

TECHNOLOGY, MEANS OF MECHANIZATION AND POWER EQUIPMENT IN AGRICULTURE

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THE PERFORMANCE OF RAW MATERIAL VOLUME FLOW DETERMINATION IN THE EXTRUDER WITH THERMAL VACUUM EFFECT

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Keywords: extruder, filjera, coefficient, effect, flow rate, thermal vacuum, volumetric.

The purpose of the research is theoretical substantiation of the influence of the thermal vacuum effect for the volume consumption of raw materials in the extruder with vacuum chamber. Theoretical studies of the working process of single screw extruders allowed us to obtain analytical expressions, which can be used to determine the volume flow rate of extruded raw materials serial machine. For extruders using thermal vacuum effect in their work, this theory does not allow to obtain acceptable results, since it does not take into account the fact that the technical solution implemented in the experimental extruder, compared with the serial machine allows to increase the coefficient of explosion of the extrudate in 1,5...2 times. In turn, this significantly affects the volume performance of the extruder and does not allow to determine with the necessary accuracy the structural and technological parameters of the vacuum chamber and its sluice gate. In this regard, in the carried out researches, on the basis of the equation of balance of mass of the processed raw materials which is in a path of the extruder and its vacuum chamber, the coefficient considering influence of thermal vacuum effect on volume consumption of raw materials in the experimental extruder is theoretically proved, and also communication of this coefficient with other significant parameters of process of extrusion is established. The obtained results can be useful for further theoretical studies of extruders with thermal vacuum principle of operation and allow to calculate by analytical methods the main parameters of the vacuum chamber of machines performing thermoplastic extrusion of vegetable raw materials.

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VETERINARY MEDICINE AND ZOOTECHNICS

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THE VARIETAL COMPOSITION OF HEREFORD BREED DIFFERENT GENOTYPES CALVES CARCASSES

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Keywords: breed, young growth, carcass, composition, Hereford, varietal.

The aim of the investigation was to improve the beef quality and varietal composition of of the Hereford breed calves carcasses by interbreeding using bulls of canadian selection. The comparative estimation of a varietal composition of carcasses of bull-calves of the Hereford breed received from bulls-producers of the canadian and domestic selection is resulted. The control slaughter of young animals was carried out at the age of 18 months. Meat division into grades was conducted according to the current GOST 7595-79. All animals were classified in the highest to fatness – to 1 category. It was found that carcasses of bulls of different genotypes had different varietal composition. The highest meat content of the highest grade was characterized by the carcass, obtained from the descendants of the bulls form the canadian selection. The large quantity of Prime beef steers given the group's Wide Load 391W – 59.3 kg, 6.6 kg more than calves obtained from bulls of domestic breeding (12.5%, $P>0.95$). The superiority of the bull-offspring of this bull over the animals of the control group was 6.3 kg (11.9%, $P>0.95$). On the yield of premium beef, the differences between the groups were insignificant and unreliable. Young growth received from the canadian bulls, was characterized by a good exit of meat of the first grade. From each bull was obtained from 115.8 to 119.2 kg of beef first grade, more than from steers in the control group 10.1 ($P>0,95$), of 6.7 and 7.7 kg In the relative magnitude of it was 9.3, of 6.1 and 7.1%, respectively. The beef yield of the first grade the biggest differences between groups were not established, as well as the quantity and beef yield of the second grade.

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METHOD OF INCREASING BY ENERGY SATURATION OF HIGH-PRODUCTIVE COWS DIETES

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Keywords: feeding, concentration, energy, productivity, exchange, dairy, reproductive, palm.

The purpose of the research is increase the concentration of energy in the dry matter of cows diets with a productivity of 7-8 thousand kg of milk per year in the first third of lactation with the use of dry palm fats prepared by various technologies. In the experiment carried out on three groups of Holstein dams cows of Black-Motley Breed with the productivity of about 7.500 kg of milk per year for 9 cows each, it was found that the inclusion of dry palm fat (II experimental group – 300 g of fractionated fat with a predominance of saturated fatty acids and III experimental group – 368 g of fat in the form of calcium salt) in the composition of the rations of cows experimental groups with the aim of balancing the metabolizable energy content to the level of crude fat in an amount of 5% of the dry matter, has no adverse effect on dry matter intake of the ration, the digestibility of nutrients of feed and the use of nitrogen, calcium and phosphorus. The result of balancing the ration of cows of the experimental groups the concentration of metabolizable energy in dry matter from 10.3 MJ/kg in the control to 10.7 MJ/kg in the experimental groups, the increase in cow milk yield, standard (4%) fat content for 100 days of lactation was 8.8% ($P \leq 0.05$) and 7.6% increase in the yield of milk fat and protein. Feed costs per 1 kg of milk of cows of experimental groups, expressed in exchange energy, were below control by 3.7 and 2.6%, respectively. According to the results of biochemical blood tests, against the background of the tendency of increasing the intensity of nitrogenic and lipid metabolism, a significant decrease in the concentration of ketone bodies in the blood of cows of experimental groups was found. Feeding by dry palm fats in tested quantities does not reduce the reproductive function of cows and is economically justified.

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DEPENDENCE OF BEEF CATTLE BODY CONDITION ON ALIVE WEIGHT AND ITS ADJUSTMENT BY FEEDING LEVEL

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Keywords: fatness, mass, evaluation, correlation, regression, level, beef

The purpose of the research is to increase the economic efficiency of beef production in the system of «cow – calf» by adjusting the feeding taking into account the score of fat beef cows. For the effective production of beef is not enough to have highly productive animals and high quality feed. It is necessary to organize their rational use of feed. In technological groups animals have different alive weight, and norms of feeding of beef cattle are calculated, generally, depending on alive weight of animals. This is the wrong approach, because in the group (in the herd) animals can have the same living mass and have different energy requirements depending on the state of fatness. Adjusting the level of feeding depending on the fatness of animals will save expensive feed, as in the structure of the cost of beef a large share of the cost falls on feed (about 60%). In the course of the research, a high positive relationship between the alive mass and the point assessment of the cows fatness ($r=0.93$ for Hereford and $r= 0.95$ for the Kazakh white-headed breed) was established, which allowed to determine the regression coefficients between the features. It is found that increasing body condition by 1 point increases the alive weight of Hereford cattle 40.4 kg and in cows of Kazakh white-headed breed of 48.1 kg. This allowed us to determine the required changes in the feeding level for 90-100 days prior to calving to increase for cows with a body condition score of 1 by 3.02; 2 points – 2.67 to 3.02; 3 points on 1.70-2.55; 4 points at 1.32-1.70; 5-6 points to 0.85-0.91 EKE, for cows with a body condition score of 8 to reduce the level of feeding of 0.47-0.85 and EKE with fatness 9 points lower on 0.85-1.70 EKE. Thus, studies show that the organization of feeding depending on the condition, is a necessary point for achieving economic efficiency of beef production for the system «cow – calf».

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ALLELES ASSOCIATION OF BLOOD GROUPS WITH MILK PRODUCTIVITY OF THE SAMARA TYPE OF BLACK-MOTLEY CATTLE BREED

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Keywords: selection, genotype, breed, group, blood, Black-and-White, dairy.

The purpose of the research is the improvement of the population of the Samara type of Black-Motley breed of cattle for signs of milk production by controlling entry into the herd geomarketing desirable complexes. The evaluation of erythrocyte antigens of animals in laboratories of immunogenetic control of authenticity of origin of the animals, OAO «Samara» for 9 genetic systems by using hemolytic tests obdarena the method of the Fortieth. Allelofond analysis was carried out taking into account the classification proposed by N. Popov and G. Eskin. The data of breeding zootechnical accounting were used to study the level of productivity. Statistical data processing is performed using a computer program Microsoft Excel.

The level of milk productivity in the studied cows of Samara type in farms ranged from 5899 to 6886 kg, fat content from 3.78 to 4.07 %, protein from 3.08 to 3.22 %. Herds of Samara type are significant different in the yield of milk, butterfat and alcoholocaust. All farms showed significant superiority over Close corporation «Lunacharsky» (agriculture-originator) protein content in milk is 0.05-0.14%. In the stud of the population of Samara was identified markers associated with high milk yield: Close corporation «Lunacharsky» (6045-6220 kg): G₂Y₂E₁Q', O₂A₂J₁K'O', «-»; the limited liability company «Plemzavod «Druzhba» (6633-7218 kg): O₄Y₂A₁I'', «-», O₄Y₂A₂, G₂Y₂E₁Q', I₂, B₁O₃Y₂E₃G'/G'', O₁G₁, O₄D'E₃F₂G'O'; SPK (kolkhoz) named Kuibyshev (6131-6881 kg): G₂Y₂E₁Q', I₂, B₁O₃Y₂E₃G'/G'', «-», O₄Y₂A₁I'', O₁G₁; PSK named Kirova (5876-6210 kg): B₁O₃Y₂E₃G'/G'', E₃F₂G'O'/G'', G₂Y₂E₁Q', «-»; joint stock company «Plemzavod «Kryazh» (5045-6217 kg): O₄Y₂A₁I'', E₃F₂G'O'/G'', G₂Y₂E₁Q', O₁G₁, «-».

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THE INFLUENCE OF FODDER CONCENTRATE FOR BULL-CALVES OF BLACK AND MOTLEY BREED GROWTH RATE

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Keywords: feeding, calves, concentrate, mass, speed, live, weight.

The purpose of research is increase of beef productivity ultra-repair young cattle calves when fed forage concentrate Zolotoy Felucen. 60 heads of 6-month bulls of black-and-white breed serve as objects of research. They were formed into 4 groups of 15 individuals each. Experimental animals were created identical conditions of feeding and maintenance. In the diets of young II, III and IV groups included the feed containing 1 kg of: 50, 75 and 100 g protein-carbohydrate-vitamin-mineral (PCVM) forage concentrate Zolotoy Felucen. The dynamics of experimental bull-calves growth was studied. Based on these data, the calculated absolute and average daily gain and relative growth rate of the experimental steers. Studies have shown that the feeding of young growth of large horned cattle forage concentrate Zolotoy Felucen has a positive effect on weight growth. It is established that for the whole period of scientific and economic experience animals of I experimental group on AB-salute growth surpassed peers of control group by 14.8 kg (4.7%; $P < 0.01$), II experimental group – by 38.3 kg (12.3%; $P < 0.001$) and III experimental group – by 42.5 kg (13.6%; $P < 0.001$); on average daily gain of live weight superiority of bulls of skilled groups over peers of control group was expressed in 4.7-13.6% ($P < 0.05-0.001$); on relative gain – 1.98-6.31%. Feeding in compound feeds in the rations of steers PCVM fodder concentrate Zolotoy Felucen in quantities of 50, 75 and 100 g per 1 kg of feed has a significant effect on the weight growth in all the periods, growing from 6 to 18 months. The greatest effect was achieved with the inclusion in the composition of the diet forage concentrate Zolotoy Felucen at a dose of 75 and 100 g per 1 kg of feed.

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**PRODUCTIVE QUALITIES OF THE SIMMENTAL BREED BULLS
BY PROBIOTICS VETOSPORIN SUSPENSION FEEDING**

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Keywords: mass, yield, probiotic, diet, productivity, quality, beef.

The purpose of research is increase of beef productivity and beef quality of Simmental calves at introduction in a diet of feeding different doses of the drug Vetosporin suspension. Of the half-yearly animals, 40 males were selected and formed into group IV for the experiment. The differences were only in feeding. The young were fed the studied additive Vetosporin suspension. In this case, the supplement was an addition to the basic diet of animals of the experimental II-IV groups. The volume of the additive added was 0.1; 1.0; and 2 ml per 10 kg of live weight, respectively. Control group I, consumed exclusively a diet that does not contain an additive. Based on the results of the experiment at the age of 18 months. The prevalence of bulls of the experimental live weight over peers was observed, which was 4.4-25.3 kg (0.78-4.67%). The study of the studied indicators after control slaughter in the context of groups showed the superiority of bulls of experimental groups in all the periods studied. It is established that at the age of 15 months. The size of the removable live weight of the youngest of the control group was less by 8.0-19.7 kg (1.75-4.29%) than in the animals of the test groups. In this case, the leading position was occupied by the youngest of group III, the prevalence of which was 0.7-11.7 (0.14 -2.51%). It should be noted that after 3 months a similar picture of the distribution of the studied quantities was observed. As for the output of carcass, we can note the following. Outsider among the animals of the experimental groups was the control group. So the bulls of group I were inferior to those who received the additive by 0.7-1.3%. At 18 months, as well as at 15 months, the dominant position was occupied by gobies of experimental groups. It should be noted that among the animals of the experimental groups the leading place was occupied by the bulls receiving the feed additive in a dose of 1.0 ml per 10 kg of live weight, that is, the youngest of the III group.

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NUTRIENTS DIGESTIBILITY OF BULL CALVES BY CONCENTRATE ZOLOTY FELUTSEN DIET

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Keywords: bulls, productivity, digestibility, diet, concentrate, beef, fodder.

The purpose of researches is improving the productive qualities of young Black-Motley breed, when fed as a part of diet by protein-carbohydrate-vitamin-mineral forage concentrate Zolotoy Felutsen. The object of research was 60 heads of 6-month bulls of Black-and-White breed. According to the principle analogues they were formed into 4 groups of 15 individuals each. Experimental animals were created identical conditions of feeding and keeping. The difference was that in the rations of young animals II, III and IV groups included feed containing 1 kg 50, 75 and 100 g protein-carbohydrate-vitamin-mineral forage concentrate Zolotoy Felutsen. The diets of experimental animals was based on the chemical composition of feeds and their actual nutritional value in accordance with the detailed rules of feeding. The research results indicate that the feeding part of the diet forage concentrate Zolotoy Felutsen promotes better digestion of nutrients. Thus, the bulls of the experimental groups surpassed the animals of the control group in terms of dry matter digestibility by 1.74 ($P \geq 0.05$); 4.75 ($P \leq 0.01$) and 4.98% ($P \leq 0.01$), organic matter – on 1.73 ($P \geq 0.05$); 4.44 ($P \leq 0.01$) and 4.89% ($P \leq 0.01$), crude protein – on 1.6 ($P \geq 0.05$); 4.55 ($P \leq 0.01$) and 3.67%, crude fat – on 0.9 ($P \geq 0.05$); 1.47 ($P \geq 0.05$) and 0.75% ($P \geq 0.05$). On the basis of the received data on the accepted and digested nutrients coefficients of their digestibility were calculated. Studies have shown that the best rates of nutrients digestibility of the diet are achieved by feeding the bulls feed containing 75 g/kg of the feed concentrate.

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BULLS CONSUMPTION AND USE OF DIET SUBSTANCES BY PROBIOTICS VETOSPORIN SUSPENSION

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Keywords: diet, probiotics, suspension, bull-calves, fattening, balanced, nutritious.

The purpose of research is increase the efficiency of the use of nutrients for rations by Simmental breed bulls with various doses of Vetosporin Suspension. Bulls were fed by probiotic in the amount of 0.1; 1 and 2 ml per 10 kg of live weight. It has been established that the use of rations including the feed supplement studied, in the feeding of experimental groups, promoted an increase in feed intake. Thus, the young growth of the three experimental groups exceeded the analogues of the control group for the consumption of hay grass by 37-118 kg (1.47-4.68%), green weight – by 31-71 kg (1.74-3.98%). Concentrates, molasses, fodder, and salt were given to the animals in the same amount. It can be stated that feeding to the Simmental bulls of different doses of the Vetosporin drug suspension had a positive effect on the digestibility of the nutrients of the diet and their assimilation by the body. It is evident that in animals of experimental groups there is a certain superiority in certain indices over analogues of the control group. In this case, the animals of group I were inferior to the experimental groups by a digestibility factor of 1.03-2.24%, raw fat by 0.43-0.77%. For the rest of the indicators, there was a similar trend. When fattening Simmental bull calves, full-fledged and, importantly, balanced feeding was organized. Taking this into account, the use of probiotic fodder supplement, Vetosporin Suspension, contributed to greater consumption of all types of feed, nutrients and energy by animal test groups. In this case, the greatest effect was observed with the use of an approved additive in a dose of 1.0 ml per 10 kg of alive weight.

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PHENOTYPIC EFFECTS OF SOMATOTROPONOGO CASCADE GENES ASSOCIATED WITH BEEF PRODUCTIVITY OF KAZAKH WHITE-HEADED BREED COWS

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Keywords: genes, cascade, polymorphism, productivity, breed, somatotropic, beef.

The aim of the research was to study the influence of polymorphisms of the somatotropic cascade genes for the signs of the beef productivity of Kazakh white-headed breed. The blood of Kazakh white-headed breed was used as a research material. Blood samples, as well as zootechnical data were provided by LLP «Zhanabek» and LLP «Karaman-K», Kostanay Region. Determination of animal genotypes by the genes of pituitary transcription factor-1 (bPit-1), growth hormone (bGH), growth hormone receptor (bGHR) and insulin-like growth factor-1 (bIGF-1) was performed by PCR-RFLP using HinFI restriction endonucleases, AluI, SspI and SnaBI, respectively. Statistical analysis of the results of genotyping and zootechnical data was carried out using the programs Microsoft Excel 2010 and Statistica 6.0. Estimation of beef productivity was carried out according to the alive weight and indices characterizing the physique. The highest stretch index was observed in animals with the genotypes bPit-1-HinFI^{AB} and bPit-1-HinFI^{AA}. Thus, the index of the stretch index in cows with the genotype bPit-1-HinFI^{AB} is 129.464 (125.000; 132.787), for the genotype bPit-1-HinFI^{AA} – 127.966 (125.000; 132.787), while this indicator in cows with the genotype bPit-1-HinFI^{BB} – 124.167 (111.864; 131.026). The polymorphism bIGF-1-SnaBI is associated with the alive weight of Kazakh white-headed breed. Thus, animals with the genotype bIGF-1-SnaBI^{BB} at all ages are characterized by reduced alive weight in relation to animals with the genotypes bIGF-1-SnaBI^{AB} and bIGF-1-SnaBI^{AA}. However, the results of the evaluation of the identified preferred and undesirable genotypes with respect to the total sample showed a lack of statistically significant associations with beef productivity.

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HEMATOLOGIC AND BIOCHEMICAL PARAMETERS WITH SILAGE FEEDIN, CANNED BY SILOSTAN AND LAXIL

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Keywords: calves, blood, productivity, milostan, laxil, meat, hematological.

The purpose of this research is increase the beef productivity of bull-calves of Black-Motley breed at the expense of introduction in a diet of silage, canned by laxil and silostan. On hematological, biochemical, and other indicators of significant influence not only physiological state of the animal (age, pregnancy, productivity), but also the conditions of feeding, keeping, exploitation, and habitat. However, the picture of the blood retains its individual and specific features. Blood is one of the liquid media of the body, through which the replenishment of organs, tissues and the flow of essential substances (vitamins, macro- and microelements, etc.), as well as the excretion of metabolic products. Changes in the morphological and biochemical composition of the blood is an indicator of the developing latent stages of the body's disease, due to the violation of the metabolism. The article presents the results of studies on the effect of silage from alfalfa harvested preservatives silostan and laxil for hematological parameters of Black-Motley breed calves blood. It was found that hematological parameters of bull blood throughout the period of scientific and economic experience in all groups of experimental animals were within physiological norm and within its limits changed accordingly with metabolism in organism and intensity of animals growth. The content of red blood cells increases by 6.2 and 7.3%, hemoglobin-by 4.3 and 6.2%, total protein-by 2.8 and 5.7%, calcium – by 10.3 and 14.9%, phosphorus-by 3.1 and 4.9%. Overall hematological parameters ifrom generations of experience in all groups of experimental calves were within the physiological norm, and its boundaries have been changed accordingly with the metabolism in the body and intensity of growth of animals.

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GENE OF SOMATOTROPIN CASCADE POLYMORPHISMS, ASSOCIATED WITH BEEF PRODUCTIVITY OF KAZAKH WHITE-HEADED BREED COWS

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Keywords: genes, polymorphism, marker, cascade, productivity, breed, somatotropic, beef.

The aim of the research was to establish the genotype association of the polymorphisms *bPit-1-HinI*, *bGH-AluI* and *bGHR-Sspl* with the beef productivity of Kazakh white-headed cattle. The material of the studies was the blood of farm animals. Blood samples and boning data were provided by LP «Zhanabek» and LP «Karaman-K», Kostanay region. The animal genotypes were determined by polymerase chain reaction-restriction fragment length polymorphism. Statistical processing of the results of genotyping and zootechnical data was carried out using the programs Statistica 6.0 and Microsoft Excel. Evaluation of genotypes with meat productivity was carried out according to the live weight index, and indices characterizing the physique of animals were also analyzed. The results of the studies showed that the genotype *bPit-1-HinF^{IAA}* of the pituitary transcription factor-1 gene was positively associated with the stretch sign at the age of 24 months. Thus, the index of the stretch index in cows with the genotype *bPit-1-HinF^{IAA}* is 132.768 (126.667; 137.500), while this indicator for cows with genotypes *bPit-1-HinF^{IAB}* and *bPit-1-HinF^{IBB}* is 127.966 (120.833; 137.705) and 119.643 (117.544; 124.074). The polymorphism *bIGF-1-SnaBI* is associated with the sign of live weight at the age of 12, 18, 24 months (the highest value is the genotype *bIGF-1-SnaBI^{IAB}* and *bIGF-1-SnaBI^{IAA}*, the smallest is the genotype *bIGF-1-SnaBI^{IBB}*). Thus, the genotype *bPit-1-HinF^{IAA}* can be recommended as a genetic marker for the increased meat productivity of cattle of Kazakh white-headed breed. The genotype *bIGF-1-SnaBI^{IBB}* is a marker of reduced meat productivity of cattle. Working with polymorphism *bIGF-1-SnaBI*, as with a genetic marker, should not be based on selection on a preferred genotype, but on elimination of the negative genotype *bIGF-1-SnaBI^{IBB}*.

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