ABSTRACT

PhD thesis entitled "RESEARCHES REGARDING THE MORPHOPHYSIOLOGICAL BASES OF SEASONALITY IN SHEEP BREEDING" addresses to a number of objectives as:

- Knowledge of the particularities of sheep breeding in the weather-climate conditions from S Moldova area;
- Monitoring the ovarian function in native sheeps during summer;
- Induction of ovarian activity and estrous phase in sheeps during the extra-season;
- Knowledge of the breeding particularities of rams in the weather-climate conditions from S Moldova area;
- Evaluation of rams reproductive function in summer weather climate;

PhD thesis contains 171 pages, written after norms in force, and includes a total of six chapters, illustrated in 124 figures and 45 tables.

Part I (state of knowledge), presents data from national and international literature, and includes 38 pages classified into four chapters supported by 15 figures.

In Chapter 1 are presented data regarding the morphology and physiology of ewe's genital apparatus, Chapter sprinkled with 14 figures. Chapter 2 describes morphological and physiological characteristics of ram genital apparatus. In Chapter 3, are presented the ewe's reproductive function particularities, like puberty and sexual precocity, the seasonality of reproduction function, external factors that influence it. In Chapter 4, is described the neuroendocrine activity in sheep, estrus synchronization methods in the extra-season, and neuroendocrine regulation of reproductive function in sheep.

Part II, personal researches section, is carried out over 133 pages and includes two chapters well outlined, with an iconography represented by 110 figures and 45 tables.

Each chapter includes material and working method section, results and discussion section and partial conclusions. The thesis concludes with a chapter of general conclusions and bibliography.

In Chapter V, entitled OBSERVATIONS ON THE BREEDING PARTICULARITIES IN SHEEPS IN THE S-E OF MOLDOVA, was monitored the ovarian activity and some sheeps breeding indices during natural mating season, also was monitored the oestrus stimulation in sheep during the extra-season. The first subchapter presents BREEDING ACTIVITY OF SHEEP UNDER

NATURAL CONDITIONS, and describes the livestock structure, analyzed during one year. The objective of this study was to monitor the breeding activity by age groups in correlation with known weather climate conditions.

Queen livestock structure (at which we can report and monitor the breeding activity) consists of ewes and rams. A number of 4749 adult sheeps (of which 96.8% ewes and 3.2% rams).Females racial distribution was 67.6% in Țigaie breed and 32.4% inȚurcana breed.

It is noted that, in the weather-climate conditions during the natural mating (14.5°C average temperature, amount of precipitation 2 mm/m and cloudiness 4.8), 91.2% of ewes have shown estrus and libido. In multiparous, 90.8% of the ewes showed estrus and mate with the rams and in primiparous estrous stage manifestation was evident, their share is over 96%.

The percentage of returns was higher in multiparous (3.5%) compared to primiparous (2.1%), for the whole flock of sheep. In Țurcana breed was noticed a more grouped appearance of oestrus period, especially in winter season (94.2%). In spring season, estrous signs in Țurcana breed females were observed only in 2.2% compared to 3.6% in the Țigaie breed. Average prolificacy was 121%, resulting a total of 4666 lambs. We note that 21% of females had twins. The number of twin parturitions were observed with greater frequency in multiparous (a prolificacy of 122%). Instead, the primiparous prolificacy was 109% and were obtained a total of 312 lambs. Calving rate had a higher value in Țurcană, the difference was of 1.2% (89.5% in Țigaie and 90.7% inȚurcană). Prolificacy in Țigaie breed was 126%, 15% higher than in Țurcana breed (111%). The number of lambs obtained is also higher and the proportion of twin parturitions was 15.5% higher (127% in Țigaie breed).

Also, in this chapter have been carried out several experiments grouped in the subchapter SHEEPS OVARIAN FUNCTION ACTIVITY DURING SUMMER.

Climate and fotoperiodism is an inductor of melatonin synthesis, especially in sheep, stimulating the function of reproduction. Stimulative is the decreasing of the day length and temperature.

After analyzing and centralizing the datas related to cyclic ovarian activity in Țigaie breed from south Moldova (Galați-Brăila area), corroborated with meteorological and hydrological datas, we see that 46.6% of the examined cases had cyclical oestrous activity at an average temperature of 23.1°C, cloudiness 2.7 and precipitation 1.3 mm/m2. We note that, under these conditions, it occurred and ovulatory estrous cycles detected by identifying the corpus luteum, in 4 cases.

In June, cycles accompanied by ovulation reached the highest level (20%) and the values of the minimum temperature (16°C) and average temperature (21.6°C) for that period were the lowest. Also, and precipitation level (2.8 mm/m2), and cloudiness (3.6) reached the highest values. So,

oestrus activity takes place in Țigaie breed in weather conditions from southern Moldova, at a value of 46.6% but ovulatory cycles are found in 13.3%.

A new focus of research was reprezented by subchapter 3, ESTRUS STIMULATION IN SHEEP DURING THE EXTRA-SEASON.

Heat synchronization during breeding season in sheep is mainly used to facilitate artificial insemination. Conventional treatment protocols are based on a scheme that aims to administrate progesterone for 12-14 days;

The effect of progesterone released by sponges and absorbed gradually into circulation is to block the sheeps hypothalamus (CNS) and stop the natural secretion of Gn RH. . The removal of the source of progesterone (after 12-14 days), will determine the entering into circulation of a sufficient quantity of natural Gn RH capable of producing a adenohypophysis response expressed through a secretion of gonadotropic hormones (FSH and LH). Follicle stimulating hormones, are released and they have direct action over evolutionary ovarian follicles. Thus, through the regimen used, occurs a hormonal cascade in waves that have as effect a ovarian follicular action. Follicles enter in the development and growth stage and then develop to maturity (de Grraf follicle). The administration of a 0.125 mg Proliz dose, suppresses the action of a potential existing corpus luteum located on the ovaries at that time. Prostaglandin F2α action is well known, producing luteolysis through some contractility phenomena of the ovarian stroma and of corpus luteum blood vessels leading to vasoconstriction.

Of the 25 sheep, inside the experimental group, subjected to estrous synchronization, a total of 24 sheep were identified with progesterone vaginal inserts. Thus, following the therapeutic protocol, in 24 of 25 sheep could use till the end the Cronogest therapeutic scheme, PG F2α and Folligon, group represented by 96%;

In 25% (6/25) of sheeps were observed reduced secretion, possible due to transient local inflammatory processes, caused by inserts reflex stimulation. Within 3 to 5 days, after the introduction of rams, and the end of hormonal synchronization regimen, the sheeps began to show estrus. A number of 23 sheeps (95.8%) responded to treatment and entered in heats. Analyzing and surveying the behavior of the sheeps, in three sheeps was observed estrus, poorly expressed clinically, between 3 and 5 days, with a rate of 12.5% (3/24);

Among the methods used to diagnose pregnancy in sheep, ultrasound method is certainly bringing more information, verifies the existence of pregnancy, make known the number of fetuses and helps us to mention quite specific calving date. Ultrasound is a fast, easy, atraumatic and unstresfull for animal. It could be done transabdominal and sometimes transrectal (when the probe is inserted into a rigid tube);

From the total of 23 sheep inseminated, in 17.39% (4/23), we could not reveal by ultrasonography any structures in pregnant uterus, and no fetal elements. So, we appreciate that fecundity in the present experiment had a value of 28.6%;

Subchapter 5.5 highlights, using histological and morfo-histochemical images, the physiological activity of the pituitary gland and ovaries of the sheeps from the experimental groups. The subchapter is entitled MORPHOLOGY AND CYTOCHEMICAL RESEARCHES REGARDING PITUITARY GLAND AND OVARIES IN SHEEP.

After the examination of the ovaries and pituitary glands from the slaughtered sheeps used for monitoring ovarian activity during the summer season, (E2), it was found that, morphological and histochemical, the foliculogenesis process takes place in the corresponding parameters. Such histological images were surprised: evolutionary follicles, cavitary follicles, corpus luteums in organization phase.

At the pituitary gland level was observed that in the chromophore adenohypophysis cells population still predominate glycoprotidic basophils cells, thus signaling a secretory activity.

In E1 group, at 3 days after removal of progesterone vaginal implants (Chronogest) has been shown, in the adenohypophysis, the prevalence of PAS positive gonadotropic cells, *beta* FSH and *gama* LH. In ovaries, were noted incipient follicles, tertiary and dehiscenct follicles that were supported in their development by the secretions of gonadotropic cells from the adenohypophysis, *beta* FSH and *gamma* LH;

Thus, 840 permanent preparations were obtained: 120 sections of hypophysis, 600 paraffin sections from the ovaries and 120 histochemical preparations by the ovaries to highlight cholesterol and its esters. Histological and cytochemical aspects were photographed under a microscope resulting in 132 images, of which 44 were selected images grouped in the 11 drawings.

In Chapter VII are presented researches directed to breeding activity of rams, aiming to elaborate the seasonal (natural mating season) and extra-seasonal (summer) spermograms; the chapter name is OBSERVATIONS REGARDING BREEDING PARTICULARITIES IN RAMS FROM S- MOLDOVA.

The first chapter presents: MONITORING THE RAMS BREEDING FUNCTION IN NATURAL BREEDING SEASON CONDITIONS. For breeding rams category we distinguish three technological phases: preparation for mating, mating period and semen collection by artificial vagina. These methods are easy to apply and the semen collected complies with quantitative and qualitative standards.

Researches regarding ejaculate volume revealed that a larger volume was collected from rams in the natural breeding season (1.12 ml) than those in the extra season (0.77 ml). Depending

on rams age, a larger volume of semen was recorded in 5 year old males. Assessing macroscopic parameters can highlight issues that do not meet quality standards. Analysis of sperm mobility recorded values consistently around 87%. Observations on sperm concentration showed averages of 3.3 billion/ml;

In the next chapter are presented the spermograms results obtained through MONITORING THE RAMS BREEDING FUNCTION IN SUMMER CONDITIONS

The rams sexual activity is influenced and controlled by a series of external and internal factors. Knowledge of seasonal dynamics, plays an important role in the production and sperm quality. Weather and climatic factors influence the production of semen by variations in temperature and light. Research supports the finding that, unlike ewes, rams exhibit libido and can perform mating all year round, but the number and quality of ejaculates obtained from rams varies by month and season, autumn being the greatest. There is a reduction in semen quality in rams due to high temperature in summer months. The high temperature associated with long light during the day can reduce mating desire to its disappearance.

Țigaie breed rams from southern Moldova had a volume of 0.76 ml average to ejaculate, durring summer. Volume limits ranged between 0.7 ml (at the 1.5 years old and 5.5 years old rams) and 0.9 ml (in 3.5 years old rams);

Semen concentration average in summer season was 2.04 billions/ml. There were no large differences between the monthly average values. Ejaculates concentration in June was 2.14 billions/ml. It has not undergone too much from summer average of 2.04 billions/ml. Weather conditions have a more striking influence over spermatogenesis and ejaculates concentration than over their volume.

Sexual activity and function are reduced at an average temperature of 23.1°C, cloudiness 2,7 and precipitation 1.3 mm/m2. Under these conditions, through spermatogenesis occurred a summer average concentration of 2.04 billion/ml, with a volume of 0.76 ml.