивидуальный домик, новорожденный телят, до и после дезинфекция.

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TRUE BUGS (HEMIPTERA: HETEROPTERA) - PESTS OF GRAIN CROPS (BARLEY, TRITICALE, WHEAT) OF «BAYSERKE-AGRO» LLP

Abstract. The purpose of the study was to clarify the species composition of hemiptera - pests of grain (barley, triticale, wheat) «Bayserke-Agro» LLP in Almaty oblast. As a result of the research conducted on the fields of grain crops of «Bayserke-Agro» LLP, 24 species of hemiptera were noted, belonging to 17 genera and 5 families. Of these, the largest number of species belongs to the family of Capsid bugs (Miridae) - 9. Next in terms of the number of families, the Real shield bugs (Pentatomidae) and the Scentless plant bugs (Rhopalidae) belong to 5 and 6 species. The Shield-backed bugs (Scutelleridae) family includes 3 species. And only 1 species belongs to the family of Milkweed bugs (Lygaeidae). Such a diversity of species composition can be explained that the high attractiveness of the fields of forage crops for various species of hemiptera, because there is a rich forage base, as well as on the fields of forage crops «Bayserke-Agro» LLP does not apply chemical insecticides. According to food relations, hemiptera - pests of grain (barley, triticale, wheat) crops of «Bayserke-Agro» LLP are plant-eating species. Of them polyphytophagous make up 68 %, wide oligophytophagous – 32 %. The most economically significant species of bugs belong to the families Miridae, Pentatomidae and Scutelleridae. It is they who are capable of causing serious damage to grain crops during mass reproduction. The rest is usually only locally harmful.

Keywords: Hemiptera, Heteroptera, true bugs, pests, barley, triticale, wheat, «Bayserke-Agro» LLP, Almaty oblast, Kazakhstan.

Introduction. True bugs, previously an independent group, and now are a suborder of Hemiptera group - one of the largest groups of insects, known about 40 thousand species, collected in 50 families. There are 35 families, more than 1200 species in Kazakhstan. Spread worldwide. Body length from 0.7 to 12 cm. Insects are very diverse in their appearance. Distinguished by sucking type mouthparts, that forms articulated proboscis. 2 pairs of wings, usually folded flat, covering abdomen from top. Upper wings (superior wings) consist of main leathery part and the membranous top part, rarely superior wings are entirely leathery or cellular. Short-wings and even absence wings is frequently encountered. Frequently with odorous glands, excretion of which have unpleasant smell, which serves to scare off enemies and attract individuals of a species. Way of life is very diverse. Majority of species live on land, but some have moved to living in water or on its surface (*water striders*). Ground true bugs often live openly on plants, sometimes on soil surface and in its upper layer, in forest floor, under tree bark, etc. They feed on plants juices, mainly on their genesic organs and seeds. Part of terrestrial true bugs, and most of water habitant and all water striders are predators, they feed on various insects, their larvae and eggs, mites, etc. Many predatory true bugs are beneficial because theirs eradicate insects harmful for agriculture and forestry and their larvae and other invertebrates. Mixed feeding species are frequent. There are many pests to agriculture and forestry among species. Some phytophages are plants viral diseases carriers. Some

swimming bugs are harmful to fisheries, feeding on eggs and young fish. Bed bugs and some tropical species are parasites to humans, mammals and birds. True bugs play an important role in biological processes in biogeocenoses and agrobiocenoses. Therefore, their study is not only theoretical, but also practical.

Basis for this work were harvest and field observations of authors made in 2015-2018 on grain crops (triticale, barley, wheat) of "Bayserke-Agro" LLP in Talgar district of Almaty oblast. Some data have already been published by us before [1-4]. However, overall summary devoted to grains Hemipterans, does not exist. Hence is the relevance of this work.

Material and methods. Research was conducted in April-October 2015-2018 on grain crops fields (triticale, barley, wheat) in "Baiserke-Agro" LLP of Talgar district of Almaty oblast of Kazakhstan. When conducting research using techniques generally accepted in entomology [5-7] (capture with entomological net, manual collection, identification of species and placement in collection), visual observations, photographing, etc. To identify hemipterans, to clarify their biological characteristics and economic significance, we used summaries, guidelines and field guide from list of literature [8-28].

Research results. As a result of research we have compiled a list of species of true bugs noticed in "Bayserke-Agro" LLP grain crop fields, Almaty oblast, given below. Some of their species are shown in figures 1-8.

Class Insecta - Insects
Order Hemipteran - Hemipterans
Suborder Heteropterans - True Bugs
Family Miridae - Capsid bugs

Adelphocoris lineolatus (Goeze, 1778). Polyphytophage (composites, goosefoot and legume, mostly prevail on legume). Mass pest of legume. It is noted on ultivated grasses as alien species migrated from soybean and alfalfa.

Heterotoma merioptera Scopoli, 1763. Polyphytophage; prefers immature fruits, buds, juices and nectar of various plants.

Lygus gemellatus (Herrich-Schaeffer, 1835). Polyphytophage; universally harms Grains, legumes.

Figure 1 – *Lygus gemellatus* (Herrich-Schaeffer)

Lygus pratensis (Linnaeus, 1758). Chortobiont; poly phytophage (harmful to fruit, grain, legumes and horticultural crops); bivoltine [10] or 3-4 generations per year; wintering imago.

Lygus rugulipennis Poppius, 1911. Horto-tamnobiont (occurs widely throughout, in floodplains, on many herbaceous and shrubby plants); poly phythophage (harmful to many crops: fruit, medicinal crops and other plants); 2 generations per year; wintering imago. Harmful to umbellate vegetable crops seeds (11).

Figure 2 – *Lygus pratensis* (L.)

Polymerus cognatus (Fieber, 1858). Chortobiont; poly phytophage (legumes, crucials, aster family (*Artemisia*) and Chenopodiaceae); up to 4 generations per year; hibernating eggs. Harmful to seeds and plants - lucerne, potatoes, grain crops

Plagiognathus chrysantemi (Wolff, 1804). Chortobiont; herb-bunchgrass grassland, poly phytophage (Chenopodiaceae, legumes, grains and other herbaceous plants, feeds on young leaves, buds, flowers and green beans [13], 10; monovoltine species; wintering eggs.

Stenodema calcarata (Fallen, 1807). Chortobiont (on grassland vegetation); polyphytophage (on grain and Cyperaceae); potential pest to grain crops [9]; 2 generations per year; wintering imago. Sometimes propagated in mass quantities.

Figure 3 – *Stenodema calcarata* (Fall.)

Trigonotylus caelestialium (Kirkaldy, 1902). Imago and larvae feed juice of the leaf blade of many grain crops and forage herbs, sometimes damaging the delicate stems and spires. In case of harm, yellow-brown spot appears, top of the leaf blade is wrapped. Found on many wild grasses.

Family Rhopalidae - Scentless plant bugs

Brachycarenus tigrinus (Schilling, 1829). Polyphytophage live on composites, crucials, and observed on plants of other families, it feeds the contents of the seeds.

Chorosoma schillingii (Schilling, 1829). Chortobiont; inhabits virgin areas, wide oligo phytophage (on grain crops: *Festuca, Poa, Koeleria, Stipa* and other); 2 generations per year; winering eggs. Pest to grain crops, especially to wheat grass at hayfields and pastures [15].

Corizus hyoscyami hyoscyami (Linnaeus, 1758). Chortobiont; poly phytophage (at spring temporarily feeding on willow flowers, young shoots of birch, pine and other trees and shrubs; then move to sow-thistle, chamomile, *Euphorbia* and other herbaceous plants; main host plants: *Hyoscyamus niger, Tabacum, Ononis spinosa, Erodium*, considered harmful to legumes (16); 2 generations per year; wintering imago. Widespread, dominant species.

Figure 4 – *Corizus hyoscyami* (L.)

Rhopalus parumpunctatus Schilling, 1829. Chortobiont; mesophytous grassfield vegetation, glades and forest edges, areas with ruderal-mixed vegetation, roadsides and other similar habitats); poly phytophage (on various herbaceous plants: Cruciferous, Labiatae, Caryophyllaceous and Compositae (*Arenaria, Lepidium, Salvia, Artemisia, Centaurea, Achillea*), is considered a lesser pest to perennial legumes and grain legumes); 2 generations per year; wintering imago. Feeding on grain crops was observed in mountains of Central Asia [17].

Rhopalus subrufus (Gmelin, 1790). Chortobiont; poly phytophage (prefers Labiatae, sometimes legumes and plants from other families); 2 generations per year; wintering imago [16].

Stictopleurus punctatonervosus (Goeze, 1778). Chortobiont; poly phytophage, occurs on cultivated legumes and grain crops and other similar habitats; widespread oligophytophage (on Compositae); 2 generations per year; wintering imago.

Family Lygaeidae - Milkweed bugs

Lygaeus equestris (Linnaeus, 1758). Herpetochoborbiont (among wild grasses, grain crops, under different plants); poly phytophage (fallen seeds of many plants and green parts juice) [18, 19]; 1 generation per year, wintering imago [20].

Figure 5 – *Lygaeus equestris* (L.)

Family Scutelleridae - Shield-backed bugs

Eurygaster integriceps Puton, 1881. Chortobiont; occurs in open areas: steppes, floodplains, cultivated fields, and other; widespread oligophytophagous (on *Hordeum, Poa*, *Dactylus, Elytrigia, Agropyron* and grain crops, is a dangerous pest to grain crops); 1 generation species; wintering imago [21].

Figure 6 – *Eurygaster integriceps* Put.

Eurygaster maura (Linnaeus, 1758). Chortobiont; mesophile (meadows, crops, in depression); wide oligophytophagous (grain crop, cereal crops, also on composites [22, 23]; 1 generation per year; wintering as imago.

Odontotarsus purpureolineatus (Rossi, 1790). Chortobiont, trophic connected with composites, grain crops and many other plants, polyphytophage, feeding mainly on generative parts; 1 generation per year; wintering as imago.

Family Pentatomidae- Real shield bugs

Dolycoris baccarum (Linneaus, 1758). Evri-Chortobiont; it can be found everywhere, in different mesophytic biotopes, including fields, gardens, along flood bed and river-valleys; polyphytophage (on different plants) after wintering imago feeds on shoots and buds of many tree species, and in autumn imago suck the contents of their seeds and fruits, crop pest; 1 generation per year; wintering imago. [20]. They feed on 58 plant species belonging to 24 plants [24] Harm is observed on many cultivated plants-wheat, corn, potatoes and other plants [18].

Figure 7 – Berrylike, Dolycoris baccarum (L.), imago on triticale

Aelia acuminata (Linnaeus, 1758). Chortobiont; wide oligophytophagous (on cultivated grasses and cereal crops), 1 generation per year; wintering imago [25, 26].

Figure 8 – *Aelia acuminata (L.)*

Aelia furcula Fieber, 1868. Chortobiont; meso-xerophile (semi-desert, steppe, open areas and steppe biotopes, lowland grasslands up to 800-1600 m); wide oligophytophagous (on cultivated grasses and cereal crops); prevalent and dominant, repeatedly causing significant harm to crops in Kazakhstan; on wheat, barley, wheat grass. Wheat crops are harmed is especially noticeable in the period of wax ripeness. K.A. Slivkina previously noted it as cereal fly [27].

Aelia melanota Fieber, 1868. Chortobiont; meso-xerophile (in steppes, dry meadows, forest, and open areas and steppe biotopes); wide oligophytophagous (on cultivated grasses and cereal crops) [23]; 1 generation per year; wintering imago.

Aelia sibirica Reuter, 1886. Chortobiont; meso-xerophile (prevalent in Kazakhstan steppes, where it is considered as cereal fly) wide oligophytophagous (on cultivated grasses and cereal crops); 1 generation per year; wintering imago. It is observed on grain crop in a wide variety of biotopes. In big quantities on wild grasses. Suck leaves and grain. Specialized pest of spire and grains [18].

Discussion of research results. Table shows taxonomic composition of the hemipterous phytophagous complex - pests of grain crop (barley, triticale, wheat) LLP "Bayserke-Agro".

Taxonomic composition of hemipterous - pests of grain crop (barley, triticale, wheat) LLP "Baiserke-Agro"

Family	Genus	Species	Found	The nature of the harm
Miridae	*Adelphocoris*	*A. lineolatus* (Goeze, 1778)	On alfalfa, wheat, triticale, prevail on alfalfa +++	Polyphytophage (composites, goosefoot and legume, mostly prevail on legume). Mass pest of legume. It is noted on ultivated grasses as alien species migrated from soybean and lucerne.
	Heterotoma	*H. merioptera* Scopoli, 1763	Alfalfa, soy, barley, wheat, triticale ++	Polyphytophage. Prefers immature fruits, buds, juices and nectar of various plants.
	Lygus	*L. gemellatus* (Herrich-Schaeffer, 1835)	On alfalfa, wheat, triticale ++	Polyphytophage; universally harms Grains, legumes
		L. pratensis (Linnaeus, 1758)	On alfalfa, triticale, soy, prevail on alfalfa, triticale ++	Polyphytophage. Harms fruit, grain, legumes and vegetable crops.
		L. rugulipennis Poppius, 1911	On alfalfa, triticale ++	Polyphytophage. Harms grain, legumes

	Polymerus	*P. cognatus* (Fieber, 1858)	On alfalfa, triticale ++	Polyphytophage (on legumes, crucials, composites, goosefoot) Harms seeds and plants - alfalfa, potatoes, cereals, grain crops
	Plagiognathus	*P. chrysantemi* (Wolff, 1804)	On alfalfa, triticale +++	Polyphytophage (on composites, legume, grain crop and other herbaceous plants, sucks juvenile leaves, buds, flowers and green beans)
	Stenodema	*S. calcarata* (Fallen, 1807)	On triticale ++	Polyphytophage (grain crop and sedge); potential pest of grain crop
	Trigonotylus	*T. caelestialium* (Kirkaldy, 1902)	Barley, wheat, wheat ++	Imago and larvae feed juice of the leaf blade of many grain crops and forage herbs, sometimes damaging the delicate stems and spires. In case of harm, yellow-brown spot appears, top of the leaf blade is wrapped. Found on many wild grasses.
Rhopalidae	*Brachycarenus*	*B. tigrinus* (Schilling, 1829)	Alfalfa, soybean, wheat ++	Polyphytophage live on composites , crucials, and observed on plants of other families, it feeds the contents of the seeds
	Chorosoma	*C. schillingii* (Schilling, 1829)	On triticale, soy +	Wide oligophytophagous (grain crop) cultivated grasses pest
	Corizus	C. hyoscyami hyoscyami (Linnaeus, 1758)	On alfalfa, triticale, soy +++	Pest of legume, polyphytophage
	Rhopalus	Parumpunctatus Schilling, 1829	On alfalfa, triticale, soy ++	Polyphytophage (on various herbaceous plants, is considered a minor pest of perennial legumes and grains-legumes)
		R. subrufus (Gmelin, 1790)	On alfalfa, triticale, soy ++	Polyphytophage (prefers labiate family, sometimes legumes and plants from other families)
	Stictopleurus	*S. punctatonervosus* (Goeze, 1778)	On alfalfa, soy, triticale, wheat ++	Wide oligophytophagous (on composites)
Lygaeidae	*Lygaeus*	*L. equestris* (Linnaeus, 1758)	On alfalfa, triticale, soy ++	Polyphytophage (fallen seeds of many plants and the juice of the green parts)
Scutelleridae	*Eurygaster*	*E. integriceps* Puton, 1881	On triticale, wheat, barley +	Wide oligophytophagous (on bread grains, dangerous cereal fly)
		E. maura (Linnaeus, 1758)	On triticale, wheat +	Wide oligophytophagous (on grain crop and cereal crops)
	Odontotarsus	*O. purpureolineatus* (Rossi, 1790)	On triticale +	Polyphytophage (grasses, cereal crops)
Pentatomidae	*Dolycoris*	*D. baccarum* (Linneaus, 1758)	On alfalfa, triticale, soy, barley, wheat +++	Polyphytophage (on different plants, imago suck the contents of their seeds and fruits, a pest of cultivated plants) Harm is observed on many cultivated plants-wheat, corn, potatoes and other plants
	Aelia	*A. acuminata* (Linnaeus, 1758)	On triticale, barley, wheat, alfalfa +	Wide oligophytophagous (on cultivated grasses and cereal crops)
		A. furcula Fieber, 1868	On wheat, barley +	On cultivated grasses and grain crops pest
		A. melanota Fieber, 1868	On wheat, barley +	On cultivated grasses and grain crops
		A. sibirica Reuter 1886	On wheat, barley +	On cultivated grasses and grain crops

Note: Occurence: + - low, ++ - medium, + + + - high.

24 species of Hemipterous related to 17 genera and 5 families were discovered on the grain fields (barley, triticale, wheat) in «Bayserke-Agro » LLP in Almaty region, Kazakhstan during our research.

Such a variety of species composition can be explained that the high attractiveness of the fields of forage crops for different species of Hemipterous, as there is a rich food reserve, and also chemical insecticides are not used on forage crops fields of «Bayserke-Agro» LLP.

As per food web, hemipterous - pests of grain crop (barley, triticale, wheat) of «Bayserke-Agro» LLP is phytophag species with wide range of feeding. Polyphytophage 68 % is and 32 % is oligophytophagous.

Results. 24 species of Hemipterous related to 17 genera and 5 families were discovered during research. Largest number of species belongs Miridae family – 9. Next largest families are Pentatomidae and Rhopalidae includes 5 species. Scutelleridae includes 3 species. And only 1 species belongs to family Lygaeidae.

As per food web, hemipterous - pests of grain crop is phytophag species, polyphytophage is 68 % and 32 % is oligophytophagous.

The most economically significant species of true bugs belong to Miridae, Pentatomidae and Scutelleridae. They are able to cause serious harm to grain crops during mass reproduction. Others usually harm only locally.

It is required to carry out protective measures against hemipterous pest on grain crops during mass reproduction. However, in pesticides (pesticides) reference book [29], permitted for use on the territory of the Republic of Kazakhstan, only chemical insecticides are registered against these pests. Thus, in order to obtain environmentally environmentally compatible agricultural products, it is required to expand the range of biological products designed to control sucking pests through the transfer and adaptation of existing foreign technologies. One of the alternatives can be artificial cultivation aculeate hymenoptera on forage crops field, including grain crop field, some species of which are entomophages of true bugs and other sucking pests. Such experiment was conducted by the authors forage crops field in "Bayserke-Agro" LLP and show positive result [30]. Similar studies on the breeding of aphidius were conducted by our colleagues [31].

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«БАЙСЕРКЕ-АГРО» ЖШС ДӘНДІ ДАҚЫЛДАРДЫҢ (АРПА, ТРИТИКАЛЕ, БИДАЙ) ЗИЯНКЕСТЕРІ – ЖАРТЫЛАЙ ҚАТТЫҚАНАТТЫЛАР (HEMIPTERA: HETEROPTERA)

Аннотация. «Байсерке-Агро» ЖШС Алматы облысы дәнді дақылдардың (арпа, тритикале, бидай) зиянкестері – жартылай қаттықанаттылардың түр құрамын анықтау. «Байсерке-Агро» ЖШС дәнді дақылдар егісінде жүргізілген зерттеулер нәтижесінде 5 тұқымдасқа 17 туысқа жататын зиянкес жартылай қаттықанаттылардың 24 түр табылды. Олардың ең көп саны соқыр тұқымдастарына жатады (Miridae) – 9. Осы қалқаншалардың (Pentatomidae) және түйреуіштердің (Rhopalidae) тұқымдастарының саны бойынша олардың соңынан келетініне 5 және 6 түрден жатады. Отбасы қалқаншалардың-тасбақалар (Scutelleridae) 3 түрді қамтиды. Тек 1 түрі жердегі отбасына жатады (Lygaeidae). Мұндай түр құрамының алуантүрлілігін дәнді дақылдар егісіндегі қоректік қордың бай болуы және мұнда химиялық инсектицидтердің қолданыл-

мауымен түсіндіруге болады. «Байсерке-Агро» ЖШС дәнді дақылдардың (арпа, тритикале, бидай) зиянкестері – жартылай қаттықанаттылардың барлығы өсімдіккоректі. Олардың ішінде полифитофагтар 68 %, кең олигофитофагтар – 32 % құрайды. Ең маңызды шаруашылық түрлері Miridae, Pentatomidae және Scutelleridae тұқымдастарына жатады. Олар жаппай көбею кезінде дәнді дақылдардың егісіне елеулі зақым келтіруге қабілетті. Қалғандары, әдетте, тек жергілікті зиян келтіреді.

Түйін сөздер: Hemiptera, Heteroptera, жартылай қаттықанаттылар, зиянкестер, арпа, тритикале, бидай, ЖШС «Байсерке-Агро», Алматы облысы, Қазақстан.

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ПОЛУЖЕСТКОКРЫЛЫЕ (HEMIPTERA: HETEROPTERA) – ВРЕДИТЕЛИ ЗЕРНОВЫХ (ЯЧМЕНЬ, ТРИТИКАЛЕ, ПШЕНИЦА) ТОО «БАЙСЕРКЕ-АГРО»

Аннотация. Целью исследования было выяснение видового состава полужесткокрылых - вредителей зерновых (ячмень, тритикале, пшеница) ТОО «Байсерке-Агро» в Алматинской области. В результате проведенных исследований на полях зерновых культур ТОО «Байсерке-Агро» отмечено 24 вида полужесткокрылых, относящихся к 17 родам и 5 семействам. Из них наибольшее количество видов относится к семейству Слепняки (Miridae) – 9. К следующим за ним по численности семействам Настоящих щитников (Pentatomidae) и Булавников (Rhopalidae) относится по 5 и 6 видов. Семейство Щитник-черепашки (Scutelleridae) включает 3 вида. И только 1 вид относится к семейству Наземников (Lygaeidae). Такое разнообразие видового состава можно объяснить, что высокая привлекательность полей кормовых культур для различных видов полужесткокрылых, поскольку здесь имеется богатая кормовая база, а также на полях кормовых культур «ТОО «БайсеркеАгро»» не применяются химические инсектициды. По пищевым связям полужесткокрылые - вредители зерновых (ячмень, тритикале, пшеница) культур ТОО «Байсерке-Агро» являются растительноядными видами. Из них полифитофаги составляют 68 %, широкие олигофитофаги – 32 %. Наиболее хозяйственно значимые виды клопов принадлежат к семействам Miridae, Pentatomidae и Scutelleridae. Именно они способны при массовом размножении нанести посевам зерновых серьезные повреждения. Остальные как правило, вредят лишь локально.

Ключевые слова: Hemiptera, Heteroptera, клопы, вредители, ячмень, тритикале, пшеница, ТОО «Байсерке-Агро», Алматинская область, Казахстан.

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FORMATION OF EPISOPOLOGICAL (EPIDEMIOLOGICAL) UNITS IN "BAYSERKE-AGRO" LLP

Abstract. The article gives a list of concepts (epizootological (epidemiological) unit, isolation), as well as the order of their formation and recording of the presence of epizootological (epidemiological) units and quantitative sampling of animals to determine the epizootic situation. The implementation of the data will improve the efficiency of veterinary interventions.

Keywords: epizootological (epidemiological) unit, livestock, herd, cattle-breeding section.

The effectiveness of veterinary activities depends largely on the technological methods of animal husbandry [1]. The currently existing forms of animal maintenance dictate the need to determine the presence of isolated groups of animals with a certain, limited range (relatively permanent or temporary), where equally (for each animal) the risk of ingestion of the causative agent is detected, with possible subsequent development of the disease.

The order of formation of the epizootological (epidemiological) unit is based on the technological methods of keeping animals;

Determination of the epizootological unit, the establishment of rules for the selection of animals from it for further research, allows you to control the epizootic situation, take measures to preserve the welfare of the herd, timely identification of sick animals and prevent further spread of infection.

In "Bayserke-Agro" LLP, in 4 cattle-breeding plots, we formed 6 epizootological units.

Proper use of the epizootological unit can be carried out in the presence of data characterizing the disease, the biological properties of the pathogen, the epidemiological features of the infection and distinctive diagnostic techniques [2, 3].

When calculating the required sample size of animals from an epizootic unit, depends on the size (population) of the epizootological unit, prevalence, and is set according to the formula below recommended by the OIE.

$$n = \frac{(1-(1-\alpha)^{1/D})(N-1/2(SeD-1)}{Se},$$

where n – sample size (Quantity of *herds* for sampling); a – reliability level (95%); D – Quantity of sickness cases (*herds* with sick animals); N – Quantity of herds; Se – sensitivity of the test system.

Data on a sample of animals can be calculated in advance and, to simplify and facilitate manipulation, be summarized in a general table from which one can easily determine the Quantity of animals required for the study in a separate epizootological unit.

Calculation of a sample of animals from EC for subsequent studies with different prevalence and different livestock.

Quantity of livestock in EU (heads)	Permissibleprevalenceofanimals,%						
	0,2	0,4	1	2	5	10	20
Less than 10	all	all	all	all	all	all	all
10	10	10	10	10	10	10	8
20	20	20	20	20	19	16	10
30	30	30	30	30	26	19	11
40	40	40	40	40	31	21	12
50	50	50	50	48	35	22	12
60	60	60	60	55	38	23	12
70	70	70	70	62	40	24	13
80	80	80	80	68	42	24	13
90	90	90	90	73	43	25	13
100	100	100	100	78	45	25	13

When sampling the studied animals, it is necessary to remember which of them are the most sensitive and susceptible to a particular infection. Thus, brucellosis often sick arthropod young mature individuals. They are target animals and if they are present in the herd, it is necessary to subject the indicated contingent to research first. If in any compound there are large and small cattle of different ages, horses, donkeys, camels and other animal species, then first of all it is necessary to investigate sexually mature heifers, heifers (pereljok), primary cows (primary flow).

All existing epizootological units should be subjected to epizootological examination for brucellosis, because, based on the definition of the disease, the characteristics of the pathogen and epizootological data, the contagiousness of brucella does not have enough severity for rapid spread in many separate groups of animals.

Thus, the use of the stated data in the practical veterinary service allowed us to focus the activities of veterinary specialists, to increase the efficiency of their work and to ensure the veterinary well-being of "Bayserke-Agro" LLP.

Results and analysis of the data. Successful implementation of veterinary activities largely depends on the technology of animal husbandry. Previously existing large farms or industrial livestock farms, often including separate farms, separated from each other by relatively large distances (3-10 km), with streamlined technological methods, which contained more than 90% of the livestock of farm animals, were disbanded. Currently, the majority of animals (up to 90%) are concentrated in private economic entities (including farmsteads).

You can observe a variety of technological methods, often there is a joint content of different types of animals.

All this has an impact on the effectiveness of veterinary services.

In addition, in our country there are various technological methods, in particular, there are features of livestock farmsteads and organized farms.

For veterinary care there is an urgent need to isolate separate, isolated groups of animals, an epizootological unit.

An important question is the question of the correct selection of animals from an epizootological unit in order to make a diagnosis and determine the well-being of a group for a particular disease.

The purpose of our research is to determine the object of activity of a veterinarian, i.e. an isolated group of animals, or an epizootological unit that will provide veterinary services, in order to preserve the well-being and prevent the occurrence and spread of a bacterial infection (for example, brucellosis).

In this case, the following tasks were assigned to the resolution:

- to define the term epizootic unit;

- to determine the order of formation of the epizootological (epidemiological) unit, which takes into account the technological methods of keeping animals in "Bayserke-Agro" LLP;

- establish the order of sampling animals from the epizootological unit for further research, in order to determine the welfare of the surveyed zoo group;

- epizootological indicators that should be used for a specific contagious disease.

The results of research on the formation and accounting of the epizootological (epidemiological) unit (group of animals) and the sampling of animals to establish the epizootic situation were carried out in accordance with the veterinary legislation of the Republic of Kazakhstan and the sanitary and veterinary regulations for combating animal diseases.

In this case, we have given the following concepts:

1) **livestock** - the total Quantity of any animals in a certain area.

2) **drove (herd)** - a group of domestic or wild animals of the same species, permanently or temporarily kept together, formed for economic use, or a population that lives in a certain range.

3) **an apiary** - a production unit of a beekeeping farm or farm containing one or several beehives with bee families.

4) **isolation (privatism)** is a separate, limited (isolated) or separate content (relatively permanent or temporary) groups of animals, populations or individuals that do not have contact (direct and indirect) with other objects (including h) alive) outside their habitat.

5) **epizootological (epidemiological) unit** is a group of animals with a specific, limited area (relatively permanent or temporary), where equally (for each animal) the risk of ingestion of the causative agent is detected, with possible subsequent development of the disease.

The basis for the formation of an epizootological (epidemiological) unit for these diseases is the **isolation** of the content (habitat, location) of individual groups of animals (or sources of infection) with the same risk of disease (threat of spread) of each individual.

An epizootological unit of **soil (anthrax, etc.) infections** is the location of the source or factors of transmission of the pathogen in those boundaries where it is possible to transmit the pathogen to susceptible animals or people (cattle cemetery, pasture plot, livestock building, and places of slaughter of an infected animal). Epizootological unit is established by administrative territories (rural district, district, etc.).

An epizootological unit for **aquatic infections** (leptospirosis, etc.) is a water environment that contains organic compounds that are a nutrient substrate for microorganisms - pathogenic for animals and humans with the presence of pathogens in them (ponds, rivers, ponds, wells, etc.) d.). Geographically, EE is determined by administrative units and natural connections between them.

Epizootological unit for **forest infections** is a territory with arachnoids, insects and birds, possible carriers of infection (tick-borne encephalomyelitis, babesiosis (piroplasmosis), etc.)

The epizootological unit in relation **to wild animals** leading a herd (brucellosis, pasteurellosis, etc.) and isolated lifestyles is a population of wild animals, among which there is circulation (preservation) of the causative agent (on the territory of distant plots of "Bayserke-Agro" LLP wolves, foxes, corsacs, jackals).

For the formation of an epizootological unit, according to its definition, it is first necessary to know the technological methods of keeping animals.

Technological methods of keeping animals are the basic basis for determining the epizootological (epidemiological) unit, since they determine the possibility of the circulation of the pathogen in a particular population of animals.

To date, the following technological methods of keeping animals that may be applicable for the formation of epizootological units can be noted on the territory of "Bayserke-Agro" LLP.

In the village, where there aremore than one to heads different species of animals (cattle, small cattle, camels, pigs, horses)in the private residence of citizens, the following flow charts take place:

- in the cold season around the clock in the yard;

- in the warm season - at night in the courtyard, in the afternoon - on pasture, disunited by animal species (rarely together).

On a pasture, animals (of a different or one type) are gathered from several farmsteads into a common herd (herd, flock), which are then returned to the yards of the owners. At the same time, there can be common cattle passes for different groups of animals and the territory of pasture areas.

Based on the above, the settlement in which there are animals and are contained according to the technology described above should be taken as one epizootological unit, since According to the Terrestrial Animal Code and its epidemiological provisions, its main characteristic is the risk of ingestion of the causative agent, with possible subsequent development of the disease, and its transfer from animal to animal.

In "Bayserke-Agro" LLP, there are groups of animals with different technology of keeping:

- in the cold season, all animals are on the livestock farm;
- in the warm season at night - within the farm, during the day on pastures allocated for them;
- year-round stall-driven content within the farm.

Animals of such farms in winter and summer contain separately, they have no contact with other groups and species of animals. Therefore, mutual contact between animals occurs only within this farm. In this connection, these economic groups of animals must be taken as an epizootic unit.

If animals are kept in organized farms with isolated groups that do not have contact (direct and indirect) with each other, with their caregivers, they should be taken as an epizootological unit.

In prosperous epizootological units, we recommended to conduct screening studies according to the formula recommended by the OIE, which provides for the control not of all the livestock of animals, but of individuals, the Quantity of which depends on the size of the groups (EU).

The size of a sample of animals from EC that is required to subject to diagnostic studies depends on the size (population) of the epizootological unit, prevalence, and is set according to the formula below recommended by the International Epizootic Bureau (OIE).

$$n = \frac{(1-(1-\alpha)^{1/D})(N-1/2(SeD-1)}{Se},$$

where n – sample size (Quantity of *herds* for sampling); a – reliability level (95%); D – Quantity of sickness cases (*herds* with sick animals); N – Quantity of herds; Se – sensitivity of the test system.

So, for example, if in one epizootological unit of "Bayserke-Agro" LLP there are an average of 269 heads of large and 3009 heads of small ruminants, then it is necessary to investigate according to the above formula and below the above calculation (table 1), respectively prevalence of 0.03%) and 3009 animals (with 0.01% of the presence of sick stock).

Table 1 – Calculation of a sample of the number of animals from EU for further research

Quantity of heads	**3 009**		Quantity of heads	**269**
Reliability of information	**95%**		Reliability of information	**95%**
Sensitivity of method	**100%**		Sensitivity of method	**100%**
Prevalence	**0,0%**		Prevalence	**0,0%**
Quantity of examined livestock	**3 009**		**Quantity of ex-d animals (n)**	**269**

$$n \cong \frac{(1-(1-\alpha)^{1/D})(N-\frac{1}{2}(SeD-1))}{Se}$$

$$n \cong \frac{(1-(1-\alpha)^{1/D})(N-\frac{1}{2}(SeD-1))}{Se}$$

In cases of greater or lesser prevalence, the Quantity of animals studied is calculated, as in the previous case, according to the above formula. In this case, two indicators change in it, namely: the Quantity of animals and the prevalence. These data can be calculated in advance and, to simplify and facilitate the manipulation, be summarized in a general table by which it is easy to determine the Quantity of animals required for the study in a separate epizootological unit (table 2).

When sampling the studied animals, it is necessary to remember which of them are the most sensitive and susceptible to a particular infection. Thus, brucellosis often sick arthropod young mature individuals. They are target animals and if they are present in the herd, it is necessary to subject the indicated contin-

Table 2 – Calculation of a sample of animals from EU for subsequent studies with different prevalence and different livestock

Quantity of livestock in EU (heads)	Permissible prevalence of animals, %						
	0,2	0,4	1	2	5	10	20
Less than 10	all	all	all	all	all	all	All
10	10	10	10	10	10	10	8
20	20	20	20	20	19	16	10
30	30	30	30	30	26	19	11
40	40	40	40	40	31	21	12
50	50	50	50	48	35	22	12
60	60	60	60	55	38	23	12
70	70	70	70	62	40	24	13
80	80	80	80	68	42	24	13
90	90	90	90	73	43	25	13
100	100	100	100	78	45	25	13

gent to research first. If in any compound there are large and small cattle of different ages, horses, donkeys, camels and other animal species, then first of all it is necessary to investigate sexually mature heifers, heifers (pereljok), primary cows (primary flow).

In FMD, only short-legged animals are susceptible, which should be subdivided by age and the target ones should be selected; for tuberculosis, cattle and camels are more susceptible to disease. Have their own characteristics and other infections.

Table 3 – Summary data on the Quantity of animals in the context of formed epizootological units (EU) of “Bayserke-Agro” LLP

Farm Name	Type and breed of animals	Quantity of animals	Quantity of EU
Central department			
Robotic farm	All cattle including	740	1 EU
	Dairy cows	411	
	Heels	23	
	Heifers	188	
	Calfs	118	
Commodity farm	All cattle including	835	1 EU
	Bulls	771	
	Cows	64	
Horse farm	Different breed horses	182	1 EU
Livestockarea«Kyrgauyldy»			
Horse farm	Different breed horses	170	1 EU
Thedistantsection "Kumtobe"			
Sheep farm	Small cattle	3019	1 EU
Thedistantsection "Kerbulak"			
Farm for the maintenance of cattle meat	Kazakh white-headed sheep	905	1 EU
	Auliekol sheep	487	
	Aberdeen – Angus	509	
	Aberdeen – Angus	237	
Sheep farm	Edilbayevskaya, Gissarskaya	2552	
Horse farm	Local breed horses	628	
Camel farm	Bactriancamel	196	

Analysis of the risk criteria for the emergence and spread of infectious animal diseases in the epizootological units (EU) of “Bayserke-Agro” LLP has established that the main reasons for the persistence of a complex epizootic situation for infectious animal diseases are the lack of EE formation, inadequate identification of animals, and the lack of equipment for livestock facilities necessary facilities and unsatisfactory conduct of veterinary and sanitary and special veterinary activities.

Consequently, in these CEs there is a risk of maintaining or even increasing the main source of infection, such as sick animals.

All the indicated epizootological characteristics of bacterial infections and technological methods of keeping animals in "Bayserke-Agro"LLP were taken into account when calculating the definition of epizootological units and the sample size in their samples for further research.

Considering the above, we in "Bayserke-Agro" LLP examined 4 cattle-breeding plots, where cattle, small cattle, horses and camels are located (table 3).

As shown in table 3, we have formed epizootological units, in particular:

1. A robotized dairy farm where cows of the Holstein-Frieze dairy productivity are located;
2. Commodity farm (TF), according to the content of cattle meat direction of productivity;
3.Horsefarm "Central Office", which contains breeding and sports horses;
4. Horsefarm "Kyrgauyldy" on the content of productive horse head;
5. The distant section "Kumtobe" with the content of fine-woolly sheep;
6. The distant part “Kerbulak”, which contains meat cattle in the direction of productivity of Kazakh breed Kazakh white-headed, Auliekol, Aberdeen-Angus, Hereford. On the same site there are 4 flocks of sheep of the Edilbaevskaya and Gissarskaya breeds, as well as camels and horses.

Thus, all animals in “Bayserke-Agro” LLP are located on 4 sites and form 6 epizootological units, i.e. separate groups with a specific, limited area (relatively permanent or temporary), where equally (for each animal) there is a risk of ingestion of the causative agent, with possible subsequent development of the disease.

All veterinary activities in “Bayserke-Agro” LLP are carried out taking into account the described epizootic units, according to the anti-epizootic plan.

Such an organization of animal husbandry technology and carrying out veterinary activities allowed to ensure the veterinary well-being of all epizootic units surrounded by epizootic disadvantages.

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«БАЙСЕРКЕ-АГРО» ЖШС ІНДЕТТАНУЛЫҚ (ЭПИДЕМИОЛОГИЯЛЫҚ) БІРЛІКТІ ҚҰРАСТЫРУ

Аннотация. Мақалада (індеттанулық (эпидемиологиялық бірлік, оқшауланған) ұғым тізімдері және де (індеттанулық (эпидемиологиялық бірлік, обособленность) бар-жоғына есеп жүргізу мен құрастыру, індеттік ахуалды анықтау үшін малдардың сандық іріктеуін анықтау келтірілген. Алынған мәліметтерді енгізу ветеринариялық шаралардың тиімділігін арттыруға мүмкіндік береді.

Түйін сөздер: (індеттанулық (эпидемиологиялық бірлік,) мал басы, табын, малшаруашылық учаскелері.

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ФОРМИРОВАНИЯ ЭПИЗООТОЛОГИЧЕСКИХ (ЭПИДЕМИОЛОГИЧЕСКИХ) ЕДИНИЦ В ТОО «БАЙСЕРКЕ-АГРО»

Аннотация. В статье приведен перечень понятий (эпизоотологическая (эпидемиологическая) единица, обособленность), а также порядок их формирования и проведения учета наличия эпизоотологических (эпидемиологических) единиц и количественной выборки животных с целью определения эпизоотической ситуации. Внедрение полученных данных позволит повысить эффективность ветеринарных мероприятий.

Ключевые слова: эпизоотологическая (эпидемиологическая) единица, поголовье, стадо, животноводческие участки.

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DIAGNOSIS OF CATTLE CAMPYLOBACTERIOSIS

Summary. Campylobacteriosis of cattle is one of the most economically important diseases of dairy cattle, leading to a decrease in the production of offspring, embryo death and abortion.

Data from literature sources showed that 55-80% of human campylobacteriosis cases are related to the consumption of products derived from poultry, as well as large and small cattle 20 - 40%.

Polymorphism of clinical manifestations in animals and humans does not allow to diagnose "campylobacteriosis" without laboratory confirmation. Microbiological diagnosis of campylobacteriosis is a time-consuming, multi-cost procedure, which is associated with the biological properties of the pathogen.

The lack of standards for the diagnosis of campylobacteriosis in the CIS has led to a distortion of the real picture of the prevalence of campylobacteriosis.

According to the OIE recommendations, along with bacteriological methods for the detection and differentiation of campylobacteria, molecular genetic methods, i.e. PCR, and modern modification of PCR with real-time detection can be used

This article reflects the improvement of the method for the isolation of DNA from clinical material with high analytical characteristics. As a result of researches Campylobacter fetus subspecies venerealis with the help of PCR in real time in the rate of cattle of the dairy direction are identified. In metagenomic studies found that the circulation of pathogenic strains of Campylobacter is associated with the metric in cows can also be important for the development of metritis in cows after calving.

The introduction of real-time PCR can improve the diagnosis of campylobacteriosis and improve the quality control of livestock products, which will have a favorable economic and social effect.

Abstract. As a result of epizootological monitoring, it was found that among the livestock of cattle campylobacteriosis is represented in the nosological profile of infectious diseases. The analysis of comparative diagnosis of campylobacteriosis of cattle microbiological and serological studies (ELISA) is presented. The real-time PCR study additionally revealed 5 heads of cattle positively reacting to campylobacteriosis, which had not previously been detected by culture isolation.

Keywords: campylobacteriosis, campylobacter fetus subspecies venerialis PCR mode rail time, cattle.

Introduction. Campylobacteriosis is an infectious disease of animals and humans caused by pathogens of the genus Campylobacter, characterized by varying degrees of severity and polymorphism of manifestations.

The genus Campylobacter includes several species that cause campylobacteriosis in animals, humans and birds, with predominant tropism to the gastrointestinal tract and reproductive system.

Campylobacteriosis is characterized by varying degrees of severity of the disease and polymorphism of clinical manifestations. Campylobacteria cause significant damage to agriculture, associated with a decrease in animal productivity, the cost of diagnostic studies and anti-epizootic measures.

The most pathogenic to ruminants are C. fetus subspecies fetus and C. fetus subspecies veneralis.

C. fetus subspecies veneralis is classified as a causative agent of genital campylobacteriosis (vibriosis - BVS) in cattle. In cows, it colonizes the epithelial cells of the vagina, cervical canal, uterus, uterine horns, and in bulls it is localized mainly in the prepucial cavity [1]. Clinical manifestation is characterized by inflammation of the reproductive system that causes abortions in 10% of cases, frequent iregular and infertility in 10% of cases [2, 3]. Private asymptomatic carriage and lifelong persistence are the main factors of transmission [4]. The disease is common in regions with extensive animal husbandry. There is a different level of infection of cattle, in some countries the infection reaches 29% [5].

C. fetus subspecies fetus is an obligate microflora of the gastrointestinal tract of ruminants, but can also cause sporadic abortions [6].

Campylobacteriosis of cattle belongs to list B, subject to registration of diseases of the international epizootic Bureau (OIE), consisting of diseases that have socio-economic significance (McMillen. L. et al., 2006).

Epidemiological studies have shown that 55-80% of human campylobacteriosis cases are associated with the consumption of products derived from poultry, as well as large and small cattle 20-40% [7, 8].

In carrying out activities related to the prevention and elimination of campylobacteriosis, much attention is paid to the diagnosis.

Currently, for the diagnosis of Campylobacter infection, there are methods - bacteriological, serological-enzyme immunoassay (ELISA) to detect antibodies, molecular genetic methods, i.e. PCR, and modern modification of PCR with real-time detection, DNA fingerprinting [9].

The classical bacteriological diagnosis of campylobacteriosis is difficult, since campylobacteria are microaerophiles, so their growth requires the creation of conditions with a high content of carbon dioxide, and, as a rule, requires the acquisition of expensive selective media (iron - etheric blood agar, Muller-Hinton medium, brucellosis agar, etc.).

Materials and methods. Research for the diagnosis of campylobacteriosis of cattle and identification of isolated cultures of Campylobacter was carried out in the laboratory of Green biotechnology and cellular engineering of the Kazakh-Japanese innovation center of the Kazakh national agrarian university.

For bacteriological, serological studies and highlight the culture of the causative agent of campylobacteriosis, samples were taken samples from cows – vaginal mucus, blood serum, aborted fruits (stomach, liver with gall bladder, lung, intestinal contents), pieces of the placenta – not later than the day after the abortion; the mucus from the cervix – the first time 3-4 days after abortion; from the bulls – prepucialna slime, a secret accessory genital glands and sperm.

For selective isolation of thermolerant campylobacters prepared agar Preston with a special modified additive (Preston, FD042, which contains-polymyxin sulfate, rifampicin, trimethoprim lactate, amphotericin B). Cultivation was carried out in microaerophilic conditions, on enriched media at 42°C for 2 to 3 hours, then at 37°C for 44 hours.

For transportation and storage of the selected crops, a semi-liquid medium (according to Wang) and a Thioglycolic medium with the addition of 5% defibrinated blood of cattle were used.

Identification of isolated cultures of campylobacteria was carried out by cultural, biochemical, serological and pathogenic properties of the pathogen.

Two collection strains were used as positive control - C. fetus subsp. venerealis No. 6829, Campylobacter jejuni subsp. jejuni № 70.2 t.

When setting ELISA used stages: the choice of antigen and its sensitizing dose, time and temperature of fixation of the antigen on the carrier, the choice of the pH of the buffer, the choice of the optimum conjugate dilutions, determination of optical limit for the determination of the titer and the establishment of a diagnostic titer. In the formulation of ELISA, an antigen destroyed by low-frequency ultrasound was used.

DNA isolation from Campylobacter cultures was carried out by phenol-chloroform extraction with modification, a set of "Cell and Tissue DNA Kit" with the help of an automatic isolation station KingFisher NK, a set of Purelink® Genomic DNA Mini Kit with modification, temperature change. Prepared solutions for phenol-chloroform method. 10% SDS-200 mGy SDS dissolved in 2 ml deionized water, 0.1 M Tris-1 ml 1M Tris diluted with 9 ml deionized water, phenol-chloroform p – 3 ml chloroform added 3 ml phenol.

The quality of the isolated DNA was assessed by quantitative determination of its concentration by spectrophotometric method using nanodrop 2000 spectrophotometer. The method is based on the existence of DNA maximum absorption at a wavelength of 260 nm. This means that in nucleic acid solutions the maximum photometric absorption is observed at 260 nm and directly correlates with the DNA concentration.

The quality of the isolated DNA was also analyzed by separating DNA fragments in agarose gel from 0.8-1.5%, depending on the length of the analyzed fragment, in the presence of an intercalating agent – ethidium bromide, which was used to visualize DNA in horizontal electrophoresis.

Real-time PCR setting. Optimization of the conditions for assessing the sensitivity and specificity of PCR protocols in real time was carried out using the device Real Time (StepOnePlus, Applied Biosystems, USA).

Selection and verification of specific primers were carried out using the Primer Select (DNASTAR) and BioEdit programs and the PrimerBlast web resource (NCBI). On primers were taken into account the main parameters: close annealing temperature of forward and reverse primer, primer length from 18 to 25 PN, a low probability of formation of secondary structures.

Based on the results of optimization, a Protocol of species identification of C. fetus, C. jejuni was developed by PCR in real time, which includes the optimal composition of the reaction mixture and the PCR amplification program. The optimal composition of the reaction mixture: primers of 10 pmol each, fluorescent probe 5 pmol, 10 mm Tris-HCl (pH 8.8 at 25 C), 50 mm KCl, 0.08% nonidet P40, 3 mm MgCl2, dntf at a concentration of 200 nm each, 5 nm Tetramethylammonium chloride, betaine – to a final concentration of 0.2 M, 1.5 units Taq DNA polymerase fermentas). PCR amplification program: long-term denaturation 95 seconds-5 minutes; 42 cycles 95 seconds-15 seconds, 61 seconds (C. fetus and C. jejuni)-15 seconds, 72 settings C-45 seconds. Accounting for the fluorescent signal at the stage of annealing primers.

Research results and discussion of the results. When a pure culture was isolated on selective Preston agar with a special modified additive Preston FD042, campylobacteria formed colonies on the 3rd day: smooth, colorless, diameter 1 mm.the Temperature optimum was 37-38^{0}C, when cultivated on this medium Campylobacter its color did not change. 9 cultures of the genus Campylobacter were isolated. The selected cultures of campylobacteria studied the enzymatic activity. Culture of C. fetus subsp. venerialis isolated catalase, did not form hydrogen sulfide, did not give rise to PJA with 1% glycine, 3,5% sodium chloride, 8% glucose, grow on PJA with 1% bile, do not ferment sugar and alcohol, do not dilute gelatin, do not develop on agar in aerobic conditions.

As a result, ELISA found that the FBI (pH 7.2) provides a stable adsorption of antigen on the surface of the microplate holes. The optimal time of antigen fixation is 18-20 hours, at 40C. In the reaction of ELISA seropositive were 16 heads of cattle, with a diagnostic titer of 1: 400.

In the framework of the studies, the comparative assessment of DNA isolation methods (table), the most effective method for gram-negative cultures has FHE. However, when days were isolated from gram-negative cultures, the greatest yield of days was achieved using the phenol-chloroform method of DNA isolation with modification.

Results of the quantitative evaluation of DNA

Name of samples	Density ng / µl	Absorption 260 nm	Absorption 280 nm	The ratio of 260/280 nm
FHE grammatricity 1	390,35	7,945	3,743	2,05
FHE grammatricity 2	146,10	3,062	1,338	2,07
FHE grammatricity 3	138,10	2,162	1,210	1,91
FHE grammatricity 4	69,15	2,672	1,342	2,31
FHE grammatricity 5	88,10	1,162	0,210	2,22
Modified FHE 1	338,10	5,472	2,242	2,39
Modified FHE 2	147,05	2,954	2,352	2,19
Modified FHE 3	189,85	3,797	0,373	1,02
Modified FHE 4	44,93	1,899	0,398	2,26
Modified FHE 5	99,05	2,707	1,207	2,02

Undoubtedly, the FHE method will give you a good result, with fewer uses in laboratory diagnostics, a hard-working method, and also a traction agent used by reagents. Cell and Tissue DNA Kit, effectively utilizing the DNA Kit, has come to terms with the ability to connect with the incubation of images with lysozyme and to penetrate the multiconductor phase in the new test tubes.

The high concentration of DNA from the prepaid mucus was found in the Purelink® Genomic DNA Mini Kit with modifications.

Taking shape, the effectiveness of the DNA sequence is up to 25% by comparing with the density of the sample. It is important to concentrate on the high density of DNA, as shown by the adsorption value of 260/280.

The spectrophotometric method used for electrophoretic analysis of the DNA results (figure 1).

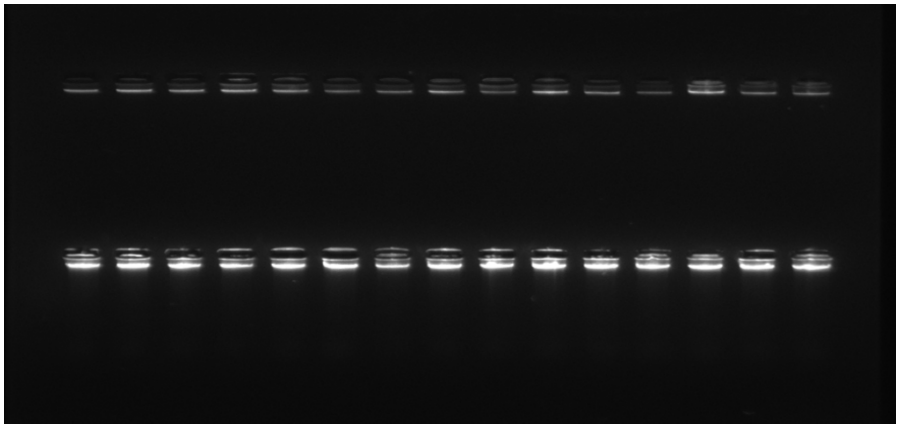

Figure 1 –Electrophoregram DNA Campylobacterium

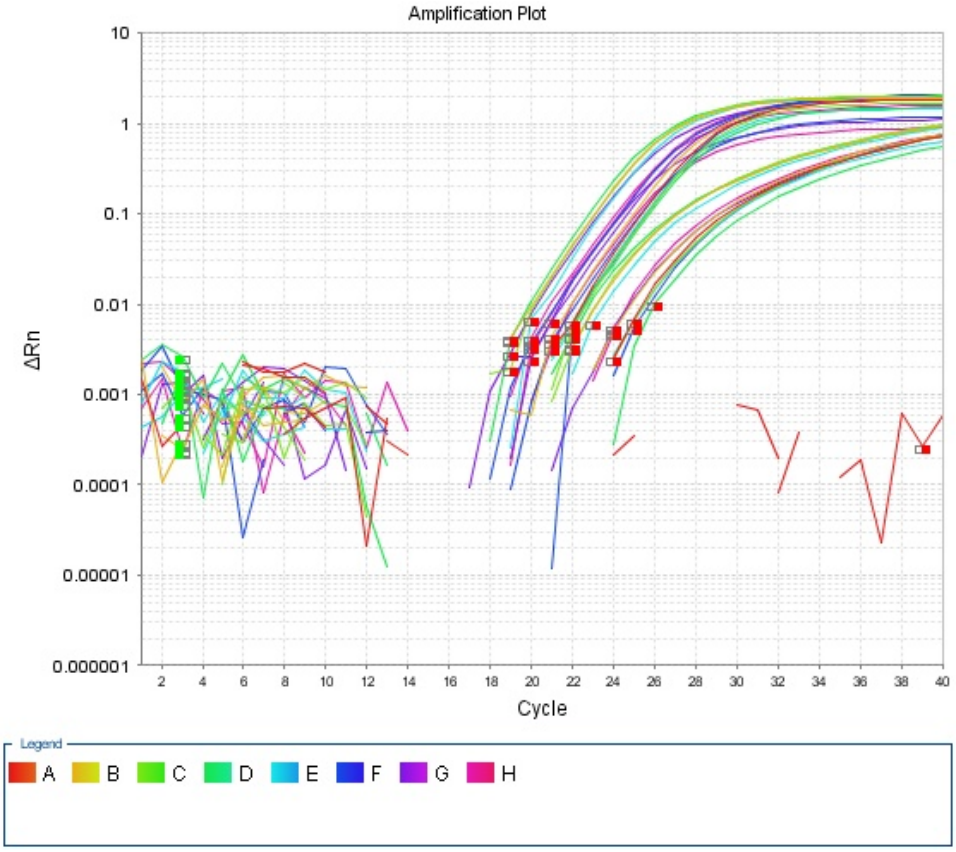

Figure 2 – Graphical image Result of Real - time PCR Diagnostic Campilobacteriosis Acne (FAM - DNA C fetus venerealis)

In consequence, metabolic research of vaginal mucous membranes with clinical triumphs of reproductive organs was established, as Helcococcus, Peptoniphilus, Peptostreptococcus, and Campylobacter bacteria should be able to mitigate the metritation of the meteorite (figure 3).

Metagenomed research has revealed that Campylobacter circulatory pathogenic strains are associated with metritis in the body, and can also be used for the development of metritin in the cockroach.

Figure 3 – Krona chart - nucleotide trace gene
16S bacterial vaginal microbioma of the rRNA of the coriander No. 19

Extraction. At this time, the diagnostics of campilobacteriosis and the detection of contamination of animal products using campilobacteria are using the "gold standard" - the identification and the identification of the pure culture. However, campilobacterium microorganisms, rusting on hardwood platelets, require the highest qualification of the staff. Diagnostics is a distinction in clinical development of campilobacteriosis. All this is why it is not easy to expose the film to the spread of carbohydrates in the infectious diseases of the animal and the human body.

As a result, the experimental laboratory experiments on campilobacteriosis revealed that microbiological methods and IFAs were unsatisfactory. Appropriate methods do not apply to all animal feeds.

The results of the IFA were found in the production of bullion-produsers. Bacteriological methods of production of pretzel slices were also produced by the producers of culture of campilobacterium.

The results of the experiments of serum serum test of 16 serum potassium immunoferential analysis were obtained by using bacteriological methods of 9 isolates of campilobacterium.

In addition, PCR detection of pathogens in clinical forms without all the culture allocation is practiced for diagnostics of labor (10, 11, 12, 13, 14).

Strengthening of PCR methods in diagnostic laboratories can help to maintain and efficacy of diagnostics of campilobacteriosis infections. Otherwise, IEC recommends that the MEB be developed with bacteriological methods for the discovery and differentiation of campilobacteria, which can be used by molecular genetic methods, PCR, and modern modification of PCR with detection in real time. The PCR method in diagnostic practice has been phased out as a highly sensitive and high-speci- fied method.

Replication of PCR can help to increase the effectiveness of the diagnostic campaigns and increase the control of quality of living products, which will have favorable economical and social effect.

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ІРІ ҚАРА МАЛДЫҢ КАМПИЛОБАКТЕРИОЗЫНБАЛАУ

Аннотация. Індеттанулық мониторинг нәтижесінде ірі қара мал басының арасында кампилобактериоз жұқпалы аурулардың нозологиялық профилінде көрсетілгені анықталды. Микробиологиялық және серологиялық зерттеулер (ИФТ) ІҚМ кампилобактериозының салыстырмалы балауы ұсынылған. ПТР әдісімен зерттеу кезінде нақты уақытта кампилобактериозға оң нәтиже берген 5 ірі қара мал басы анықталды,олардан бұрын-соңды өсінді бөліп алынбаған.

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ДИАГНОСТИКА КАМПИЛОБАКТЕРИОЗА КРУПНОГО РОГАТОГО СКОТА

Аннотация. В результате эпизоотологического мониторинга установлено, что среди поголовья крупного рогатого скота кампилобактериоз представлен в нозологическом профиле инфекционных болезней. Представлен анализ сравнительной диагностики кампилобактериоза КРС микробиологические и серологические исследования (ИФА). При исследовании методом ПЦР в реальном времени дополнительно были выявлены 5 голов КРС положительно реагирующих на кампилобактериоз, которые ранее не были обнаружены путем выделения культуры.

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KETOSIS OF CATTLE IN THE FARM "BAYSERKE-AGRO»

Abstract. Results the pathomorphological studies of corpses 5 forcedly the killed cows belonging to farm of "Bayserke-Agro" LLP of Almaty region. As a result of autopsy are established: protein-fat hepatosis and nephrosis, myocardiodystrophy and dilation of the heart ventricles, acute catarrhal abomasitis and enteritis, serous lymphadenitis, atony of the pancreas were established. Histologically, the parenchymatous organs detected vascular disorders, diffuse fatty infiltration, granular desprotegidos hepatocytes, kidney cells causes significant release and cardiomyocytes.

Keyword: cattle, ketosis, metabolic disorders, pathological morphology, fat infiltration.

Introduction. Improving animal feeding is the main source of increase livestock. Non-recovery of basic and biologically active substances in animals 'diet leads to metabolic disturbances (acidosis, ketosis, etc.), a decrease in natural immunity, diseases of the reproductive system, which negatively affects the economic efficiency of the industry. In recent years, literature review veterinary medicine in the country has provided sufficient and complete feeding of livestock, foodborne diseases, prevention of metabolic disorders, including vitamins A, D, E, iodine, selenium, etc.

In addition to government subsidies allocated to agriculture, it provides concessional loans. Farms throughout the country yield cattle, meat and dairy cattle from their own funds and state leasing from abroad. Among importing countries can be called Europe and America with strong economies. Livestock imported from these countries is adapted to climate, nutrition, and etc. Unfortunately, breeding herders have a large number of breeding cows due to the lack of scientifically based and complete feeding on farms, including various metabolic disorders and other diseases, including oedema. The disease is mainly observed in the first 1-2 months after calving, predominantly in high-producing cows, with the productivity level of 4,000 kg of milk during lactation, however, there are common cases when onset of the disease occurs in the interlactation period of cows [1, 2].

Disbolism at animals one of the burning issues in modern livestock production of many countries. With transfer of livestock production to industrial technology extent of distribution of a ketosis considerably increased [3, 4].

Materials and methods. Scientific work was carried out in 2016-2018 at Department of "Biological Safety" of the Kazakh National Agricultural University and in "Bayserke-Agro" LLP private enterprise.

Necessary materials were received from collective farm of "Bayserke-Agro" LLP in Talgar district of Almaty region, 4 cowsheds and 17 cows who died as a result of natural disasters. Their age changed. The disease was diagnosed by results of complex researches, called: clinical, pathological, anatomic, biochemical studies.

Clinical signs of cattle, its treatment, leaving and the epidemiological status of farms were collected by poll of the veterinarians who are engaged in livestock production and collected on clinical symptoms at

14 mentioned cows. For clinical tests the following general recommendations were used: viewing to iron, percussion and thermometry.

Pathological and pathosurgical researches were conducted.

To determine some biochemical parameters of blood, we have to conform to requirements of an aseptic and antiseptic arthroplasty, bloodsheds will not be given yet.

The biochemical inspection of cows noted by ketosis symptoms was carried out in laboratory laboratory of a farm, and the content of crude protein was determined by type of the RLU refractometer.

Results. Works were carried out in 2016-2018 on a farm of "Bayserke-Agro" located in the territory of Talgar district of Almaty region. On the basis of livestock production in collective farm of "Bayserke-Agro" treats black and Swiss seeds. To define disease degree, it was got according to 21 infested cows during 2 years old (table).

Occurrence of a disease on age among cows in"Bayserke-Agro" LLP

Quantity of infected animals 21			
#	Age	Infected animals	%
1	Up to 3 years	4	19,4
2	Up to 5 years	9	42,8
3	Up to 10 years	12	57,1

As it is shown in table 1, "Bayserke-Agro" LLP in livestock production has the highest share of cows in an age group till 10 years old, i.e. 57.1%, as a result of a disease. The reason of it is that large organisms of young animals are physiologically insufficient for reduction of formation of slate acids because of a lack of minerals therefore when in an organism the content of ketones increases, there is a lack of propionate and glucose that, in turn, reduces tricarboxylic reactions.

When studying specific features of relative clinical features of a cation among cows, cattle-farmers of country economy "Bayserke-Agro" LLP were observed recently by the following changes at milk cows: abdominal tenderness, abnormal changes, diarrhea hypotension, decrease in efficiency, the Black - refusal of meal, change of excitement on fatigue, decrease in fertility and efficiency, frequent decrease in body temperature, an atony, I am a constipation, diarrhea, liver border increase, reduction of a diuresis, growth and reproductive frustration, postnatal complications, frequency mastitis, the last wall and are absorbed a tail vertebrae delete. Results and the analysis of a research showed that we carried out clinical tests for the nursing cows. The general methods were applied to clinical tests.

Results of clinical test of cows were the following: when cows weak, their pupils change, the surrounding objects and cells attached to each other are visible lying, wool and wool indistinct, coloring and time of wool). Between horns and wool around a brush and a brush we found out that the milk plants reduced the milk yield, dropped mesial fabric and fell from its normal size. We learned from the words of veterinarians that cows did not receive timely noise after the birth when heart, heart sounds weak, low, accurate and when the bone tissue is injured is heard, force a move of cattle, front legs brilliant decreases, joint pains were not observed, extremities were noted, edges of walls decayed, final scales were reduced, absorbed 3/1, the last tail department of a backbone is absorbed, including relaxations of coxofemoral parts the wool tousled, the animal does not move to rise from the photo (1b).

Thus, the main clinical signs of a disease, irrespective of age and a floor of cattle, were same: loss of skin fabric, the complicated breath, a loss of appetite, absorption of face walls and a tail and absorption of vertebrae. Features: abortion and noise at cows, loss of milk at cows and an osteodystrophy at adults (more than 5 year old).

Result of a biochemical research of ketones of blood in blood by means of the RLU refractometer. We conducted a biochemical research to define composition of ketones in blood. In our research we generally received 15-20 ml of blood for biochemical researches of a cerebral palsy of 21 cows with clinical symptoms. In the analysis of results of biochemical researches the content of calcium and crude protein in a blood-groove significantly did not differ from normal, the content of glucose and alkali considerably decreased, and donors of ketones increased several times. For example, in our case cancer of ketone makes from 1 to 6 mg of % in a normality, in our research we showed 21-63 mg of %.

Photo 1 – Natural loss of wool (a), disorder of moving (b)

Because of a pathomorphologic trend of deep internals at flash pathogenetic - the histologic research of internals showed the following results, generally on a farm within two years, 21 catheters for the head, 5 of which were a cataract, and, therefore, pathomorphologic researches, 5 cows on the basis of the obtained data.

3 of 5 dead cows had an acute disease, and at 2 - chronic therefore it is important to describe acute and chronic type of pathomorphologic changes which are directly connected with the course of a disease.

At cows who are observed at the most acute forms of diseases: process of a mutilation, identification of internals of a liver, emergence of fat on all internals (figure 1). Dystrophy of a myocardium, liver, kidney dandruff, the orange-red, fatty tissue always left on a knife without fat (figure 2). The size of kidneys enlarged, and particles of bark and dirt are scattered. The bast layer is filled with blood of orange tone and matter. The expanded myocardial dystrophy in a right ventricle is the main fatty rest which bleeds in heart under an epicardium, inflammation of a myocardium, myogenetic space of a stomach (figure 3).

Figure 1 – Complete degreasing fat of internal organs

Figure 2 – Enlarged liver

Figure 3 – Fatty dystrophy

Acute catarral gastroenteritis. In intestines, especially in the stomach, dry and dense fodder weight is full. The expressed hypostasis and hemorrhagic inflammation in glaciers and separate small and large intestines. Lymph nodes in a cell wet, wet, are increased (figure 4).

Dystrophic changes in a liver and kidneys at chronic diseases were more expressed (more than figures 6, 7) mesenchymal cells. In heart, along with defeat dystrophy, the dysphagy was noted (figure 5). Walls of blood vessels were mucous fibrinedidales, with necroses character. Tubular bones, a forehead, lumbar department of a backbone, soft tissues, friable fabrics, soft tissues in some parts of a bone are developed in rather soft, mixed bone joints (especially in a backbone). Lymph nodes of a breast are not enlarged, a light gray bean seal dense, borders of layers are not clear.

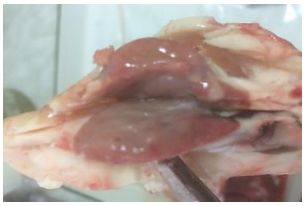

Figure 4 –
Enlarged lumph nodes

Figure 5 – Accumulation
of fat and haemorrhages
in an epicard

Figure 6 –
Fatty dystrophy in liver

Figure 7 – Fatty and
granular dystrophy in kidneys

The urolithiasis is slightly filled with urine, the mucous membrane is light gray. The uterus is abundant, the wall of the uterus is dense, the mucous membrane is light gray. Vagina without any changes. Eggs are not enlarged, the sizes of yellow bodies are up to 2,5 cm. Lumbar, hip and hip, lymph nodes are enlarged, dense, with a water surface, light gray color.

The roots of the brain are a little filled with blood, not very moist, in the brain plate contains a large amount of clear fluid. The back is unchanged. Bone fat is very moist, light red color of thoracic, ribbed and spine.

Stomach in green color, there are minor.Intestinal tract and the mucous membranes are the steel-colored. The ovary in small amount of liquid food, and a cream crust light and gray. . The duodenum is partially filled with fluid in small amounts. The mucous membrane is shiny, gray-red. Mesenteric lymph nodes are not enlarged. When cutting the surface is wet, light gray, some areas are hollow. There are gray spots. In the round intestine, small intestine and colon contains a small amount of substance yellowish - brown, light gray with purple spots with mucosa. The large intestine, the cecum and rectum are gray-brown, filled with a semi-liquid substance. The mucous membrane is light gray, unchanged.

Microscopic changes. Changes in a ketosis always were in a liver. Hepatocytes are affected by fat, carbohydrates and granular dystrophy. Inflammation of mitochondrions and granular tanks of an endoplasmic lattice extended, and the number of cytoplasmatic tanks with a flat lattice increases, and they become bubble (figure 8).

At the same time fatty infiltration of a liver is connected with carbon dioxide and cerebral dystrophy. In this regard there is mitochondrial hypostasis, granular endoplasmic (EPT) substrate extends, and granular ENK increases. The renal failure of a liver was caused by a degenerative degeneration with symptoms of fatty dystrophy.

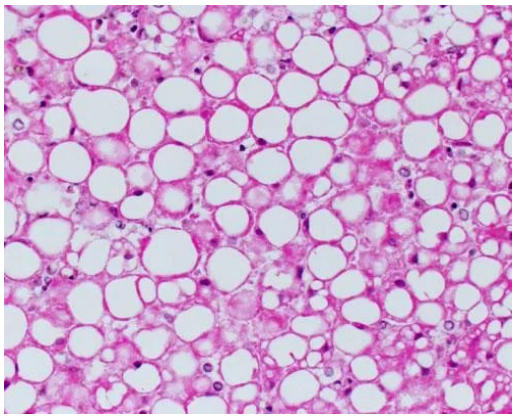

Figure 8 – Infiltrative Fatty dystrophy in liver.
Hematoxylin - Eozin stain, x 100

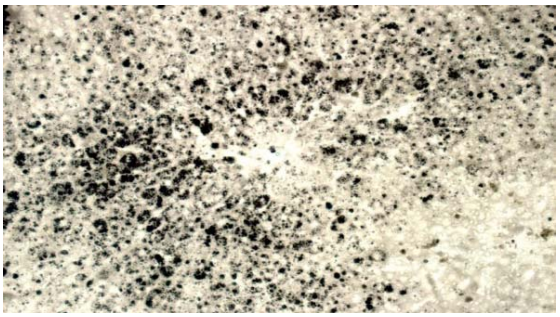

Figure 9 –
Fatty dystrophy in liver. Black Sudan stain, x 100

In process of growth of phagocytal activity of cells of Kupfer of a sinusoid, apparently, are replaced with macrophages and lymphocytes in the place of hepatocytes which were affected by dead (figure 9).

Renal vertical hoses tend to settle fat drops. Neurons of a nervous system of heart are exposed to a chromatolysis, neyronofag, and fibers are thickened and cut. Mesh dystrophy of protein is characteristic of cardiomyocytes and fibers of skeletal muscles. Acute fatty infiltration in kidneys is directly connected with brain dystrophy. In a chronic case - a glomerular and epithelial coronary necrosis. In heart - the intestinal impassability, an intra arterial nervous system is formed by neurophages. Purkin's Fiber - the majority of fibers, fatty spots, at a myocardium - a degeneration, fatty and cerebral dystrophy, a muscular atrophy. Tubular and lymph nodes - a hyperplasia of a mesenchyma and eosinophils.

Conclusion. The research conducted on the basis of "Bayserke-Agro" LLP the farm of dairy cows and some biochemical changes in blood changes in clinical signs, amounts of glucose in normal conditions, the total amount of ketones increased by 6-7 times, and pathological researches of cattle of a ketosis gloss dystrophy of a liver, catarrhal abomasitis and enteritis, serous lymphadenitis, atony, deformation of hoofs, osteomalyation, metabolic disorders – which indicate ketoses in animals.

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«БАЙСЕРКЕ-АГРО» ШАРУАШЫЛЫҒЫНДАҒЫ ІРІ ҚАРА МАЛ КЕТОЗЫ

Аннотация. Мақалада Алматы облысына қарасты "Байсерке-Агро" шаруа қожалығына тиесілі лажысыздан сойылған 5 сиыр өлексесінің патоморфологиялық зерттеу нәтижелері келтірілген. Зерттеу нәтижесінде: белокты-майлы гепатоз және нефроз, миокардтың дистрофиясы, жүрек қарыншасының дилятациясы, жедел катаральды абомазит және энтерит, серозды лимфаденит, қарыншалардың атониясы анықталды. Гистологиялық зерттеулер нәтижесінде паренхималық мүшелерде қан айналымының бұзылуы, Паренхиматозды мүшелерде гистологиялық тұрғыдан тамыр бұзылыстары, диффузды майлану инфильтрациясы, гепатоциттердің, нефроциттердің, кардиомиоциттердің түйіршікті диспротеинозы анықталды.

Түйін сөздер: ірі қара мал, кетоз, зат алмасуының бұзылуы, патологиялық морфология, майлану инфильтрация.

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КЕТОЗ КРУПНОГО РОГАТОГО СКОТА В ХОЗЯЙСТВЕ «БАЙСЕРКЕ-АГРО»

Аннотация. В статье приводятся результаты патоморфологических исследований трупов 5 вынужденно убитых коров, принадлежавших хозяйству «Байсерке-Агро» Алматинской области. В результате аутопсии установлены: белково-жировой гепатоз и нефроз, миокардиодистрофия и дилятация желудочков сердца, острый катаральный абомазит и энтерит, серозный лимфаденит, атония преджелудков. Гистологически в паренхиматозных органах обнаружены сосудистые расстройства, диффузная жировая инфильтрация, зернистый диспротеиноз гепатоцитов, нефроцитов, кардиомиоцитов.

Ключевые слова: крупный рогатый скот, кетоз, нарушение обмена веществ, патологическая морфология, жировая инфильтрация.

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IDENTIFYING THE RISKS OF POSSIBLE APPEARANCE AND SPREAD OF INFECTIOUS DISEASESIN "BAYSERKE-AGRO" LLP AND ADJACENT TERRITORY

Summary. Taking into account the epizootologylaw on the continuity of the epizootic process and the data of the epizootologicalinspection of the livestock sites of "Bayserke-Agro" LLP and the adjacent territory, we identified possible risks of the occurrence and spread of infectious animal diseases (with different forms of infections - exogenous, endogenous and cryptogenic), which were nominallydivided into 4 groups:

- risks associated with the source of the pathogen;
- risks associated with the transmission mechanism of the infectious beginning;
- risks associated with a susceptible organism;
- risks common to several links of the epizootic chain.

Analysis of the risk criteria for the emergence and spread of infectious animal diseases in epizootological units (EU) made it possible to establish that the main reasons for the persistence of a complex epizootic situation for infectious animal diseases are:

- the absence of separate groups of animals, which causes the contact of separate individuals contained in various livestock formations and requires the organization of the ES;
- inadequateprocess of identification of animals, which does not allow for the timely detection and isolation of an infected animal;
- lack of equipment of livestock facilities with necessary installations, which leads to the possible penetration of pathogens into animals;
- unsatisfactory implementation of veterinary and sanitary measures for the destruction of the pathogen in the external environment;
- insufficient implementation of special veterinary measures, which does not increase, in necessary cases, the body's resistance to a specific disease.

Results and analysis of the data. Taking into account the law of epizootology on the continuity of the epizootic process [1] and the data of the epizootological inspection of the livestock sites of "Bayserke-Agro" LLP and the adjacent territory, we identified possible risks of the occurrence and spread of infectious animal diseases (with different forms of infections - exogenous, endogenous and cryptogenic) which were divided into 4 groups:

- risks associated with the source of the pathogen;
- the risks associated with the transmission mechanism of the infectious beginning;
- risks associated with a susceptible organism;
- risks common to several links of the epizootic chain.

The criteria for the risk of occurrence and spread of infectious animal diseases associated with the source of the pathogen:

- lack of formation of epizootological units;
- lack of identification of farm animals;
- incomplete coverage of diagnostic studies of the actual livestock of farm animals;
- lack of quality control of used diagnostica;
- failure to comply with the multiplicity of studies during the health of anti-epizootic measures;
- concealment by owners of cases of clinical manifestations of animal diseases;
- untimely declaration of the economy as unfavorable and establishment of quarantine and restrictive measures;
- untimely isolation and delivery of sick animals for slaughter;
- joint grazing on pasture of different species (cattle, small cattle, horses, etc.) from animals that are unfavorable and prosperous for infectious diseases EU;
- unsatisfactory implementation of veterinary and sanitary measures;
- lack of veterinary control in the sale and purchase of animals;
- lack of centralized slaughter of sick stock in the region.

The criteria for the risk of occurrence and spread of infectious animal diseases associated with the mechanism of transmission of infection:

- low veterinary and sanitary condition of some livestock farms;
- non-compliance with the rules for the destruction of animal corpses;
- the lack of facilities for livestock facilities to collect afterbirth, aborted fruits and disinfection of animal care items;
- inadequate carrying out disinfection of milk obtained from animals of dysfunctional herds and dairy equipment;
- the absence of a planned change of pasture plots and watering places of animals;
- the lack of measures to prevent livestock farms of animals not kept on it (stray dogs, wild animals, birds, rodents) of possible carriers of the infectious principle.

The criteria for the risk of occurrence and spread of infectious animal diseases associated with a susceptible organism:

- low resistance of animals, due to poor feeding and maintenance of animals;
- unreasonable choice of means and methods of their use in the fight against infectious animal diseases;
- lack of quality control of used vaccines and non-compliance with the multiplicity of their use;
- lack of post-vaccination control of immunity in vaccinated animals;
- the presence of latent forms of the course of diseases and not their timely detection.

General risk factors:

- livestock technology without taking into account the possibilities of breaking the epizootic chain;
- unreasonable division of territory into zones according to the degree of tension of the epizootic situation and factors of the possible spread of infectious animal diseases;
- population density in a certain area and a high concentration of herd animals;
- facts of uncontrolled movement and sale of animals and animal products;
- untimely purchase of materials for anti-epizootic measures and animal identification;
- inadequate compensation to owners for surrendered for slaughter or destruction of a sick animal;
- the presence of pathogens in adjacent territories.

Thus, the analysis of the risk criteria for the emergence and spread of contagious animal diseases in epizootic units (EU) made it possible to establish that the main reasons for the persistence of a complex epizootic situation for infectious animal diseases are:

- the absence of separate groups of animals, which causes the contact of individual individuals contained in various livestock formations and requires the organization of EU [2];
- inadequate identification of animals, which does not allow for the timely detection and isolation of an infected animal;

- lack of equipment of livestock facilities with necessary facilities, which leads to the possible penetration of pathogens into animals;
- unsatisfactory conduct of veterinary and sanitary measures to destroy the pathogen in the external environment [3];
- insufficient implementation of special veterinary measures, which does not increase, in necessary cases, the body's resistance to a specific disease [4].

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«БАЙСЕРКЕ-АГРО» ЖШС ҚАРАСТЫ ТЕРРИТОРИЯ МАҢЫНДАҒЫ ЖҰҚПАЛЫ АУРУЛАРДЫҢ ТАРАЛУЫ МЕН ПАЙДА БОЛУ ҚАУПІН АНЫҚТАУ

Аннотация. Мақалада «Байсерке-Агро» ЖШС қарасты территория маңындағы мал фермаларындағы індеттанулық зерттеулердің мәліметі бойынша жұқпалы аурулардың пайда болуы мен таралу қаупінің індетке қарсы шараларды жетілдіру үшін анықтауға мүмкіндік беретіндігі келтірілген.

Түйін сөздер: пайда болу қаупі, жұқпалы аурулар, ауру қоздырушысының бастауы, жұқпалы ауруларының берілу механизмі, бейім организм.

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ВЫЯВЛЕНИЕ РИСКОВ ВОЗМОЖНОГО ПОЯВЛЕНИЯ И РАСПРОСТРАНЕНИЯ ЗАРАЗНЫХ БОЛЕЗНЕЙ В ТОО «БАЙСЕРКЕ-АГРО» И ПРИЛЕГАЮЩЕЙ К НЕМУ ТЕРРИТОРИИ

Аннотация. В статье приведены данные эпизоотологического обследования животноводческих участков ТОО «Байсерке-Агро» и прилегающей к ним территории, анализкоторых позволил определить возможные риски возникновения и распространения заразных болезней животных, с целью последующей разработки противоэпизоотических мероприятий.

Ключевые слова: риски, заразные болезни, источник возбудителя заболевания, механизм передачи заразного начала, восприимчивый организм.

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TRUE BUGS (HEMIPTERA: HETEROPTERA) – ALFALFA PESTS (BARLEY, TRITICALE, WHEAT) OF «BAYSERKE-AGRO» LLP

Abstract. In the paper presents the composition of the species of hemiptera suborder of the true bugs - alfalfa pests of «Bayserke-Agro» LLP. As a result of studies conducted in 2018 on the fields of fodder crops (alfalfa) in Bayserke-Agro LLP, Almaty oblast of Kazakhstan, we noted 39 species of bugs belonging to 27 genera and 7 families. By species diversity of the identified true bugs, representatives of the family Miridae dominate - 17 species, followed by Coreidae - 7 species, Rhopalidae - 6 species, Pentatomidae - 4 species, Alydidae - 3 species. The least diverse Plataspidae - 2 species and Lygaeidae - 2 species. According to food relations, true bugs - alfalfa pests are herbivorous species with a wide range of food, of which polyphytophagous make up 55 % (24 species), wide oligophytophagous – 42 % (14 species), narrow oligophytophagous – 3 % (1 species). The most harmful types of alfalfa pest bugs belong to the families Miridae, Pentatomidae and Alydidae, which can periodically multiply in large quantities. Representatives of other families, as a rule, inflict local damage, and are not of great economic importance.

Keywords: Hemiptera, Heteroptera, pests, alfalfa, «Bayserke-Agro» LLP, Almaty oblast, Kazakhstan.

Introduction. Hemiptera - true bugs suborder of Hemiptera - one of the largest groups of insects in Kazakhstan (35 families, more than 1200 species), is of great importance in natural and anthropogenic biocenoses. Due to the species diversity, the body shape and size of the true bugs are very variable: some species of true bugs are very small and have a length of less than 1 mm, representatives of the largest species grow to 10-15 cm. Females are usually larger than males. Colouring of true bugs is of two types: protective colouring or display colouring. All parasites, as well as vulnerable species of true bugs, having ruduced or poorly developed odorous glands have a protective coloruring. Display colored true bugs with bright colors of combinations of red, black, blue, green and white colors are, as a rule, herbivorous species that have almost no natural enemies. A common feature of true bugs is a piercing-sucking type of oral apparatus. It is represented by an elongated lower lip, forming a long proboscis, inside which there is a deep groove with modified jaws, turned into prickly, thin and long bristles. Proboscis is divided into 2 channels: the upper and wider serves for the absorption of food, the lower-for saliva. On top of the proboscis is covered by the upper lip. The specific structure of the mouth allows the bug to easily pierce the skin of humans and animals, as well as the green parts of plants, sucking blood and cell juice. Herbivorous bugs have thin and long proboscis , at rest it is bent under the body and hidden in the groove, which is on the head and chest. Predators true bags have a short, thick and strong proboscis, with beak shape and curved in the form of an arc. Way of life is very diverse. Most true bugs are herbivorous. There are also predators which benefit from the destruction of caterpillars, aphids, larvae of beetles and many other pests. Some of them are used in biological plant protection, as well as riders and other entomophages [30]. In addition, among true bugs there are varieties with mixed type of feeding. The diet of

parasitic true bugs is the blood of humans and warm-blooded animals or birds. These include bed bugs - Cimicidae, as well as triatomic bed bugs (Triatominae). But still the basis of the fauna of true bugs are Terricole herbivorous species. Terrestrial Hemiptera of the suborder often live openly on plants, sometimes on soil surface and in its upper layer, in forest floor, on the banks of ponds, under tree bark, etc. They feed on plants juices, mainly on their genesic organs and seeds. Among herbivorous bugs there are many pests of agriculture and forestry. Therefore, their study is not only theoretical, but also practical.

Some data have already been published by us before [1-5]. However, the overall summary is dedicated to bugs related to lucerne, did not exist. Hence is the relevance of this work.

Material and methods. Research was conducted in April-October 2015-2018 on forage crops fields in «Bayserke-Agro» LLP of Talgar district of Almaty region of Kazakhstan. When conducting research using techniques generally accepted in entomology [6-9] (capture with entomological net, manual collection, identification of species and placement in collection), visual observations, photographing, etc. To identify hemipterans, to clarify their biological characteristics and economic significance, we used summaries, guidelines and field guide from list of literature [10-29].

Research results. As a result of research we have compiled a list of species of true bugs noticed in «Bayserke-Agro»LLP Lucerne fields, Almaty oblast, given below. Some species are shown in figures 1-8.

Class Insecta - Insects

Order Hemiptera - Hemipterans

Suborder Heteropterans - True Bugs

Family Miridae - Capsid bugs

Adelphocoris lineolatus (Goeze, 1778). Polyphytophage (composites, goosefoot and legume, mostly prevail on legume); 2-3 generations per year; overwinters as eggs. Mass pest of legume. With a significant population of fields with this species, fall of generative organs to 75 % is observed, which leads to a sharp decrease in the lucerne seeds seed harvest [10].

Figure 1 – *Adelphocoris lineolatus* (Goeze)

Adelphocoris seticornis (Fabricius, 1775). Polyphytophage (live mainly on legume) clover, lucerne, astragalus, chin and many other herbaceous plants); 2 generations per year; wintering as eggs. It is a pest of legumes [11, 12].

Adelphocoris vandalicus (Rossi, 1790). Polyphytophage (legumes, Labiatae, including clovers *Trifolium*, alfalfa *Medicago*, sainfoin *Onobrychis gracilis*, *Glycyrrhiza licorice*, sage *Salvia*, etc.; 2 generations per year; overwinters as eggs. Harms crops of lucerne and sainfoin [13].

Brachycoleus decor Reuter, 1887. Polyphytophage (on various herbaceous plants: lucerne, wheat, corn etc. 6 feeds the generative organs of plants); monovoltine species; wintering as eggs.

Chlamydatus pullus (Reuter, 1870). Polyphytophage (on legume, composites, and other herbaceous plants; up to 3 generations per year; overwinters as eggs. It is known as a pest of legumes [16].

Euryopicoris nitidis Meyer-Dur, 1843. Polyphytophage (legumes grasses, especially, lucerne, clover and sainfoin); 1 generation per year; overwinters as eggs.

Globiceps flavomaculatus (Fabricius, 1794). Imago and larvae suck the juice of herbaceous plants, most often of the Legume family (Fabaceae). Overwinters at the egg stage.

Halticus apterus (Linnaeus, 1758). Wide oligo phytophage (on legumes: *Ononis, Vicia,* etc.); 1 generation per year; overwinters as eggs.

Heterotoma merioptera Scopoli, 1763. Polyphytophage. Prefers immature fruits, buds, juices and nectar of various plants.

Lygus adspersus (Schilling, 1937). Polyphytophage (on legumes,composites: *Artemisia* and other herbaceous plants); 2 generations per year [14]; overwinters as imago.

Lygus gemellatus (Herrich-Schaeffer, 1835). Polyphytophage harms grain, legumes.

Lygus pratensis (Linnaeus, 1758). Polyphytophage (harmful to fruit, grain, legumes and horticultural crops); bivoltine [15] or 3-4 generations per year; overwinter as imago.

Lygus rugulipennis Poppius, 1911. Horto-tamnobiont (occurs widely throughout, in floodplains, on many herbaceous and shrubby plants); poly phythophage (harmful to many crops: fruit, crops medicinal and other plants); 2 generations per year; overwinter as imago. Harmful to umbellate vegetable crops seeds.

Plagiognathus chrysantemi (Wolff, 1804). Polyphytophage (on composites,legume, grain crop and other herbaceous plants, sucks juvenile leaves, buds, flowers and green beans, 2 generations per year; overwinters as eggs [17].

Plagiognathus bicolor (Jakovlev, 1880). Polyphytophage (on composites, legume, grain crop and other herbaceous plants, sucks juvenile leaves, buds, flowers and green beans, 1 generations per year; overwinters as eggs [18].

Polymerus cognatus (Fieber, 1858). Polyphytophage (legumes, crucials ,composites (artemisia) and goosefoot); up to 4 generations per year; overwinter as eggs. Harmful to seeds and plants - alfalfa, potatoes, grain crops [16].

Polymerus vulneratus (Panzer, 1806). Poly phytophage (legumes, crucials, goosefoot, *Artemisia*) harm manyagriculture and medicinal plants [17]; 2 generations per year; overwinters as eggs.

Family Rhopalidae - Scentless plant bugs

Brachycarenus tigrinus (Schilling, 1829). Polyphytophage live on composites, crucials, and observed on plants of other families, it feeds the contents of the seeds.

Figure 2 – *Brachycarenus tigrinus* (Schilling)

Chorosoma schillingii (Schilling, 1829). Chortobiont; inhabits virgin areas, wide oligo phytophage (on grain crops: *Festuca, Poa, Koeleria, Stipa* and other); bivoltine; overwinter as eggs. Pest to grain crops, especially to wheat grass at hayfields and pastures [18]. It is noted on lucerne as alien species migrated from grain crop.

Corizus hyoscyami (Linnaeus, 1758). poly phytophage (at spring temporarily feeding on willow flowers, young shoots of birch, pine and other trees and shrubs; then move to sow-thistle, chamomile, Euphorbia and other herbaceous plants; main host plants:) Hyoscyamus niger, Tabacum, Ononis spinosa,

Erodium, considered harmful to legumes [18]; 2 generations per year; overwinter as imago. Widespread, dominant species.

Rhopalus parumpunctatus Schilling, 1829. Polyphytophage (on various herbaceous plants: (crucials, Labiatae, caryophyllaceous etc., is considered a secondary pest of perennial legumes grasses and grain legumes); 2 generations per year; overwinters as imago. Feeding on grain crops was observed in mountains of Central Asia [19].

Rhopalus subrufus (Gmelin, 1790). Polyphytophage (prefers Labiatae, sometimes legumes and plants from other families); 2-3 generations per year; overwinter as imago [18].

Stictopleurus punctatonervosus (Goeze, 1778). Wide oligo phytophage (on composites plants) found on cultivated legumes and grain crops and other similar biotope; 2-3 generations per year; overwinter as imago.

Family Lygaeidae - Milkweed bugs

Graptopeltus lynceus (Fabricius, 1775). Polyphytophage (it feeds the contents of seeds of legumes, Boraginaceae and Geraniaceae families).

Lygaeus equestris (Linnaeus, 1758). Polyphytophage (among wild grasses, grain crops, under different plants, fallen seeds of many plants and green parts juice) [21]; 1 generation per year, overwinter as imago [22].

Figure 3 – *Graptopeltus lynceus* (F.)

Family Coreidae - Leaf-footed bugs

Ceraleptus gracilicornis (Herrich-Schaffer, 1835). Polyphytophage (it feeds the contents of the seeds).

Ceraleptus lividus Stein, 1858. Wide oligophytophage (on legumes: type species *Trifolium, Medicago*); 1 generation per year; overwinter as imago [25].

Ceraleptus sartus Kiritshenko, 1912. Wide oligophytophage (on various legumes); 1 generation per year; overwinter as imago [23, 24].

Coriomeris denticulatus (Scopoli, 1763). Wide oligophytophage (it feeds on seeds of legumes, imago sometimes comes on herbaceous plants from other families); up to 2 generations per year; overwinter as eggs laying in plant tissue [27].

Figure 4 – *Coriomeris denticulatus* (Scopoli, 1763)

Coriomeris hirticornis (Fabricius, 1794). Wide oligophytophage (on legumes and grain crops, main food plant: alfalfa *Medicago minima* [24]; 1 generation per year, overwinter as imago.

Coriomeris scabrocornis scabrocornis (Panzer, 1805). Wide oligophytophage (on legumes, alfalfa *Medicago*, clover *Trifolium,* sainfoin *Onobrychus,* imago sometimes comes on herbaceous plants from other families); up to 2 generations per year[26]; overwinter as imago and larvae.

Ulmicola spinipes (Fallen, 1807). Narrow oligophytophage (on clovers *Trifolium* and other legumes [24, 26]; 1 generation per year; overwinter as imago.

Family Alydidae - Broad-headed bugs

Alydus calcaratus (Linnaeus, 1758). Wide oligophytophage (on legumes, suck buds, flowers and shoots); 2 generations per year; overwinter as eggs and larvae. Harmful to alfalfa seeds [24].

Camptopus lateralis (Germar, 1817). Wide oligophytophage (trophic connected with legumes: *Trifolium, Onobrychis, Lotus,* etc. It harms seed alfalfa); 2 generations per year; overwinter as imago. Adults meet from April to November, larvae - from May to September [24].

Figure 5 – *Camptopus lateralis* (Germar)

Megalotomus junceus (Scolopi, 1763). Wide oligophytophage (lives on various wild legumes, a pest of legumes and grain legumes)

Family Plataspidae - Hemispherical shield bugs

Coptosoma mucronatum Seidenstucker, 1963. Wide oligophytophage (perennial legumes, soy and beans); 1 generation per year; larvae of III-IV age; it was noted as pests of cultivated plants [23].

Coptosoma scutellatum (Geoffroy, 1785). Wide oligophytophage (permanent legumes grasses, soy and beans: *Onanis, Medicago, Trifolium, Lotus, Vicia, Astragalus, Onobrychis, Glycyrrhiza* etc.); 1 generation per year; larvae of III-IV age; it was noted as pests of cultivated plants [23].

Figure 6 – *Coptosoma scutellatum* (Geoffroy)

Pentatomidae family - Shield bugs

Dolycoris baccarum (Linneaus, 1758). Evrichortobiont; it can be found everywhere, in different mesophytic biotopes, including fields, gardens, along flood bed and river-valleys; polyphytophage (on different plants) after wintering imago feeds on shoots and buds of many tree species, and in autumn imago suck the contents of their seeds and fruits, crop pest; 1 generation per year, overwinter as imago. [21]. They feed on 58 plant species belonging to 24 plants [29]. Harm is observed on many cultivated plants [21].

Halyomorpha halys Stal, 1855. Dangerous invasive polyphagous pest. Polyphytophage. It harms more than 300 species of plants [5].

Figure 7 – *Halyomorpha halys* Stal

Peribalus (*Holcostethus*) *strictus vernalis* (Wolff, 1804). Polyphytophage feeds mainly on legume, composites, and figwort.

Piezodorus lituratus (Fabricius, 1794). Wide oligophytophage (on various legumes: *Vicia, Caragana* etc, young adults often are found on many species of trees and shrubs [28]; 1 generation per year; over-winter as imago.

Figure 8 – *Piezodorus lituratus* (F.)

Discussion of research results. Table shows taxonomic composition of the Hemiptera phytophagous complex - pests of Lucerne of «Bayserke-Agro» LLP.

39 species of Hemiptera - true bugs suborder related to 27 genera and 7 families were discovered on forage crops fields (lucerne) in «Bayserke-Agro» LLP in Almaty oblast, Kazakhstan during our research.

Taxonomic composition of true bugs – pests of alfalfa of «Bayserke-Agro» LLP.

Miridae family		
Species	Found	The nature of the harm
Adelphocoris lineolatus (Goeze, 1778)	On alfalfa, triticale, prevail on alfalfa ++	Polyphytophage (composites, goosefoot and legume, mostly prevail on legume).
Adelphocoris seticornis (Fabricius, 1775)	On alfalfa, triticale, prevail on alfalfa ++	Polyphytophage (live mainly on legume) clover, lucerne, astragalus, chin and many other herbaceous plants).
Adelphocoris vandalicus (Rossi, 1790)	On alfalfa, triticale, prevail on alfalfa ++	Polyphytophage (legumes, Labiatae, including clovers *Trifolium*, lucerne*Medicago*, sainfoin *Onobrychis gracilis* etc.) Harms crops of lucerne and sainfoin.
Brachycoleus decolor Reuter, 1887	On alfalfa, wheat +	Polyphytophage (on various herbaceous plants: lucerne, wheat, corn, etc.).
Chlamydatus pullus (Reuter, 1870)	On alfalfa +	Polyphytophage (on legumes, composite and other herbaceous plants).
Euryopicoris nitidis Meyer-Dur, 1843	On alfalfa +	Polyphytophage (legumes grasses , especially, lucerne, clover and sainfoin).
Globiceps flavomaculatus (Fabricius, 1794)	On alfalfa, soy +	Imago and larvae suck the juice of herbaceous plants, most often of the Legume family (Fabaceae). Overwinters at the egg stage.
Halticus apterus apterus (Linnaeus, 1758)	On alfalfa +	Wide oligo phytophage (legumes grasses).
Heterotoma merioptera Scopoli, 1763.	On alfalfa, soy, barley, wheat ++	Polyphytophage. Prefers immature fruits, buds, juices and nectar of various plants.
Lygus adspersus (Schilling, 1937)	On alfalfa, soy +	Polyphytophage (on legumes, composite and other herbaceous plants).
Lygus gemellatus (Herrich-Schaeffer, 1835)	On lucerne, wheat ++	Polyphytophage harms grain, legumes.
Lygus pratensis (Linnaeus, 1758)	On alfalfa, triticale, wheat ++	Polyphytophage (harmful to grain, legumes and other crops).
Lygus rugulipennis Poppius, 1911	On alfalfa, wheat ++	Horto-tamnobiont (occurs widely throughout, in floodplains, on many herbaceous and shrubby plants); poly phythophage (harmful to many crops: fruit, crops medicinal and other plants); bivoltine; overwinter as imago. Harmful to umbellate vegetable crops seeds
Polymerus cognatus (Fieber, 1858)	On alfalfa, triticale, wheat ++	Polyphytophage (legumes, crucials, composites and goosefoot, harmful to seeds and plants - lucerne, grain crops.
Polymerus vulneratus (Panzer, 1806)	On alfalfa, triticale, wheat ++	Polyphytophage (legumes, crucials, goosefoot); harmful to manyagriculture and medicinal plants.
Plagiognathus chrysantemi (Wolff, 1804)	On alfalfa, triticale, wheat ++	Polyphytophage (on legume, grain crop and other herbaceous plants, sucks juvenile leaves, buds, flowers and green beans).
Plagiognathus bicolor (Jakovlev, 1880)	On alfalfa, triticale, wheat ++	Polyphytophage (on legume, grain crop and other herbaceous plants, sucks juvenile leaves, buds, flowers and green beans).
Coreidae		
Ceraleptus gracilicornis (Herrich-Schaffer, 1835)	On alfalfa +	Polyphytophage (it feeds the contents of the seeds).
Ceraleptus lividus Stein, 1858	On alfalfa +	Wide oligophytophage (on different legumes).
Ceraleptus sartus Kiritshenko, 1912	On alfalfa +	Wide oligophytophage (on different legumes).
Coriomeris denticulatus (Scopoli, 1763)	On alfalfa +	Wide oligophytophage (feeds on legumes seeds).
Coriomeris hirticornis (Fabricius, 1794)	On alfalfa ++	Wide oligophytophage (on legumes , main food plant: alfalfa).

Coriomeris scabrocornis scabrocornis (Panzer, 1805).	On alfalfa +	Wide oligophytophage (on legumes).
Ulmicola spinipes (Fallen, 1807)	On alfalfa +	Narrow oligophytophage (on clovers *Trifolium* and other legumes).
Rhopalidae		
Brachycarenus tigrinus (Schilling, 1829)	On alfalfa, soy, wheat ++	Polyphytophage live on composites , crucials, and observed on plants of other families, it feeds the contents of the seeds
Chorosoma schillingii (Schilling, 1829)	On alfalfa, wheat +	Chortobiont; inhabits virgin areas, wide oligo phytophage (on grain crops: *Festuca, Poa, Koeleria, Stipa* and other); bivoltine; overwinter as eggs. Pest to grasses, especially to wheat grass at hayfields and pastures. It is noted on lucerne as alien species, incidental occurrence.
Corizus hyoscyami hyoscyami (Linnaeus, 1758)	On alfalfa, triticale, +++	Pest of legume, polyphytophage.
Rhopalus parumpunctatus Schilling, 1829	On alfalfa, triticale, ++	Polyphytophage (on various herbaceous plants, is considered a minor pest of perennial legumes and grains-legumes).
Rhopalus subrufus (Gmelin, 1790)	On alfalfa, triticale, ++	Polyphytophage (prefers labiate family, sometimes legumes and plants from other families).
Stictopleurus punctato-nervosus (Goeze, 1778)	On alfalfa, soy ++	Wide oligophytophagous (on composites).
Lygaeidae		
Graptopeltus lynceus (Fabricius, 1775)	On alfalfa, soy ++	Polyphytophage (it feeds the contents of seeds of legumes, Boraginaceae and Geraniaceae families).
Lygaeus equestris (Linnaeus, 1758).	On alfalfa, triticale, ++	Polyphytophage (fallen seeds of many plants and the juice of the green parts).
Alydidae		
Alydus calcaratus (Linnaeus, 1758)	On alfalfa +	Wide oligophytophage (on legumes, suck buds, flowers and shoots).
Camptopus lateralis (Germar, 1817).	On alfalfa, soy +++	Wide oligophytophage (trophic connected with legumes).
Megalotomus junceus (Scolopi, 1763)	On alfalfa +	Wide oligophytophage (lives on various wild legumes, a pest of legumes and grain legumes).
Plataspidae		
Coptosoma mucronatum Seidenstucker, 1963	On alfalfa, soy +	Wide oligophytophage (permanent legumes grasses, soy and beans).
Coptosoma scutellatum (Geoffroy, 1785)	On alfalfa, soy +	Wide oligophytophage (permanent legumes grasses, soy and beans).
Pentatomidae		
Dolycoris baccarum (Linneaus, 1758).	On alfalfa, triticale, +++	Polyphytophage (on different plants, imago suck the contents of their seeds and fruits, a pest of cultivated plants).
Halyomorpha halys Stal, 1855.	On alfalfa, soy +	Dangerous invasive polyphagous pest. It harms more than 300 species of plants.
Peribalus (Holcostethus) strictus vernalis (Wolff, 1804)	On alfalfa, soy +	Polyphytophage feeds mainly on legume, composites, and figwort.
Piezodorus lituratus (Fabricius, 1794)	On alfalfa, soy ++	Wide oligophytophage (on legumes).
Note: Occurence: + - low, ++ - medium, + + + - high.		

Such a variety of species composition can be explained that the high attractiveness of the fields of forage crops for different species of Hemipterous, as there is a rich food reserve, and also chemical insecticides are not used on forage crops fields of «Bayserke-Agro» LLP.

As can be seen from the data indicated in table 1, representatives of the family Miridae – 17 species are predominated as species diversity, followed by Coreidae - 7 species, Rhopalidae - 6 species, Pentatomidae - 4 species, Alydidae - 3 species. Plataspidae - 2 species and Lygaeidae - 2 species are least diverse.

As per food web, hemipterous - pests of forage crops (lucerne) of «Bayserke-Agro» LLP are herbivorous species. Polyphytophage is 55 % (24 species) and wide oligophytophagous - 42 % (14 species) narrow oligophytophagous - 3 % (1 species).

The most economically significant species of true bugs lucerne pests belong to Miridae, Pentatomidae and Alydidae. They are able to cause serious harm to grain crops during mass reproduction. Representatives of other families, as a rule, harm only locally, and have no great economic significance.

Results. 39 species of Hemiptera- true bugs suborder related to 27 genera and 7 families were discovered on alfalfa field in Bayserke-Agro LLP in Almaty region, Kazakhstan during our research. Family Miridae - 17 species are predominated as species diversity, followed by Coreidae - 7 species, Rhopalidae - 6 species, Pentatomidae - 4 species, Alydidae - 3 species, Plataspidae and Lygaeidae - only 2 species.

As per food web, hemipterous - pests of grain crop is phytophag species, Polyphytophage is 55 % (24 species) and wide oligophytophagous - 42 % (14 species) narrow oligophytophagous - 3 % (1 species).

The most harmful kinds of alfalfa bug pests are Miridae, Pentatomidae and Alydidae, which may occasionally reproduce in large numbers. Representatives of other families cause, as a rule, local harm, and do not have much economic significance.

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«БАЙСЕРКЕ-АГРО» ЖШС АЗЫҚТЫҚ ДАҚЫЛДАРДЫҢ (ЖОҢЫШҚА) ЗИЯНКЕСТЕРІ – ЖАРТЫЛАЙ ҚАТТЫҚАНАТТЫЛАР (HEMIPTERA: HETEROPTERA)

Аннотация. Жұмыс барысында Алматы облысындағы "Байсерке - Агро" ЖШС жоңышқа зиянкестерінің жартылай қатты қанатты кіші тобының түрлік құрамы келтіріледі. Алматы облысының "Байсерке-Агро" ЖШС-де жүргізілген зерттеулер нәтижесінде 27 түрге және 7 тұқымдастарға жататын қылқан жапырақты тұқымның 39 түрі анықталды. Олардың артынан Coreidae – 7 түр, Rhopalidae - 6 түр, Pentatomidae - 4 түр, Alydidae - 3 түр. Plataspidae - 2 түрі және Lygaeidae - 2 түрі. Тағамдық байланыстар бойынша жоңышқа - зиянкестері қоректендірудің кең спектрі бар өсімдік тектес түрлері болып табылады, оның ішінде полифитофагтар 55 % (24 түрі), кең олигофитофагтар – 42 % (14 түрі), тар олигофитофагтар – 3 % (1 түрі) құрайды. Жоңышқа зиянкестерінің ең зиянды түрлері жаппай мөлшерде дүркін-дүркін көбейтілетін Miridae, Pentatomidae және Alydidae тұқымдастарына жатады. Басқа тұқымдастардың өкілдері, әдетте, жергілікті зақым келтіреді және үлкен экономикалық мәні жоқ..

Түйін сөздер: Hemiptera, Heteroptera, жартылай қаттықанаттылар, зиянкестер, жоңышқа, ЖШС «Байсерке-Агро», Алматы облысы, Қазақстан.

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КЛОПЫ (HEMIPTERA: HETEROPTERA) – ВРЕДИТЕЛИ ЛЮЦЕРНЫ ТОО «БАЙСЕРКЕ-АГРО»

Аннотация. В работе приводится состав видового состава полужесткокрылых подотряда клопов - вредителей люцерны ТОО «Байсерке-Агро» в Алматинской области. В результате проведенных исследований в 2018 г. на полях кормовых (люцерна) культур в ТОО «Байсерке-Агро» Алматинской области Казахстана в результате проведенных исследований нами было отмечено 39 видов клопов, относящихся к 27 родам и 7 семействам. По видовому разнообразию из выявленных клопов преобладают представители семейства Miridae – 17 видов, за ними следуют Coreidae - 7 видов, Rhopalidae - 6 вида, Pentatomidae - 4 вида, Alydidae - 3 вида. Наименее разнообразны Plataspidae - 2 вида и Lygaeidae - 2 вида. По пищевым связям клопы - вредители люцерны являются растительноядными видами с широким спектром питания, из них полифитофаги составляют 55 % (24 вида), широкие олигофитофаги – 42 % (14 видов), узкие олигофитофаги - 3 % (1 вид). Наиболее вредоносные виды клопов-вредителей люцерны относятся к семействам Miridae, Pentatomidae и Alydidae, которые могут периодически размножаться в массовом количестве. Представители прочих семейств наносят, как правило, локальные повреждения, и не имеют большого экономического значения.

Ключевые слова: Hemiptera, Heteroptera, вредители, люцерна, ТОО «Байсерке-Агро», Алматинская область, Казахстан.

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EFFICIENCY OF METHODS OF STRUGGLE AGAINST GASTROINTESTINAL INTESTINAL DISEASES OF CALVES IN "BAYSERKE-AGRO" LLP

Abstract. The article presents the results of diagnostic studies of pathological and biological material from calves. The diagnosis was established on the basis of epizootological data, clinical signs, pathological changes, and results of bacteriological and serological studies.

As a result of studies of biological material from newborns of clinically sick calves, the causative agent of colibacillosis Escherichia coli was identified and identified. When staging a bioassay on white mice, the animals fell on the second day, which indicates the virulence of the isolated cultures of Escherichia, during typing of which they were assigned to the O78 serogroup. Based on the results of diagnostic studies on the farm, health measures were taken. Sick calves were subjected to therapeutic effects of bactericidal antibiotics, as well as symptomatic treatment of animals. After the complex of antiepizootic, economic, veterinary, sanitary and preventive measures in "Bayserke-Agro" LLP, there were no cases of colibacillosis among newborn calves. The farm improved from colibacillosis, which had a positive effect on the number of output livestock.

Introduction. Infectious diseases of young farm animals cause enormous economic damage to the republic's animal husbandry and represent an important veterinary and biomedical problem. The fight against infectious animal diseases is a national problem. Colibacteriosis - an acute infectious disease of young animals in the first days of life, manifested by profuse diarrhea, signs of severe intoxication and dehydration. Calves get sick mainly in the first 1-7 days of life, as well as in the pre- and post-detachment periods. Characterized by the massive incidence of emerging young. The disease occurs in all seasons of the year, but more often in the period of mass calving, farrowing, lambing. The source of the pathogen are sick and ill animals, as well as mothers - carriers of pathogenic Escherichia. Infection occurs in utero or during childbirth with non-compliance with hygiene; when feeding colostrum and water, feeding feed contaminated with the causative agent of colibacillosis [1-3].

The leading role in the development of diarrhea of newborn piglets, calves, lambs belongs to enterotoxigenic strains of Escherichia with adhesive antigens K88, K99, 987P, F41, F18, A20, Att25 of various O-serogroups.

The causative agent of E. coli is a short thick bacillus with rounded ends, mobile (there are flagella), gram-negative, does not form a spore, an aerobic or facultative anaerobic, grows well on ordinary nutrient media, in smears it is located single. To establish the genus and species of Escherichia, the identification of biochemical properties and cultivation on special media, Endo, Levin, Kligler, is of great importance.

Colibacteriosis is one of the most common diseases of young stock of all types of farm animals. Calves suffer mainly in the first 1-7 days of life; piglets - in the first days and weeks of life, as well as

during the pre-withdrawal and post-detachment periods; lambs, from the first days of life and up to 5-7 months of age; foals from the first days; fur-bearing animals in 1-5 days and less often in 6-10 days of age. The disease occurs in all periods of the year. Calves and lambs are more likely to get sick in the stall period. The source of the infection pathogen is sick and colibacillosis-infected animals, as well as mothers who carry pathogenic types of Escherichia. Animals release the pathogen into the environment with feces, and sometimes with urine. Among young calves during the period of mass calving, lambing, and farrowing, the pathogen is transported on susceptible livestock, as a result of which its virulence increases significantly, which leads to a new outbreak of the disease.

The incubation period of colibacillosis lasts from several hours to 1-5 days. In calves, there are three forms of the disease: septic, enterotoxemic and intestinal (enteric) [4].

Research results. In 2015, cases of death of newborn calves of a daily or two-day age were observed on the farm. Calves were born non-viable and died in the first hours after birth. On January 12, 2015, pathological material from a 7-day-old calf (inventory no. W/n) and an 8-day bull (inventory no. 577759906) were delivered from a private farm in the Talgar district of the Almaty region for research. In sick calves, diarrhea, dehydration, intoxication, fever, and general depression were noted. In calves, a septic form of colibacillosis prevailed, characterized by an acute course, severe diarrhea, septicemia and a rapid onset of death. In some calves, an enterotoxemic form of colibacillosis was observed with a characteristic penetration of pathogenic strains of Escherichia coli into the anterior sections of the small intestine and the development of diarrhea. Bacteremia was usually absent, calves died due to toxemia and collapse. The intestinal form manifested as diarrhea with a milder course of the disease in the absence of signs of toxicosis. Mortality was less common than in the first two forms. In calves, hyperacute, acute and subacute course of colibacillosis was noted. Hypertensive course of colibacillosis was manifested mainly in calves of the first 3-5 days of life. The body temperature increased briefly to 40-41 °C, the wool became disheveled, conjunctivitis developed, and depression developed. . An acute form of colibacillosis was observed in calves in the first days of life. Figure 1 shows a calf suffering from an acute form of colibacillosis.

Figure 1 – Calf, patient with an acute form of colibacillosis

Figure 1 shows the characteristic posture of a calf suffering from an acute form of colibacillosis. The neck is extended, thrown back, the head rests against the body. One can see the depressed serious condition of the animal.

There was pain when pressing on the abdominal wall, depression, rapid breathing, loss of appetite. Calves' eyes subsided, diarrhea and severe dehydration were expressed. On the first or second day of the disease, the consistency and color of feces changed. First, the faeces are liquefied, then they become gray-white, often frothy, streaked with blood, mucous, then watery. Breathing difficult, superficial, and later rapid. Pulse frequent and weak. Exhausted animals died in a deep coma. The illness lasts 2-3 days.

The subacute course in calves aged 5-10 days was accompanied by the development of secondary microflora of the upper respiratory tract.

In the autopsy study of corpses of calves who died from colibacillosis, pronounced changes in the rectum (punctate or banded hemorrhages) are pronounced. Mass hemorrhages were noted in the small intestine. Lymph nodes swollen and juicy on the cut, sometimes in hemorrhages. Spleen enlarged. In the liver, kidneys, heart, as well as in the muscles, degenerative processes are expressed. The gel bubble is filled and stretched. Hemorrhages were noted under the epicardium and on the endocardium, as well as on other serous integuments. Pulmonary edema, catarrhal inflammation of the lungs was observed.

Diagnosis of colibacillosis. The diagnosis of colibacillosis was established on the basis of the epidemiological, clinical, pathoanatomical data and the results of bacteriological examination of the material.

For bacteriological research, the material from calves (heart pieces, spleen, liver with gall bladder, kidneys, mesenteric lymph nodes, small intestine bandaged from two ends) was transferred from the farm to the bacteriology laboratory of KazSRVI LLP.

For in vivo bacteriological diagnosis, fresh feces from a sick calf not treated with antibiotics were examined. Bacteriological examination includes the isolation and identification of colibacillosis, determination in the agglutination reaction (RA) with colibacillosis diagnostic sera and the production of a bioassay on white mice.

Fresh pieces of the lung, liver, spleen, kidney, mesenteric lymph nodes were delivered. From patmateriala calves (from the liver, spleen, mesenteric lymph nodes, heart, kidney, lung) crops were made on the BCH, MPA, Endo differential diagnostic medium. After 20 hours, the growth of large round colonies was observed on nutrient media. On dense media, weakly convex, translucent colonies with smooth edges and a shiny S-shaped surface were formed. A uniform turbidity and a slight precipitate were observed on the BCH. On the Petri dishes with the Endo medium, brilliant smooth colonies, painted in a bright crimson color with a metallic sheen, grew.

Figures 2 and 3 show the growth of Escherichia on MPA and Endo medium.

Figure 2 – The growth of Escherichia in MPA

Figure 3 – The growth of Escherichia in the Endo environment

In figures 2 and 3, there are visible large round colonies on the MPA and on the Endo medium.

In figure 4, Escherichia is represented in a smear prepared from a daily agar culture isolated from the calf.

The figure shows gram-negative large sticks with rounded ends, located singly.

Escherichia cultures isolated from patmaterial from both calves possessed high enzymatic activity. Escherichia decomposed with the formation of acid and gas: arabinose, galactose, lactose (differential distinction of Escherichia from Salmonella), maltose, mannitol, rhamnose, sucrose. The cultures isolated from calves did not liquefy gelatin, formed indole, did not form hydrogen sulfide (a distinctive feature of Escherichia from Salmonella), reduced nitrates to nitrites, and gave a negative Voges-Proskauer reaction. The mobility of both isolated cultures was noted.

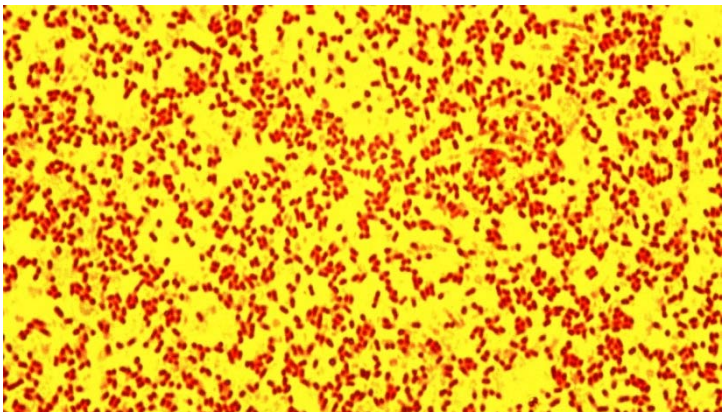

Figure 4 – Culture of Escherichia in a gram-stained smear

The tested cultures agglutinated with diagnostic sera of colibacous OK polyvalent and monovalent dry production of AOOT Biomed them. Mechnikov. The sera contained specific agglutinins to the surface K- and somatic O-antigens. Serum diagnostic escherichiosis OK are preparations obtained from native serum of rabbits hyperimmunized with a mixture of corpuscular antigens of Escherichia. The active principle of the sera is specific K- and O- agglutinins against the antigens of Escherichia pathogenic groups. In the formulation of RA with monovalent serum, both E. coli cultures obtained from calves are assigned to O78 serogroup. Coarse agglutinate is well pronounced, full clarification of the drop was noted with negative control, the reaction was evaluated on four crosses.

The cultures were identified in accordance with the Burge determinant [7].

Based on cultural, morphological, tinctorial, biochemical, and serological properties, both cultures were identified as Escherichia coli.

The virulence of epizootic cultures of E. coli was tested in an experiment on 6 white mice weighing 16–18 g (for each culture, 3 heads). Experimental animals weighing 16-18 g were injected subcutaneously with 0.5 ml daily broth culture of Escherichia. On the third or fourth day, the death of all experienced white mice was observed. An infected culture of Escherichia, not contaminated by extraneous microflora, was sown from the liver and heart of dead mice.

Control measures. Before treating the sick calves the sensitivity of the Escherichia to antibiotics was determined. Started treatment immediately at the first signs of the disease. Bacteriophage, hyperimmune anti-esterichiotic serum, gamma globulin were used. Antibiotics were prescribed in accordance with the results of determining the sensitivity of E. coli, the most effective are (enroxil, flumequin, kanamycin, cobactan, gentamicin, etc.), sulfanilamide (sulfazole, sulfadimethoxin, etc.) and nitrofuran (furazolidone, furazidin, etc.) were used simultaneously.) drugs. Symptomatic agents were used intravenously to restore the water-salt metabolism, acid-base balance, neutralize toxins. Symptomatic treatment was carried out in the form of intravenous injections.

Specific prevention is based on carrying out a complex of organizational, economic, antiepizootic, zootechnical, veterinary and sanitary and zoohygienic measures aimed at increasing the resistance of the mothers and young animals, ensuring the hygiene of childbirth, as well as preventing infection of animals through environmental objects. Timely vaccination of pregnant cows and pregnant sows, passive immunization of newborn young animals with specific immune serum and gamma globulins. In the first hours of life, non-specific globulins, ABA, PABA, acidophilus are used as prophylactic agents.

Young animals who have had colibacillosis become immune to subsequent infection. Artificial immunity in newborns is poorly formed, vaccination does not provide the formation of active protection against colibacillosis that occurs in the first days of the animal's life. Therefore, it is necessary to immunize pregnant animals, which provides a high concentration of immune bodies in colostrum. For specific prophylaxis of colibacillosis in the farm, a vaccine against colibacteriosis (escherichiosis) of animals is used. Vaccines associated inactivated against colibacillosis, salmonellosis, klebsiellosis and proteic infection of young farm animals and fur animals (OKZ vaccine), produced by OO Agrovet, Moscow.

After the complex of antiepizootic and economic activities in “Bayserke-Agro” LLP, there were no cases of colibacillosis among calves. The economy improved from colibacillosis.

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«БАЙСЕРКЕ-АГРО» ЖШС БҰЗАУЛАРДЫҢ АСҚАЗАН-ІШЕК АУРУЛАРЫМЕН КҮРЕСУ ӘДІСТЕРІНІҢ ТИІМДІЛІГІ

Аннотация. Мақалада бұзаулардан алынған патологиялық және биологиялық материалдыңбалаулық зерттеу нәтижелері келтіріледі. Балауіндеттанулықлық деректер, клиникалық белгілер, патологоанатомиялық өзгерістер, бактериологиялық және серологиялық зерттеулердің нәтижелері негізінде анықталған. Жаңа туған бұзаулардан биологиялық материалға жүргізілген зерттеулер нәтижесінде клиникалық ауру бұзаулардан Escherichia coli колибактериоз қоздыруышсы бөлініпалынды. Биопробаны ақ тышқандарда қою кезінде жануарлар екінші тәулікте өлім-жітімге ұшырады, бұл эшерихийдің бөлінген өсінділерінің вируленттілігін растайды, олардыңтипін ажырату кезінде 078 серотобына жатқызылатындығы анықталды. Балаулық зерттеулер нәтижелері негізінде шаруашылықта сауықтыру шаралары өткізілді. Ауру бұзауларда бактерицидті антибиотиктердің терапевтік әсері байқалды, сондай-ақ жануарларға симптоматикалық емдеу жүргізілді. «Байсерке-Агро» ЖШСіндетке қарсы, шаруашылық, ветеринариялық-санитариялық және алдын алу іс-шаралар кешені жүргізілгеннен кейін жаңа туған бұзаулар арасында колибактериоз ауруы байқалмады. Шаруашылық колибактериоздан сауықтырылды, бұл мал басының санының артуына оң әсер етті.

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ЭФФЕКТИВНОСТЬ МЕТОДОВ БОРЬБЫ С ЖЕЛУДОЧНО-КИШЕЧНЫМИ БОЛЕЗНЯМИ ТЕЛЯТ В ТОО «БАЙСЕРКЕ-АГРО»

Аннотация. В статье приводятся результаты диагностических исследований патологического и биологического материала от телят. Диагноз установлен на основании эпизоотологических данных, клинических признаков, патологоанатомических изменений, результатов бактериологического и серологического исследований.

В результате проведенных исследований биологического материала от новорожденных клинически больных телят выделен и идентифицирован возбудитель колибактериоза Escherichiacoli. При постановке биопробы на белых мышах животные пали на вторые сутки, что свидетельствует о вирулентности выделенных культур эшерихий, при типировании которых они были отнесены к серогруппе О78. На основании результатов диагностических исследований в хозяйстве проведены оздоровительные мероприятия. Больных телят подвергли терапевтическому воздействию бактерицидными антибиотиками, а также проведено симптоматическое лечение животных. После проведения комплекса противоэпизоотических, хозяйственных, ветеринарно-санитарных и профилактических мероприятий в ТОО «Байсерке-Агро» случаев колибактериоза среди новорожденных телят не отмечалось. Хозяйство оздоровлено от колибактериоза, что оказало положительное влияние на количество выходного поголовья.

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EPISOOTOLOGICAL MONITORING OF CATTLE MORAXELLOSIS

Abstract. Infectious keratoconjunctivitis (IKC) of moraxella etiology, according to the literature, is registered in many countries of the world, including in the Republic of Kazakhstan. Monitoring of infectious keratoconjunctivitis of moraxella etiology in the Republic of Kazakhstan shows that the disease was detected in 9 areas and 11,738 head of cattle of the breed Aberdeen-Angus were infected, the incidence averaged 39.98%.

In the economic entities of the Republic of Kazakhstan, where cattle were imported from far abroad, in all cases the presence of the disease, as well as all links of the epizootic process, i.e. the source of the pathogen, the transmission mechanism of the infectious agent (transmission factors - non-living objects and vectors - insects), as well as susceptible animals.

One of the main reasons for the appearance of the disease is the import of imported breeding stock, among which there were sick animals, and the movement of infected livestock without appropriate anti-epizootic measures led to a wide spread of the disease and an increase in the number of unfavorable items.

Infectious keratoconjunctivitis in cattle of moraxella etiology is clinically characterized by a lesion of the eye from inflammation until complete loss of vision and is manifested by staging.

Moraxellosis of cattle is manifested mainly in the spring-summer period of the year, more often in the warm season, in the period of mass activity of insects.

Animals of all ages get sick, but more often animals up to 2 years of age, regardless of gender, and hot and sunny weather, high dustiness of indoor and pasture air, as well as insects contributed to its wide and rapid spread and clinical manifestation in the herd.

On the basis of the conducted studies, it can be concluded that in the fight against moraxellosis of cattle it is necessary to conduct a full range of these antiepizootic measures that require dynamic improvement depending on the biological properties of the pathogen, antibacterial resistance, clinical manifestations of the disease, as well as feeding conditions and content.

Key words: infectious keratoconjunctivitis, moraxellosis, epizootological monitoring, cattle.

Research objective. To conduct epizootological monitoring of cattle moraxellosis in the context of epizootological units of economic entities of the Republic of Kazakhstan.

Material and methods. The studies were carried out within the framework of the program "Ensuring veterinary and sanitary safety and epizootic well-being on cattle moraxellosis". Epizootological, clinical, pathologic-anatomical and bacteriological methods for diagnosing animal moraxellosis were used in the performance of research work.

Relevance. One of the most common diseases that manifest themselves in damage to the organs of sight in cattle is infectious keratoconjunctivitis (ICH), caused by bacteria of the Moraxella genus, which is registered in many countries around the world, including the Republic of Kazakhstan.

Thus, in the United States of America, the ICC of cattle of moraxella etiology annually affects about 10 million animals, causing economic damage of more than $ 150 million (Hansen, 2001).

In some of the far abroad countries, the ICC of the large horn cattle reaches 45.4%, and the economic damage caused by the disease is reduced by the live weight of the animal, and the milk production is reduced, the milk is reduced, the decrease in production is reduced by 45.4%.

Results and analysis of the data. Monitoring of cattle disease with infectious keratoconjunctivitis in the Republic of Kazakhstan shows that one of the main causes of the disease is the import of imported breeding livestock, among which sick animals took place, and the movement of infected animals throughout the regions of the Republic of Kazakhstan without corresponding antiepizootic measures led to widespread disease and an increase in the number of dysfunctional business entities [2].

According to the data of the Meat Union of Kazakhstan sent to us, mores among the cattle are noted mainly among the imported stock of Aberdin-Angus breed (table, figure 1).

Table 1 – Information on the distribution of moraxellakeratoconjunctivitis among the Aberdeen-Angus breed imported to the Republic of Kazakhstan

Name of regions	The number of imported livestock animals for 2012-2018 / the presence of patients		
	Aberdeeno-Angus		
	Delivered	Got sick	
		absolute amount	percent
Akmola	7355	2942	40,00
Aktobe	2382	952	39,96
Almaty	4811	1924	39,99
Atyrau	–	–	–
East Kazakhstan	1103	441	39,98
Zhambyl	503	201	39,96
West Kazakhstan	–	–	–
Karaganda	–	–	–
Kostanay	6646	2658	39,99
Kyzylorda	–	–	–
Mangystau	–	–	–
Pavlodar	2347	938	39,96
North Kazakhstan	3572	1428	39,97
South Kazakhstan	637	254	39,87
Total	**29 356**	**11 738**	**39,98**

As shown in table and figure 1, the disease was detected in 9 regions of the Republic of Kazakhstan, where 11,738 heads of cattle were infected, with an average incidence rate of 39.98%.

Epizootological monitoring in respect of moraxellosis of cattle, carried out by us in the economic entities of the Republic of Kazakhstan, this year allowed us to identify the characteristics of the occurrence, development and manifestation of the disease, as well as to establish the extent of its spread.

The first cases of the disease among cattle were registered by us during an epizootological survey of the beef herd of productivity in Bayserke-Agro LLP.

During epizootological examination of separately contained groups of animals in Bayserke-Agro LLP (Kumtobe mountain distant site), we found that eye disease in cattle was observed mainly in animals of the Aberdeen-Angus breed. In a clinical examination of 274 heads of cattle, we noted in 16 animals the characteristic features of moraxellosis.

The animal disease manifested initially in the form of swelling of the conjunctiva and tearing and covered 5.8% of the population. At the initial stage, a serous outflow from the medial angle of the eye appeared, and later a congestion of mucous and purulent exudates was observed. Palpation revealed eyelid tenderness, increased local temperature. Later, a more or less pronounced corneal clouding appeared and on the 6–10th day erosion about 1 mm in diameter developed at its center, which soon turned into an ulcer. The stage of ulceration was accompanied by strong anxiety of animals, relatively high body

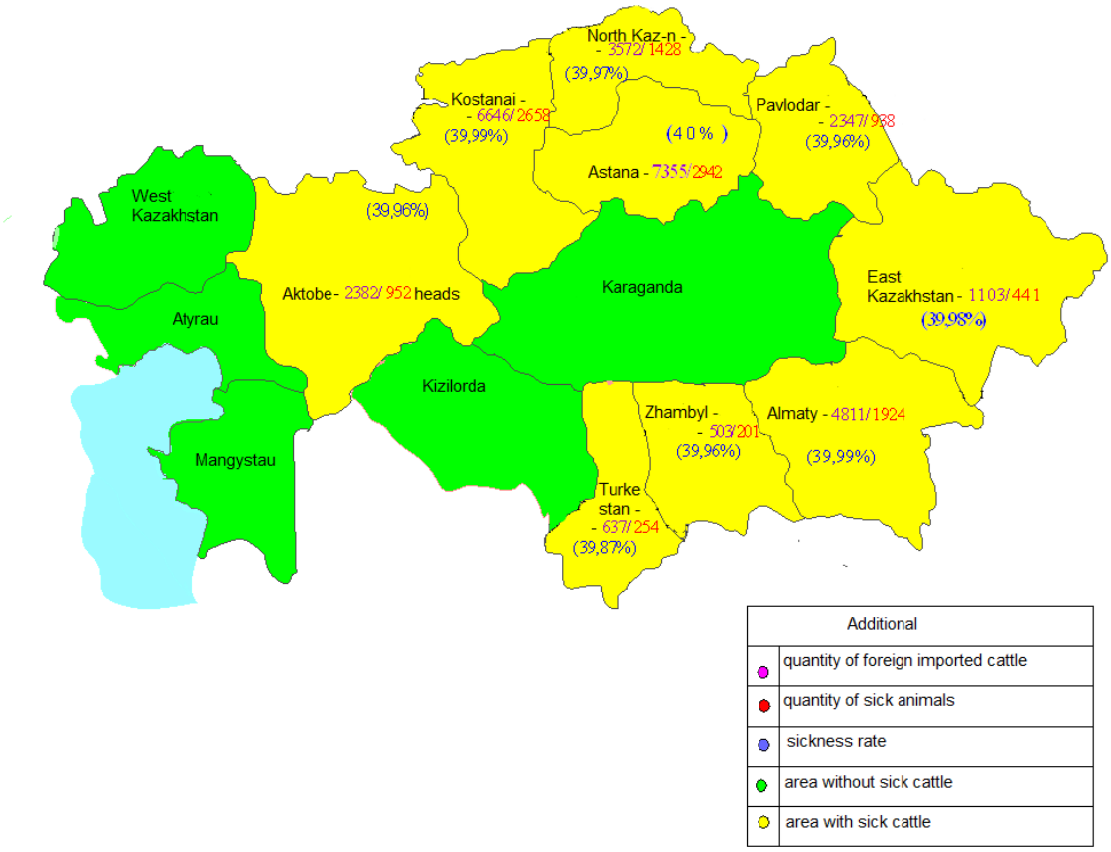

Figure 1 – Mapping (zoning) of the territory of the Republic of Kazakhstan into zones according to the extent of the spread of morax cough infection among cattle for 2012-2018

temperature, reaching up to 41 ° C and refusal of food. Corneal opacification quickly spread in all directions from the ulcer. Over the next 10-15 days, the development of the vascular network appeared at the edge of the lesion, and in some particularly severe cases, it surrounded the entire cornea along the periphery, forming a red rim. These changes led to a thickening of the cornea and a loss of its transparency. Cases have been observed where the vessels germinated toward the center of the cornea and formed an elevation in the shape of a nipple. Subsequently, the blood supply was stopped, and the bright color of the vascular plexus assumed a pale hue. Within 25–50 days, vascular induction decreased in size and completely disappeared. Among animals and especially young animals of 6-10 months of age, the deformation of the eyeball was observed. In 2% of 6-8-month-old calves, all layers of the cornea perforated as a result of its ulceration and the vitreous flowed out. As a result, one- or two-sided blindness occurred. Defeat was usually observed in one eye, and if in both - then at a different stage of the course.

These features of the development of animal diseases. In “Baiserke-Agro” LLP we were also noted when examining the livestock of cattle (mainly aberdine-angus breed) and in other regions of the Republic of Kazakhstan, which was confirmed by clinical manifestations of the disease.

In the dynamics of the development of the disease, we can conditionally note five stages that go smoothly into one another:

- catarrhal conjunctivitis with photophobia, serous lacrimation, hyperemia of the peripheral tissues of the eyeball and blepharospasm is possible, figures 2, 3;
- parenchymal keratitis, corneal edema, figures 4, 5;
- beginning purulent keratitis, keratocele, corneal ulcer, corneal opacity, figure 6;
- purulent keratoconjunctivitis, corneal perforation, figure 7;
- purulent panophthalmia, blindness, figure 8.

These stages of the disease were detected by us during the examination of the livestock of cattle in all regions of the country.

Figure 2 – Serous tearing,
hyperemia of peripheral tissues of the eyeball

Figure 3 – Catarrhal Conjunctivitis
with photophobia

Figure 4 – Parenchymal keratitis

Figure 5 – Corneal Edema

Figure 6 – Starting purulent keratitis

Figure 7 – Corneal Perforation

Figure 8 – Purulent anoftalmia, blindness

Figures 2–8 show photographs of the clinical manifestations of all keratoconjunctivitis stages we have found in cattle.

In the center of the cornea appears a center of dark gray opacities, which turns into a lighter, gray-blue spot. From the edge of the cornea, capillaries grow into the zone of diffuse opacification, thereby creating a narrow pink hyperemic strip (ring) around the zone of turbidity. In some animals, swelling of the clouded part of the cornea and the development of ulcers leading to blindness are observed. With delayed treatment, recovery is delayed for a long time (weeks, months) or is not achieved at all.

Sick animals are anxious and kept in the shadows, their appetite and productivity decrease, and animals that have completely lost their eyesight can eat only after they feed them directly in a container.

Trying to find out the alleged source of the pathogen and possible ways of bringing the disease, we found that the emergence of animal diseases is associated with the importation from the foreign countries (Canada, Australia) of pedigree cattle of the Aberdeen-Angus breed. In the future, the epizootic process intensified in the summer period of time, which may be due to the presence of pathogen carriers, which can be stinging insects, and as a result of increased pathogenicity as a result of the passage of the pathogen when it is transmitted from an infected animal to a healthy one.

Observations have established that the causative agent of the disease can be transferred by means of transmission factors (not living objects), and also insects can be probable carriers. Auxiliary factors affecting the course and clinical manifestation of the disease are also eye injuries, hot weather, wind and dust. And moving an infected livestock carrier of a pathogen from one farm to another is a direct path to a significant spread of the disease. Consequently, the continuity of the epizootic process was ensured, which caused the emergence of new outbreaks of the disease.

There are observations of the employees of the Kazakh SRVI on the availability of the disease among some other breeds, in particular, Hereford and Kazakh white-headed. Obviously, there is a potential possibility of further expansion of the specified disease among other breeds of CRC contained in the territory of the Republic of Kazakhstan.

In the Republic of Kazakhstan, despite the wide spread of infectious keratoconjunctivitis of moraxella etiology, the issues of microbiology and immunology of the disease have not been studied. The reason for this is that moraxellosis of cattle in our country is a new, poorly studied disease, and its early diagnosis in our country has not yet been developed. Therefore, in the absence of proper antiepizootic measures, there is a potential danger of further spreading it to other species of animals that are kept together.

Based on the above, it is very important to develop methods for the isolation, conditions for the cultivation of bacteria of various species, including Moraxella bovis and Moraxella bovoculi. Requires the study of the biological properties of pathogens circulating among animals in the territory of the Republic of Kazakhstan. It is very important to determine the role of different types of moraxell in the etiology of the disease and on this basis the development of diagnostic methods, specific prevention, and the implementation of antiepizootic measures.

On the basis of the conducted research, it can be concluded that in the fight against moraxellosis in cattle it is necessary to carry out the full range of these antiepizootic measures [3,4], which require dynamic improvement depending on the biological properties of the pathogen, antibacterial resistance, clinical manifestations of the disease, and feeding conditions and content.

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ІРІ ҚАРА МАЛМОРАКСЕЛЛЁЗЫНЫҢ ІНДЕТТАНУЛЫҚ МОНИТОРИНГІ

Аннотация. Ірі қара малморакселлёзіне жүргізілген індеттанулық мониторинг аурудың этиологиясын, ауру қоздырушысының бастауын, ауру тетігінің берілу факторын анықтауға, індетке қарсы шараларды жетілдіру үшін алынған деректерді талдауға мүмкіндік берді.

Түйін сөздер: инфекциялық кератоконъюнктивит, моракселлёз, індеттанулық мониторинг, Ірі қара мал.

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ЭПИЗООТОЛОГИЧЕСКИЙ МОНИТОРИНГ МОРАКСЕЛЛЁЗА КРУПНОГО РОГАТОГО СКОТА

Аннотация. Проведен эпизоотологический мониторинг моракселлёза крупного рогатого скота, который позволил выявлять этиологию заболевания, определить источник возбудителя болезни, установить факторы передачи заразного начала, провести анализ полученным данным с целью разработки противоэпизоотических мероприятий.

Ключевые слова: инфекционный кератоконъюнктивит, моракселлёз, эпизоотологический мониторинг, крупный рогатый скот.

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MORAXELLOSIS IN CATCHES OF DIFFERENT BREEDS OF MEAT DIRECTION OF PRODUCTIVITY

Abstract. On the basis of the results of the investigations, an episode analysis was carried out. It has been determined that many business entities of the Republic of the Quartet Systromes, the Republic of the Middle East and South Ossetia, the Republic of the Middle East and South Africa have been tracked by other large countries from other districts of the Far East and the Middle East and South Africa. When identifying the causes of some of them, in particular, infectious diseases of the eye, it was revealed that the causative agent of the disease is a bacterium of the genus Moraxell. The study of the episodes situation was carried out in the management of "Bayserke-Agro" LLP in Almaty region of Kazakhstan.

As a result, 883 animals from different herds of the same economy were observed, 47 of them with clinical signs revealed 47, which was 5.3%. From living with signs of eye disease infectious etiology, bio-material is taken. In the result, cultures were isolated, which were subsequently identified as a culture of Moraxelle security, according to the distributor M.A. Sidorova (1995) [1]. It was not possible to isolate the moraxellian cultures during the second survey on the same farm.

Key words: moraxellosis, import of livestock, breeds, distribution, damage, epizootic situation.

Relevance of the topic. By the present time in many economic entities of the Republic of Kazakhstan, there are imports of large coal from other districts. In this case, it is noted that there are cases among the livelihoods of diseases that are not registered in our country before, among which there are moraxellosis.

According to official statistical data, for the period 2012-2017, 29 356 animal parts of the Aberdeen-Ingusov of the Meat Production Unit were imported into the Republic. Of the aforementioned number of 11,738 heads, which was 39.9%, had a depression in the eyes of corycoconjunctivitis. In the dissection, the regions of the live animals with inclined eyes vary from 39.8 to 40.0.

In terms of the development of modern animal husbandry eye diseases remain an urgent problem. One of the most common diseases that manifests itself in damage to the organs of sight in cattle is infectious keratoconjunctivitis (ICH), which is registered in many countries of the world, and in recent years cases of this disease have been detected in the Republic of Kazakhstan. Monitoring of infectious keratoconjunctivitis in the Republic of Kazakhstan shows that ONE of the main causes of the spread of the disease is the massive importation of imported breeding stock, among which there were sick animals, and the movement of infected animals through the regions of the Republic of Kazakhstan without corresponding diagnostic studies led to an intensive spread of the disease and an increase in the number of disadvantaged farms. [2]

In this case, it is important to note that earlier in our country this disease was not registered and the means and methods of dealing with it were far from it.

It is worth noting that out of 5,290 animals with a free-flowing gland of a case of ocular disease, no cases of Aberdeen-Angus animals have been reported.

There are observations on the presence of disease among some other breeds, in particular, of the Kazakh white. Obviously the potential for further complications of the aforementioned disease among other CSCs, who are proprietors on the territory of the Republic of Kazakhstan.

According to the special literature, in some countries of the Near and Far abroad, the economic damage caused by moraxellouskeratoconjunctivitis reaches significant proportions and is composed of a reduction in the growth of live weight of the animal, not obtaining additional offspring, reducing milk production, as well as the cost of treatment and veterinary and sanitary measures [3-8].

The highest incidence is observed in calves aged 1-6 months. (50-70%). In the groups of rearing and fattening, especially when the cattle is on sites with a large population density, the disease is registered up to 30%. IKC among the dairy herd varies from 10-12% [2].

On animal-breeding complexes, the disease is recorded year-round, but most massively in the summer months, when cattle are on pasture and are susceptible to attack by stinging insects that carry the pathogen. The disease is characterized by lacrimation, hyperemia of the conjunctival vessels, photophobia, serous purulent outflow, clouding and ulceration of the cornea, deformity of the eyeball in the form of keratoglobus or keratoconus, partial or complete loss of vision of the affected eye of the animal [2].

The purpose of research: clarification of the epizootic situation of moraxellosis among various breeds with the aim of developing antiepizootic measures

Materials and methods. The studies were carried out in the framework of the program "Scientific and methodological support of veterinary and sanitary well-being and increasing the productivity of animal husbandry, on the example of "Bayserke-Agro" LLP.

The study of the episodes of the situation with the CPC moraxellosis in the economic entities of the Republic of Kazakhstan was carried out by analyzing the data of the Meat Union of Kazakhstan of the Ministry of Agriculture of the Republic of Kazakhstan and its own research during trips to business entities of various regions of the republic.

Work was done in the laboratory of bacteriology KazSRVI.

During the period of investigations, a clinical examination of a large rogue cluster was conducted, biomaterial was taken, and bacteriological studies were carried out.

In a clinical study of bovine infectious keratoconjunctivitis drew attention to their General condition, the presence (absence) of epiphora, photophobia, hyperemia of the vessels of the conjunctiva, blepharospasm, iridoplasty, serous – mucous or sero – purulent flow from the eyes of turbidity, and (or) ulceration of the cornea.

The study of the biological properties of selected cultures of moraxels and the selection of the most promising ones for the manufacture of immunological drugs was carried out in strict accordance with the sanitary rules "Safety of working with microorganonisms of the I - II groups of pathogenicity".

Results and analysis of the data. During the stay at the Zamantal site of "Baiserke-Agro" LLP, it was revealed that the cattle of the Aberdeen-Angus and Hereford breeds are kept on the pasture areas of the foothills of the Dzungarian Alatau in 5 herms, of which 4 are concentrated in Aberdeen-Angus and 1 are in animals Hereford breeds:

The animals are on pasture keeping with relatively good grass stand and provided with a flowing watering. In general, the animals are quite well-fed, with the exception of the individual, having a disease of the eyes and lung lesions (pneumonia).

Epizootic situation is characterized by the following indicators:

In herd No. 1 we contained 179 heifers and adult heifers. Among them, 4 animals with eye lesions were detected, of which 4 (2.3%) were detected and 3 animals with signs of pneumonia (1.6).

In the herd № 2 112 heifers and adult heifers were found 3 animals with eye disease, of which 1 bull (only 3.5%), 2 (1.7%) heifers with clinical signs of pneumonia.

Herd No. 3 there were 204 adults heifers and heifers, 2 (8,6%) with eye lesions 1 (0,49) with diseases Lekha.

The herd №4 contained 202 heifers and adult heifers, including 1 (0.4%) animal with clinical signs of pneumonia.

In the herd №5 contained cattle breed Hereford in the amount of 186 heifers and adult heifers, of which 10 (5.3%) animals with eye damage.

In addition, a separate group collected 62 heads of young 2-3 months of age, of which 15 (24.2%) have eye damage.

In total, we found 7 animals with clinical signs of pneumonia and 19 with eye damage among the adult population, which is 0.79% and 2.15%, respectively.

The clinical examination revealed the following signs of eye lesions: animal disease was manifested first in the form of swelling of the conjunctiva and lacrimation, then there was a accumulation of mucous and purulent exudate.

Later, more or less pronounced corneal opacities appeared and on the 6th-10th day, erosion with a diameter of about 1 mm developed in its center, which soon turned into an ulcer. Corneal opacities spread rapidly in all directions from the ulcer.

Over the next 10-15 days on the edge of the lesion appeared the development of the vascular network, and in some, especially severe cases, it surrounded the entire cornea on the periphery, forming a red rim.

These changes led to thickening of the cornea and loss of its transparency. There were cases when the vessels sprouted to the center of the cornea and formed an elevation in the form of a nipple. In the future, the blood flow ceased, and the bright color of a plexus of vessels took a pale shade.

Within 25-50 days, the vascular seal decreased in size, and the eyeball deformed.

In some animals, all layers of the cornea as a result of its ulceration were perforated and the vitreous body flowed. As a result, there was one - or two-sided blindness. Damage is usually observed in one eye and if both on different stages of course.

Figure 1 – Right eye damage

Figure 2 – Ulceration of the eye

Sick animals show anxiety and stay in the shade, reduced appetite and productivity, and animals who have lost sight completely, can take food only after direct feeding them in any capacity.

These features of development of diseases of animals marked during the examination of a number of cattle contained in bayserke –agro on distant plot Amantel.

In on distant area Amental in 2017, a survey of 883 animals, 47 of them (5,3%) with clinical signs of eye disease. Biomaterial is taken from these animals. As a result of biomaterial studies, bacteria of the genus Moraxella were isolated.

In 2018 re-conducted epidemiological survey of the site "Amental" and to date, the cases morcellator do not exist.

The site contained cattle in the amount of 274 animals. The clinical examination revealed 16 sick animals with eye damage. Biomaterial for laboratory studies was taken from animals with clinical signs.

All animals subjected to the therapeutic effects of antibiotics and immunotherapies protivotuberkuleznoe vaccine. The causative agent could not be identified.

Conclusion. Many economic entities of the Republic of Kazakhstan imports of cattle from foreign countries c is not enough clear epizootologicheskie characteristics.

When placing imported from outside the livestock of animals in the territory of our country, the subsequent examination revealed cases of clinical manifestations of eye disease.

When determining the causes of eye disease in animals found the presence of their pathogen - bacteria of the genus Moraxella.

Previously, this disease was not found in the territory of the Republic of Kazakhstan and, in this regard, it was required to study the epizootic situation in the territory of our country and study the biological properties of the pathogen secreted from animals.

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ӘР ТҮРЛІ ТҰҚЫМДЫ ЕТ ӨНДІРУ БАҒЫТЫНДАҒЫ ІҚМ МОРАКСЕЛЛЕЗІ

Аннотация. Алынған зерттеу нәтижелері негізінде індеттік ахуалға талдау жүргізілді. Қазақстан Республикасының көптеген шаруашылық жүргізуші субъектілері алыс шетелдерден ірі қара малдың импортын жүзеге асыратыны анықталды. Олардың кейбірінің, атап айтқанда, көздің жұқпалы ауруларының себептерін анықтау кезінде жануарларда ауру қоздырғышының - моракселл тектес бактериялардың болуы анықталды. Індеттік ахуалды зерттеу ҚР Алматы облысындағы "Байсерке Агро" ЖШС-нің шаруашылығында жүзеге асырылды.

Нәтижесінде бір шаруашылықтың әртүрлі табындарынан 883 мал тексеріліп, оның ішінде клиникалық белгілері бар 47 мал анықталды, бұл 5,3% құрады. Жұқпалы этиология көз аурулары белгілері бар малдардан биоматериал алынған. Нәтижесінде М. А. Сидоровтың (1995) анықтамасына сәйкес өсінді ретінде мораксел бовис бөлініп алынды. Осы шаруашылықта қайта зерттеген кезде мораксел өсіндісін бөліп көрсетуге мүмкіндік болмады.

Түйін сөздер: моракселлез, мал импорты, тұқым, аурудың таралуы, шығын, індеттік ахуал.

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МОРАКСЕЛЛЁЗ У КРС РАЗНЫХ ПОРОД МЯСНОГО НАПРАВЛЕНИЯ ПРОДУКТИВНОСТИ

Аннотация. На основании полученных результатов исследований проведен анализ эпизоотической ситуации. Было выяснено, что многие хозяйствующие субъекты Республики Казахстан осуществляют импорт крупного рогатого скота из стран Дальнего зарубежья среди которых встречаются ранее не регистрировавшиеся в нашей стране заболевания. При выяснении причин некоторых из них, в частности, инфекционных болезней глаз, выявлено наличие у животных возбудителя заболевания - бактерии рода Моракселла. Изучение эпизоотической ситуации осуществлялось в хозяйстве ТОО «Байсерке Агро» Алматинской областей РК.

В результате было осмотрено 883 животных из разных гуртов одного хозяйства, из них с клиническими признаками выявлено 47, что составило 5,3%. От животных с признаками заболеваний глаз инфекционной этиологии взят биоматериал. В итоге было изолированы культуры, которые в последующем идентифицированы как культура моракселлабовис, согласно определителю М. А. Сидорова (1995) [1]. При повторном обследовании в этом же хозяйстве культур моракселл выделить не удалось.

Ключевые слова: моракселлез, импорт скота, породы, распространение, ущерб, эпизоотическая ситуация.

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NECROBACTERIOSIS AND MEASURES TO FIGHT AGAINST IT IN LLP «BAYSERKE-AGRO»

Abstract. The article presents the main non-specific and specific measures in the fight against necrobacteriosis in the conditions of "Bayserke-Agro" LLP. The main etiological and contributing factors necessary for the occurrence of a necrobacteriosis infection are indicated. The clinical picture of the initial stage of the disease of cattle necrobacteriosis is shown. The therapeutic measures for sick animals with this disease are shown. For the specific prophylaxis of necrobacteriosis, the farm has been offered an experimental vaccine against this disease. The results of the experiment on testing the vaccine in the experiment on cattle are given.This indicated that the vaccine was harmless, not reactogenic, and preventive efficacy was 95%. The calculations of economic efficiency with the use of an experimental vaccine are given. It was shown that the payback of veterinary measures when using this vaccine is 36 tenge per 1 tenge of costs.

Keywords: animals, necrobacteriosis, animals, control measures, vaccine.

Necrobacteriosis should be primarily attributed to the number of diseases that have been of increasing importance in recent years and are of practical importance for the livestock industry. Thus, among the group of diseases of infectious diseases, by incidence and mortality, it takes 2-3 place, which gives every reason to consider this disease as one of the factors restraining the increase in profitability of the agricultural sector.

Necrobacteriosis causes significant economic damage to farms, affecting 30-75% of the available livestock, among which waste and forced slaughter amount to 10-14%.

The source of the causative agent of infection are sick animals that excrete the pathogen to the external environment with feces, urine, saliva, excreta, purulent contents of necrosis foci, secretions from the uterus, etc., infecting pastures, watering places, livestock buildings, bedding, dung, care products and others objects. It is also worth noting that necrobacteriosis is a soil infection, i.e. the causative agent of the disease is constantly present in the soil, especially on wet, marshy pastures.

In addition, it was found that the gastrointestinal tract of farm animals is the main reservoir of the infectious agent, which contributes to its constant circulation in walking areas and pastures. Therefore, the source of the pathogen can be not only sick, but also healthy animals - microcarriers.

In the external environment (in stagnant puddles, swamps, wet pastures where the infectious agent with animal excreta, especially manure, falls) it remains viable for 90 days.

Infection of animals occurs both through direct contact of sick animals with healthy ones, and through infected environmental objects when the pathogen enters the injured skin of the extremities, the hoofed horn, the mucous membranes of the gastrointestinal tract and the birth canal. The disease can occur as a secondary infection.

The appearance of necrobacteriosis is facilitated by a number of reasons: injuries of the limbs or mucous membranes of the oral cavity, low sanitary and hygienic condition of the premises (humidity, dampness, manure, etc.), inadequate feeding, lack of vitamins and minerals in the diet.

Most species of domestic and wild animals, as well as humans, are susceptible to necrobacteriosis.

Most often cattle and reindeer are sick, less often pigs, small cattle and horses.

The purpose of the study is to develop and propose effective measures to combat necrobacteriosis in the conditions of the cattle-breeding complex of "Bayserke-Agro" LLP.

Materials and methods. The work was carried out under production conditions, namely in the cattle-breeding complex of "Bayserke-Agro" LLP in Almaty region with a stall technology for keeping animals.

Laboratory studies were carried out in the laboratory of bacteriology LLP of the Kazakh Scientific Research Veterinary Institute. In order to determine the species composition of microflora, the biomaterial was sown on ordinary (BCH, MPA, MPB).

Results and discussion. During a mass survey of cattle at the cattle-breeding complex of "Bayserke-Agro" LLP, isolated cases of the occurrence of this pathology were noted.

In the process of inspection of the total livestock in several animals, we identified the onset of necrobacteriosis infection.

The disease was manifested by slight depression and loss of appetite, a rise in temperature of 0.5-0.7 °C, mass claudication caused by inflammatory changes in the distal extremity. In the next 3-4 days in sick animals on the extremities - in the place of penetration of the pathogen, reddening, swelling, and an increase in the local temperature reaction were noted.

After the discovery of animals with this pathology, all measures were taken for the emergency treatment of sick animals.

Veterinary specialists of this complex were recommended to subject to clinical examination of all animals every 10 days, for the timely detection and isolation of newly infected.

Sick and sick animals were isolated and treated.

The first and one of the important manipulations is the local treatment of a sore limb - this is a mechanical clearing, trimming and "toilet" wounds, which are carried out in a special orthopedic machine with rigid fixation of the affected limb.

Veterinary specialists used foot baths with disinfectant solutions for sick and contact animals: 10% formalin solution, alternated with 10% copper sulfate solution.

For the treatment of sick animals used parenteral and local (external) antibiotic therapy. Parenteral injections of penicillin and tetracycline antibiotics, erythromycin, ampicillin, talan preparations (tylosin), enroflons and other modern antibacterial drugs of a wide spectrum of action, to which the pathogen is sensitive.

For external treatments, aerosol forms of antibacterial preparations based on levomycetin, tetracycline, tylosin, etc. are used.

It should be noted that therapeutic measures allow to obtain positive results with the initial and moderate degree of the course of necrobacteriosis infection. The chronic form of the disease, accompanied by the irreversible deformation of the diseased limb, as a rule, cannot be treated and the animal is rejected.

The most acute and urgent problem of modern veterinary medicine today is the prevention of necrobacteriosis. The most important link, which is the prevention of the introduction of the pathogen into the economy with patients with animals and microcarriers.

In order to prevent necrobacteriosis, measures are being taken to increase the overall resistance of the organism of animals (optimize housing and feeding conditions).

Natural immunity in the treatment of necrobacteriosis in animals is practically not produced.

As an experiment for the specific prevention of necrobacteriosis of animals, a domestic inactivated vaccine against necrobacteriosis of animals was developed.

The vaccine is inactivated, concentrated and adsorbed antigens of both museum strains of microorganisms and epizootic cultures, i.e. derived from local cultures of the pathogen. It should be noted that in the manufacture of the vaccine was used epizootic culture Fus. necrophorum, isolated on the territory of this animal breeding complex. The additional content of epizootic antigens has significantly increased the prophylactic efficacy of the vaccine, increasing its immunogenicity.

This vaccine was successfully tested on the cattle-breeding complex of "Bayserke-Agro" LLP, in experiments on cattle.

The vaccine was administered to clinically healthy animals subcutaneously inthe middle third of the neck in a dose of 5.0 cm^3, twice with an interval of 30 days.

Observation of vaccinated animals showed that the preventive efficacy of an experimental vaccine was 95%, while it was harmless and non-reactogenic for immunized cows.

The use of this vaccine twice a year (spring and autumn) in the livestock complex will completely eliminate the necrobacterium infection and stop the spread of the pathogen, preventing the disease of healthy animals.

I would like to note that detailed calculations of the economic efficiency of using the experimental vaccine on other similar complexes showed that the prevented damage in various farms reached from 853 to 928 000 tenge per year, and the payback period for veterinary measures was 36 tenge per 1 tenge of costs.

Long-term monitoring, analysis of our own research showed that vaccination today is the most highly effective way to prevent necrobacteriosis, and at the same time highly profitable, i.e. quickly - paid back, which allows to significantly reduce the financial costs of disadvantaged farms.

Thus, timely diagnostics, competent conduct of therapeutic and preventive measures (compliance with sanitary and hygienic requirements, balanced diet, the use of specific vaccines) can significantly reduce the incidence of animal necrobacteriosis, and therefore reduce the labor and material costs of livestock farms.

Transparency of research: Studies were carried out within the framework of the program “Development of an integrated system for increasing productivity and improving the breeding qualities of farm animals, using the example of “Bayserke-Agro” LLP, on the task:“Ensuring epizootic well-being in the context of individual epizootological (epidemiological) units”.

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"БАЙСЕРКЕ-АГРО» ЖШС НЕКРОБАКТЕРИОЗ ЖӘНЕ ОНЫМЕН КҮРЕСУ ШАРАЛАРЫ

Аннотация. Мақалада "Байсерке-Агро" ЖШС жағдайында некробактериозбен күресу кезіндегі негізгі арнайы емес және арнайы іс-шаралар берілген. Некробактериозінде тінің пайда болуына қажетті негізгі этиологиялық және ықпал ететін факторлар көрсетілген. Ірі қарамалдың некробактериозбен ауруының бастапқы сатысының клиникалық көрінісі сипатталған. Осы ауру кезінде ауру жануарларға арналған терапиялық іс-шаралар көрсетілген. Некробактериоздың арнайы алдын алу үшін шаруашылыққа осы ауруға қарсы тәжірибелік (эксперименталды) вакцина ұсынылды. Ірі қара малдарға тәжірибелік вакцинаны апробациялау бойынша жүргізілген тәжірибе нәтижелері келтірілген. Бұл ретте вакцина зиянсыз, реактогенді емес, оның аурудың алдын алу тиімділігі 95%-ды құрады. Тәжірибелік вакцинаны қолдану кезіндегі экономикалық тиімділік есебі келтірілген. Сонымен қатар, осы вакцинаны пайдалану кезіндегі ветеринариялық іс-шаралардың өтелімділігі 1 теңгеге (шығынға) 36 теңгені (кірісті) құрайды.

Түйін сөздер: жануарлар, некробактериоз, күресу шаралары, вакцина.

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НЕКРОБАКТЕРИОЗ И МЕРЫ БОРЬБЫ С НИМ В ТОО «БАЙСЕРКЕ-АГРО»

Аннотация. В статье приведены основные неспецифические и специфические мероприятия при борьбе с некробактериозом в условиях ТОО «Байсерке-Агро». Указаны основные этиологические и способствующие факторы необходимые для возникновения некробактериозной инфекции. Показана клиническая картина начальной стадии заболевания крупного рогатого скота некробактериозом. Показаны терапевтические мероприятия, проводимые для больных животных при данной болезни. Для специфической профилактики некробактериоза хозяйству предложена экспериментальная вакцина против данной болезни. Приведены результаты опыта по апробации вакцины в опыте на крупном рогатом скоте. При этом указано, что вакцина была безвредной, не реактогенной, а профилактическая эффективность составила 95%. Приведены расчеты экономической эффективности при применения опытной вакцины. При этом показано, что окупаемость ветеринарных мероприятий при использовании данной вакцины составляет 36тенге на 1 тенге затрат.

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BACTERICIDAL AND SPOROCHID PROPERTIES OF THE DISINFECTANT "BA-12" IN THE CONDITIONS OF ANIMAL BREEDING COMPLEX LLP «BAYSERKE-AGRO»

Abstract. The article presents experimental data on the use of the BA-12 disinfectant in the conditions of the cattle-breeding complex Bayserke-Agro. Experience in conducting production tests of a new domestic BA-12 disinfectant is shown. The qualitative composition of the combined disinfectant is given. It is indicated that it consists of basic and buffer solutions, which are mixed immediately before use. To control the quality of disinfection in the experiment, test objects made of wood, concrete, metal, tile, rubber, brick and previously sterilized cattle manure were used. As test strains in the experiment used an aerobic culture of Staphylococcus aureus 209 P and an anaerobic vaccine strain Bac. Anthracis № 55. As a result of the experiment, it was found that the BA-12 disinfectant at 10.0% concentration with a consumption rate of 0,5 l/m^2 and an exposure of 60 minutes has a pronounced bactericidal and sporicidal activity against the Staphylococcus aureus 209 P strains and Bac. Anthracis № 55.

Key words: disinfection, animals, livestock complex.

The urgency of the problem of creating industrial disinfection means is caused by the need to prevent infectious diseases on livestock farms and the associated mortality, reduced gains, reproductive functions of animals and milk yields; preventing the loss of raw materials, feed and finished products during production, transportation and storage from the action of mold fungi and putrefactive bacteria; reduction in product quality due to the action of mycotoxins, the products of the vital activity of fungi; ensuring sanitary standards at enterprises in the presence of extraneous microflora [1].

Currently, a small range of disinfectants has been proposed for prophylactic and forced disinfection, the disadvantage of which is high toxicity, carcinogenicity, relatively low efficiency, insufficient processability, anaggressive effect on metal structures [2, 3].

In addition, an urgent problem is the growth of microflorares is tance to monocomponent drugsand the possibility of sanitation of premises in the presence of animals. For their integrated solution, it is advisabletousenewd is infectants base doncompositions of promising active substances that can increase the efficiency of treatments, reduce the like lihood of the formation of microbial resistance, and disinfectin the presence of animals [4].

The purpose of the study is to determine the bactericidal and sporicidal properties of the BA-12 veterinary disinfectant under the conditions of the animal breeding complex.

Materials and methods. The work was carried out under production conditions, namely in the cattle-breeding complex of "Bayserke-Agro" LLP in Almaty region with a stall technology for keeping animals.

Laboratory studies were carried out in the laboratory of bacteriology LLP of the Kazakh Scientific Research Veterinary Institute. In order to determine the species composition of microflora, the biomaterial was sown on ordinary and differential diagnostic media (Endo agaro). Differentiation of the isolated cultures was carried out on the basis of a study of morphological, tinctorial, cultural, and enzymatic properties.

Results and discussion. As a disinfectant, a new disinfectant veterinary agent "BA-12" was tested, intended for preventive and forced disinfection of veterinary and sanitary inspection objects.

Veterinary disinfectant BA-12 consists of two solutions: basic and buffer. Before using, 1 part of the buffer solution is combined with 8 parts of water and 1 part of the basic solution is added.

The combined agent is a clear, colorless liquid, with a characteristic odor, containing as an active ingredient glutaricaldehyde, didecyldimethylammonium bromide, didecyldimethylammonium chloride and auxiliary components isopropyl alcohol and carbamide.

Before carrying out production experiments, this tool was tested in the laboratory for the main quality indicators, namely: sterility, harmlessness, pH, qualitative and quantitative content of the main and auxiliary components. After receiving positive results for all the above criteria, this tool was tested in the conditions of the animal breeding complex.

Disinfection was carried out in the room (base) for the maintenance of cattle area of 125 m^2 in the absence of animals. Previously, mechanical cleaning of the livestock building and the surrounding area was carried out.

Disinfecting solution "BA-12" was prepared in the tank by adding 5.0 l of the stock solution of the test preparation to 45.0 l of warm water.

To apply the obtained 10.0% disinfectant solution, a hydraulic control was used at a consumption rate of 0.5 l/m^2. After the processing was completed, the windows and doors of the room were closed and left for 3 hours.

To control the quality of disinfection, before the treatment began, two sets of test objects made of wood, concrete, metal, tile, rubber, bricks and previously sterilized cattle manure were laid out in different parts of the room. One copy of the kit contaminated 1 billion suspension of the vaccine strain Bac. anthracis No. 55, and the second suspension of the test strain of Staphylococcus aureus 209 R. Both sets of test objects were treated with a disinfectant solution. The control of the experience were similar test objects not treated with a disinfectant solution.

After the expiration date (60 minutes), samples from the test objects were collected in centrifugal tubes, washed three times with sterile saline and delivered to the testing laboratory of Kazakh Scientific Research Veterinary Institute LLP.

Collected samples of swabs from the test objects were investigated according to the standard technique.

Growth accounting and evaluation of the results of cultivation of Staphylococcus aureus 209 P and Bac. anthracis No. 55 was carried out every day after sowing for 10 days. After the expiration of the observation of the medium in all tubes remained sterile. In the control tubes, an intensive growth of the same cultures was noted.

As a result of the experiment, it was established that the BA-12 disinfectant at 10.0% concentration with a consumption rate of 0.5 l/m^2 and an exposure of 60 minutes has a pronounced bactericidal and sporicidal activity against the strains of Staphylococcus aureus 209 P and Bac. anthracis number 55.

Thus, studies have shown that the disinfecting veterinary agent BA-12 exhibits high bactericidal and sporicidal activity against gram-positive, gram-negative and spore-forming microorganisms, providing the possibility of a wide range of use.

On the basis of the tests carried out, it is possible to recommend the use of the BA-12 disinfectant for disinfection when the livestock breeding premises are contaminated with pathogens of diseases belonging to the II-IV resistance groups.

Transparency of research. Studies were carried out within the framework of the program "Development of an integrated system for increasing productivity and improving the breeding qualities of farm animals, using the example of Bayserke-Agro LLP, on the task:" Ensuring epizootic well-being in the context of individual epizootological (epidemiological) units "

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«БА-12» ДЕЗИНФЕКТАНТЫНЫҢ «БАЙСЕРКЕ-АГРО» ЖШС МАЛ ШАРУАШЫЛЫҒЫ КЕШЕНІ ЖАҒДАЙЫНДАҒЫ БАКТЕРИЦИДТІ ЖӘНЕ СПОРОЦИДТІ ҚАСИЕТТЕРІ

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БАКТЕРИЦИДНЫЕ И СПОРОЦИДНЫЕ СВОЙСТВА ДЕЗИНФЕКТАНТА «БА-12» В УСЛОВИЯХ ЖИВОТНОВОДЧЕСКОГО КОМПЛЕКСА ТОО «БАЙСЕРКЕ-АГРО»

Аннотация. В статье приведены экспериментальные данные использования дезинфектанта «БА-12» в условиях животноводческого комплекса ТОО «Байсерке-Агро». Показан опыт по проведению производственных испытаний нового отечественного дезинфицирующего средства «БА-12». Приведен качественный состав комбинированного дезосредства. При этом указано, что оно состоит из основного и буферного растворов, которые смешиваются непосредственно перед использованием. Для контроля качества дезинфекции в опыте были использованы тест-объектыиз дерева, бетона, металла, кафельной плитки, резины, кирпича и предварительно стерилизованного навоза крупного рогатого скота. В качестве тест-штаммов в опыте использовали аэробную культуру Staphylococcusaureus 209 Р и анаэробный вакцинный штамм *Bac. anthracis № 55.* В результате опыта установлено, что дезинфицирующее средство «БА-12» в 10,0 % концентрации при норме расхода 0,5 л/м^2 и экспозиции 60 минут обладает выраженной бактерицидной и спороцидной активностью по отношению к штаммам Staphylococcusaureus 209 Р и *Bac. anthracis № 55.*

Ключевые слова: дезинфекция, животные, животноводческий комплекс.

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ASSOCIATIVE IMPACT OF TNFα GENE ALLERIES ON THE REPRODUCTIVE FUNCTION OF COWS OF "BAYSERKE-AGRO" LLP

Abstract. The authors of the article carried out work on the genotyping of Holstein breeding cows in Bayserke-Agro LLP on the TNFα gene locus and identified animals with the desired genotype (GG genotype) on the locus under study. SNP polymorphism in the promoter part of the TNFα gene at position 824 A → G in Holstein cows is represented by the following genetic variants: AA - 22.4%, AG - 63.8%, GG - 13.8%, the frequency of A and G alleles was 0 54 and 0.46. In the studied population, there was an excessive occurrence of the heterozygous genotype AG +21.49, according to other genotypes, there was a deficiency of homozygous variants GG and AA, respectively - 11.16 and -10.32 individuals. Reproductive rates were high in cows with the GG genotype: the interval between calving and fruitful insemination was 89 days, the insemination index was 1.63, the proportion of animals inseminated after more than 30 days was minimal (52%) in individuals of the homozygous GG genotype. It has been established that the use of the PCR-RFLP method of analysis allows genetic certification of breeding animals and predict their reproductive function.

Key words: promoter part of TNFα gene, PCR-RFLP, reproductive function of cows, DNA markers.

Studies by Japanese scientists have established the effect of polymorphism in the promoter part of the TNFα gene and SNP replacement of one nucleotide in the exon part of the named gene on the immune status and reproductive function in cows. The authors of the study population of dairy cows for the TNFα locus identified the following genetic variants: A / A, A / G, G / G and T / T, T / C, C / C in the promoter and exon parts of the gene, respectively [1].

The interval between calving and the first ovulation was short in cows with a heterozygous genotype A / G and a homozygous genotype G / G compared with animals with a homozygous genotype A / A. Polymorphism of the promoter portion of the tumor necrosis factor (TNFα) gene in cows does not affect the rate of apoptosis of polymorphonuclear leukocytes. However, the rate of transmigration was significantly higher in animals with genotypes A / A and A / G compared to animals with homozygous genotype G / G. A correlation was found between the expression level of the mRNA of the promoter part of the TNFα gene and the formation of interleukin 8 (IL-8), which performs a protective function in the body. Thus, mRNA expression of polymorphonuclear leukocytes and peripheral blood mononuclear cells was higher in cows with genotype A / A compared to genotype G / G. The results indicate that TNFα gene allele polymorphism has a significant effect on immune function and reproductive performance in cows. Thus, according to the results of Japanese scientists, the proportion of cows that showed ovulation within three weeks after calving in individuals with homozygous GG and heterozygous AG genotypes in the SNP polymorphism locus of the TNFα promoter part was the same, 59.5% and 57.1%, respectively, alleles of this gene did not affect the number of insemination [1].

Associative data and some studies suggest that inhibiting the expression of the TNFα gene contributes to liver obesity with an energy deficit in dairy cattle. Experimentally, in vitro cultivation, the ability of TRLP to inhibit TNFα signaling on primary cattle hepatocytes with recombinant TNFα has been

proven. Four Holstein breed lactating cows injected TRLP subcutaneously for 24 hours with an interval of 4 hours at a rate of 0.15 and 3.0 mg per kg body weight and intravenous recombinant TNFα at a dose of 5 μg per kg body weight of the cow. According to the results of the study, injection of recombinant TNFα and TRLP for 2 hours provides a reduction in the amount of non-esterified fatty acid in plasma (non-esterified fatty acid, NEFA), which indicates a change in the metabolic process in the body of cows. Despite the fact that TRLP inhibited signals of bovine TNFα using recombinant TNFα for 7 days did not change the metabolism in cows with a negative energy balance [2].

Thus, the development and introduction into the DNA selection practice of markers of the reproductive function of animals, milk and meat productivity, the creation of a population of animals that are resistant to diseases, the prediction of useful traits is an urgent problem of molecular and population genetics.

The goal of the study was genotyping of Holstein cows of Bayserke-Agro LLP at the TNFα gene locus by PCR-RFLP analysis, studying the effect of the alleles of the gene under study on the manifestation of reproductive function.

Material and method. The experiments were carried out on 152 Holstein cows of the Canadian breeding farm breeding; blood for the study was taken from the jugular or caudal vein into the vacuum tube with EDTA. DNA isolation was carried out by the phenol method. Amplification of the TNFα gene region was performed on an Efendorf amplifier (Germany) using primers: F 5′-GAGAAATGGGACAACCTCCA-3 ′ and R: 5′-CCAGGAACTCGCTGAAACTC - 3 ′ [3].

The length of the obtained amplification of the tumor necrosis factor (TNFα) gene was 249 bp. (figure1), for the detection of SNP polymorphism at position 824 A → G, Sac I restriction enzyme, which has the restriction site GAGCT / C, was used after restriction of the PCR product, depending on the genotype of animals, electrophorems appeared fragments: in individuals with a heterozygous genotype AG - 249 , 168 and 81 bp, for homozygous AA and GG, respectively, 168, 81 bp. and 249 bp (figure2). To visualize the results of electrophoresis, Infinity VX2 3026 gel-documenting system was used, WL / LC / 26M X-Press, Vilber Lourmat (USA), as a DNA marker plasmid pUC19 / MspI (Thermo Fisher Scientific).

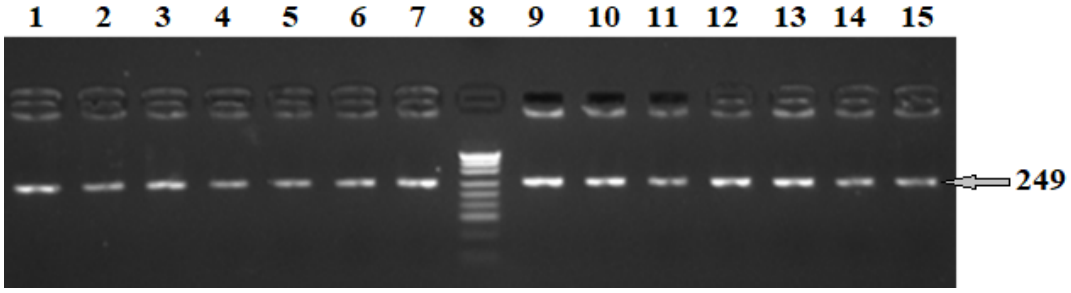

Figure 1 – Electrophoregram amplification of the TNFα gene, agarose 3%, lanes 1-7, 9-15 PCR product, lane 8 — DNA marker pUC19 / MspI

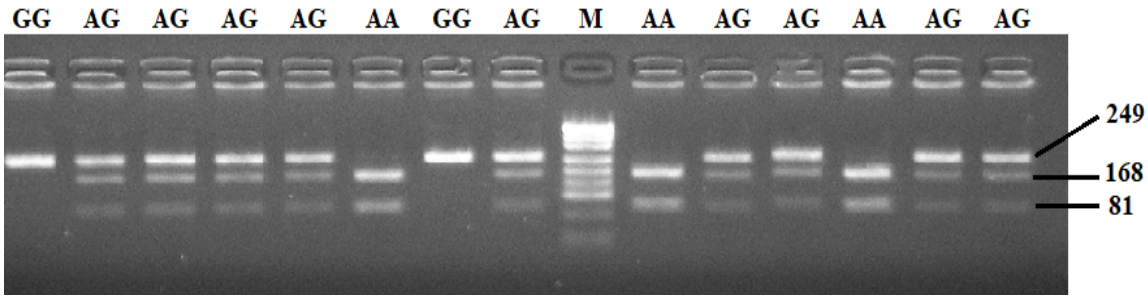

Figure 2 – Electrophoregram of the restriction enzyme Sac I PCR gene product TNFα, agarose 3%, M - DNA marker pUC19 / MspI, genetic variants GG, AG, AA

Results. The results of identification of SNP polymorphism in the promoter part of the TNFα gene at position 824 A → G in Holstein cows in the amount of 152 heads of the breeding farm "Bayerke-Agro" LLP indicate a shift in the frequency of allele A compared to G, 0.54 and 0.46, respectively. In the studied group of animals, the heterozygous AG genotype prevails and its prevalence is 63.8%, the occurrence of homozygous genotypes was: GG -13.8% and AA - 22.4%.

In cows with a homozygous genotype GG (n = 19), the interval between calving and fruitful insemination was 89 days, in individuals with a heterozygous AG genotype (n = 50), this indicator had a value of 128 days, the intermediate position (95 days) was occupied by animals with genotype AA (n = 27). There is a correlation between the interval from calving to fruitful insemination and the insemination index in animals of all three groups, the low insemination index (1.63) was in cows with the homozygous GG genotype (the interval duration was 89 days), the high insemination index (2.76) was heterozygous animals (the duration of the interval is 128 days). In homozygous individuals with genotype AA, the insemination index had a value of 1.85, the duration of the interval between calving and fruitful insemination was 95 days.

Indicators of reproductive function of cows with different genotypes at the TNFα gene locus in cows (n = 96)

Animals with genotype TNFα (n=96)	Interval between calving and fruitful insemination (days)	Cow insemination index	The number of fruitfully inseminated cows in the period more than 30 days after calving
GG (n=19)	89	1,63	9/47,36%
AG (n=50)	128	2,76	43/86,0%
AA (n=27)	95	1,85	17/62,96%

Discussion. Analysis of the literature shows that most authors study polymorphism in the promoter part of a gene, since the level of gene expression depends on the functional activity of the promoter part of the corresponding gene [4].

We found that in all three genetic variants in cows there is a discrepancy between the actual distribution of genotypes and the theoretically expected number of genotypes, an excessive occurrence of the heterozygous genotype AG +21.49 was found, on the contrary, other genotypes showed a deficit of homozygous variants GG and AA, respectively -11 16 and -10.32 individuals. Similar results were obtained by foreign authors, so the distribution of genetic variants of the promoter part of the TNFα gene in Japanese dairy cows was AA - 36 (16%), AG - 108 (48%), GG 80 (36%) heads [1]. An SNP study of the polymorphism of the promoter part of the TNFα gene at position 824 A → G in cows (n = 127) of Holstein breed shows a more even distribution of genetic variants: AA - 26.0%, AG -37.8% and GG - 36.2% [five]. As can be seen from table 1, there is an association of the homozygous GG genotype with reproductive function indicators in the studied group of animals (the minimum interval between calving and fruitful insemination, a low insemination index, the minimum number of cows (47.36%) fruitfully inseminated during more than 31 days after calving).

Conclusion. Thus, the studied locus of the promoter part of the TNFα gene in Holstein cows is polymorphic, the prevalence of genetic variants is: AA - 22.4%, AG - 63.8% and GG -13.8%. The positive effect of the GG genotype of Holstein cows on reproductive function was established, and in heterozygous animals the reproductive abilities were low.

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TNFα ГЕН АЛЛЕЛЬДЕРІНІҢ «БАЙСЕРКЕ-АГРО» ЖШС СИЫРЛАРЫНЫҢ РЕПРОДУКТИВТІ ФУНКЦИЯСЫНА ТИГІЗЕТІН АССОЦИАТИВТІ ӘСЕРІ

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АССОЦИТАТИВНОЕ ВЛИЯНИЕ АЛЛЕЛЕЙ ГЕНА TNFα НА РЕПРОДУКТИВНУЮ ФУНКЦИЮ КОРОВ ТОО «БАЙСЕРКЕ-АГРО»

Аннотация. Авторами статьи проведена работа по генотипированию племенных коров голштинской породы в ТОО «Байсерке-Агро» по локусу гена TNFα и выявлены животные с желательным генотипом (генотип GG) по изучаемому локусу. SNPполиморфизм в промоторной части гена TNFαв позиции 824A→Gy коров голштинской породы представлены следующими генетическими вариантами: AA - 22,4%, AG - 63,8%, GG -13,8%, частота аллелей A и G составила 0,54 и 0,46. У исследуемой популяции выявлена избыточная встречаемость гетерозиготного генотипа AG+21,49, по другим генотипам отмечается дефицит гомозиготных вариантов GGи AA, соответственно на -11,16 и -10,32 особей. Показатели репродуктивной функции были высокими у коров с генотипом GG: интервал между отелом и плодотворным осеменением составил 89 дней, индекс осеменения1,63, доля животных, осемененных по истечению более 30 дней была минимальной (52%) у особей гомозиготного генотипа GG. Установлено, что использование метода ПЦР-ПДРФ анализа позволяет проводить генетическую паспортизацию племенных животных и прогнозировать их воспроизводительную функцию.

Ключевые слова: промоторная часть гена TNFα, ПЦР-ПДРФ, репродуктивная функция коров, ДНК маркеры.

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STUDY OF THE BIO CONTAINERS OF OPTIMAL COMPOSITION TO IMPROVE THE GROWTH AND DEVELOPMENT OF PLANTS

Abstract. The article deals with the ways and technologies of creating biocontainers of optimal composition for laying highly productive plants with high biological potential has acquired practical value. The use of biocontainers with a real volume of components leads to economic efficiency of saving fertilizers, does not threaten the safety and security of the environment and products. The approaches to the introduction of effective components of biocontainers in agriculture, which increase the yield of plants on the basis of agricultural waste and minerals, comprehensively solving the environmental problem, are defined. The method of effective agricultural technology, ensuring the safety of the environment and food, saving fertilizers, feed supply for each plant, stabilization of quality and quantity of products. The conducted research allowed to scientifically prove the effectiveness of the use of biocontainer phytotechnology in two directions: in a short time to grow high-quality plant seedlings and repeatedly receive plant products in the season.

Keywords: biocontainer, phytotechnology, soil, fertility, agriculture, optimal composition, vermicompost, glauconite.

Introduction. According to today's data, the amount of pollutants in soils in the industrialized regions is much higher than the background concentration. In our case it is very difficult to obtain a lot of saline soils. It requires constant fertilization with a variety of fertilizers, which is complicated and expensive. In this regard, it is crucial to provide ways to cope with the factors that hinder the growth of plants. Thousands of tons of agricultural waste will be produced annually in Kazakhstan. Collected wastes can pollute the soil, air and water sources, and create conditions for the spread of various diseases and endanger the environment. The toxic substances contained in the waste accumulate in the soil and eventually lead to its degradation and the formation of technogenic deserts. This situation is economically inefficient for the growing plant growth in damaged, non-fertile soil. In recent years, biotechnology methods and processes have been widely used to address these issues. This method will allow for the deep processing of agricultural, industrial and household wastes, as well as the production of high quality products.

The purpose of the research is to create a new and effective composition of biocontainers on the basis of agricultural wastes and natural minerals for the planting of high-productive seeds that provide environmental safety.

In recent years (2000-2009), major scientific researches in the field of agro-engineering have mainly focused on: the discovery of new types of organic and mineral fertilizers; environmental assessment and optimal clean products; to find a combination of chemical and biological melioration in the field of specialized crop rotation of cultural and agricultural plants; control over the improvement of product quality, mineral nutrition and soil fertility changes in climatic conditions. In this regard, it is crucial to provide ways to cope with the factors that hinder the growth of plants. In this regard, bioconstransformers, which are based on agricultural waste that improve our plant growth, will be the solution to the problem. According to the results, biocontainers have shown that it is possible to plant crops, gardening, medicinal or ornamental plants, vegetables, seedlings and tubers as well as planting of green sprouts of various crops.

Using biocontainers all over the world is an innovative way to ensure a high growth rate of any grain and melon crops and increase their productivity. Bio-container is a ball-shaped material with a cylinder or small well, depending on the selected technology. According to the Committee of the Federation Council on Industrial Policy of Russia (2009), only 1-2% of biocontainer research is implemented in Russia and 70% in the United States. Brazil has introduced biocontainers as a resource-saving technology for 60% of agricultural land, with an annual revenue of $ 10 billion, generating an area of 11% for the last decade. In Germany, more than 70% (large and small) farming uses these new technologies. The technology of cultivation of therapeutic and decorative plants in biocontainers is also popular in Holland and Denmark. In these countries, potato cultivation in pesticides was done in small quantities because potato seeds were grown in active containers. In China, near Shanghai, the purpose of using biocontainers is the balanced nutrition of plants. In agro technology, watermelon intensified by 14 to 27%, potatoes three times, rice harvesting by 9-13%, wheat by 18%.

Land processing through natural fertilizers is an environmentally profitable technology. It is widely used in many countries, particularly in Russia, China and the United States [1, 2].

However, the technology of producing this efficient biogasm requires a long time. In this regard, we have conducted scientific research to accelerate the technology of vermicultural technology.

We used calcium peroxide, which is widely used in various sectors of the national economy, to take care of the Californian worm life in the need of oxygen and calcium, and to help eliminate hazardous helminths and other harmful microorganisms in manure. One of the pleasant properties of calcium peroxide is the ability to prevent unpleasant smells that occur during the rotation process, meaning active participation in the oxidation of toxic substances. Also, when the calcium is gradually decoupling peroxide, one of the substance dissolved makes the medium hydrogen peroxide [3-5].

The following way is used for growing rainfall. Individual wooden boxes include a variety of animal fodder, plant residues, wooden fibrous and propagated wastes, 1% calcium peroxide, and red californian worms were sent to them.

Then the second layer of the manure is laid, worms are also sent to there and flooded. In the process of obtaining the biomass, the content of the feed should be about 70-80%, and the darkness (worms in the light-resistant) room so that the temperature is <18 ° C for the worm breeding and development [6].

The content of biogumous from different species is shown in table 1 below.

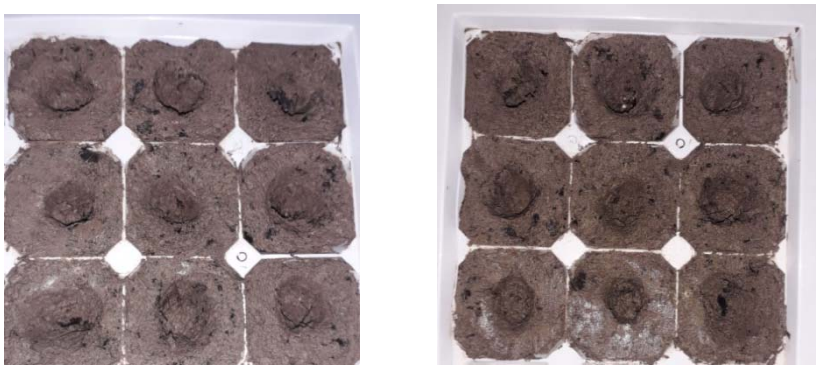
Table 1 – Basic composition of cocoa and bio humus (%)

Indicators Name	Mixture Manure	Biogumus
The average reaction	8,11± 0,33	6,74± 0,22
Organic substances	24,03± 0,45	47,23± 0,56
Hormonic acid	2,42± 0,15	3,74± 0,04
Folic acid	0,53± 0,01	2,83± 0,01
Organic carbon	2,12± 0,02	3,92± 0,02
Nitrogen	1,50± 0,03	3,51± 0,03
Phosphorus	0,42± 0,01	0,50± 0,01
C:N	1,13± 0,02	1,02± 0,01
In general, the K_2O	2,01± 0,01	2,40± 0,02
The bacterium of the intestinal bacterial group	0,05	Don’t exist
Pathogenic microorganism	Exist	Don’t exist
Helminths and their eggs	Exist	Don’t exist

Development of optimal composition of bioconaters based on biomass. Bio-container is a connecting element between the plant material (seeds, seedlings, sprouts, etc.) and soil, which allows for the development of the plant, the target nutrition of the plants and their good development.

Biocontainers are composed of highly active biological components such as humus, peat, and various soil mixtures from the soil that grows from the plants that act as natural fertilizers. Cylindrical or ball-shaped forms are formed after these ingredients and special bonding organic admixtures, which are suitable for plastic processing. In some cases mixing mineral fertilizers to biocontainers for the use of very poor composition, such as phosphate, potassium and others [7].

In our work, biocontainers are the optimal amount of organic, ecologically clean substances which are needed for plant growth, without chemical additives. They contain mainly biohumus, which is about 95% of the dry matter, which we received in bioguum in the previous section, meaning the remnants of agricultural wastes and cattle, with the help of California red worms. Bio-container is a natural mineral bentonite for resistance to environmental factors and resistance to toxic substances. In the case of introduction of bentonite clay into the composition of biocontainers, the volume of openings filled with capillary water increases and the air filling decreases. In particular, benthonite clay allows water to be stored in the soil system, meaning the moisture content of the soil required for the plant increases by 3-5% in relevance to the amount of bentonite clay (figure).



Optimal biocontainers

The share of nutrients contained in biocontainers is as follows: nitrogen (N) not less than -0.7%; phosphorus (P) -0.6%; Potassium (K) not less than -0.9%; PH-7.0. Microelement content: Zn, Gu, Mn, Mo, B, Fe, Se. There is a shell of one or more blends of biological substances that are available for planting bioconcredit material. The material of the material contains absorbent granules that absorb water in the soil.

According to the technology developed biocontainers have the following properties:

- Ensure the growth of plants and high crops in the fertile soils;
- Protects from unfavorable external climatic environment factors, especially frost and drought;
- in terms of economic efficiency, the amount of fertilizers and their purchase will be less, as the seeds or seedlings of the plant consume nutrients contained in the biocontractor;
- Reduces the number of the most damaging weeds in the field of agriculture, reduces the number of diseases and pests, and, consequently, the cost of combating them decreases;
- Reduces the appearance of fine sprouts and seedlings.

The use of biocontainers with a substantial amount of components - economically feasible in fertilizer saving, does not jeopardize the environment and product cleanness [8].

Technology of seed sowing in biocontainers. Biocontainer is a substance containing a compressive compressive substrate for the cultivation of various seeds in suitable environments. Bio-container provides nutrients in the early stages of seed or seedlings and protects the environment from stress factors. In this case, the weeds, the fertile soil, and the sick are not terrifying. Bio-container consists of bioguum, bentonite, cotton wastes and nutrients. In our research, the biocompatibility was different in shape and diameter, but in most cases 50 mm.

At the start of the season, biocontainers are planted on wet soils with seeds (or other planting material) of the plants. Additional irrigation works are carried out when the initial soil moisture is insufficient. When placed on wet soils, the biocontainer will be increased to at least 1.5-2.5 times with water supply at 60-80%. Due to the lack of adhesives or other binders in the bioconstrictor material, it quickly releases the moisture, molecular interaction interruption, and absorbs the matter quickly for several hours (with soils over moisture) or for some hours (due to soil moisture deficiency) that absorbs the substance and increases its volume, The result is a favorable microclimate around the seeds or seedlings, and the seeds are provided with full primary nutrition. In addition, biocontainer prevents the growth of weeds and its external nutritional bark protects plants from early illnesses such as disease, cold, stroke and infection [9].

Since biocontainer is a complex three-dimensional structure, ultimately, when the outer shell has been completely degraded in the soil, homogeneous biogumus and bentonite distribution in the soil leads to a good development of plant-based substances and moisture collection root systems. The soil was sown on the bottom of the bio-container so that the seeds were planted and additional soil was closed so that two to three millimeters thick from the surface to the surface. Bio-containers are planted at a depth of 4 for 5-7 cm for large seeds (maize, cucumber, pumpkin, etc.) and for small seeds (tomatoes, peppers, standing etc.). Then, with a 200- 300 ml water hole with a bio-container, it was covered with soil, waiting for one or three minutes. For growing seedlings, biocontainers can be placed in boxes or platos. In this case, no additional soil is used. Biocontainers are filled with water, and after a while, they tend to take up the whole volume. After irrigation in wet soils, the bioconvitation of the molecules interrupts and breaks down. Around the seed loose, airborne, nutrient-rich environment, which forms approximately twice as high as the original size.

Features of the studied biocontainers. Biocontainers can be used to plant almost all plantations. The only limiting factor in this direction is the need to overuse some crops. Research shows that, for example, the high cabbage irrigation rates are high, the active ingredients in the biocontractor can cause the root system to burn and cause the death of the root system. By maintaining all standards, growth and yield can be provided at a high level. In addition, the bioconnector reduces the consumption of organic and mineral fertilizers, reducing the cost of the harvest by 19-25%, due to the immune system in plants due to fertilizer components that are included in the soil composition. Biocontainer reduces the consumption of organic and mineral fertilizers by 19-25%. Bioconnectors with organic fertilizers application to local soil is an effective means of increasing its fertility, Organic components of biokondrier improve agrophysical, agrochemical and biological properties of soil, provide intensive growth of plants, improve their productivity and improve product quality. One of the interesting and important properties of biocontainers is the increase in volume by 2-2.5 times after their placement in wet soils , contact with the roots of plants, free space around plant seeds, the formation of breathing space, nutrient biocontainers can also be used to grow nutrient-intensive care products. The important components of bioseconds are the presence of biocontainers that go into plants and produce iron, potassium, calcium, iodine and other micro-macro elements complement the shortage.

Conclusion. Biocontainers are encouraged to have a positive impact on their release during sowing. Their seeds are packed with power from the point nutrition process and immediately form a strong root system. An ecological and agro-technical basis for the creation of optimal composition of biocontainers of different sizes has been developed and the possibility of cultivation of agricultural plants in field conditions in the fields has been proven. The use of biocontainers for optimal composition of biocontainers for planting large plants with high biological potential has proven to be of practical value. The use of biocontainers with a substantial amount of builders results in economical effectiveness in fertilizer saving and does not jeopardize the environment and product cleanness. Researchers have shown that biocontainers can be used to plant crops, gardening, medicinal or ornamental plants, vegetable seedlings, tubers as well as planting green sprouts of various crops.

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ӨСІМДІКТЕРДІҢ ӨСІП ӨНУІН ЖАҚСАРТАТЫН ОҢТАЙЛЫ ҚҰРАМДЫ БИОКОНТЕЙНЕРЛЕРДІ ЗЕРТТЕУ

Аннотация. Мақалада жоғары биологиялық потенциалы бар мол өнімді өсімдіктерді отырғызу үшін оңтайлы құрамды биоконтейнерлер жасау технологиясы практикалық құндылыққа ие болғаны дәлелденді. Құрауыштардың нақты көлемді мөлшері бар биоконтейнерлерді қолдану – тыңайтқыштарды үнемдеуде экономикалық жағынан тиімділікке әкеледі, қоршаған ортаның және өнімнің таза болуына қауіп төндірмейді. Экологиялық мәселені жан-жақты шешетін ауылшаруашылық қалдықтар мен минералдар негізінде өсімдіктердің өнімділігін арттыратын тиімді құрамды биоконтейнерлерді егіншілікке енгізу тәсілі айқындалды. Қоршаған ортаның және азық-түліктің қауіпсіздігін қамтамасыз ететін, тыңайтқыштарды үнемдейтін, әр бір өсімдікке қажетті қоректі жеткізетін, өнімнің сапасы мен мөлшерін жоғарылатып тұрақтандыратын тиімді агротехнология әдісі ұсынылды. Жүргізілген зерттеулер биоконтейнерлік фитотехнологияны пайда-

ланудың тиімділігін екі бағыт бойынша ғылыми негіздеуге мүмкіндік берді: қысқа мерзімде өсімдіктердің жоғары сапалы көшетін өсіру және өсімдіктер өнімдерін маусымға бірнеше рет алуға.

Түйін сөздер: биоконтейнер, фитотехнология, топырақ, құнарлылық, ауыл шаруашылығы, оңтайлы құрамы, биогумус, глауконит.

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ИССЛЕДОВАНИЕ БИОКОНТЕЙНЕРОВ ОПТИМАЛЬНОГО СОСТАВА УЛУЧШАЮЩИХ РОСТ И РАЗВИТИЕ РАСТЕНИЙ

Аннотация. В статье рассматриваются пути и технологии создания биоконтейнеров оптимального состава для закладки высокопродуктивных растений с высоким биологическим потенциалом приобрела практическую ценность. Применение биоконтейнеров с реальным объемом компонентов-приводит к экономической эффективности экономии удобрений, не угрожает сохранности и безопасности окружающей среды и продукции. Определены подходы к внедрению в земледелие эффективных составляющих биоконтейнеров, повышающих урожайность растений на основе сельскохозяйственных отходов и минералов, всесторонне решающих экологическую проблему. Предложен метод эффективной агротехнологии, обеспечивающий безопасность окружающей среды и продуктов питания, экономию удобрений, поставку кормов для каждого растения, стабилизацию качества и количества продукции. Проведенные исследования позволили научно обосновать эффективность использования биоконтейнерной фитотехнологии по двум направлениям: за короткое время выращивать высококачественные саженцы растений и многократно получать растительную продукцию в сезон.

Ключевые слова: биоконтейнер, фитотехнология, почва, плодородие, сельское хозяйство, оптимальный состав, биогумус, глауконит.

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PROVIDING VETERINARY WELFARE ON PARASITIC DISEASES OF FARM ANIMALS IN LLP "BAYSERKE-AGRO»

Abstract. The results of parasitological studies in LLP "Baiserke-agro"are presented. The horses were recorded strangelets in the form of monoinvasion and options parasitocenosis: strangulate+ anoplocephalidae; strangulate+precarity; strangulate+parserid+oxyuris; two abdominal gadflies: Rhinoestrus purpureus and Rhinoestrus latifrons; one type of gastric gadflies Gastrophilus intestinalis. 5 types of helminths have been registered in cattle: Dicrocoelium lanceatum, Fasciola hepatica, Moniezia autumnalia, Haemonchus contortus, Neoascaris vitulorum; one kind of protozoa- Eimeria bovis and subcutaneous gadfly. Sheep had 4 types of helminths: Dicrocoelium lanceatum, Moniezia expansa, Haemonchus contortus, Trichocephalus ovis, Neoascaris vitulorum. Echinococcus granulosus larva; one kind of intestinal protozoa - Eimeria faurei; cavity gadflies - Oestrus ovis and scabies mites Psoroptes ovis. Developed and proposed recommendations for each registered farm parasitic disease.

Keywords: epizootic situation, diagnostics, coprological methods, helminthiasis, protozoan, arachnos, antimony, ticks; bogowie disease, nags drug.

Relevance. Analysis of the literature, statistics and results of many years of own research allows us to draw conclusions about the deterioration of epizootic and epidemiological situation in many parasitic diseases, and lack of attention to the problems of Parasitology. The current catastrophic situation with the pollution of the environment by the invasive origin and the state of human and animal health in many regions of the CIS, including Kazakhstan, the reduction of life expectancy, inefficiency, and often insufficient hygienic justification of environmental and anti-parasitic measures urgently require a shift in emphasis on an adequate assessment of the potential and real danger of biological pollution by parasitic diseases.

Changes in the socio-economic living conditions of the population, the emergence of private property, the development of farming and individual production, increasing the migration of the population not only within the country but also from countries near and far abroad, the intensification of anthropogenic transformation of nature, leading to changes in the living conditions of parasitic diseases in the environment, indicate the need to review and adjust existing approaches to the diagnosis and prevention of parasitic diseases of animals and humans.

Today in Kazakhstan actively develops sports and breeding horse breeding, breeding cattle breeding and sheep breeding, cynology and other branches of animal husbandry, regularly held different levels of equestrian sports, exhibitions, auctions, made the import and export of breeding animals from both Near and Far abroad, active exchange and sale of animals between individual economic entities [1]. In carrying out such activities is relevant timely quality diagnosis of particularly dangerous, certified in the import and export of animal parasitic diseases, such as zoonotic helminthiasis, trypanosomiasis horses, piroplasmosis and anaplasmosis of cattle and others.

The southern region is dysfunctional in many parasitic diseases such as helminthiasis: strongylatosis digestive and respiratory tract of cattle, sheep, horses; protozoos: piroplasmosis of cattle, sheep, horses; noctalis horses; Trypanosomosis horses; anaplasmosis in cattle and sheep; arachnoentomoses: common scab, sarcoptic mange, ticks; bogowie disease: hypodermatosis, astros, gasterophilus.

In the CIS and in Kazakhstan marked increase in the incidence of people of parasitic diseases: giardiasis at 94.4 per cent, trichinosis in 6.1 times, toxocarosis 9 times, difillobotrioz 9.3 %, opisthorchiasis 11.3%. According to who, the most common are nematodes, which cause a wide range of diseases. In particular, ascariasis affected about 1 billion people, ankilostomidoze 900 million, trihozefaleza 600 million, enterobiasis – 350 million, strongyloidiasis, about 90 million, filariidae – more than 80 million [2, 3].

Epizootic and epidemic situation on echinococcosis in Kazakhstan is quite alarming, as evidenced by the results of research by a number of scientists. According to Y. M. Kereev (2010), 1931 sheep were infected with helminths out of 4724 examined sheep, which amounted to 40.9%, while 1562 heads were infected with echinococci, which amounted to 33.1 %. Among cattle infection with echinococcosis is also quite high and is 21.8 %. There is also infection with echinococcosis of pigs and horses, respectively 3.7% and 5.4 %. Infection of dogs-the main distributors of the disease, imaginal echinococcosis in the country is from 1.8 to 10.4% [3]. A number of researchers studied the epizootic situation of parasites in the southern regions [5-7].

Known postulate that the contamination of animals, we can assume and make predictions on the contamination of the population by parasites, so many of the parasitic diseases are zoonotic, ie common to humans and animals.

The incidence of echinococcosis has increased dramatically, regardless of place of residence, profession, age and sex. According Agabekova S. O., S. A. Amireev, G. A. Abdrakhmanova, J. F. Vyshpolskiy for 15 years in Kazakhstan was 3794 cases of human echinococcosis, among which 2990 or 78,8% were residents of the southern regions of the country [3]. YM Ker (2010) indicates that in 10 years, the incidence of echinococcosis increased 4.6-fold [4]. During this period 4529 patients with echinococcosis were operated. Mortality varies from 2.4 to 6.8%, disability-from 3.5 to 8.7%, relapse in 6.2–16.0% (S. A. Amireev, 2002) [2]. The average contamination of soils with eggs ehinokokka in Kazakhstan amounted to from 3.3 to 30.0 %. The damage caused by echinococcosis is significant. So according Kireeva J. M. (2010) an average of one sick animal loses 9,5 % wool, 7 % milk, a 3.2 % increase, of 8.1% meat 18.5% of internal fat, 84.2% of the liver, 76.1% of light for the sum about 5 thousand tenge. From every 1000 patients with echinococcosis of sheep per year receive less than 262 kg of wool, 7.8 tons of milk, 1.7 tons. growth, 1.4 tons of meat, 88 kg of internal fat, 529 kg of liver and 354 kg of lungs. From every 100 patients with echinococcosis ewes receive less than 13 lambs and 8 die in the first two months of life. The average amount of damage during echinococcosis of sheep is more than 1.5 thousand tenge per sheep, and per cow – 3100 tenge [4].

For example, nematodes of horses are the most common helminthic diseases, occur in 70-100% of the population and cause significant economic damage. Thus, the case among young animals, especially foals of the current year, from the migration stage of parascaris sometimes reaches 20-30% of the number of cases. Despondos or thromboembolic colic also frequently leads to direct loss – the mortality among horses [6].

In connection with the above, the study and clarification of the issues of regional epizootology of animal parasites, the development of effective means and methods of their therapy and prevention is of great practical and prognostic value.

The purpose of the research: clarification of the epizootic situation on parasitic disease among animals of LLP "bayserke-agro", contained in different conditions: stationary, pasture, and mixed environments.

Material and methods. The research was carried out within the framework of the program "Scientific and methodological support of veterinary and sanitary well-being and increase of livestock productivity, on the example of LLP "Baiserke-agro". The following materials and methods were used in parasitological studies: 1. Scatological research methods darling,., Berman-Orlov with the definition of intensity of infestation (AI, ind.) and extensiveness (EI, %); 2. Entomological studies the methods of visual inspection and palpation of the skin in the back and sacrum, diagnostic irrigation of the nasal cavity 1% solution of trichlorfon, an examination of stomachs at slaughter animals; 3. Acarological research methods and clinical examination of scrapings of the vital method of Priselkova; 4. Protozoological studies by examining peripheral blood smears; 5. Anatomic and histological examination by autopsy of the fallen and slaughtered animals by the method of partial helminthological dissection (NGV) in

combination with a complete helminthological dissection of individual organs and systems (PRTs) corpses, K. I. Skryabin systems and organs. The detected helminth eggs and cysts of protozoa are differentiated by means of drawings, photographs, verbal descriptions given in the handbooks on the diagnosis of helminthiasis [8]. The found larvae of gadflies and ticks are differentiated on the basis of specificity of parasites to species of animals, and also by means of drawings, photos, the verbal descriptions given in reference books and the monograph [9,10]. Upon detection of intra-erythrocyte forms of the simplest determination of their genus and species was carried out on the basis of "Atlas of blood parasites".

Results and analysis of the data. Based on the coprological studies have found that invasion by helminths of the horse farms are significant, the overall extensity of invasion (EI) with helminths in horses ranges from 56.4 per cent to 69.2 per cent. Strongylata met in the form of monenvasia horses fattening (33.3 per cent). There are several options of parasitocenosis: strongylata+anoplocephalidae; strangulate+precarity; strangulate+parserid+oxyuris. Helminths from the order of Ascaridia, Parascaris eguorum in its pure form is not registered. A mixed invasion of helminths in the form of 2-and 3-membered parasitocenoses composed of the following components was noted: Strongylidae SPR.+Parascaris eguorum in horses of Kurchum breed (63,6%) and mares (100,0%). Cestodes Anoplocephalata excl.planed in its pure form is not registered, met the horses of the Kurchum breed in a mixed infestation of the two components, together with strangulate in 3 samples, which accounted for 27.3% of the number of infected samples. Combined infestation is composed of 3 components was observed in 1 stallion imported from Russia. He was worms Strongylidae excl.planed+Parascaris eguorum+Oxyuris egui. In mixed form AI ranges from 3 to 17 copies in 20 p. s. microscope (figures 1–4).

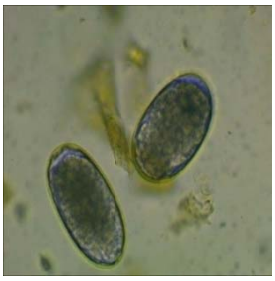

Figure 1 – Helminth eggs of *Strongylus equinus*

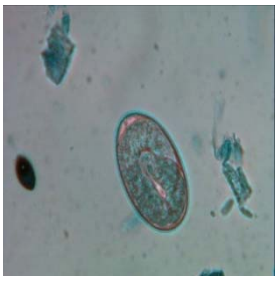

Figure 2 - Egg Strongylus spp., with larva

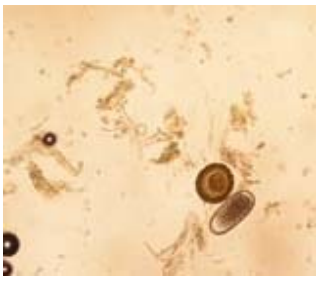

Figure 3 – Combined strongylidae-prasarita invasion

Figure 4 - The egg of Parascaris equorum (Mature)

Significant invasiveness of cattle of different ages was established. The total extent of invasion (EI) by parasites from different systematic groups is high – from 94.4 to 100.0%.

5 species of helminths, particularly trematodes: Dicrocoelium lanceatum and Fasciola hepatica, the cestodes: Moniezia autumnalia; nematodes: Nemesi contortus and Neoascaris vitulorum. And also noted one type of protozoa-Eimeria bovis.

Marked 2 version mixed helminth-protozoan infestations: 1. *Haemonchus contortus+Fasciola hepatica+Moniezia autumnalia+Eimeria bovis*; 2. *Fasciola hepatica+Dicrocoelium lanceatum+Moniezia autumnalia+Haemonchus contortus+Eimeria bovis* (figures 5–7).

Figure 5 – Oocyst Eimeria *Eimeria bovis*

Figure 6 – Trematode egg *Dicrocoelium lanceatum*

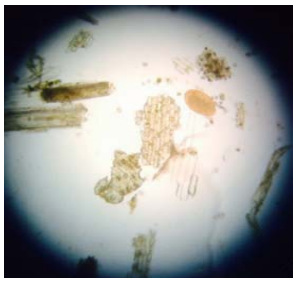

Figure 7 – Trematode egg *Fasciola hepatica*

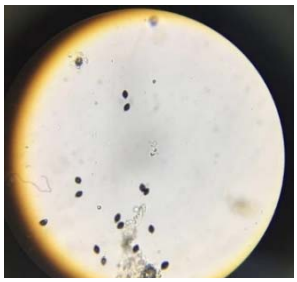

Figure 8 – Egg *Trichocephalus ovis*

During scatological studies, 60 samples of feces of sheep, was 4 species of helminths, in particular, the trematode is Dicrocoelium lanceatum; intestinal cestodes - Moniezia expansa; nematodes: Nemesi contortus, Trichocephalus ovis (figure 8) and Neoascaris vitulorum. And also noted one type of intestinal protozoa-Eimeria faurei. Marked mixed invasions: parasitoses, composed of two types of worms Nemesi contortus+Dicrocoelium lanceatum was at 15.0 per cent. Parasitoses, composed of two types of worms Nemesi contortus+Moniezia expansa was observed in the 5.0%; consisting of two types of helminths Dicrocoelium lanceatum+Trichocephalus ovis in 5.0% of the studied fecal samples. Marked parasitoses made of several variants of the three types of worms: made up of the types of Nemesi contortus+Dicrocoelium lanceatum+Trichocephalus ovis was observed in 25.0 percent; the second of the three components helminth Dicrocoelium lanceatum+Trichocephalus ovis+Moniezia expansa in 22.5% of cases.

Entomological studies of cattle showed that the total invasion of cattle by hypodermatosis was 35.4%. The intensity of invasion (II) was, on average, for each group of animals from 9 to 23 larvae (ex.) per 1 head (figure 9).

Invasion is astrosom in adult sheep 62.8% II=3-7 copies; of the lambs - 64,7%=1-5 specimens studied Total infested sheep of different ages abdominal gadflies reached 63.3% (figure 10).

Figure 9 – Larvae of II and III stages of subcutaneous cattle gadflies (*Hypoderma bovis*)

Figure 10 – Larvae of the III stage of the cavity sheep gadflies (*Oestrus ovis*)

Figure 11 – Larvae of the III stage of horses cavity gadflies (*Rhinoestrus purpureus*)

Figure 12 – Larvae of the III stage of gastric gadflies of horses (*Gastrophilus intestinalis*)

In the study of horses for the presence of cavity gadflies, the total invasion of rhinestruses of horses of different ages was 45.0%, and adult horses and youngsters of the last year of birth are affected approximately the same - more than 60.0%. This year's foals are affected by 20.0%. The intensity of infestation, on average, ranges from 2 to 11 individuals in Almost all the cases are two types of abdominal gadflies: Rhinoestrus purpureus (figure 11) and Rhinoestrus latifrons, which corresponds to the literature data on the prevalence of various types of Anastrozol in the regions of Kazakhstan. Foals observed one species: *Rhinoestrus latifrons.*

Study horses at gasterophilus (gastric gadfly) was carried out on the basis of the results of the examination of the stomach in the slaughter of animals and the collection of larvae of gastric gadflies. Were scored 3 horses productive breeds, the invasion amounted to 100.0% with an intensity of from 3 to 59 specimens of larvae of gastric gadflies of the species Gastrophilus intestinalis (figure 12).

Figure 13 – Mites of the species Psoroptes ovis in the skin scrapings from the sheep

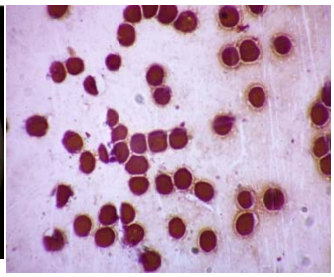

Figure 14 – Nags is a drug from the liver: poikilocytosis

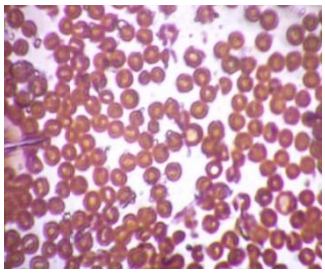

Figure 15 – Nags is a drug from the liver: hemolysis of red blood cells

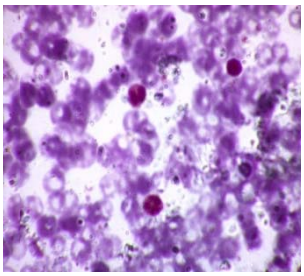

Figure 16 – Key-preparation of the spleen: adhesion of red blood cells and hemolysis of red blood cells

Bacteriological studies for the presence of various sarcoptosis (scabies mites) were carried out. The greatest number of clinically expressed skin lesions was noted among the last year of birth and accounted for 8.52% of the number of examined. In adult sheep psoroptosis was confirmed in 53.13% of cases. the species Psoroptes ovis, the causative agent of psoroptosis or scabies (figure 13).

During protozoologica studies taken of the blood smears troweprice not detected. On the basis of pathoanatomical autopsy, microscopic examination of blood smears from peripheral and internal vessels; smears-prints from the liver, spleen and intestines, the presumable diagnosis of blood parasitosis was excluded (figures 14–16). Preventive measures were proposed to prevent blood parasitic diseases of animals.

Based on the results of the study of the epizootic situation in the economy for all registered parasites, recommendations for their treatment and prevention are proposed [10].

Conclusion. The article presents the materials of diagnostic studies conducted in the framework of the program "Scientific and methodological support of veterinary and sanitary well-being and increase the productivity of livestock, on the example of LLP "Bayserke-Agro". In parasitological studies used scatological research methods of Darlin, Vyshnuskas, Berman-Orlov with the definition of intensity of infestation (AI, ex.) and extensiveness (%); entomological studies by methods of visual examination and palpation of the skin in the back and sacrum, diagnostic irrigation of nasal cavities with 1% solution of chlorophos, examination of stomachs at slaughter of animals; acarological studies by clinical methods and study of scrapes by vital method of Priselkovoy; protozoological studies by studying blood smears and nag drugs; anatomic and histological examination by autopsy of the fallen and slaughtered animals by the method of partial helminthological dissection (PHD) in combination with a complete helminthological dissection of individual organs and systems (CHD) corpses, K.I.Skryabin's systems and organs.

Established in LLP "bayserke-agro" in horses were recorded parasites from different systematic groups: strongylata in the form of monoinvasion and options parasitocenosis, in particular, strangulate+anoplocephalidae; strangulate+precarity; strangulate+parserid+oxyuris; two abdominal gadflies: Rhinoestrus purpureus and Rhinoestrus latifrons; it is one kind of gastric gadflies Gastrophilus intestinalis.

In cattle was 5 helminth species: Dicrocoelium lanceatum, Fasciola hepatica, Moniezia autumnalia, Haemonchus contortus, Neoascaris vitulorum; one species of protozoa - Eimeria bovis and subcutaneous gadfly Yu sheep observed 4 species of helminths: lanceatum Dicrocoelium, Moniezia expansa, Haemonchus contortus, Trichocephalus ovis, Neoascaris vitulorum. Echinococcus granulosus larva; one type of intestinal protozoa-Eimeria faurei; cavity gadflies-Oestrus ovis and scabies mites Psoroptes ovis.

On the basis of the obtained data, recommendations for the treatment and prevention of each parasitic disease registered in the farm have been developed and proposed.

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«БАЙСЕРКЕ-АГРО» ЖШС АУЫЛ ШАРУАШЫЛЫҚ МАЛДАРЫНЫҢ ПАРАЗИТТІК АУРУЛАРЫНАН ВЕТЕРИНАРЛЫҚ ТҰРҒЫДАН САУ БОЛУЫН ҚАМТАМАСЫЗ ЕТУ

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ОБЕСПЕЧЕНИЕ ВЕТЕРИНАРНОГО БЛАГОПОЛУЧИЯ ПО ПАРАЗИТАРНЫМ БОЛЕЗНЯМ СЕЛЬСКОХОЗЯЙСТВЕННЫХ ЖИВОТНЫХ В ТОО «БАЙСЕРКЕ-АГРО»

Аннотация. Приведены результаты паразитологических исследований в ТОО «Байсерке-Агро». У лошадей регистрировались стронгиляты в виде моноинвазии и варианты паразитоценозов: стронгиляты+анаплоцефалиды; стронгиляты+параскариды; стронгиляты+параскариды+оксиурисы; два вида полостных оводов: *Rhinoestrus purpureus* и *Rhinoestrus latifrons;* один вид желудочных оводов *Gastrophilus*

intestinalis. У крупного рогатого скота зарегистрированы 5 видов гельминтов: *Dicrocoelium lanceatum, Fasciola hepatica, Moniezia autumnalia*, *Haemonchus contortus, Neoascaris vitulorum;* один вид простейших - *Eimeria bovis* и подкожные овода. У овец отмечены 4 вида гельминтов: *Dicrocoelium lanceatum*, M*oniezia expansa, Haemonchus contortus, Trichocephalus ovis, Neoascaris vitulorum. Echinococcus granulosus larva;* один вид кишечных простейших - *Eimeria faurei;* полостные овода – *Oestrus ovis* и чесоточные клещи *Psoroptes ovis*. Разработаны и предложены рекомендации по каждому зарегистрированномув хозяйстве паразитарному заболеванию.

Ключевые слова: эпизоотическая ситуация, диагностика, копрологические методы, гельминтозы, протозоозы, арахнозы, энтомозы, иксодовые клещи; оводовые болезни, кляч препарат.

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THE PROCESS OF DEHUMIFICATION OF HUMUS IN THE SOIL SARYKOL DISTRICT OF KOSTANAY REGION

Abstract. In the presented article, the agrochemical soil map was compiled on a scale of 1: 500,000 according to agrochemical studies on the sown areas of the soil of the Sarykol district of the Kostanay region and significant values of the soil tracts of the cultivated soil on the area of 157,082 ha. According to the results, in the sown areas the content of humus in the composition of arable land varies from 2.13 to 5.67%. These figures show that over the past 30-40 years, the content of humus has decreased by 25-30% compared with the scientific literature of previous years. One of the soil-ecological problems of the region is the dehumification process of chernozem, which is the main source of natural resources of the Kostanay region. The composition of the soil in the field of sowing reflects low and average values depending on the technology of cultivation of agricultural crops on agricultural land, soil types.

Keywords: soil, acreage, agrochemical map, dehumification.

Introduction. The current state and prospects of development of agro-industrial complex of the Republic of Kazakhstan are inextricably linked with the proper use of soil [1]. Soil protection and preservation of fertility is one of the main environmental problems at present. Preservation and increase of soil fertility-the main condition for ensuring environmental sustainability of the entire biosphere on the planet [2].

The use of steppe massifs of Kostanay region in agriculture began in the middle of the 19th century. Especially in the period of "resettlement" in 1909-1918, people began to actively use the land in agriculture. Massive development of virgin and fallow lands of steppe regions of Northern Kazakhstan was carried out from 1954 to 1960. By 1990, the "worked Land" of the region amounted to 47 million us dollars hectares ($36 million) arable land and 11 million area of land requiring General improvement) [3]. In the sixties in the Kostanay region after development of the southern chernozems with easy mechanical structure and carbonate, there were an erosion of soils, an imbalance of mineral nutrients and organic substances in the soil. Over the past 30-40 years, due to intensive menstruation of such processes, there have been significant changes in the content of humus and soil dehumification.

Due to the fact that in the region with extensive use of agricultural land is not established system of conservation agriculture, the soil is reduced from 8.6 to 27.7% [3]. One of the main causes of dehumification soil cover is prolonged use monochronic farming systems and the violation of the rotation.

Reduction of humification reserves in the soil leads to a decrease in the phytosanitary situation in the soil, deterioration of humification and water-physical properties, violation of nutrient regimes, compaction, neutralization [4-5]. Therefore, the reduction of humus content in the soil is one of the main causes of soil degradation.

Kostanay region is part of three grain provinces of Kazakhstan. In the field crops amounted to 3 million sown more than 10 hectares and produced a quarter whole grain.

Sarykol district, where the study is conducted, is one of the main areas in the provision of agricultural products. The total area of the district is 611 613 hectares of agricultural land 504 240 hectares, including

arable land 366 474 hectares, pastures 130498 hectares, forest lands 27 040 hectares. Mainly grown wheat, barley, oats, lentils, buckwheat and legumes and oilseeds[6]. Therefore, the study of the processes of soil dehumification Sarykol district, one of the main grain-producing districts of Kostanay region, the development of agrochemical cartogram for rational use of agriculture land is the source of the natural resources of the region, is very important and necessary.

Study area. Acreage of Sarykol District of Kostanay region. The coefficient of humidification in the area is characterized by the number of temperatures above 10 ° C in the range of 2200-2500 °C, which has a value of K = 0,8-0,1. The average annual rainfall is 250-300 mm [7]. All the territories of Sarykol District are located in the limiting half-life zone of the steppe zone of the usual ground field zone. In the Northern part of the region there are ordinary black soils, rooted in ordinary black soils and ordinary black soils, rooted roots, mixed species of meadow chernozems with roots. In the southern part, common chernozems, ordinary black soil, withered roots, as well as South-Chernozem soil formed on the depressions of lakes, which formed meadow-Chernozem soil, in the South-Western edge of which in the valley of the Ubagan river multiply southern chernozems [8]. The most common soils in the region are soil-forming rocks of heavy metals of four deposits [9, 10].

Methods. To determine the humus content in the soil, soil samples were taken from the soil layers of 0-25 cm of sown areas. The obtained soil samples I. V. were Determined by the method of determining the humus of Tyurin. And agrochemical map of soils developed on the basis of analytical cart mapping.

Results and discussion. Agrochemical soil survey of the sown areas of Sarykol District with a total area of 366 474 hectares, including 157 082 hectares, which is 45.1%, was carried out. According to the obtained results the content of humus varies in the range of 2.13-5,67% on the sown area of the district where held agrochemical examination. The area with a relatively low humus content is 102.77 thousand hectares (65.1 %). The area with an average area of 55.1 thousand hectares of humus (34.9 %), and in acreage are not found acreage of high importance in soil content (table, figure).

Percentage of survey size of soil humus, carried out on areas of Sarykol area cultivated more widely

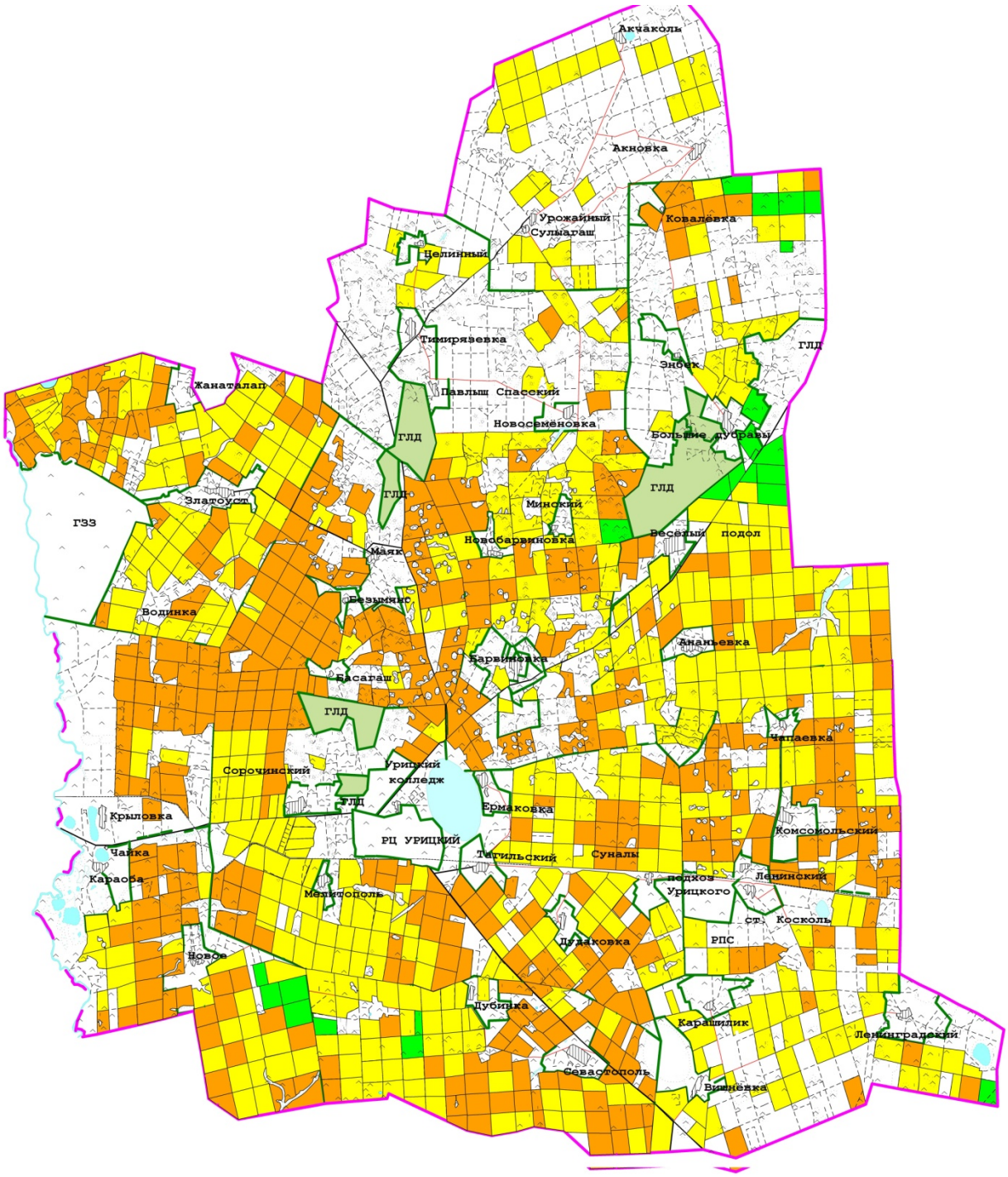
Humus content in the soil					
low		average		high	
Border grouping by percentage of humus content					
not exceed 4,0		4,1-6,0		more 6,0	
Thousand hectare	%	Thousand hectare	%	Thousand hectare	%
Arable					
102,8	65,1	55,1	34,9	–	–

One of the urgent problems was the dehumification of soils of Kostanay region due to intensive compliance with the technology of cultivation of crops. The results of scientific research [11-19] show that every year the reserves of humus in the amount of 400-600 kg of one hectare of cultivated area are lost. One example of the fact that high values of humus with the intensity of water erosion decrease from year to year, amounting to low and very low values of humus (3.0%), low and medium (4.2%) in most of the region is Sarykol district, where the study is conducted. These indicators show a decrease in humus content to 25-30% over the past 30-40 years compared to the data in the scientific literature of previous years.

Conclusions. In Sarykol District after the development of virgin and fallow lands, especially over the past 30-40 years, the humus content in the soil decreases to 25-30% and undergoes significant changes. The process of dehumification have an intense place.

Humus content in soils of cultivated areas is classified into two groups with low and medium content. Neskoromny composition of 2.13-3,6 % (4,0%) and middle 4,13-5,67 % (4,1-6,0 %) values.

Below the percentage occupied by the size of humus, the value of 65.1% (4.1-6.0 %) < the average value of 34.9% (0-2-4 %).



Agrochemical cartograms scale 1:500 000 on the composition of Caprica Sarykol district of Kostanay region

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ҚОСТАНАЙ ОБЛЫСЫ САРЫКӨЛ АУДАНЫ ТОПЫРАҚТАРЫНДАҒЫ ҚАРАШІРІНДІНІҢ ДЕГУМИФИКАЦИЯЛАНУ ҮРДІСТЕРІ

Анотация. Ұсынылып отырған бұл мақалада Қостанай облысы Сарыкөл ауданы топырақтарының дегумификациялану үрдістері және топырақтың қарашірінді құрамының егіс алқаптарындағы мәндік көрсеткіштері бойынша 157 082 гектар көлеміндегі егіс алқаптарына жүргізілген агрохимиялық зерттеулер нәтижелері негізінде құрастырылған 1:500 000 масштабтағы топырақтың агрохимиялық картаграммасы келтірілген. Алынған нәтижелер бойынша қарашірінді құрамы ауданның агрохимиялық зерттеу жүргізілген егіс алқаптарында 2,13-5,67 % аралығында ауытқиды. Бұл көрсеткіштер соңғы 30-40 жыл ішінде бұрынғы жылдардағы ғылыми әдебиеттердегі мәліметтермен салыстырып қарағанда 25-30 %-ға дейін қарашірінді мөлшерінің азайғанын көрсетеді. Қостанай облысының табиғи ресурстарының негізгі қайнар көзі саналатын қара топырақтың жылдан-жылға дегумификациялану үрдістеріне ұшырауы облыстың топырақ-экологиялық проблемаларының бірі болып саналады. Егіс алқаптарында топырақ қарашіріндісінің құрамы егіншілікте ауылшаруашылық дақылдарын өсіру технологиясына, топырақ типтеріне қарай төмен және орташа мәндегі көрсеткіштерді көрсетеді.

Түйін сөздер: дегумификация, топырақ, агрохимиялық картаграмма, егістік алқап, қарашірінді.

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ДЕГУМИФИКАЦИОННЫЕ ПРОЦЕССЫ В ПОЧВЕ САРЫКОЛЬСКОГО РАЙОНА КОСТАНАЙСКОЙ ОБЛАСТИ

Абстракт. В представленной статье агрохимическая карта почвы составлена в масштабе 1 : 500 000. Агрохимические исследования посевных площадей проводились в Сарыкольском районе Костанайской области на площади 157082 га. Согласно результатам исследований содержание гумуса в составе пахотных земель варьируется от 2,13 до 5,67 %. Эти цифры показывают, что за последние 30-40 лет по сравнению с научной литературой предыдущих лет содержание гумуса снизилось на 25-30 %. Одной из почвенно-экологических проблем региона является дегумификационный процесс черноземов, которые являются основным источником природных ресурсов Костанайской области. Состав почвы в области показывает низкие и средние значения гумуса в зависимости от технологии возделывания сельскохозяйственных культур и типов почв.

Ключевые слова: почва, посевные площади, агрохимическая карта, дегумификация.

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