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Adaptive Ability And Efficient Qualities Of Foreign Breeding Goats Under The Conditions Of Russian Federation.

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ABSTRACT

There are presented data on the adaptive flexibility of goat organism of foreign breeding according linear implement with the use of yard housing box technology on the blood leucogram and the number of integrative indicators (state index, adaptive rate, ratio of lymphocytes and monocytes). The results of a study of the biochemical composition of blood and milk productivity of imported goats are given. It is established that in the new natural climatic and fodder conditions of the Middle Ural, the most stable functional system of immunological protection, phagocytosis, of imported goats begins to dominate, it is confirmed by increasing in the number of banded neutrophils in 2,6-4,3 times in comparison with the species norm. The redistribution of white blood cells (eosinopenia, neutrophilia, lymphopenia) is aimed at preserving functional homeostasis with long-term adaptation to stressful environmental conditions and indicating a peculiar disruption in the adaptation of imported goats in new natural climatic and fodder conditions. Integral indicators: state index - 19,6 - 19,8; coefficient of adaptation - 3,4 - 5,6; index of the ratio lymphocytes and monocytes - 17,9 - 29,3, characterize the functional state of the organism and the degree of tension of the body's regulatory systems when adapting to external influences, indicate the state of strain of the organism of imported goats in the conditions of the Middle Ural. An analysis of the biochemical composition of the blood of imported goats showed that in the blood of animals of all groups the content of total protein and the amount of globulins in its composition were increased in relation to the species norm. In the KRITTER KOUNTRY and THE EG66 lines these changes were more pronounced than in the goats of the STAR-FIRE line, which confirms a different level of adaptive abilities depending on the genetic affiliation of the animals. The yield of animals of the STAR-FIRE line was 727.4 kg, which exceeded the minimum requirements for the milk production of goats of this breed by 21.2%. The advantage of milking for lactation of STAR-FIRE goats before the herdmates of the THE EG66 and KRITTER KOUNTRY lines was 2.8 and 5.3%. A similar dynamics was also in the fat and protein content in the milk of goats. The highest mass fraction of milk fat and protein was in STAR-FIRE goat milk, the lowest line was KRITTER KOUNTRY. This result is confirmed by the results of hematological studies, suggests higher adaptive abilities of goats of the STAR-FIRE line and proves the expediency of further selection-breeding work using animals of this line.

Keywords: goats, adaptation, blood, leukocytes, integral index, milk productivity, milk composition.

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INTRODUCTION

Nowadays there is an intensive development of goat breeding in Russia that assumes creation of heavy yielder herds of animals. The production and processing efficiency of goat milk depends not only on the size of a yield of milk, but also on quality indicators of milk, such as content of fat and protein [7,8,9,10]. Often domestic breeds of goats do not provide fully these requirements therefore to the country deliver small cattle of foreign selection (breeding). One of unique breeds of goats is nubian for which the reference, along with high lactation performance, is the considerable content of fat and protein in milk. However changing of climatic and fodder conditions leads to increasing strength of functioning of all systems of organism and decrease in its resistance to external factors.

Due to the high cost of a breeding livestock of the imported goats, costs on its transportation and raising there is a need of more careful studying of adaptive capability of small cattle in relation to new climatic conditions, conditions of feeding and husbandry and also depending on their genetic accessory. The most significant studying element of adaptation flexibility of organism are results of blood analyses as allow to give a precise assessment of changes of a metabolism and define existence of stress and its stage. First of all the leukocytal system of blood which reflects the nature of adaptation reactions reacts to changes of external conditions. [3,4,6]

The easiest and informative way of assessment of the functional states is definition of the integral indexes generalizing the quantitative characteristic of rate of strain the regulatory systems of an organism at adaptation to new living conditions.

CONDITIONS OF KEEPING AND FEEDINGS OF GOATS

The organism of animals in the life-sustaining activity is exposed on various factors exerting the considerable impact on emergence of a stressful state. At the same time for 70-80% this process depends on conditions of feeding and keeping and only for 20-30% - on genetic accessory. Today in cattle breeding for keeping farm animals use the modern rooms which protect an animal organism from influence of adverse environmental factors. Despite it, when importing goats the greatest impact on adaptation of an organism to new conditions of dwelling is exerted by climate.

As basic farm for carrying out researches was chosen the farm of Sverdlovsk region which has typical for the region breed and age animals and the average level of production performance. The genetic structure of herd is presented by animals of the lines of goats-getters, most widespread in the region such as STAR-FIRE and KRITTER KOUNTRY. For milk production is used the loose housing box technology widespread in most enterprises of area. Floor indoors is warm, strong, smooth, waterproof, not slippery, is convenient for cleaning and disinfection, is made of concrete, sawdust is used as a laying. The ratio of the area of window and floor is 1:20. Air exchange is carried out at the expense of the forced-air and exhaust ventilation system through the exhaust mine with a section of 80 cm2 equipped with the adjusting valve and the affluent channels located at the level of the upper edge of windows. Air temperature indoors is optimum and is supported in cold season at the level 6-10oC. The relative degree of humidity of air is 60 — 70%. Traveling speed of air does not exceed 0,3 — 0,5 m/s., that provides air exchange indoors and enhances the cooled ability of air. The production technology and making of feeds, their nutritional and power value are traditional for a middle Urals. Watering and feeding of animals carry out in full accordance with their requirements and the standard norms of goat feeding.

The object of researches were the goats of nubian breed imported from the USA. For studying of adaptation processes and lactation performance of the imported goats three groups of animals up to 10 heads in everyone were created. There were goats of STAR-FIRE line in 1 group, THE EG66 – in 2 group, KRITTER KOUNTRY – in 3 group.

ADAPTIVE FLEXIBILITY OF GOATS.

Results of researches demonstrate that all animals have a satisfactory common condition and average fatness, not tousled smooth wool with a glossy shade, damages on extremities are absent, hoofs are put

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correctly, the wholeness of an integument has no signs of violation, the sensitivity is not increased. Pathological changes in work of the main systems of an organism are not revealed.

At assessment of a physiological condition of the imported goats was carried out the assessment of hematological and immunologic parameters of blood that allowed to reveal the level of tension of internals work.

Table 1: Indexes of the general resistance of goat's organism ($\overline{X}$ ±Sx, n=5)

Показатель	Группа		
	1 (STAR-FIRE)	2 (THE EG66)	3 (KRITTER KOUNTRY)
Leucocytes, 10^9/л	12,6±0,75	15,84±0,81	17,6±0,95*
which includes, % Eosinophil	0,7±0,27	1,6±0,36	1,7±0,39
Basophile	0,5±0,01	0,4±0,01	1,0±0,02
Banded neutrophile	2,6±0,26	3,4±0,19	4,3±0,34
Segmented neutrophile	35,5±0,99	34,0±0,95	36,3±1,11
Monocyte	3,2±0,09	2,0±0,12	2,0±0,16
Limphocyte	57,5±0,98	58,6±0,92	54,7±0,87

The obtained data showed that the quantity of leukocytes in goat's blood of different lines was unequal. It should be noted that only animals of the STAR-FIRE line had a value of this index within physiological norm. In blood of goats of THE EG66 and KRITTER KOUNTRY lines increase the number of leukocytes of upper bound of specific norm by 21,8 and 35,4%. In comparison with animals of the STAR-FIRE line this index was 25,7 and 39,7% higher. According to us, the physiological leukosis of animals in 2 and 3 groups is caused by processes of long-term adaptation in connection with the long-lived impact on their organism of new climatic and fodder conditions.

Using data of morphological blood composition it is possible to say about the general resistance of an organism which is defined as set of the physiological adaptive reactions directed to maintaining of a homeostasis to external irritations. The resistance is hereditarily determined and has genetic character. The mechanisms providing natural resistance extremely react to external influences and violations of the internal environment constancy. The characteristic of the general resistance is possible dew to defining in blood differentiated structure of leukocytes. Some types of leukocytes have the biological features therefore changing their ratio indicates the nature of impact of the external environment factors on an organism.

Proceeding from results of the research of a leukocytic profile, in blood of the imported goats are established changes of quantity and a ratio of formed elements which are typical for a stress condition. This state is expressed by eosino- and lymphopenia and a neutrocytosis. The number of eosinophiles in blood of 1 group goats was less than specific norm on 30 points, and at herd mates of 2 and 3 groups - at the level of its lower bound.

Neutrophils perform protective functions of an organism from pathogenic microorganisms and toxiferous compounds penetration. Neutrophils are polymorphonucleocytes therefore their numerical and functional state can affect on formation of an immunologic goats reactivity. It should be noted that banded neutrophile are seldom in goat's blood whereas at the imported animals it was from 2,6 to 4,3%. It's about a condition of a neutrocytosis and strength of adaptation mechanisms.

The quantity of segmented neutrophils in goat's blood of all lines was nearly at one level and did not overstep the bounds of physiological norm. Differences between groups were in limits of an arithmetic-mean error.

The quantitative maintenance of basophiles characterizes strength of processes of an immunogenesis in an animal organism. The obtained results demonstrate that in nubian goat's blood of the American selection the quantity of leukocytes was in limits of normative values.

The analysis of adaptation flexibility of an imported goat's organism showed that in new climatic and fodder conditions the quantity of the lymphocytes that produce antibodies and participating in cell-like immune operations was from 54,7 to 58,6%. At goats of the KRITTER KOUNTRY line it contents was lower concerning analogs of the STAR-FIRE and THE EG66 lines on 4,9 and 6,7 points.

In blood of goats of THE EG66 and KRITTER KOUNTRY lines is established the identical quantity of immune competent cells – monocytes and it was lower relatively to animals of the STAR-FIRE line on 37,5 points.

The indicator of a state is the objective characteristic of adaptation flexibility and shows the depth of system's reorganization organism's functions in a stressful condition. Its value is inversely expressivenesses of a condition of organism tension. The value of shape index at imported nubian breed goats of the American selection of different lines was in limits 19,6 – 19,8 that confirms emergence in an organism adaptation reactions as a result of influence of various factors of the external environment.

The value of assessment index of adaptation at goats of all lines was in limits 3,4 – 5,6 that indicates a condition of a chronic stress. It should be noted that goats of the KRITTER KOUNTRY line have smaller adaptation flexibility in comparison with animals of the STAR-FIRE and THE EG66 lines, their adaptation index was on 37,5% lower. For characteristic of an immune responsiveness of an organism people use the index of a ratio of lymphocytes and monocytes. Results of its calculation confirm tension of adaptive mechanisms in organism of the imported goats and indicate that an immune responsiveness of the animal organism KRITTER KOUNTRY and THE EG66 lines lower than animals the STAR-FIRE lines.

THE BIOCHEMICAL STATUS OF GOATS OF FOREIGN SELECTION IN NEW REGIONAL SOIL AND CLIMATIC CONDITIONS

Proteins of blood are its important constituent. They are in constant exchange with proteins of body tissues and have big informational content in respect of intensive proteometabolism in animal organism.

Proteins of blood contain albuminous and globulinous fractions. Albumins create colloidal osmotic pressure of blood, promoting transfer of solvable intermediate byproducts between tissues. Globulinous fractions provide nutrients transportation and perform protective function of an organism from adverse factors of the external environment.

The obtained data and its analysis demonstrate that the linear implement of goats affected on a protein structure of blood.

Table 2: Content of the crude protein and its fractions in blood serum of goats (n=5, $\overline{X}$ ±Sx)

Index	Group			Specific norm
	1 (line STAR-FIRE)	2 (line THE EG66)	3 (line KRITTER KOUNTRY)	
Crude protein, г/л	85,8±1,25	77,3±1,38	79,6±1,31	61,0-75,0
Albumen, г/л	28,5±0,46	33,6±0,52	31,8±0,39	23,0-36,0
Globulin, г/л	57,3±0,73	43,7±0,61	47,7±0,45	27,0-44,0

The amount of the crude protein in animal blood of all groups was above an upper bound of specific norm for 3,1 – 14,4% that can be caused by the physiological reasons, such as gestation, or abundance in a protein feed diet (tab. 2). Strengthening of the crude protein in blood can demonstrate also disorder of hepar,

the chronic course of infectious or inflammatory process at which protein comes to blood from the destroyed tissues. The highest level of the crude protein is established in blood of animals of the STAR-FIRE line, it was higher, than at analogs of THE EG66 and KRITTER KOUNTRY lines, for 10,9 and 7,8%.

The analysis of fractional protein composition showed that concentration of albumins in animal blood of all groups was in limits of physiological borders. Goats of the THE EG66 line had the most high level of it and was 33,6 gr/l and it was more in comparison with animals of the KRITTER KOUNTRY and STAR-FIRE lines for 5,7 and 17,9%. It should be noted that only animals of the THE EG66 line had a quantity of globulins within physiological norm. There is increasing of this index in goats blood of the KRITTER KOUNTRY and STAR-FIRE lines of rather upper bound of specific norm by 8,4 and 30,2%. We think that it can be caused by the chronic course of the hidden inflammatory process.

With changing amount of calcium, phosphorus, urea and glucose in blood it is possible to speak about providing organism with minerals and carbohydrates, and also about the level and intensity of course of exchange processes [1,2].

Our researches established that in goats blood of the STAR-FIRE and KRITTER KOUNTRY lines the amount of calcium was lower than physiological norm for 7,5 – 8,5%, the THE EG66 line – higher than physiological norm for 24,8% (tab. 3). Concentration of inorganic phosphorus in animals blood of 1 and 2 groups was on level with a difference in 0,01 mmol/l, in the 3rd group the value of this index was lower on average for 30%, but as in 1 and 2 groups, corresponded to normative. At the same time the ratio of calcium and phosphorus in blood of goats of all groups was in limits 1,3 – 2,2:1 at optimum 1,2-2:1. Development of hypercalcemia in animals of 2 group can be provoked by extra flux of calcium in organism against the background of increasing level of its absorbability in digestive tract. Lack of this element as well as its surplus, negatively affects the functioning of all organs and systems of organism of productive animals. The condition of a hypocalcemia at goats of 1 and 3 groups is perhaps caused by the lack of vitamin D as a result of poor receipt with feed, violation of its absorption, or a lack of solar irradiating.

Table 3: Biochemical indexes of goats blood (n=5, $\overline{X}$ ±Sx)

Index	Group			Specific norm
	1 (line STAR-FIRE)	2 (line THE EG66)	3 (line KRITTER KOUNTRY)	
Calcium, mmol/l	2,14±0,03	3,62±0,21	2,12±0,02	2,3-2,9
inorganic Phosphorus, mmol/l	1,66±0,11	1,67±0,06	1,28±0,06	1,2-3,1
Urea, mmol/l	6,68±0,36	5,28±0,82	5,78±0,90	4,5-9,2
Glucose, mmol/l	3,14±0,04	3,26±0,10	2,90±0,12	2,7-4,2
Triglycerides, mmol/l	0,38±0,02	0,26±0,007	0,30±0,004	0,2-1,1
Cholesterol, mmol/l	1,96±0,12	1,82±0,096	2,58±0,42	1,7-3,5

In goats blood of foreign selection of different lines is established different level of urea which was in physiological borders. Reliable difference on this index between groups was not established. Concentration of urea in blood of goats was ranging from 5,28 up to 6,68 mmol/l. At the same time it was the highest in blood of animals of the STAR-FIRE line and it was on 26,5 - 15,6% higher, than at goats of THE EG66 and KRITTER KOUNTRY lines. Perhaps, it is caused by the fact that urea is the end products of proteins breakdown and increasing its in blood is bound increasing in a mass fraction of the crude protein at animals of 1 group.

Level of glucose in blood of goats on average has to be 2,7-4,2 mmol/l. Carbohydrates represent the major energy source for an alive organism. Rather small amount of glucose is capable to provide course of power processes on rather high level. The great influence on carbohydrate metabolism in organism of goats is exerted by processes of ruminal digestion. In forestomachs of ruminants intensively proceed the processes of

polysaccharides hydrolysis and monosaccharides fermentation that lead to formation of the low-molecular volatile fatty acids which are a source for synthesis of glucose, a glycogen, fat and other compounds.

The amount of glucose in blood of goats of all groups varied from 2,90 to 3,26 mmol/l and was in physiological borders. The most high level of this monosaccharide is find out in blood of goats of the THE EG66 line that demonstrates increasing intensity of hydrolytic processes of polysaccharides digestion. As a result, increase in level of glucose involves increase in intensity of course of all oxidation-reduction processes in an organism.

It is known that triglycerides represent the main source of energy for cells. They come to an organism of animals with feed, further are synthesized in fatty tissue, then in liver and in intestines. High amount of triglycerides in blood foretells emergence of a metabolic syndrome, low amount– says about a chronic disease of lungs, violation of work of a thyroid gland, etc. On quantity change of triglycerides affect the overfeeding of animals and their weak physical activity.

In goats blood of the STAR-FIRE line was find out the highest amount of triglycerides that was higher, than at animal THE EG66 and KRITTER KOUNTRY lines for 46,2 and 26,7%, but did not overstep the bounds of physiological norm. Perhaps it is bound to the hormonal level of reorganization of work of an organism during a fetation at goats of 1 group. The quantity of triglycerides in blood is defined together with cholesterol.

Cholesterol falls into a class of lipids. About 80% of it synthesized in liver, other part comes to an organism with feed. Cholesterol is vital substance and plays an important role in metabolism of cells. It is an obligatory component of cell membranes and estrogen and a hydrocortisone shares in production of steroid hormones, including testosterone, also supplies body tissues with antioxidants, participates in fusion reactions of bilious acids which help an organism to acquire fats.

The highest level of cholesterol is find out in blood of goats of the KRITTER KOUNTRY line, it was higher, than at the animal STAR-FIRE and THE EG66 lines for 31,6 and 41,8%, but was in limits of physiological norm.

Enzymes of blood are catalysts of all vital processes of organism, on its activity it is possible to speak about productive qualities of animals.

Taking into consideration that in protein synthesis the important role belongs to transaminaznous activity of blood, was analyzed the activity of an aspartate aminotransferase (ASAT) and alaninaminotranspherases (ALAT) at goats of foreign selection

Table 4: Activity of aminotransferases of goats blood serum, Unit/l (n=5, $\overline{X} \pm S\overline{x}$)

Index	Group			Specific norm
	1 (line STAR-FIRE)	2 (line THE EG66)	3 (lineKRITTER KOUNTRY)	
АсАТ	107,54±2,13	96, 29±1,75	104,33±2,21	66,0-230,0
АлАТ	31,26±0,27	27,84±0,42	28,17±0,34	15,0-52,0

Serum glutamic oxalacetic transaminase and alanine aminotransferase are enzymes of a transaminases class which provide reversible tests of transfer of amino groups between amino acids and ketonic acids.

During researches we find out concordance of enzymes activity of a transamination to physiological needs of animals. The size of this index in all groups was in limits of physiological norm. On activity of an aspartate aminotransferase goats of the STAR-FIRE line had superiority over analogs of THE EG66 and KRITTER KOUNTRY lines. The difference was 11,7 and 3,1% The animal STAR-FIRE line surpassed in activity of an alaninaminotranspherase the analogs of THE EG66 and KRITTER KOUNTRY lines. The difference was 12,3 and

10,9%. Increasing in activity of aminotransferases at goats of the STAR-FIRE line serves as an indicator of the most intensive synthesis of protein that is confirmed by increasing the amount of the crude protein in blood serum of these goats. Increasing activity of transaminases is caused by features of a physiological condition of goats during researches that is followed by high intensity of course of biochemical processes in an animals organism.

MILK PRODUCTIVITY OF GOATS

The milk productivity of goats represents one of the major selection indexes. The maximal average daily yield of milk for a lactation is find out at goats of the STAR-FIRE line. It was higher, than at herdmates of THE EG66 and KRITTER KOUNTRY lines for 2,6 – 5,3%. This regularity is seen on all lactation periods.

Table 5: Average daily milk yields of goats, kg (n=10, $\overline{X} \pm S\overline{x}$)

Lactation period, day	Group		
	1 (line STAR-FIRE)	2 (line THE EG66)	3 (line KRITTER KOUNTRY)
1-100	3,51±0,27	3, 42±0,25	3,34±0,21
101-200	2,43±0,17	2,36±0,22	2,31±0,14
201-305	1,27±0,08	1,23±0,09	1,20±0,06
On average for a lactation	2,40±0,19	2,34±0,21	2,28±0,15

Throughout lactation the intensity of processes of milk formation significantly changes. The value of yield at milk lactation depends also on constancy of a lactation curve. Till 100th day of a lactation on which was the maximal yield of milk (the 4th month) in all groups of animals, except control, increased the milk productivity. Further lactations are gone by natural decrease in average daily yields of milk all the way. Such regularity is caused by a physiological condition of animals during the different lactation periods. However the intensity of change of average daily milk yields on months of a lactation depending on the linear accessory of goats was various.

Based on our researches, in the first 100 days of a lactation there is a natural increase in average daily milk yields at animals of all groups. The most stabile milk yields are noted at goats of 1 group, they had a high resist lactation curve. Animals of 2 and 3 groups had also high, but unstable lactation curve.

One of the indexes of account and assessment of milk productivity is the milk yield in 305 days of lactation (tab. 6). The most milk for a lactation is from goats of 1 group. The milk yield of these animals was 727,4 kg that exceeded the minimum requirements to milk productivity of goats of this breed for 21,2%. Advantage on a milk yield for a lactation of goats of the STAR-FIRE line before herdmates of THE EG66 and KRITTER KOUNTRY lines was 2,8 and 5,3%.

The main quality indicators of milk are the fat and protein content of it. The butterfat content of goats is the most important sign of assessment of animals on milk productivity. With increasing the concentration of fat the nutritional and power value of milk increases and its prime cost decreases [5].

The highest mass fraction of fat is in goats milk of the STAR-FIRE line (4,45%) and it was higher, than at analogs of THE EG66 and KRITTER KOUNTRY lines, on 0,9 and 1,6 points.

Along with milk fat the most valuable constituent of milk is protein. The maximal value of this index is in 1 group (3,50%) and it was higher, than at herdmates of 2 and 3 groups on 0,8 – 1,1 points.

Table 6: Milk productivity of goats in 305 days of a lactation, (n=10, $\overline{X} \pm S\overline{x}$)

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Index	Group		
	1 (line STAR-FIRE)	2 (line THE EG66)	3 (line KRITTER KOUNTRY)
Milk yield, kg	727,4±6,8	707,2±8,4	691,0±7,3
Mass fraction of fat, %	4,45±0,05	4,41±0,02	4,38±0,01
Mass fraction of protein,%	3,50±0,01	3,47±0,02	3,46±0,02
Quantity of milk fat, kg	32,37±0,86	31,19±0,78	30,26±0,62
Quantity of milk protein, kg	25,46±0,93	24,54±0,71	23,91±0,58

The determination of amount of milk fat and protein from goats with milk for a lactation in general is important for assessment of economic efficiency of milk production . Monthly monitoring of content of fat and protein in milk allowed to calculate these indicators. The maximum output of milk fat is with milk of goats of the STAR-FIRE line (32,37 kg) and it was higher, than at analogs of THE EG66 and KRITTER KOUNTRY lines, for 3,8 and 6,9%. Similar results are also on milk protein: its least contents was in milk of goats of the KRITTER KOUNTRY line – 23,91 kg. The most large amount of milk protein is in 1 group that exceeded on 0, 9 and 1,6 kg (3,7 and 6,5%)the value of this index in 2 and 3 groups.

Milk is an indispensable food stuff dew to the content of the significant amount of the nutrients which are in form available to fixing. Protein is an important component of milk. It has the high biological value as contains indispensable amino acids which share in creation of cells of an organism, enzymes, protective bodies, hormones etc.

Table 7: Casein and serum proteins contain in milk of goats, % (n=10, $\overline{X} \pm S\overline{x}$)

Index	Group		
	1 (line STAR-FIRE)	2 (line THE EG66)	3 (line KRITTER KOUNTRY)
Casein, %	2,70±0,01	2,66±0,01	2,65±0,02
Serum proteins, %	0,80±0,01	0,81±0,01	0,80±0,01

The protein of milk is heterogenious and is presented by a casein and serum proteins. The greatest specific weight in total proteins has casein. Its biological value is defined by contents of key amino acids. Serum proteins have great physiological value. Their quantity is a marker of various metabolic disorders and the states of animals health.

The analysis of fractional composition of milk proteins showed that the linear accessory of goats affected on protein composition of (tab. 7). The mass fraction of a casein was the highest in milk of goats of the STAR-FIRE line that exceeded value of this index at animal THE EG66 and KRITTER KOUNTRY lines on 1,5 and 1,9 points. The amount of serum proteins in milk of goats of all groups was almost identical with a difference in 0,01%. Dynamics of concentration of these components is similar to changing of the crude protein. At the same time the ratio of a casein and serum proteins was in limits of normative values.

DEDUCTIONS

1. Values of monocytes and banded neutrophils are higher on 2,6 – 4,3 times In blood of the imported goats in comparison with specific norm.
2. The amount of the crude protein in blood of animal of all groups was higher an upper bound of specific norm for 3,1 – 14,4%. In blood of goats of the KRITTER KOUNTRY and STAR-FIRE lines increase concentration of globulins of rather upper bound of specific norm by 8,4 and 30,2%.

3. The milk yield of animals the STAR-FIRE line was 727,4 kg that exceeded the minimum requirements to milk productivity of this breed goats for 21,2%. Advantage on a milk yield for a lactation of goats the STAR-FIRE line before herdmates of THE EG66 and KRITTER KOUNTRY lines was 2,8 and 5,3%.
4. The highest mass fraction of fat is in milk of goats the STAR-FIRE line (4,45%) and was higher, than at analogs of THE EG66 and KRITTER KOUNTRY lines, on 0,9 and 1,6 points. The maximal protein content is in milk of goats the STAR-FIRE line (3,50%), it was higher, than at herdmates of THE EG66 and KRITTER KOUNTRY lines on 0,8 – 1,1 points.

CONCLUSION

Thus, in the adaptation course of imported goats organism there is tension of system of a leukopoiesis and change a ratio of various forms of leukocytes that is confirmed by the nature of change of integral indexes.

In the new natural climatic and fodder conditions of the Middle Ural, the most stable functional system of immunological defense, phagocytosis, begins to dominate in imported goats, which is confirmed by higher values of the number of monocytes and increasing in the number of stab neutrophils in 2,6-4,3 times compared to the species norm. The redistribution of white blood cells (eosinopenia, neutrophilia, lymphopenia) is aimed at preserving functional homeostasis with long-term adaptation to stressful environmental conditions and indicating a peculiar disruption in the adaptation of imported goats in new natural climatic and fodder conditions.

An analysis of the biochemical composition of imported goat's blood showed that in the blood of animals of all groups the content of total protein and the amount of globulins were increased in its composition in relation to the species norm. These changes were more pronounced in the KRITTER KOUNTRY and THE EG66 lines than in the goats of the STAR-FIRE line, which confirms a different level of adaptive abilities depending on the genetic affiliation of the animals.

The yield for 305 days lactation of all imported goats was higher than the minimum requirements for the milk production of this breed, but differed depending on the genetic affiliation of the animals. Goats of the STAR-FIRE line had an advantage in terms of this indicator relative to the animal KRITTER KOUNTRY and THE EG66 lines, which amounted 2.8 and 5.3%. A similar dynamics was also in the content of fat and protein in the goat's milk. The highest mass fraction of milk fat and protein was in STAR-FIRE goat milk, the lowest line was KRITTER KOUNTRY. This result is confirmed by the results of hematological studies, suggests higher adaptive abilities of goats of the STAR-FIRE line and proves the expediency of further selection-breeding work using animals of this line.

The advantage of selecting animals that possess high adaptive flexibility is the possibility of creating highly productive goat herds of domestic breeding, as well as increasing the efficiency of goat's milk production. In addition, it is possible to accumulate genetic material to create a sperm bank of breeding animals with a high genetic potential for productivity and quality of milk.

CONFLICT OF INTEREST

The authors confirm that the presented data do not contain a conflict of interest.

GRATITUDE

The research was carried out at the expense of the federal budget at the request of the Ministry of Agriculture of Russia in 2017, while carrying out the theme of research work AAAA-A17-117072510065-7 "Theoretical justification and development of a program for adapting goats of foreign breeding (Alpine and Nubian breeds) taking into account genetic potential and regional soil-climatic features to achieve economic efficiency of milk production".

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