

ABSTRACT

The Karakul of Botoșani sheep breed is a representative breed for the northeastern part of the country, being encountered on a vast area, in a larger number in the counties like Botosani, Iasi, Vaslui and in a smaller flock in the counties like Bacau, Neamt and Suceava. Through the occupied area, but also by the size of the current population, it can be said that it is a breed loved and appreciated by breeders not only for the quality of the skins, but also for the level and quality of milk, meat and wool production it delivers.

The need to carry out a more laborious research on reproductive features is due to the fact that the Karakul of Botoșani breed, being quite recent approved, has not been evaluated at a complex level to see how it responds to the optimization of some predominantly economic factors for improving the mating activity.

In this purpose, the research was carried out over a longer period of time and characters on which the mating activity depends were included between the analyzed objectives.

The structure of the research was done on the basis of a priori plan, which included objectives and activities associated with them and were carried out on the Karakul of Botoșani sheep breed. The researches were carried out on the breed raised and exploitation within the Research Development Unit for Sheep and Goats Rearing in Botoșani County, and the informations regarding some specific breeding function characters were taken from the unit's zootechnical records. Other data were obtained based on the organization of experimental lots and researches in which the Karakul of Botosani breed was used.

All objectives included in the research program aimed at analyzing and researching efficient ways through which reproductive activity can contribute to genetic improvement, increasing the main reproductive indicators activity and shorten the intergenerational interval as well as increasing the precocity level.

All of these goals are extremely important because breeding activity is vital, first of all because the reproduction on this race is accomplished through selected breeders and is based on human factor involvement in matching pairs. Matching pairs takes place every season based on the use of objective criteria that support the program for improving the Karakul de Botosani breed. So, success in this area is dependent not only on the way in which breeding is organized and carried out in each season, but also on how the herds are prepared to manifest heat cycles during the natural period or in seasons considered atypical to this function .

The purpose of the planned researches was to carry out some analyzes, studies and researches regarding the identification of economic ways to guide the sexual cycle in Karakul of Botoșani sheep in order to increase production and breeding performance.

In this sense, the experimental protocol initiated the development of several activities and objectives, distinguished by certain experimental procedures, but all had the role of analyzing the direct, practical and technical impact on the breeding activity applied in the Karakul of Botosani breed.

Also, given the fact this breed is part of those who are recognized as conservative over the period in which they have heat cycle, research has also been carried out to assess the degree and manner in which certain useful and stimulating protocols and procedures can be applied to trigger ovulatory heat in other periods of the year.

Another important aspect of the research was represented by the study of the technological elements, referring to the ones that can generate an increase in body development rate allowing mating of

the youth categories (females and males) at reduced younger age compared to 15-18 months in traditional way.

During this research, other analyzes were carried out to find a more complex elucidation of the way in which Karakul of Botoşani sheep react in optimizing the influence of some natural factors that could be successfully used in an economical and efficient management way of breeding activity, with direct reference to the issuance of useful technologies for improving breeding activity in this sheep breed.

The biological material subject to research belongs only to the Karakul of Botosani breed, of known origin, being raised and improved for the production of lamb skins. During the research period the main breeding stock of the Karakul of Botosani breed was represented by the youth and respectively adult categories.

To meet the objectives set out in the research plan the working methods used were adequate to them and were recognized in the experimental technique in this field.

The first objective was to assess the influence of growth technology over body development in youth sheep categories. Through the experimental plan developed in a priori plan, we intend to investigate how the intervention in the process of raising lambs influences their body intensity and development at different ages, starting with the first day of birth until they are introduced into the reproductive circuit.

In order to assess the rhythm in which the body development process takes place in the two lambs batches, control weights were carried out, and to eliminate the influence of age, differences between lambs were less than 30 days.

For the actual rhythm and growth intensity determination, all individuals were weighed at different time intervals, respectively at the age of 6 months, 9 months, 12 months and at the transition to the basic flock, each stage of body mass accumulations assessment was preceded by a 12-hour starve.

To investigate the possibilities of sheep use in early reproduction, several experimental variants have been developed. In this way, the youth used for mating was divided into three batches differentiated between them by age. At the time of mating the females constituting batch 1 (L1) had 9 months, those in batch 2 (L2) were 15 months old and those in the third experimental batch (L3) were 20 months old. Detecting youth in heat was done with the help of trial rams and the mating was carried out respecting the leading list in the autumn 2015 season.

Assessing the influence of early use on reproduction over body development has been an important objective as it can have positive consequences on reproductive and productive cycle elements. In this way, in order to determine the influence of early breeding use of ewes from the first year of life, the batches made in 2013 were weighed after two successive breeding campaigns. The weighing took place after all ewes had a 12 - hour starve.

Determining the influence of age over the reproduction activity, analyzed by specific indicators, was an important objective of the research.

For a real analyze of how age influences breeding function in sheep, the research was conducted over the five natural seasons held between 2011 and 2015. In each season, was analyzed the heat cycle manifested by the ewes that form the main livestock of the Karakul of Botosani breed, as well as the number of sexual cycles at the beginning of each season required for fertilization according to the sheep age.

The total size of the research stock was over 700 adult ewes of different ages Karakul of Botoşani, from three years to ewes older than eight years. In order to assess the influence of age on breeding, this

stock was divided by age groups. All batches have the same experimental protocol, the only difference being represented by age or breeding generation.

The research regarding stimulating feed influence over breeding activity was based on the examination of how the Karakul of Botoşani ewes are responding to a period of stimulating feeding in order to carry out a new breeding season. In order to be able to compare the data obtained and to analyze it properly, two adult ewes batches were set up, each with a total of 250 females.

A batch was subjected to „flushing” feeding. This supplementary feed was based on the administration of a medium amount of 250 grams of grain and legume derived from the selection of grain and legume seeds, delivered in the shelter during the night, prior to grazing, for a period of 30 days.

The second batch had the same number of females but they did not benefit from additional grain, the whole batch being taken to the pasture without previous consumption of grain and legume.

After the set interval, rams were introduced to the herd each morning, and the mounting of females showing heat was made by using the nursery ram allocated through the mating leading list.

Research regarding the influence of atmospheric temperature over breeding activity in the Karakul of Botoşani breed was an important objective because the main purpose was to analyze the role of a microclimate parameter, respectively the temperature, on the onset of sexual cycles in sheep.

The biological material was represented by the adult sheep that formed the main breeding stock of the Karakul of Botosani breed. To ensure the high accuracy of data, in each season, from the three observed, the activities performed were similar, applying the same experimental treatments.

In order to highlight the correlation between the ewes number who manifested heat in relation to the thermal thresholds recorded in natural season, the studies were carried out on three consecutive breeding seasons, respectively in the breeding seasons of 2013, 2014 and 2015.

Research regarding the influence of nursery rams over the outbreak of sex cycles was another important objective. To investigate how the presence of breeding rams influenced the onset of sexual cycles in breeding females, in different months than normal mating season, a group of adult females were maintained separately from the herd.

The research was conducted in months placed outside the natural breeding season, respectively in May-June and was repeated for three consecutive seasons. Each year the batch was maintained in a separate compartment, and a breeding ram was introduced inside. To avoid exhaustion, the ram was changed every 5 days. On a daily basis, when the presence of a female in heat was reported, she was mated with the nursery ram allocated through the mating routing list.

Research regarding the influence of environmental and maintenance factors on rams breeding activity were an objective that attempted to highlight behavior in breeding rams in the off-season. In this sense, the experimental factor was represented by the influence of the daily light and temperature duration over a period considered to be out of season, respectively the calendar interval March - May. This time interval is totally different as thermal regime and daylight duration from October to November, which is considered as the normal one for mating sheep raised and exploited in the northern hemisphere and implicitly in our country.

First investigated aspect, in order to have conclusive results on the practical possibility of intensifying breeding activity in rams, was to subject rams to a program of gradual rotation of the temperature and the duration of light hours. During the first 17 days, a gradual increase in temperature and light duration was achieved until the daily values between 26 and 28 °C and 15 hours of light (average multiannual values corresponding to June 22) were obtained, followed by the gradual reduction

of those two facts so that after 18 days the rams could be exposed at an average temperature of 18 ° C and 10,45 hours of daylight (multiannual values for October 15 in the northeastern part of Romania).

When all influencing factors got synchronized were conducted studies, semen collection and observations, analyzing quantitative and qualitative aspects of semen and were made direct observations to see sexual behavior of breeding rams during off-season periods.

To investigate specific behavior, they were monitored and subjected to rhythmic activities of reflex initiation and formation required to collect semen through artificial vagina. The evaluation of sexual behavior was based on the intensity of the reflexes and the individual interest in performing the leap in presence of the sheep, the scoring being carried out on a scale of 1 to 5.

In order to analyze the seasonal effect on the semen quality, the rams were subjected to a collecting process after olfactory stimulation due to the presence of a ewe, process that took place in a compartment.

Research regarding specific genetic parameters determination in breeding activity was based on the analysis, processing and reading of the results in the zootechnical registers of SCDCOC Popăuți-Botoșani and included over 8000 data on adult sheep and the results obtained in each breeding season between the year 2011 and 2015. To eliminate errors and provide statistical data, the interpretation was done on animals of same age.