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MORPHOGENESIS OF THE HIND LEG DISTAL MUSCLES OF HISSAR SHEEP OF DIFFERENT BREEDS IN DIFFERENT ECOLOGICAL CONDITIONS

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ABSTRACT:

The morphometric parameters of the muscles acting on the joints of the proximal chest limbs in different physiological periods of the postnatal ontogenesis of the Hissar breed were studied, and an intensive increase in the absolute indices up to 3 months was revealed and the highest indices were noted at 18 months of age than the other studied ages of postnatal ontogenesis.

KEYWORDS: Hissar sheep, postnatal ontogenesis, adequate conditions, inadequate conditions, thoracic limb, proximal section, muscle, growth factor, absolute indicator, morphometric, linear parameters, mass.

INTRODUCTION:

Muscles are an active part of the vertebrate organs of voluntary movement, and their morphofunctional properties are directly influenced by the anatomical and topographic location and scale of movement, as well as the natural living conditions of organisms, geographical relief. The study of the laws of the dynamics of muscle growth at different physiological stages of the postnatal ontogeny of the body is of great scientific and practical importance.

According to some authors [3], subcutaneous adipose tissue provides energy to other tissues as well as muscle tissue during milking. It is noted that the sarcoplasmic fractions of proteins that make up all levels of metabolism in skeletal muscles are maintained at a high level and have the ability to maintain a slightly higher level of biosynthetic processes in the muscles.

N.D. Tsyrendondokov (1991) and F.R. Feyzullaev (2009), as a result of studying the meat productivity of sheep of the Volgograd breed, found that rapid fattening of young animals is a characteristic feature of this breed [4, 5]. According to the authors, 3-4-month-old rams weigh 28-36 kg, and females 26-32 kg live weight.

C. S.Tailor et al studied 12 muscles of sheep belonging to four different breeds, and according to their data, these muscles make up 41% of the body muscles [6]. Although significant differences in individual muscle weights were observed during the studies, surprising results emerged when the numerical measurements were determined as a percentage of the total body muscle weight. That is, there was no significant difference in individual muscles in any breed, however, Southdown sheep had the highest rate of 6 out of 12 muscles, and therefore this type of muscle development was recognized as somewhat expedient.

According to E.A. Nikonova, with increasing age of lambs of the Tsigai breed, the specific gravity of the musculature increased in the axial part of the skeleton, and, conversely, decreased in the peripheral part [2]. The author's research also revealed a more rapid growth of the shoulder girdle muscles within the bullet skeletal muscles, and the chest and

abdominal wall muscles after weaning the lambs from their mothers.

The study of the morphofunctional properties of skeletal muscles and the factors influencing the dynamics of change at different physiological stages of postnatal development of the organism has long been of interest to experts and researchers in the field. In particular, the dynamics of growth of skeletal muscle tissue in sheep during postnatal ontogeny were studied [1], its weight increased rapidly from the neonatal stage to 4 months, then slowed down to 10 months, and slightly increased at 12 months. The author connects this situation with the manifestation of sexual deformity.

Inspection method and materials. Adequate - Boysun district of Surkhandarya region, "Boysun Terakli" farm and inadequate - Sariosiyo district, "Surkhan Hisor sheep" farm, Uzun district "D Rozibadal Shohrukh" farm was carried out. The proximal muscles of the anterior leg of animals at 3-day, 3, 6, 12, 18, 36, 60-month stages of postnatal ontogeny were obtained for scientific studies.

The general morphological methods used and introduced by N.P. Chirvinsky was used in determining the morphometric parameters of muscles.

All numerical data obtained as a result of scientific research were mathematically processed by the method of E.K. Merkureva.

To determine the dynamics of muscle-age change, the growth coefficient was determined using a formula developed by K.B. Svechin.

The mathematical-statistical analysis was performed on a computer's Microsoft Excel spreadsheet using Student and Fisher criteria.

THE RESULTS OBTAINED AND ITS DISCUSSION:

Absolute values of long muscle length recording posterior toe joints in adequately cared for Hisor sheep ranged from 15,44 ± 0,2 cm to 17,74 ± 0,16 cm ($p < 0,01$; $K = 1.14$) from 3 days to 3 months of postnatal ontogeny increased, and decreased slightly at 6 months (16,96 ± 0,19 cm, $p < 0,01$), at 12 months to 18,6 ± 0,22 cm ($K = 1,09$), at 18 months Increase to 20,2 ± 0,28 cm ($p<0,02$), decrease to 17,34 ± 0.18 cm ($p < 0,01$; $K = 0,85$) at 36 months, and almost unchanged at 60 months (18.1 ± 0.25 cm, $p < 0.02$, $K = 1.04$). It was noted that the growth rate of the absolute indicator of muscle length reached 1,17 times during the studied stages of postnatal development of sheep.

The absolute measure of the length of the long muscle that records the hind toe joints ranges from 2,02 ± 0,4 cm to 2,16 ± 0,05 cm ($p<0,03$; $K = 1,06$) from 3 days to 3 months of postnatal development in Hisor sheep, an increase of 2,76 ± 0,05 cm ($K = 1,27$) at 6 months, a slight decrease at 12 months (2,5 ± 0,05 cm, $p<0,02$), the highest at 18 months compared to other ages (2,9 ± 0,05 cm, $p < 0,02$; $K = 1,17$), falls to 2,58 ± 0,09 cm ($K = 0,87$) at 36 months, and 2,72 ± at 60 months. 0.06 cm ($p < 0,02$). It was found that the growth rate of this muscle indicator was 2.34 times in sheep from 3 days to 60 months of postnatal ontogeny.

In absolute conditions, the absolute value of this muscle thickness in sheep of Hisor breed increased from 0,74 ± 0,02 cm to 0,84 ± 0.02 cm ($p < 0,04$; $K = 1,13$) from 3 days to 3 months of postnatal development. Almost unchanged at 6 and 12 months (0,82 ± 0,02 cm, $K = 0,97$; 0.84 ± ,.02 cm, $p < 0,03$, $K = 1,02$, respectively), and increased to 96 ± 0,02 cm ($p < 0,03$; $K = 1,14$), decreased significantly at 36 months (0,74 ± 0,02 cm; $K = 0,77$), and increased to 0,94 ± 0,02 cm ($p < 0,03$; $K = 1,27$) 60 months. It was noted that the growth rate of the absolute indicator of muscle thickness was 1,27 times during the studied stages of postnatal ontogeny.

The absolute value of long muscle mass recording posterior toe joints increased rapidly from 3 days to 3 months of postnatal ontogeny in esophageal sheep under adequate conditions, from 8,88 ± 0,2 g to 12,0 ± 0,39 g (p <0,04; K = 1,35), followed by a gradual process in the next 6 and 12 months (12,98 ± 0,3 g, K = 1,08; 13,98 ± 0,19 g, p <0,02, K = 1,07, respectively), reaching its highest level (22,38 ± 0,31 g; K = 1,6) at 18 months of age, and at 19,6 g (K = 0,87) at 36 months of age. fall and rise again at 60 months (21,6 ± 0,32 g, p<0,2, K = 1,1). The absolute rate of increase in muscle mass was 2,43 times during the period from 3 days to 60 months of postnatal development in sheep.

Absolute index of long muscle length recording posterior toe joints in inadequate conditions of Hissar sheep from 3 days to 3 months of postnatal ontogeny from 14,4 ± 0,19 cm to 16,04 ± 0,25 cm (p<0,02; K = 1,11) increased slightly at 6 months (15,68 ± 0,01 cm; K = 0,79), at 12 months 17,66 ± 0,29 cm (K = 1,12), at 18 months Increased to 18,66 ± 0,23 cm (p<0,02; K = 1,05) and decreased to 16,4 ± 0,2 cm (K = 0,87) at 36 months, and almost unchanged at 60 months (16, 7 ± 0.23 cm, p <0,02, K = 1,01). It was noted that the growth rate of this muscle indicator was 1,15 times during the studied stages of postnatal ontogeny in sheep.

The absolute value of the long muscle width of the hind toe joints ranges from 3 days to 3 months of postnatal development in Hissar sheep under inadequate conditions are increased from 1,82 ± 0,04 cm to 2,18 ± 0,04 cm (p <0,02; K = 1,19) and it was significantly at 6 and 12 months (2,32 ± 0,06 cm; K = 1,06; 2,2 ± 0,07 cm, p <0,02, K = 0,94), slight increase at 18 months (2,56 ± 0,05 cm; K = 1,16), decreased to 2,3 ± 0,05 cm (K = 0,89) at 36 months, and insignificant change at 60 months (2,5 ± ,.06, p <0,03, K = 1,08) were observed. It was noted that the growth rate of the absolute value of muscle width was 1,37 times from 3 days to 60 months of postnatal ontogeny.

The absolute value of this muscle thickness ranged from 0,62 ± 0,02 cm to 0,72 ± 0,02 cm (p <0,03; K = 1,16) from 3 days to 3 months of postnatal ontogeny in sheep, and Increased to 0,8± 0,03 cm at 6 months (K = 1,11), and decreased to 0,64 ± 0,02 cm at 12 months, the highest level at 18 months compared to other ages (0,86 ± 0,02 cm, p<0,03; K = 1,34), decreased to 0,64 ± 0,02 cm (K = 0,74) at 36 months, and increased again at 60 months (0,78 ± 0,02, p <0,03, K = 1,21) was observed. It was noted that the growth rate of this muscle is 1,25 times higher from 3 days to 60 months of age.

In absolute conditions, the absolute value of long muscle weight, which records the hind toe joints, increased rapidly from 3 days to 3 months of postnatal development, from 7,76 ± 0,1 g to 10,66 ± 0,21 g (p <0,02; K= 1,37), at 6 months it reaches 11,5 ± 0,17 g (K = 1,07), at 12 months it reaches 12,64 ± 0,16 g (p <0,02), at 18 months it is more intense. increase (21,6 ± 0,22 g, p<0,01, K = 1,7), decreased to 18,6 ± 0,22 g (K = 0,86) at 36 months, and 20,46 ±0.2 g at 60 months. It was noted (p <0,01; K = 1,1). It was found that the coefficient of growth of the absolute indicator of muscle weight was 2,63 times during the studied stages of postnatal ontogeny in sheep.

The absolute value of the deep muscle length of the hind toe flexors in adequately cared for sheep increased rapidly from 3 days to 3 months of postnatal development, from 9,22 ± 0,13 cm to 17,68 ± 0,18 cm (p <0,01, K=1,91), insignificant decrease at 6 months (16,82 ± 0,27 cm K = 0,95), at 12 months 20,68 ± 0,24 cm (p<0,01; K = 1,22), at 18 months of age 22,7 ± 0.22 cm (p <0,01; K =1,09), at 36 months it is 17,54 ± 0,21 cm (K = 0,77) and reached 60,5 ± 0,25 cm (p <0,02; K =1,16) at 60 months of age.The absolute value of muscle

length was found to be 2,22 times the growth factor.

The absolute measure of the width of the deep muscles flexing the hind toes ranged from 2,74 ± 0,05 cm to 5,32 ± 0,09 cm (p <0,02; K = 1,94) from 3 days to 3 months of postnatal development in Hisor sheep. increased and decreased slightly at 6 months (4,9 ± 0,07 cm; p<0,02), and increased rapidly at 12 and 18 months (7,8 ± 0,07 cm, p<0.01, respectively K = 1,59), 8.94 ± 0,13 cm, K = 1,14), falling to at 36 months 6,76 ± 0,07 cm (K = 0,75) and at 60 months 7,96 ± 0,13 (p <0,02; K = 1,16). This muscle growth rate was observed to increase 2,9 fold during the period from 3 days to 60 months of postnatal development.

The absolute thickness of this muscle increased rapidly from 1,02 ± 0,04 cm to 2,42 ± 0,07 cm (p <0,03; K =2,37) during the first 3 days to 3 months of postnatal development in Hisor sheep. , Decreased to 1,92 ± 0,04 cm (K = 0,79) at 6 months, and increased significantly at 12 and 18 months (2,58±0,06 cm, respectively, p <0,03, K = 1,34; 3,14 ± 0,05 cm, p <0,02, K = 1,21), at 36 and 60 months it decreased compared to 18 months (respectively 2,24 ± 0,05 cm, p <0,03, K = 0,71; 2,6 ± 0,07, p<0,03). The absolute rate of increase in muscle thickness was 2,54 times during the studied stages of postnatal ontogeny in sheep.

Absolute values of deep muscle flexion of the hind toes in adequate conditions are 12,58 ± 0,22 g to 31,9 ± 0,37 g (p <0,01; K = 2,5) from 3 days to 3 months of postnatal ontogeny, which gradually increases to 18 months, at 6 months to 33,0 ± 0,79 g (p <0,03; K = 1,03), at 12 months to 34,0 ± 0,79 g (K =1.03), at 18 months 41,0 ± 0,6 g (p <0,02; K =1.21), at 36 months it decreased significantly in proportion to its linear dimensions (29,92 ± 0,37 g K =0,72) and the highest level (43,4 ± 1,03 g, p <0.03; K = 1,45) was observed at 60 months of age compared to other age groups. it was noted that the growth rate of the absolute index reached 3,44 times during the period from 3 days to 60 months of postnatal development of sheep.

The absolute size of the deep muscle length of the hind toes flexed in inadequately cared for sheep increased rapidly from 8,76 ± 0,09 cm to 16,4 ± 0,2 cm (p<0,02; K=1,87), from 3 days to 3 months of postnatal development. at 6 months it was almost unchanged, at 12 and 18 months, respectively, 19.18 ± 0.26 cm (p<0,02; K =1,25); Rise to 21,68 ± 0,21 cm (p <0,01; K=1,09), a sharp decrease at 36 months (16,82 ± 0,18 cm, p<0,01; K =0,77) and was found to be 19,76 ± 0,25 cm (K =1,17) at 60 months. It was noted that the growth rate of the absolute indicator of muscle length was 2,25 times in sheep from 3 days to 60 months of age.

The absolute measure of the width of the deep muscles flexing the hind toes is 2,16 ± 0,25 cm to 5,08 ± 0,08 cm (p<0,02; K =2,35) from the first 3 days to 3 months of postnatal development in Hisor sheep. increased to 4,52 ± 0,07 cm (K = 0,88) in the next 6 months and decreased to 7,5 ± 0,15 cm (p <0,02; K =1,65) in the, at 18 months Rise to 8,82 ± 0,12; p <0,02; K = 1,17), fall to 12 month period 6,56 ± 0,13 cm (K = 0,74), at 36 months and 7,8 ± 0,1 cm, at 60 months (p <0,02; K =1,19). The growth rate of this indicator of muscle was 3,62 times from 3 days to 60 months of study.

The absolute value of the deep muscle thickness of the hind toe flexors increased slightly from 3 days to 3 months of postnatal ontogeny in sheep of the Gissar breed under inadequate conditions from 0,6 ± 0,03 cm to 2,1 ± 0,07 cm (p<0,04 K = 3,5), falling to 1,7 ± 0,06 cm (K = 0,84) at 6 months, and 2,28 ± 0,04 cm (p <0,02; K = 1,34) at 12 months, increased to 2,84 ± 0,05 cm (p <0,02; K = 1,24) at 18 months, decreased significantly at 36 months (1,98 ± 0,06 cm, K = 0,69), Almost unchanged at 60 months (2,18 ± 0,07 cm, p <0,04). It was

noted that the growth rate of this muscle was 3,65 times during the studied stages of postnatal ontogeny in sheep.

Absolute values of deep muscle flexion of the hind toes in sheep with inadequate natural conditions ranged from 3 days to 3 months of postnatal development increase from 11,68 ± 0,22 g to 30,7 ± 0,51 g ($p < 0,02$; K = 2,63) and gradually continue this process until the next 18 months, that at 6 months 32,08 ± 0,43 g ($p < 0,02$), at 12 months 34,7 ± 0,6 g ($p < 0,02$; K = 1,08), 38,6 ± 0,59 g ($p < 0,02$; K = 1,11), a significant decrease at 36 months (28,88 ± 0,36 g K = 0,74), at 60 months, had the highest level (41,22 ± 0,46 g, $p<0,01$; K =1,42) compared to other ages. It was found that the growth rate of the absolute indicator of muscle weight reached 3,52 times during the period from 3 days to 60 months of postnatal ontogeny of sheep.

CONCLUSION:

- The absolute value of the linear size and weight of the muscles affecting the hind toe joints of Hisori sheep increases rapidly from the first 3 days to 3 months of postnatal ontogeny;
- Morphometric parameters of the muscles of the hind toe joints of sheep of the Hissar breed, adequately and inadequately cared for in natural conditions, show a high level in the adult stage of postnatal development, that at 18 months;
- The morphometric parameters of the muscles affecting the joints of the hind toes are higher than those under inadequate conditions at all stages of the postnatal ontogeny of sheep of the Hissar breed, adequately cared for under ecological conditions.

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