RESEARCH RESULTS OF POTATO TUBER CLEANING PROCESS WITH ULTRASONIC TREATMENT

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Key words: potato, root crop, onion, cleaning, ultrasound, multifactor experiment, research, frequency, intensity, installation.

Currently produced machines for harvesting root crops and onions are designed according to well-known tried and tested schemes that have their traditional drawbacks, therefore, such machines initially cannot carry out the technological process of harvesting well. Attempts to use digging machines for mechanization of harvesting (potato diggers, potato harvesters, root-diggers and diggers of other vegetable crops) were not widely spread due to heavy textured soil and poor quality of separation. To eliminate the above disadvantages for cleaning root vegetables, potatoes and onions, a method of ultrasonic treatment has been proposed, which intensifies the process of cleaning root vegetables from soil impurities at the final stage of root vegetables, potatoes and onions processing. The article presents instrumentation for carrying out research on the technological parameters of ultrasound treatment on the quality of the root crop cleaning process from soil impurities, the methodology and results of the laboratory studies of the ultrasonic treatment in the cleaning process of the Red Scarlet potato tubers, the suitable parameters of ultrasonic treatment that intensify the root crop cleaning from soil impurities were determined. The results of the comparative laboratory studies of potato tubers cleaning from soil impurities of different physico-mechanical composition (sandy and loamy soils) allow us to conclude that the best parametres of intensification of ultrasonic treatment with an increase of tuber cleaning ν from 7.2% to 19.5% with sandy soil impurities applied on a tuber with a mass of 50 g to 250 g with an average increase step ν = 2.3% are provided with the technological parameters of f_1 = 48 kHz, S = 42 W / cm². Cleaning of potato tubers from loamy soils with identical values of the technological parameters of ultrasonic treatment does not provide a satisfactory cleaning.

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SPECIFICATION OF COLD RUNNING-IN QUALITY TO POWER CHANGE LOSSES FOR FRICTION

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Keywords: wear, surfactants, resource, testing, quality, efficiency.

Measures aimed at ensuring the quality of engine running-in after repair take an important place in activity of engine-repair enterprises. Their reduction can be facilitated by the acceleration of the running-in time of engine parts after repair and the use of better-quality domestic engine oil for running. Research in the field of application of various oils with running-in compositions containing surface-active (surfactant) and chemical-active substances accelerate the running-in process and improve its quality. Research was carried out at the run-in area of OAO Ulyanovsk Car Repair Plant No. 2 and in the testing laboratory of internal combustion engines (ICE) of the Ulyanovsk State Agrarian University. The authors' team has developed oil running-in additive - VARKS. It allows to significantly speed up the running-in time of the mating surfaces during the run-in. Experiments have shown that the quality of engine running can be judged by the power loss for friction. It was found that with the addition of the running-in composition VARKS (3% of weight) in the operating oils, the mechanical friction losses were intensely reduced. The effectiveness of oils of different composition to reduce and stabilize mechanical friction losses decreases in the following order: M-8-B + 3% VARKS; I-40A + VARKS; I-40A; M-8-B; M-5_3/10-G_1; M-6_3/10-B. Research results indicate that the power loss due to friction after the accelerated running in of engines on M-8-B and I40A oils with running-in composition VARKS is lower compared to the typical running-in on pure oils. This confirms the effectiveness of use of the composition. In case of its application with M-8-B and I40A oils, friction losses are 1.45 and 1.47 times lower, respectively, compared to running-in on pure M-8-B oil.

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RESULTS OF BENCH TESTS FOR WEAR RESISTANCE OF MOBILE STRAIGHT-SIDED SPLINE FITTINGS AFTER ELECTROMECHANICAL HARDENING

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Key words: spline fittings, electromechanical hardening, stand, research, wear

Movable spline fittings for agricultural equipment are operated in high dust and humidity conditions at high rotational speeds and relative slip speeds, with significant torques. These factors determine the durability of mobile fittings. The nature of damage to spline fittings mainly depends on the conditions of their loading, design features, manufacturing technology and hardening of the executive surfaces. Working surfaces, therefore, should have a high crushing strength, good corrosion resistance and wear resistance during abrasive wear. The quality of the executive surfaces of the mobile spline fittings, required by the operating conditions, is achieved by applying electromechanical treatment of the shaft and bushing splines, which combines hardening and finishing effects on the surface to be treated. The wear resistance of fittings, as well as individual shafts and bushings with electromechanically hardened and not hardened splines was studied. Bench studies are important for an integrated assessment of the effectiveness of the use of strengthening technologies for parts and compounds subject to various types of wear. A test bench for research on wear resistance of spline mobile fittings has been developed, and its design features have been

described. The methodology and the results of comparative studies for abrasive wear of samples of straight fittings, depending on the size of load and the duration of wear are given. It has been established that the use of electromechanical hardening of the lateral working surfaces of straight spline fittings can significantly reduce the run-in time and increase the wear resistance of these compounds by approximately 2 times.

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BIOLOGY FEATURES, CULTIVATION EXPERIENCE AND PROSPECTS OF PROCESSING OF SWEET SORGHUM IN THE SOUTH-WEST OF CENTRAL RUSSIA

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Key words: sweet sorghum, varieties, seeding amount, sorghum cluster, mobile press, vegetable juice, processed products.

The article provides an analysis of promising areas for cultivation of sweet sorghum in the production of various feeds and processing of top mass for food, technical and energy purposes for production of secondary products. The results of the study of agrotechnical methods of cultivation and primary processing of the top mass of sweet sorghum on gray forest soils in the agro-climatic conditions of

Bryansk region are considered. The features of growth, development and formation of biomass harvests of sweet sorghum varieties were studied depending on the seeding amount and possibilities of processing the top mass in field conditions were revealed. The objectives of the study included: to identify the effect of different seeding amount on the features of production process of sweet sorghum; to give a comparative assessment of the economic efficiency of cultivating new varieties for silage; to consider the prospects of primary processing of top mass on the field to obtain vegetable juice and its further use for various purposes in the economy of the region. The information of the proposed model to create Bryansk agroindustrial merchandise cluster is given. This cluster is the first in Russia in the direction of development of commercial crops, technologies and equipment for their processing in order to obtain completely new products. Innovative company OOO Satellite-M (Bryansk) proposed a breakthrough technology for squeezing juice from green mass of sweet sorghum using a mobile (mobile) press to produce vegetable juice on the field. Studies were conducted on the experimental field of Bryansk State Agrarian University, on the state farm of Kokino, Vygonichsky District, production testing of scientific development was carried out in May-September 2018 (OOO Bryansk Lyon, Dubrovsky District, industrial seedings, primary processing of sweet sorghum stem - in the workshops of the enterprise) . On average, over 3 years of sweet sorghum testing, the highest yield of green mass - over 72 tons per 1 ha of green mass or dry matter of 17.6 t / ha was noted on Sazhen variety with a seeding amount of 500 thousand pieces of viable seeds / ha. It was noted that new technologies and equipment for processing, obtaining and preserving new products from sweet sorghum allows the farms of Bryansk region to expand their activities and increase the profitability of enterprises.

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APPLICATION OF GIS IN THE STUDY OF MODERN TECHNOLOGIES OF CROP CULTIVATION ON THE TYPICAL BLACK SOIL OF THE TRANS-VOLGA REGION

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When examining the fields of the test site on the typical black soil of Samara region, changes of the agrochemical properties of the soil, plant growth and development over time and under the influence of modern resource-saving cultivation technologies were noted in the long-term stationary experiments at Samara Research Institute and on the areas of Federal State Institution "Station of Agrochemical Service" Samara ". Joint studies have established that, despite the increasing losses of humus and nutrients until 2015, the deterioration of agro- and water-physical properties, black soils of the test site have a relatively high productivity potential. More than 50% of the areas have an average value of humus in the soil: from 4 to 6%, about 80% of the area - high content of mobile phosphates: 151-200 mg / kg, about 60% of arable land - very high content of exchangeable potassium: from 180 to 260 mg / kg. The monitoring conducted in 2018 revealed the stabilization of the agrophysical and agrochemical properties of the soil. The transition from traditional to resource-saving technologies has provided a significant increase of phosphates on 9 of the 12 fields and the potassium regime of the soil. Based on the results of studies, electronic charts of nutrient content in the soil of the test site and agrochemical field passports were prepared, data on the rate of change of soil fertility over time, the degree of utilization of soil nutrients and fertilizers, and standards for dependence of crops on the agrochemical properties of soil and fertilizers to create a database of soil fertility regulation and arable land productivity were obtained.

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GROWTH AND DEVELOPMENT OF COMMON BARLEY OF GELIUS VARIETY DEPENDING ON THE TECHNOLOGY ELEMENTS

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Key words: fertilizers, seeding amount, density and fullness of shoots, preservation, plant survivability, number of productive stems, grains from an ear and their weight, grain yield.

Recently, new highly productive varieties of common barley have been introduced into production. The study of ways to increase its productivity by improving mineral nutrition and planting density has great importance, both in theoretical and in practical terms. The aim of the research is a scientific justification for obtaining high yields of common barley of Gelius variety on the basis of the suitable nutrition level and area . The task of the research is to study the change of phenological phase time, the fullness of sprout,

preservation, survivability, elements of the crop structure and grain yield from mineral nutrition and plant density. To accomplish this task, a two-factor field experiment was conducted on field № 4 in the State Unitary Enterprise Lukhovskoye of Oktyabrsky District of the city of Saransk, Republic of Mordovia in 2016–2018. The test scheme includes: factor 1. - the background of mineral nutrition. 1.1. - control - without fertilizers. 1.2. - N_{30} $P_{30}K_{30}$. 1.3. - $N_{60}P_{60}K_{60}$. 1.4 - $N_{90}P_{90}K_{90}$; factor 2. - seeding amount. 2.1. - 2.5 million of viable seeds per hectare (control). 2.2. - 3.0. 2.3. - 3.5. 2.4. - 4.0. 2.5. - 4.5. It was established that the maximum density of spouts (329 - 375 pcs./m^2) on all backgrounds of mineral nutrition was at amount of 4.0 and 4.5 million seeds per hectare. The preferential survivability of plants was revealed on the background of $N_{30}P_{30}K_{30}$ when sowing 3.0 million seeds (63.6%) and on the background of $N_{90}P_{90}K_{90}$ in case of sowing of 2.5 million seeds (63.3%). The number of productive stems prevailed with the introduction of $N_{90}P_{90}K_{90}$ in all seeding amounts (300 pcs / m^2). Advantageous grain content of the spike is marked on a non-fertilized background when sowing at the amount of 3.0 million (28 pcs.); on the backgrounds of $N_{30}P_{30}K_{30}$; $N_{60}P_{60}K_{60}$; $N_{90}P_{90}K_{90}$ at all seeding amounts (25 - 30 pcs.) The application of mineral fertilizers in all areas of plant nutrition contributed to an increase in the mass of grain per spike (1.22 - 1.44 g) compared with the control (0.88 g). Application of fertilizers ($N_{60}P_{60}K_{60}$, $N_{90}P_{90}K_{90}$) and sowing of 4.0 and 4.5 million seeds contributed to formation of maximum grain yield (2.84 - 3.05 t / ha).

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CHANGE OF SEED QUALITY DEPENDING ON FERTILIZERS AND SEEDING AMOUNT OF COMMON BARLEY OF HELIUS VARIETY

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Keywords: barley varieties Gelius, mineral fertilizers, seeding amount, weight of 1,000 seeds, uniformity, nature, seed germination, protein.

The purpose of the research was the scientific substantiation of obtaining high-quality common barley seeds due to use of mineral fertilizers and seeding amounts under the conditions of the Republic of Mordovia. The task of the research is to study the change in the mass of 1,000 seeds, their uniformity, and the level of mineral nutrition and nutritional area; -to identify the dependence of seed germination and protein content on the studied factors. To accomplish this task, a two-factor field experiment was conducted on field № 4 in the State Unitary Enterprise Lukhovskoye of Oktyabrsky District of the city of Saransk, Republic of Mordovia in 2016–2018 The test scheme includes: factor 1. - the background of mineral nutrition. 1.1. - control - without fertilizers. 1.2. - N30 P30K30. 1.3. - N60P60K60. 1.4 - N90P90K90; factor 2. - seeding amount. 2.1. - 2.5 million of viable seeds per hectare (control). 2.2. - 3.0. 2.3. - 3.5. 2.4. - 4.0. 2.5. - 4.5.The area of the plot of the first row (the background of mineral fertilizers) is 45 m^2 (5 × 9 m^2), the second row is 27 m^2 (1.8 x 5). The repetition is threefold, placement is systematic. It was established that the weight of 1,000 seeds was the highest when fertilizers $N_{30}P_{30}K_{30}$ were applied and the seeding amount was 2.5 million (51.5 g), as well as $N_{90}P_{90}K_{90}$ — 3.5 and 4.0 million (51.9 and 53.0 g); their uniformity prevailed on the background of $N_{30}P_{30}K_{30}$ and $N_{60}P_{60}K_{60}$ with a sowing of 3.0 million seeds (88.3 and 91.3%), as well as $N_{60}P_{60}K_{60}$ when sowing 3.5 and 4.5 million (88.3 and 91.3%) and against the background of $N_{90}P_{90}K_{90}$ - 4.0 million seeds (90.0%); the nature of the grain had an advantage compared to the control on the background of $N_{30}P_{30}K_{30}$ and the seeding amount of 4.5 million (746.7 g / l); $N_{60}P_{60}K_{60}$ and seeding of 3.0; 4.0 and 4.5 million seeds (753.3; 746.7 and 743.3 g / l); $N_{90}P_{90}K_{90}$ - 4.0 and 4.5 million seeds (743.3 and 773.3 g / l); factors under study did not affect seed germination (96%); the greatest content of protein in the grain was observed against the background of $N_{90}P_{90}K_{90}$ and sowing of 3.0 million seeds (13.78%) ;. a strong correlation has been established between nature and grain yield.

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CHANGE OF PHOTOSYNTHETIC ACTIVITY OF BARLEY CROPS DEPENDING ON THE TIME OF APPLICATION OF BIO AND HUMIN COMPOUNDS

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Key words: biological compounds, humic compounds, barley, photosynthetic potential, dry matter, net productivity of photosynthesis.

The article presents research data in which an increase of the leaf area at the phase of going into the tube on the variants treated with the studied compounds is established. A conclusion of the effective impact of bio and humic preparations on plants at the initial stages of their development was made. Studies have shown that in case of application of potassium humate three times for treatment of crops, the maximum assimilation surface of the leaves was formed and the spring common barley was kept in an active state for a long time. Changes of leaf surface area over the years were significant, since in some years climatic conditions favored the growth and development of spring common barley plants, while others did not. It should be noted that for all the years of research, the greatest assimilation surface was on the variant with

potassium humate treatment three times, and the smallest was on control, and this pattern was preserved at all phases of the growing season of spring common barley plants. Analysis of the data showed that not only the environmental conditions, but also bio and humic preparations have a significant effect on the dynamics of changes of leaf surface area and, along with this, the time of the introduction of these preparations leads to changes in the processes of growth and development of plants. The research results showed that the net productivity of photosynthesis during the inter-phase vegetation period of spring common barley (from tillering to going into the tube) varied from 3.74 to 5.17 g / m^2 per day, depending on the variants, and it was the lowest in the control variant, while the greatest was in case of triple treatment with potassium humate. The application of biological and humic preparations also significantly influenced the net productivity of photosynthesis in the interphase period, (going into the tube – earing), where the minimum value was on the control variant (5.22 g / m2 per day), and the maximum value - on the variant with triple treatment with potassium humate 5.47 g / m2 per day). Consequently, bio and humic preparations have a significant impact on the photosynthetic activity of spring barley plants.

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BIOLOGIZATION OF CROP ROTATIONS AND QUALITY OF SPRING WHEAT GRAIN IN THE CONDITIONS OF THE FOREST-STEPPE OF THE VOLGA REGION

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Key words: biologization, crop rotation, tillage, fertilizers, spring wheat, yield, grain quality.

The aim of the research was to substantiate the system of biologization of crop rotation to increase the yield and quality of grain of spring soft wheat in the conditions of the forest-steppe zone of the Volga region. Long-term studies in stationary field experience showed that forecrops have different effects on soil fertility, which is explained by differences in the chemical composition of plant residues left on the field, the amount of symbiotic nitrogen of legumes entering the soil, the consumption of productive moisture, and the effect on the phytosanitary condition soil and crops. When using perennial grasses as forecrop of spring wheat, depending on the level of yield and grain quality of spring wheat, they can be divided into 3 groups: 1) legumes-symbionts (alfalfa, sainfoin, peas) after which the highest yield and the highest quality grain were obtained; 2) meadow brome - the lowest yield and grain of lower quality; 3) spring wheat occupies an intermediate position in terms of yield and grain quality. Research on biologization of spring wheat technology makes it possible to recommend ways to improve the structure of arable land by expanding leguminous crops, perennial leguminous phytocenoses — alfalfa and sainfoin. Legumes are vegetable protein resources for increasing livestock production, they are valuable forecrops for winter and spring wheat. Legumes accumulate nutrients rich in nitrogen, which allows to regulate the regime of organic matter and the nitrogen fund of the soil. Symbiotic nitrogen fixation of leguminous crops in crop rotations, post-harvest phytomass, straw, crop residues and other biogenic resources are an important reserve for compensating the biotic circulation of matter and energy in agro-ecosystems, as well as restoring soil fertility, increasing yields, quality of spring wheat grain and other crops, ensure effective management of agricultural production.

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SOIL MOISTURE, BALANCE OF NUTRITION ELEMENTS AND WEED CONTAMINATION DEPENDING ON THE CALCULATED DOSES OF FERTILIZERS, DEPTH OF PLANTING AND PRE-PLANTING TREATMENT OF POTATO TUBERS

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The article deals with the influence of calculated doses of fertilizers, the depth of planting of tubers and the method of pre-planting preparation of tubers on soil moisture, the balance of nutrients and weed contamination in the south-eastern part of the Volga-Vyatka zone. The depth of planting of tubers, estimated doses of fertilizers and methods of pre-plant preparation of tubers have a direct impact on soil moisture, the balance of potato nutrition elements, weed contamination, content and intake of mineral nutrition elements by potato on leached black soil of the south-eastern part of the Volga-Vyatka zone. The accumulation of elements of mineral nutrition is also significantly influenced by the weather conditions that exist during potato growing season. Potatoes require good soil fertility. Potatoes consume and intake a large amount of nutrients from the soil. With an increase of the planting depth of potato tubers and the calculated doses for fertilizers, the intake of mineral nutrients increases accordingly. Studies have shown that the highest nitrogen content in the soil was observed during the beginning of the growing season of potato - at the time of emergence. The maximum phosphorus concentration was during the budding and flowering phase of potatoes. During the potato growing season, the content of exchangeable potassium increased and in the budding phase, it reached its maximum value. After flowering, the potassium parametre in the soil began to decline and by the harvesting time it reached a minimum value.

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INTERRELATIONSHIP OF MICROELEMENTS-SYNERGISTS OF VARIOUS AGRICULTURAL CROPS IN CASE OF TREATMENT OF SEEDS AND LEAF FERTILIZATION

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Keywords: ion interaction, ontogenesis, synergism, additivity, yield, sugar content, high quality.

On the basis of the formula we derived, questions on the interaction of the trace elements of the d-family of D.I. Mendeleev periodic table system and a representative of the p-family (boron) for sugar beet were studied for many years on various agricultural plants. It has been established that the interaction of ions contributes to enhancement of the production process by increasing the activity of hydrolytic and redox enzymes and plant regulation mechanisms; there is an increase of the attracting processes, which results in active imbibition of seeds and their absorption of water. It was established on the example of spring wheat that the combined effect of seed treatment increases the water consumption rate to 7%, the respiration rate increases by 26.1 - 29.9%, as a result, the activity of the amylase enzyme increases. Trophic regulation is also activated and due to the interaction of microelements of the plant, mineral fertilizers are used more fully. The interaction of ions does not only enhance the physiological and biochemical processes at the beginning of ontogenesis, but also includes regulatory contours, which affects the long-term effect, the result is an increase of yield of winter, spring wheat and sugar beet, there is also an increase in the quality of agricultural products, the quality of those substances that are produced by plants during evolution.

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INFLUENCE OF STRAW AND GREEN MANURE ON BALANCE OF NUTRITION ELEMENTS IN TYPICAL BLACK SOIL OF THE MIDDLE VOLGA REGION

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Keywords: green manure, straw, biological product, balance of nutrients, fertilizer, winter wheat.

Studies were carried out on the experimental field of Ulyanovsk State Agrarian University in the following crop rotation: green manure fallow (vetch -oat mixture) - winter wheat - millet - spring wheat -

barley. We studied 10 variants of fertilizer systems in the experiment: 1. Control (without fertilizers); 2. Straw of the forecrop; 3. Straw of the forecrop + N10 per ton of straw (N10 / t); 4. Straw + Biopreparation Baikal EM-1; 5. Straw + N10 / t + biological product; 6. Biological product; 7. NPK; 8. NPK + straw; 9. NPK + straw + N10 / t; 10. NPK + straw + biological product. As a result of the experiments, it was established that the use of green manure and straw for fertilizer system of grain crops helps to increase the return of nutrients to the soil. At the same time, the content of mineral nitrogen increased by 5.9 mg / kg, mobile phosphorus - by 21 mg / kg and exchangeable potassium - by 14.5 mg / kg of soil, on average, during the growing season in the arable layer of typical black soil. The application of chopped straw to the soil as an organic fertilizer significantly reduced the lack of nutrients. Their balance was close to positive values on variants with straw, nitrogen mineral compensation additive (N10 / t) and the biological preparation Baikal EM-1. The most effective is simultaneous application of straw with nitrogen mineral compensation additive (N10 / t) or a biological preparation Baikal EM-1 together with the calculated doses of mineral fertilizers.

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SULFUR MIGRATION IN SIEROZEMIC SOIL ZONE UNDER THE INFLUENCE OF SULPHUREOUS GASES

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Key words: sulphureous gases, monitoring, agrolandscape, atmosphere, pollution, light gray soil, mechanical composition, humus.

Today, as a result of the activities of various industrial enterprises, mining, using natural resources in various industries and the influence of the anthropogenic factor, chemical pollution of the soil cover, changes in its properties, as well as a decrease in soil fertility are observed, since there are more 660 than refineries in 116 countries around the world. Pollution of the environment leads to formation of acid rain, soil degradation, reduced quality and quantity of crop yields, as well as problems associated with appropriate functioning of ecosystems. Technogenic biogeochemical sulfur anomalies in soils were identified in agrolandscapes of the desert zone near the gas processing plant. Sulfur accumulation in soils along with distance from the source of pollution depends on the type of soil and its place in the landscape. The coefficient of biological absorption is less than 1 unit in the organs of fruit trees, which means that sulfur is retained in different parts of these plants.

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FUNDAMENTALS OF RESOURCE SAVING TECHNIQUES OF INCREASING THE YIELD OF COMMON ONION IN THE CONDITIONS OF IRRIGATION OF THE LOWER VOLGA REGION

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Keywords: common onion, variety, hybrid, plant growth regulator, water soluble fertilizer Mortar, yield

The work substantiates the direction of research to reduce resource costs: saving irrigation water and selecting a set of measures to increase the effective soil fertility, the introduction of adaptive technologies for cultivation of vegetable crops by including mineral water-soluble fertilizers and a growth regulator contributing to accumulation of macro- and microelements in the soil, with high efficiency irrigation, allowing to increase significantly the productivity of irrigated land and the effectiveness of its use. The purpose of the research is to substantiate the feasibility and efficiency of cultivation of promising varieties of bulb onions in the Lower Volga region on the basis of improvement of technological methods in accordance with the prevailing climatic conditions and the possibility of obtaining yields of 150 or more tons / ha of high-quality products. Promising hybrids turned out to be more adapted to the conditions of the external environment with high heat supply. In case of creating suitable water and nutrient regimes, they were more responsive to the elements of cultivation technology. In the end, the introduction of resource-saving technology allowed to make a combination of the main yielding factors for obtaining the planned onion yield. Data analysis of a combination of these factors showed that it is necessary to maintain a differentiated level of moisture for onion cultivation of promising hybrids such as Octant F1 and Valero F1 and planning yields of 130 and 150 t / ha, and when grown without fertilizers and planning 110 t / ha it is required to create a permanent irrigation regime.

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METHODS FOR PRESERVING THE QUALITY OF WHEAT GRAIN IN THE YEARS OF WIDELY SPREAD LEAF AND STEM INFECTIONS

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Key words: spring wheat, gluten content, leaf-stem infection, fungicides.

The studies were carried out at Kurgan Research Institute of Agriculture - FSBI "Ural Federal Agrarian Research Center of the Ural Branch of the Russian Academy of Sciences" in the laboratory of plant growth regulators and plant protection. Field experiments were carried out in a grain- fallow crop rotation on wheat sown after fallow with application of herbicides for protection against weeds. The variety of spring soft wheat is mid-early Omsk 36, the sowing period is the third decade of May. Generally accepted techniques were used. It was determined that in case of moderate leaf infections, the economic efficiency of systemic fungicides was 17%, or 4.8 dt/ha compared to control. At the same time, the weight of grains increased by 1.8 g, and the amount of raw gluten in the grain increased by 2.4 % in relation to the control. Biofungicide protected cereal plants from diseases less effectively, saving 2.6 dt/ha, and there was no effect on the mass fraction of gluten proteins in the grain. In case of massive development of leaf infections without application of fungicides, it is impossible to obtain appropriate productivity and good grain quality. During the epiphytotic years of aerogenic infections, due to the fungicidal protection of plant leaves, an average of 6.9 dt/ha of wheat was preserved. At the same time, quality improvement of grain was noted (the weight of the caryopsides was 5 grams higher than the control variant, the gluten content was 3 % greater). The correlation between the damage to plants and the mass fraction of gluten in the grain was characterized during these years as strong negative and very strong negative (r = 0.89–0.96). It is recommended to carry out double spraying of crops with fungicides during years with epiphytotic leaf infections and the development of stem rust during the wheat ripening period. A lasting positive effect on the quality of the grain was provided by the treatment with fungicides in the earing phase (25%), as well as double treatment (27-28%).

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YELLOW RUST OF WHEAT. EXPANSION, HARM, CONTROL MEASURES (REVIEW)

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Keywords: wheat, yellow rust, Pucciniastriiformis, plant protection, wheat diseases, expansion, harm

Yellow rust of wheat caused by Puccinia striiformis f. spr. tritici is one of the most significant diseases of cereal crops in the world. Infection can affect (naturally or artificially) about 320 species of grass of 50 genera. The review presents basic information about the pathogen, its economic significance, expansion, biological features of development. The current issues in the development of a pathogen remain the influence of an alternative host on the occurrence of epiphytotics and the significance of sexual and asexual developmental stages in its life cycle. Closely isogenic lines and differentiating varieties allow to determine the racial composition of the P. striiformis population and to monitor its change. Population studies on virulence and racial composition have been conducted for many years in almost all countries of wheat production, therefore the study of the genetic structure of P. striiformis remains relevant due to the emergence of new, more aggressive races of the pathogen throughout the world. The main ways of pathogen migration are described. Long-term scientific research and annual surveys of sown areas revealed that the occurrence of wheat yellow rust in the world, including in southern Russia, is increasing due to climate change, the genetic structure of the pathogen population, infection from neighboring areas and other causes. The most effective, economical and environmentally friendly way to protect wheat from yellow rust is the use of resistant varieties, the selection of which must be carried out taking into account intrapopulation changes and the effectiveness of the known resistance genes (Yr).

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APPLICATION OF NEUTRAL ANOLYTE IN CASE OF GASTROINTESTINAL DISEASES OF CALVES

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Key words: mixed intestinal infection, diarrhea, Escherichia coli, enterococci, neutral anolyte, Electrochemically activated solutions, survivability.

The paper presents data on the use of neutral anolyte for treatment of diarrhea of newborn calves. Experiments were carried out under the conditions of Farm Oktyabrsky in Cherdaklinsky district of Ulyanovsk region. Pathogenic variants of Escherichia coli and Enterococcus faecalis, which died under the influence of anolyte within 5 and 7 minutes, respectively, were isolated from material from sick and dead calves in bacteriological studies. The experiment on treatment of calves involved 40 newborn animals suffering from diarrhea, which were divided into 2 groups of 20 animals in each. The animals of the first (experimental group) were fed with a neutral anolyte at the doses of 300-350 ml per os 2 times a day (until diarrhea disappeared). Calves of the second (control group) used the antibiotic gentamicin as an antimicrobial drug. The results of the experiment on treatment of calves with diarrhea showed greater efficacy of the neutral anolyte compared with the antibiotic. Thus, the survivability of animals in the experimental group was 100%, whereas in the control group one calf died (survivability 90%). As for animals of the experimental group, signs of diarrhea ended more quickly and, accordingly, the average duration of the disease was shorter by almost 2 days.

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MAIN GROWTH PATTERNS OF SKULL BONES OF RED DEER AND CATTLE IN THE PERIOD FROM BIRTH TO 18 MONTHS

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Key words: cattle, red deer, skull, growth, adaptation, age.

Reduced productivity and population of red deer and cattle is a significant threat to stable development of the national economy and economic security of the country. One of the main tasks of farm veterinarians is prevention and treatment of various animal diseases. To achieve this objective, detailed knowledge in the field of anatomy, growth and development of animals is required. We investigated the turbinates of red deer and cattle in different age periods and revealed patterns of their growth and development. For fulfilment of this task, heads of red deer and cattle of various age groups were selected in sufficient quantity. Red deer material was selected on red deer breeding farms of the Altai Republic, cattle material - in OOO Barlakskoe of Novosibirsk Region and instructional farm Prigorodnoye of the Altai Territory. Immediately at the place of slaughter, a sagittal cut of the skull was made with an anatomical saw a well as measurement of turbinates with a caliper. Further statistical processing of the data was performed at the Department of Anatomy and Histology of Altai State Agrarian University. By means of mathematical calculations, the arithmetic average of each parametre was derived. Then we established the percentage ratio of the turbinate sizes for all parametres and obtained the main patterns of their growth. Analyzing the data, we found that in the period from birth to 6 months the skull of cattle grows significantly faster than the skull of the deer, from 6 months to a year the situation becomes diametrically opposite, after 6 months the bone of the deer and cattle grow approximately at same speed.

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THE ROLE OF POTENTIALLY PATHOGENIC MICROBIOTA, PROBIOTICS AND ADAPTOGENS IN FORMATION OF MICROBIOCOENOSIS STRUCTURE OF AFRICAN CATFISH ROE

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Key words: African catfish, adaptogens, probiotics, microbiocenosis, roe, testicles, larvae

When incubating the fertilized eggs of the African catfish, a certain proportion of embryos stops in development several hours after fertilization. Dead roe or roe shells undergo decomposition processes. Potentially pathogenic bacteria, colonizing the membrane of other embryos, subsequently colonize the intestines of the larvae. The structure of the natural microbiocenosis in the intestine of the larvae is disrupted. Consequently, infectious diseases develop in fish larvae, starting from early postembryonic ontogenesis. Identifying the causes of the mass death of fertilized eggs during its incubation is one of the most pressing fish problems that need to be solved. Our work is devoted to the study of the microbiocenosis of fertilized eggs and the role of potentially pathogenic microbiota in the formation of its structure. The results of bacteriological studies revealed potentially pathogenic bacteria Citrobacter freundii (Enterobacteriaceae family) and Enterococcus faecalis (Enterococcaceae family) in the microbiocenosis of fertilized eggs of female catfish. When seeding from germ cells on nutrient media, their growth was revealed (up to 10^8 cells). In order to form intestinal normocenosis, to increase immunity and, ultimately, to achieve an increase in the viability and survivability of fish in the process of growing, biologically active substances are used. To enhance the survivability of embryos and larvae of the African catfish, Trecresan adaptogen, a derivative of phenoxyacetic acid, a synthetic analogue of natural adaptogens (ginseng, Rhodiola rosea) was used when incubating fertilized eggs. Also, new generation probiotic - sporothermin as an alternative to antibiotics was used. The use of probiotic sporothermin and the adaptogen Trecresan significantly reduced the bacterial content of roe and significantly increased the yield and survivability of the larvae.

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PROTEOMIC ANALYSIS OF YE3-F2 BACTERIOPHAGE, SPECIFIC FOR YERSINIA ENTEROCOLITICA BACTERIA

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Key words: bacteriophage, Yersinia enterocolitica, protein, composition, proteome, molecular weight, isoelectric point, system

The article presents results of the analysis of the proteome of Ye3-f2 bacteriophage, specific for bacteria Yersinia enterocolitica (study of the quantitative composition, isoelectric point of proteins, molecular weight) isolated from environmental objects, which will eventually be included in the phage biologic preparation used for treatment of enterobacterial infections in veterinary medicine. The resources of SnapGene Viewer v.4.1.7, ExPasy (https://web.expasy.org), BASys (Bacterial Annotation System; https://www.basys.ca) were used in the studies. Research was conducted based on the data of the Ye3-f2 sequence. Using SnapGene Viewer 4.1.9 application, the bacteriophage Ye3-f2 detected 46 proteins with molecular masses from 4.1 to 144 kDa. A bit different different data was obtained when working with sequencing data of Yersiniosis Ye3-f2 phage in the BASys application (Bacterial Annotation System) - 41 proteins with molecular weights from 4.1 to 143 kDa were detected. When analyzing the conformity of the proteomic composition of Yersinia enterocolitica Ye3-f2, the amount of proteins and their distribution by molecular masses in the bio-information applications SnapGene Viewer 4.1.9 and BASys version 1.0, their identity was revealed. The analysis of the proteome of Yersinia enterocolitica Ye3-f2 bacteriophage is an integral part of the classification base of candidate bacteriophages, based on the criteria of biological characteristics, features of phage-host interaction, features of the genetic organization and characteristics of the proteome.

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DEVELOPMENT OF PCR-DETECTION SYSTEMS OF BACTERIOFAGES OF PROTEUS PHAGE (PR 4 - UGSKHA), ENTEROBACTER PHAGE (E7) AND YERSINIA PHAGE (YE3-F2)

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Key words: bacteriophage, Proteus phage, Enterobacter phage, Yersinia phage, PCR, detection, system, primers, phylogenetic tree

The article presents results of studies on development of PCR detection system of such bacteriophages as Proteus phage (PR 4 - UGSKhA), Enterobacter phage (E7) and Yersinia phage (Ye3-F2). A phylogenetic tree was constructed to match their genetic organization with each other, and it was found that the correspondence between the genomes of Proteus phage (Pr 4 - UGSKhA), Enterobacter phage (E7) and Yersinia phage (Ye3-f2) is from 24 to 31%. It was determined that the specific fragment for Proteus phage (Pr 4 - UGSKhA) is located in the genome region of 3700-4500 bp. Highly specific fragments, characteristic only for Enterobacter phage E7 and Yersinia phage Ye3-f2, were not found in the studied genomes, however, areas were found that would allow only the genome of this group to be detected when PCR was used. Two areas were established, the simultaneous detection of which is characteristic for Enterobacter phage and for Yersinia phage. Primer systems were identified in the BLAST system for simultaneous detection of fragments of the genome characteristic of the group of bacteriophages studied. As a result of the studies, primer systems were developed for PCR typing of bacteriophages of the Proteus, Enterobacter and Yersinia groups, allowing to indicate bacteriophages belonging to certain groups in material obtained from environmental objects and pathological material without isolating pure culture in when screening the indicated groups in case of detection of a genome fragment of 125 bp in the range of 3700-4500 bp of DNA Proteus phage (Pr 4 - UGSKhA); sizes of 294 and 431 bp in the range of 17500-18000 and 26500-27500 bp respectively, Enterobacter phage DNA (E7) and sizes of 226 and 85 bp. in the range of 2000-2500 and 24,100-24300 bp - Yersinia phage (Ye3-f2), respectively.

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ANALYSIS OF BACTERIOPHAGE PROTEOME ACTIVE AGAINST ENTEROBACTER

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Keywords: Enterobacter, bacteriophage, proteome, composition, protein, isoelectric point, molecular weight, system

The article presents results of a proteomic analysis of the virulent bacteriophage Enterobacter E7 (study of the quantitative composition, isoelectric point of proteins, molecular weight) isolated from environmental objects, which is a candidate for phage biological preparation for treatment of enterobacterial infections in veterinary medicine. The resources of SnapGene Viewer v.4.1.7, ExPasy (https://web.expasy.org), BASys (Bacterial Annotation System; https://www.basys.ca) were used in the experiments. As a result of the conducted studies, data of proteomic analysis on the basis of the previously conducted sequence were obtained. It was found that bacteriophage E7 detected 50 proteins with molecular masses from 5.5 to 139 kDa in the SnapGene Viewer 4.1.9 application. When working in the BASys application (Bacterial Annotation System), we obtained slightly different results - according to the sequencing data of the bacteriophage E7 nucleic acid, 41 proteins with molecular masses from 4.1 to 143

kDa were detected. When analyzing the compliance of the proteomic composition of Enterobacter phage E7, the number of proteins and their distribution by molecular masses in the bio-information applications SnapGene Viewer 4.1.9 and BASys version 1.0, their identity was revealed. Data on the proteome of Enterobacter phage E7 bacteriophage supplement the information necessary to create a classification database of bacteriophages studied according to the project, based on criteria of biological characteristics, features of phage-host interaction, features of genetic organization and characteristics of the proteome.

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IMPROVEMENT OF SIMMENTAL BREED LINES OF THE VOLGA REGION

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Key words: Simmental breed, genealogical line, factory line, genotype, cross, selection, subpopulation, selection, matching, family, heterosis, breeding core.

This paper describes the cows of the formed breeding core of the lines of Simmental cattle widely distributed in the Volga region according to the main features selected. There are 79 cows in the breeding core of Florian 374 line, they are descendants of Muravey 5219, Buyan 846, Albinos 5804, Monolit 4262 bulls. 651 cows were selected for Fasadnik 648 line – they are daughters of Nadel 289, Stishka 5292 bulls. The breeding core of Mergel line is represented by 25 cows. The descendants of Luka 1048 and Nivelir 724 bulls have the largest percentage in the core. In order to improve the hereditary consolidation of the breeding core of the baselines, cattle derived from a uniform and partially heterogeneous selection were included in it. It has been established that the descendants of the bulls constituting the breeding core of Mergel 2122 line are the most productive, surpassing the milk yield of the descendants of Florian 374 and Fasadnik 642 by 282- 367 kg. The cows of the breeding core of these lines with milk yield from 4894 to 5261 kg did not significantly differ on the coefficient of milk yield changes (15.8-17.3%). The best coefficient of milk yield stability had representatives of Mergel 2122 line (85.8%). Cows of a breeding core of all lines have significant live weight (633,4-673,1 kg). The interlinear difference in live weight of cows is 10.5–39.7 kg in favor of the descendants of the Fasadnik 642 line. Cows with a bowl shape udder (66, -81.7%) and a good udder volume (11.45–11.99 l) prevail in the breeding core. The best dug form is cylindrical, 22% of descendants of Florian 374 line have this shape, which is 14.9-16.4% more compared to animals of other lines. The first successful insemination of heifers was carried out at the age of 18.7 months in Florian 374 line, with an average live weight of 432 kg, in the line of Fasadnik 642 and Mergel 2122, - at the age of 19 and 20 months with a live weight of 434 and 449 kg, respectively. With an increase of live weight of heifers with successful insemination, the milk yield of cows increases significantly. In the heifer group with a live weight of 439.2 kg, the milk yield of heifers amounted to 3952 kg, and in the group of heifers with a live weight of 469.9 kg, the milk yield reached 5002 kg.

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PRODUCTIVE FEATURES OF COWS OF THE RED-SPOTTED BREED OF DIFFERENT EXTERIOR-CONSTITUTIONAL TYPES

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Key words: milk production, constitution, exterior, type, lactation, fat, milk yield, selection.

Three exterior-constitutional types among cross-bred cows bred in OOO “Fruit-growing nursery” of Krasnoslobodsky district of the Republic of Moldova are distinguished from 428 heads: stout shallow, stout mesosomal and stout broad. Broad-type cows exceeded their shallow-type peers in height at crest by 3.98 cm, chest depth by 3.33 cm, chest width by 8.25 cm, chest girth by 5.5 cm, slanting body length by 5.37 cm (P ≥0,999). Mesosomal cows occupy an intermediate position. Proportion of the broad-type cows is 64.7%, they are distinguished by a wider-body, have an advantage in chest indexes (5.5–9.2%, P≥ 0.999), and pelvic-chest index (7.2–13.1%, P ≥ 0.999), but inferior in long-legged parametre index (0.6-0.9%). Shallow type heifers gave 5353 kg of milk during the first lactation, which is 500 - 539 kg more than mesosomal and broad-type cows (P ≥ 0.99). According to the content of the mass fraction of fat in milk, the advantage remains among the cows of the broad type, its content is 3.79%, which is 0.04-0.07% more than among the peers of the mesosomal and shallow type (P≥0.999). As for milk fat yield, shallow-type cows are superior by 16.8–17.5 kg (P ≥0.95) than their broad-type and and mesosomal peers. Milk yield has a positive correlation with all measurements, the closest connection is established in shallow-type cows with chest depth (r = 0.425), with chest girth (r = 0.642), with width of hook bones (r = 0.392), as for broad-type cows, the correlation between milk yield and body depth is a bit lower and amounts to (r = 0.242), chest girth (r = 0.292), and width of hook bones (r = 0.297).

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GENETIC AND PARATYPICAL FACTORS WHEN CREATING A DAIRY CATTLE HERD

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Key words: breed, line, servicing bull, milk yield, genetic factor, paratypical factor, fertility index.

As a result of the research, the degree of influence of genetic and paratypical factors in the creation of breeding dairy cattle herds and a certain difference between the lines of Holstein and Black-Spotted breed in terms of reproductive ability and milk productivity of first-calf cows has been established. Thus, the Holstein breed heifers are older at their first calving than the peers of the Black-Spotted breed of Oreshek 1 line, and the service period is longer. Therefore, the integral parametres of reproductive ability of heifers from the lines of Holstein breed are smaller. The influence of the genetic factor “line” on milk yield of first-calf cows is η^2 = 0.089 or 8.9% (n = 664 cows, P <0.001). The effect of this factor on the mass fraction of fat in milk is weaker: η^2 = 0.0097 or 0.97%, P> 0.05. The “line” factor did not have a significant impact on fertility indexes of first-calf cows. The influence degree of this factor on the service period is 0.9%, and on the fertility index - 0.65%, P> 0.05. The influence of the genetic factor “breeder” on milk yield of first-calf cows is η^2 = 0.307 or 30.7%, P <0.001, and this effect on the mass fraction of fat in milk is less than η^2 =

0.19 or 1.9%, P <0.001. The genetic factor “beeder” had a significant impact on the integrated fertility index (F index): η^2 = 0.099 or 9.9, P <0.001 and on the index of reproductive ability η^2 = 0.068 (6.8%), P <0.05. Studying the effect of paratypical factors on milk productivity of first-calf cows leads to the following results. The impact of the year of lactation on the yield of first-calves is η^2 = 0.038 or 3.8% (P <0.01), the age of the first calving is η^2 = 5.6% (P <0.05), and the service period is η^2 = 5.9%, P <0.001 .

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SOME SELECTION CONSIDERATIONS ON THE COMPLEX OF SIGNS IN BEEF BREEDING

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Keywords: selection by the complex of signs, beef cattle, breeding background, inbreeding, breed improvers

The possibilities of obtaining management information for breeding based on the results of approbation of the breeder's automated workplace (APM Breeder -2005), on actual materials in the breeding herd of beef cattle are described. Applied in the APM method, each animal in the herd is assigned an individual rank for the whole range of useful traits. A group of cows selected by this method in terms of body weight exceeded a group of elite cows that make up more than half of the herd. The difference in average body weight at the age of 4 years was +44 kg. The negative difference between cows of the lower classes (1st and 2nd) with cows of the worst half of the herd in terms of a complex indicator (- 5kg and -8kg) also turned out to be reliable. APM Breeder -2005 gives the chance to automatically receive data on breeding background and about ancestors' share in it. This is significant when selecting animals, when breeding by lines, taking into account the inbreeding of an individual animal and the degree of inbreeding in a selected group of animals. It is possible to assess service bulls and queens by the quality of offspring. As a result of such assessment, each service bull receives its own rank for each sign of descendants and a rank for a complex of signs of descendants, at the same time, information is provided about reliable complex improvers and degraders. The effect of beef cattle selection by this method significantly exceeds the results of selection by grading classes.

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EFFECT OF AMINOBIOL PREPARATION ON COW MILK PRODUCTIVITY

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Keywords: cow, milk, medication, amino acids, productivity.

The aim of the work is to study the effect of free amino acid preparation AMINOBIOL, made by Spanish company INAGROSA on milk productivity of cows. To achieve this goal, two groups of animals were formed: 1st — control, 2nd — test one. The experiments were carried out on cows of the Black-Spotted breed aged from 3.5 to 8 years old, with live weight from 500 to 600 kg. The experiments were conducted for 30 days in a private dairy farm in Ulyanovsk region. All cows were given the main ration. Feeding was carried out during the transitional period from summer to winter ration according to the scheme: cows from the test group received the medication (depending on live weight - 1 cm^3 / 100 kg) with bread (100 g) before the main morning feeding, the control group did not receive the medication. The qualitative composition of milk was determined on the analyzer "Laktan 1-4", "AKBa-01-BIOM", milk production was recorded daily. It was established that cows' average daily milk yield gradually increased under the influence of "AMINOBIOL", the milk increase was on average: for 10 days - 0.72 ... 1.68 kg, for 20 days - 2.28 ... 2.3 kg, for 30 days - 2.28 ... 2.44 kg. As for percentage, it was 21.27 ... 28.86% compared to this parametre before the experiment. As for the control group, as a result of stress due to a change in the

ration, there was a decrease in productivity on the 5th day. Application of the compound of active amino acids helps to improve the reproductive ability of cows and their insemination. The use of the medication "AMINOBIOL" increases the ecological value and quality of milk, contributing to the increase in fat, protein, lactose, the amount of milk fat, in general, it has a beneficial effect on the entire body of cows, and reproductive function. The biological effect of using this preparation is associated with an increase of assimilation of nutrient and biologically active substances of the ration.

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ELEMENTS OF PHOSPHORUS METHOBOLISM OF DAIRY COWS WHEN GIVING TO THEM WINTER AND SUMMER RATIONS

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Key words: feeding, exchange, metabolism, phosphorus, statistical analysis.

The article is devoted to a current problem of studying the characteristics of phosphorus metabolism in the body of dairy cows in the conditions of summer and winter feeding rations. The experimental and analytical part of the research was carried out at FSBSI All-Russian Research Institute of meliorated Lands, at an experimental test site located in the south-eastern part of Tver region. Zootechnical part of the study was conducted on Black-Spotted cows with a productivity of 4600..5000kg of milk. The experiment was conducted on summer and winter rations in a special place. The methodical principle of "unity of intergroup differences" and the presence of control animals was provided in the experiments, which allowed to obtain objective comparative experimental data and reliable conclusions based on mathematical processing using statistical computer programs. Study of the physiological experience results was carried out by method of correlation and regression analysis. The correlation analysis method was used to determine the interdependence of the phosphorus content in feed, feces, urine, milk and in the body (balance) of animals from its content in the ration. It allowed to establish a general relationship in phosphorus metabolism which occur in the body of the animal in the summer and winter feeding rations. It was established that phosphorus feed is mainly removed from the body of the cow with feces, as for muscles and tissues, it mainly gets into milk and urine. The digestion coefficient of organophosphorus compounds of silage and the absorption of phosphorus into the blood was significantly lower - 29.79 and 37.65%, than when feeding with green natural food. The phosphorus retention of experimental animals was maximum - 19.68 g during the winter period of feeding with Eastern galega silage, whereas from meadow clover - 9.14g. Conclusions made in the analysis of correlation matrices mainly confirm and clarify the dependences of phosphorus concentrations in feces and urine on its content in the feed, and are described by parabolas, the tops of which correspond to the range of phosphorus concentrations in the feed from 83 to 87 g.

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INFLUENCE OF VITAMIN A ON CONVERSION OF FEED INTO MAJOR NUTRITIONAL SUBSTANCES OF COMESTIBLE PARTS OF CALVES BRED WITH APPLICATION OF MALT SPROUTS IN THE RATION

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Keywords: bull-calves, feeding ration, malt sprouts, vitamin A, meat productivity, protein, energy, feed conversion ratio, food protein.

The article presents results of studies to determine the effect of vitamin A on feed conversion into main nutrients of the comestible part of bull calves fed application of malt sprouts in the ration. For scientific and economic experiment, 3 groups of bull-calves (10 heads in each) aged 12 - 13 months with live weigh of 280 - 290 kg were formed. Bull-calves of group I received 19 - 20 thousand of IU of vitamin A per 100 kg of body weight, which is equivalent to the norms of RAAS for carotene (1 mg of carotene is 400 of IU of vitamin A), group II - 20% more (23 - 24 thousand of IU per 100 kg of body weight), group III - 40% more (27 - 28 thousand of IU per 100 kg of body weight). The level of vitamin A was regulated by “Microvit A” with an activity of 500 thousand of IU per 1 g. It was established that the appropriate level of vitamin A is its content of 23–24 thousand of IU per 100 kg of live weight, or 20 % more than the recommended dose calculated for carotene. This provides an increase of the average daily gain of 11.4%, an increase of the carcass weight by 6.0%, including meat - by 7.3 and improves the quality of meat. The percentage of protein feed conversion into food protein was 7.46, which is 1.28% more than that of calves fed with the standard dose of vitamin A.

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CHEMICAL COMPOSITION AND ACCUMULATION OF HEAVY METALS IN TISSUES AND ORGANS OF BROILER CHICKENS IN CASE OF INTRODUCTION OF FEED ADDITIVE “GUMEL LUX” IN THE RATION

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Key words: feed, ration, health feed additive "Gumel Lux", broiler chickens, protein, fat, heavy metals.

The article presents materials on the effectiveness of feeding broiler chickens with feed additive “Gumel Lux” at a dose of 100 grams per 1 ton of feed. A positive impact on productivity, physical-chemical parametres of the quality of meat products and internal organs and a decrease in accumulation of heavy

metals has been established. Mass fraction of protein in the test group significantly increased in muscle tissue by 1.9%, in heart by 1.0%, in liver by 2.0% compared to the control group. The fat content in the test group significantly decreased by 0.8% in muscle tissue, by 1.0% in heart, and by 0.5% in liver compared to the control group. There was a significant decrease in lead content by 0.057 mg / kg, arsenic by 0.025, and mercury by 0.0043 mg / kg in muscle tissue in the test group of broiler chickens. The lead content decreased by more than 0.017 mg / kg, arsenic by 0.015, mercury by 0.0034 and cadmium by 0.006 mg / kg in heart. A significant decrease in lead content by 0.035 mg / kg, mercury by 0.007 mg / kg, arsenic by 0.009 mg / kg, and cadmium by 0.010 mg / kg was observed in liver of the test group chicken.

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IMPROVING STRESS RESISTANCE, PRODUCTIVITY AND MILK NUTRITION VALUE OF COWS IN CASE OF USAGE OF ANTIOXIDANT ADDITIVES IN THEI RATIONS

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Keywords: cow, antioxidant medication Lipovitam beta, Carcesel, milk, productivity, technological properties

The article presents data of experimental studies conducted on Black-Spotted and Bestuzhev breeds in industrial dairy complexes that prove that the introduction of antioxidant additives, such as Lipovitam Beta and Carcesel reduces the influence of man-made and feed stress factors, reduces accumulation of free radicals, which causes an increased level of assimilation processes, functional activity of the mammary gland, improvement of technological parameters of milk and milk products. It has been established that cows that were given antioxidant additives had significant productivity increase during lactation, the yield of milk fat and protein increased by 9.94% and 11.98% in case of using Lipovitam Beta, and by 6.22% and 4.89% in case of Carcesel. Along with the improvement of quantitative parametres, the technological parameters of milk-cream, butter and curd products have also improved. It is proved that antioxidant additives do not only increase the bioavailability of products of ruminal fermentation (acetic acid) and fat feed in the formation of milk fat, but they also significantly increase the size of fat globules. The differences among the compared groups of cows of each test on the yield of raw cream, butter and quark from the same amount of milk were also established: they were obtained respectively by 7.92 and 10.3%; 10.94 and 7.40%; 5.26 and 3.52% more in the test groups.

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CARBON AND FAT METABOLISM OF CALVES IN CASE OF APPLICATION OF SORTIBING - PROBIOTIC ADDITIVE BIOPINULAR

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Key words: sorption-probiotic feed additive Biopinular, calves, productivity, carbohydrate-fat metabolism, VFA (volatile fatty acids), ketone bodies.

The article presents results of experimental studies of the state of carbohydrate-fat metabolism of calves of Black-Spotted breed at the age of from birth to 6 months in case of introduction of a sorbent-probiotic feed additive Biopinular in their ration. It has been established that when it is used in the amount of 0.5 (group II) and 1.0% (group III) of the dry matter of the ration, the condition of the carbohydrate-fat metabolism improves, which is traced (within the physiological norm) in their blood at the age of 3 and 6 months, respectively, the concentration of sugar (by 3.38 and 4.27; 4.94 and 8.50% (P <0.01… 0.001)), with simultaneous reduction of VFA content in it (by 4.54 and 7.74; 5.63 and 9.40%, P <0.05… 0.001) and its saturation with ketone bodies (by 10.80 and 12.85; 7.46 and 11.99%, P <0.05 ... 0.001). Improvement of carbohydrate-fat metabolism parametres is direct evidence that the introduction of a sorption-probiotic additive Biopinular in the diet of calves improves their use of nutrients and their energy as a plastic and energetic material in assimilation processes, which was reliably reflected in the increase of live weight gain and improved feed conversion.

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WAYS TO IMPROVE THE PRODUCTIVITY OF NATIVE HORSE BREED

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Keywords: Trans-Baikal horse, Russian heavy horse, crossbreeds, live weight, productivity, meat qualities.

Herd-keeping of horses has become widespread in areas with natural forage lands. In this respect, the eastern regions of our country, including Zabaykalsky Krai, have great potential. Eastern Transbaikal occupies a vast territory. The pasture area is 58.3%, hayfields - 22.6% in the structure of agricultural land in this region. Proper use of pastures in winter and in summer period provides good grass-fattened qualities of young horses. Therefore, the main activity of farming is grassland farming, in which horse breeding plays a significant role. In this respect, it was decided to study meat productivity of horse colt of Native Transbaikal horse breed and compare it with its crossbreds with the Russian heavy breed under the conditions of rational use of pastures. In our studies, the assessment of the weight growth of young animals showed that by the age of 18 months, crossbreds with Russian heavy horse colts reached a live weight of 376.4 kg, and Transbaikalian ones - 328.5 kg. The slaughter yield for the test group was 64.1%, and in the control group - 60.2 %.

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