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MORPHOFUNCTION OF THE GENITAL ORGANS OF LAMBS

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Annotation: Puberty in females of all types of farm animals is characterized by the complete morphological completion of the tissue structures of the genital organs and the manifestation of full sexual cycles. Therefore, studying the morphology of the genital organs in connection with the function of the pituitary-ovarian system can reveal some patterns in the formation of the sexual cycle of Karakul sheep.
Key words: Ovaries, follicles, oviducts, uterus, vagina, genitals, puberty.

Introduction. To intensify karakul farming, increasing demands are being put forward to increase productive qualities and ensure high reproductive capacity of animals with the organization of a clear rhythm in obtaining offspring [1]. As is known, the morphofunctional structure of the ovaries is quite variable. Knowledge of the structure, topography and functional characteristics of the ovaries in female animals at different physiological periods allows us to determine their normal state, diagnose obstetric and gynecological pathology, and also take them into account in selection and breeding work [2].

Object and methods of research. The objects of our study were the ovaries, oviducts, uterus and vagina obtained from females of the following age groups: 4-, 5-, 6-, 7-, 8- and 9 months of age. When studying the anatomical features of the genital organs, generally accepted methods were used. The topography of the organs was described directly in the opened pelvic cavity of the animals. The resulting material was fixed in a 10% solution of neutral formaldehyde, after which their linear weight parameters were measured. The mass of the studied organs was determined on laboratory scales. Ovaries, pieces from the middle part of the oviduct, uterus and vagina were subjected to histological analysis. They were fixed in a 10% solution of neutral formalin and embedded in paraffin.

The results obtained and their analysis. As a result of the conducted research, morphometric and anatomical characteristics of the ovaries, oviducts, uterus and vagina of livestock bred in Uzbekistan were given.

The histostructure of the ovaries, oviducts, uterus and vagina of the female species and its age-related changes were studied.

Starting from 4 months of age, the morphology of the genital organs of lambs was studied. The research results showed that at the age of 5-6 months, some morphofunctional changes in the genital organs are already noticeable (Table 1 and 2).

Table 1.

Anatomical changes in the genital organs are striking during puberty

№	Indicators (sm)	Age of lambs (in months)					
		4	5	6	7	8	9
1.	Length of uterine horns	4,0±0,6	4,3±0,2	5,0±0,3	5,2±0,2	6,0±0,3	6,5±0,01
2.	Uterine body length	2,0±0,2	2,2±0,01	2,2±0,1	2,3±0,1	2,4±0,2	2,5±0,2
3.	Uterine horn diameter	1,5±0,1	1,5±0,1	1,6±0,2	1,7±0,01	1,7±0,1	2,0±0,01

4.	The length of the vagina itself	4,0±0,2	4,2±0,3	4,4±0,01	4,5±0,2	4,6±0,2	6,0±0,1

Table 1 shows that, starting from 5-6 months of age, there is a noticeable growth of the horns of the uterus and vagina. At the age of 4 months, the length of the uterine horns is 4.0±0.6; 5 months – 4.3±0.2; 8 months – 6.0±0.3 and 9 months – 6.5±0.01. Changes in the length and diameter of the uterine horns, starting from 6 months of age, can be explained by the function of the ovaries, which is to a certain extent confirmed by morphological changes in these organs (Table 2).

Table 2.

Anatomical changes in the ovaries (n=5).

№	Indicators	Возраст ярок (в месяцах)					
		4	5	6	7	8	9
1.	Number of small follicles	0	0	3,0 (1-4)	4,0 (2-5)	4,0 (2-5)	5,0 (2-6)
2.	Number of medium follicles	0	0	0	1,0 (0-2)	2 (1-3)	4 (3-5)
3.	Number of large follicles	0	0	0	0	1 (0-2)	2 (1-3)
4.	Number of pathological follicles	0	0	1,0 (0-2)	1,0 (0-2)	2 (0-2)	2 (1-3)
5.	Number of corpora lutea	0	0	0	0	0	1 (0-2)

Table 2 shows that the first follicles in the ovaries begin to be detected at the age of 6 months. Large follicles are detected only at 8 months of age. With age, the number of pathological follicles at various stages of atresia also increases. However, the first corpora lutea are formed only at the age of 9 months. A certain pattern is revealed in the dynamics of growth and development of the genital organs. With the beginning of the formation of follicles in the ovaries, the growth and development of the horns of the uterus and vagina accelerates.

Observations of lambs during puberty have shown that only 5-15% of them exhibit full sexual cycles with the phenomena of heat and ovulation. It follows that the vast majority of lambs at the age of 8-9 months do not reach puberty, although all the morphological structures of the genital organs are formed. We attribute this to the seasonality of reproduction, since lambs reach 8-9 months of age at the end of the sexual season (November-December). In December, sexual processes begin to slow down and completely die out in the winter and spring. And only at the border of the next sexual season (September) do sexual processes resume again. At this time, the sheep already reach 1.5 years of age. Consequently, it is impossible to determine the onset of sexual maturity of Karakul sheep only by morphological data, which is confirmed by histological studies of the genital organs.

At the age of 5 and 6 months, histological examinations of the genital organs of the eggs showed the following:

Ovaries. The tunica albuginea is 28-30 microns, primordial follicles are 25-30 microns in diameter. In sections of the ovaries, there are 1-2 growing follicles measuring 800 microns, the remaining follicles measuring 70-100 microns.

Uterine horn. The thickness of all uterine walls at the bifurcation is 1080 microns, in the middle - 1050 microns. The epithelium of the uterine mucosa is represented by cylindrical cells 10-15 microns in height, their nuclei are located closer to the basal pole. The cells in the uterine glands

are almost the same; they are slightly convoluted, their lumens are narrow, up to 10 microns. There are few blood vessels and they are not completely filled.
Muscular membrane. Shell thickness from 54 to 800 microns, perimetry - 30-40 microns. There are many connective tissue fibers in the thickness of the muscle layer.
Body of the uterus. Mucous membrane - 470 microns, epithelium and glands are the same as in the uterine horn, but they are more convoluted.
Cervix. Villi up to 150 microns long. The epithelium is represented by several rows of cells, each of which is up to 10 microns.
Oviduct. Thickness – 1600 microns, has long fibers. Primary villi - 150 microns, secondary - up to 150 microns and tertiary - 70 microns long. The epithelium is cylindrical, up to 20 microns high. Muscular membrane up to 100 microns.
Vagina. Multilayer epithelium up to 30 microns thick. The height of the epithelial cells is 30 microns. The walls of the vagina consist of a thick connective tissue layer and thin muscle bundles.
Histology of the genital organs of lambs at the age of 8 months.
Ovaries. The tunica albuginea is 40 microns. In a section of the ovary there are up to 6 developing follicles with signs of atrophy. Primordial follicles up to 25-30 microns in size. There are blood vessels with a diameter of up to 300 microns; they are filled with blood.
Uterine horn. The mucous thickness is up to 650 microns, the epithelial cells are low, up to 10-12 microns. Uterine glands with a wide lumen. At the basal end the width of the lumen is 20 μm, and at the apical end it is 8-10 μm.
The muscular layer is up to 850 microns thick, the perimeter is 50 microns thick and contains connective tissue fibers.
Body of the uterus. Mucous membrane - 500 microns, epithelium and glands are the same as in the uterine horn.
Cervix. Villi up to 150 microns long. Epithelial cells are arranged in several rows. The height of the cells is 10 μm.
Oviduct. Thickness 1600-1800 microns. Primary villi - up to 160 microns, secondary - up to 150 microns and tertiary - 70 microns. The height of the cylindrical epithelium is up to 20-23 microns. The muscular layer is up to 135 microns thick.
Vagina. The mucous membrane is represented by multilayered epithelium up to 40 microns thick. The height of the epithelial cells is 30 microns. A powerful connective tissue layer is well expressed. There are muscle fibers.
Conclusions. A comparison of the results of morphological studies with the manifestation of sexual cycles shows that in Karakul sheep puberty occurs in two stages.
The first stage begins at the age of 6-7 months and continues until December. By this time they reach 8-9 months of age. In winter and spring, sexual processes slow down, which is expressed by a slowdown in the growth and development of follicles in the ovaries and their production of estrogens. Therefore, most females do not exhibit sexual cycles.
The second stage of the formation of sexual cycles and, consequently, the period of puberty begins in early September and is completely completed in late October - early November. By this time they reach 1.5 years of age. Long-term observations have shown that in years with unfavorable pasture and feeding conditions, 1.5-year-old sheep do not exhibit sexual cycles until November–December, and most of them remain barren. Consequently, in such years the second stage of puberty is also disrupted in sheep.
The results obtained make it possible to expand and supplement the existing information on the morphology of the reproductive system of farm animals.
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