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The breeding scheme of the Karagouniko sheep in Greece

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SUMMARY - About 200,000 animals of the Karagouniko breed are kept in Thessaly, central Greece. These sheep are distinguished for their high production and endurance to difficult conditions. A genetic improvement programme for the Karagouniko breed has been established in central Greece by the Karditsa Animal Genetic Improvement Centre in collaboration with the local Artificial Insemination Centre and the Extension Services of the Ministry of Agriculture. At the age of 18 months, the semen of 20 performance tested lambs is used to inseminate 4,000 ewes in a nucleus population of 20,000 controlled animals. The best three or four male lambs are selected on the basis of their daughters' performance and are used for planned matings in the controlled population.

Key words: sheep, Karagouniko, milk, improvement

RÉSUMÉ *- Environ 200.000 ovins de la race Karagouniko sont élevés dans la region de Thessalie en Grèce centrale. Ces animaux sont caractérisés par leur haute production et par leur dureté aux conditions difficiles. Un programme d'amélioration génétique de cette race a été etabli de la part du Centre d'Amélioration Génétique de Karditsa en collaboration avec le Centre d'Insemination Artificielle et les Services du Ministère de l'Agriculture. A l'age de 18 mois, la semence de 20 béliers, testés pour leur performances, est utilisée pour l'insemination de 4.000 brebis qui font part d'une population nucléaire de 20.000 animaux contrôllés. Les trois ou quatre meilleurs agneaux mâles sont sélectionnés à la base des performances de leurs filles et sont utilisés pour des accouplements programmés dans la population contrôlée.*

Mots cles: *ovins, Karagouniko, lait, amélioration*

INTRODUCTION

In the majority, the sheep population in Greece belongs to the Zackel type, which is found all over the country and is characterised by the long tail and the coarse wool. All the so-called mountain breeds and the relatively numerous Karagouniko lowland (plain) breed can be classified into this group. In a second category belong breeds of the Ruda type, which they have finer and more uniform wool and are found mainly in Macedonia, Thrace and on some Aegean islands. In a third category belong sheep of the so-called semi-fat-tailed type, found on East Aegean islands. Although all of the above breeds can be broadly classified as dual purpose sheep (milk and meat), in the second and third category are breeds combining high prolificacy and milk yield. Among the most important dairy and prolific breeds are those of Chios and Skopelos. Also, worth mentioning is the breed of the Ionian island of Zakynthos (Zante), in the west coast of Greece, which, according to some sources, was introduced from Italy.

Today's evolution and distribution of the different sheep types and breeds is the result of developments and changes that took place over the past thirty years. Uncontrolled crossbreeding between the different breeds and the unplanned extension of artificial insemination played a major role in the disappearance of certain smaller breeds and in the diminishing number of the pure-bred mountain populations; this led to the creation of a cross-bred sheep that today is representative of the majority of the Hellenic sheep populations.

Sheep population in Greece is characterised by certain specific situations, as well as breed structure and husbandry methods. A large number of sheep producing units are composed of a small number of animals per flock (in fact, 60% of all flocks contain 1-50 ewes, which shows that they are of complementary importance to other agricultural production branches). The major production branch is milking, followed by the slaughtering of young lambs after early weaning at 40 to 60 days. Complementary feeding of flocks during the last part of pregnancy and during the suckling period (with the exception of some semi-intensive or housekept flocks of the plains) and the application of a transhuming system are characteristic of most of the major extensive flocks. At present, with a total sheep population of some 10 million head, milk production in Greece reaches about 640,000 tons per year and meat production 83,000 tons. The possibilities for growth in this sector of agriculture are very important and can be the result of long term genetic programmes, as well as the acceptance of better nutrition and keeping conditions.

THE KARAGOUNIKO SHEEP

Originated from central Greece (Thessaly) it is a classical lowland breed of the thin-tailed mixed-wool type. The population numbers around 200,000 head, with additional 800,000 crossbreds. Rams of this breed are used in many cases to upgrade the mountain breeds for better productivity. It is of medium size with a ewe height and weight of 68.4 cm and 56.9 kg, respectively. The relevant data for the rams are 77.8 cm and 80.4 kg. The weight of lambs at the age of 42 days is 14.7 Kg for single born and 11.5 for twins. Colouring is varying from white to black. The typical colouring is whitish with black spots on the head and feet. The males have horns.

Breeding can take place at 8-9 months of age, the lambing period is from November to February and the prolificacy reaches an average of 1.41. The flock's size varies between 40 and 150 head. The average marketable milk yield of the whole population is about 120 kg. The average marketable milk yield of all controlled flocks (350) is 183 kg milked in 166 days (1992-93). Cases of high producing flocks marketing 200-250 kg of milk per ewe are quite common. The officially controlled population (1992-93) is about 18,000 head in 350 units and a progeny testing scheme is under development.

THE ESTABLISHMENT OF THE NUCLEUS POPULATION

The Animal Genetic Improvement Centre of Karditsa was established in 1978 with the aim to improve the genetic potential of the sheep population of central Greece. For this reason, the establishment of a nucleus of 30,000 sheep belonging to the Karagouniko breed, was planned for the middle eighties (1986); an effort which was supported by the Extension Services of the Ministry of Agriculture in the Counties of Karditsa and Trikala, through the local agricultural bureaux.

Today, this nucleus consists of 20,000 sheep kept in 350 flocks. The performance recording of all the above sheep is carried out by 24 milk recorders, who either are employees of the Agricultural Extension Services, or they have been employed, for this purpose, by the Agricultural Co-operatives and the Co-operative Unions.

Milk recording together with other data are being collected by the Animal Genetic Improvement Centre of Karditsa for further processing in the existing computer facilities (PC's). At the end of each lactation period, summarised data for each flock are available, as well as the performances of each ewe separately. This makes possible the selection of: (a) the ewes which are going to be culled because their performances are considered to be low, and (b) the ewes the daughters of which will be kept for the natural renewal of the flock. The finally kept adult animals, together with the daughters of the high performing ewes, increase steadily every year, though in a slow way, the average performances of the controlled flocks.

Every year, the new data are published in a booklet, where all the controlled flocks of the nucleus are classified according to marketable milk yield level. The above booklet is a useful tool for the breeders, because it gives to them the opportunity to choose the flock from which will supply the rams, which, with great possibility, will genetically improve their flocks.

Recommendations and encouragement are given to the breeders of the nucleus in order to supply the appropriate rams for their flocks. The genetic improvement method applied and the plan used for securing rams, have been welcomed by the sheep breeders and have given satisfactory results.

An important part of the average milk yield increase is attributed to the improvement of the feeding of animals, which is the result of the close co-operation between the sheep breeders participating in the genetic improvement programme and the specialists of the Extension Services. Nevertheless, this increase is limited because of the fact that every year new flocks enter into the genetic improvement programme, which cannot keep pace with the others and, therefore, show low yields as a result of the inadequate feeding and management of animals.

THE PROGENY TESTING OF RAMS

Since 1986, the Animal Genetic Improvement Centre of Karditsa applies a progeny testing programme of the rams. The application of this programme is based on the substantial help provided by the Artificial Insemination Centre, which belongs to the Veterinary Service of the Karditsa County, as well as by the Directors of the Agricultural Extension Services of the Counties of Trikala and Karditsa and the Veterinary Service of the Trikala County.

The progeny testing programme applied by the Centre is the following:

About 55-60 male lambs at the age of 60 days, coming from the best ewes (mothers) of the best 20 controlled flocks of the Karagouniko breed, are bought every year by the Artificial Insemination Centre of Karditsa and are kept there until they reach the age of 18 months. The completion of this age coincides with the onset of the breeding season of the flocks.

At this age, some of them are slaughtered, either because their growth and, generally, their body condition is not the expected one, or because they do not produce semen, or because their semen is unsuitable for insemination. At the end, about 20 animals from the total number of rams remain in the programme.

Each one of the above 20 rams give 600 doses of semen with 40 ejaculations, which are used in 300 ewes belonging to 20 flocks of the Karagouniko breed controlled nucleus - each ewe receives two doses of semen in the same day. The semen of one breeding season of the 20 rams is used in a total of 6,000 ewes belonging to 100 sheep breeders.

Two inseminations are taking place within a period of 50 and 58 hours from the sponge removal and the simultaneous injection of 500 IU of PMS hormone. The number of ewes that conceive as a result of the inseminations, reaches a percentage of 35-45% and varies from year to year and among flocks.

Finally, from the total number of lambs born, 600-800 female lambs remain in the reproduction and production. According to this number, 30-40 daughters correspond to each ram.

The rams' daughters are bred in their flock, where prolificacy is being measured. Also, milk yield measurements after lambing at the age of 2 years approximately, are being taken. Four or five controlled rams are selected, having as standard the performance of their daughters, in order to be used in planned matings with exceptional ewes. The derivatives from these matings are expected to be of very high standards to be used for further improvement. The rams which are not selected, remain in the Artificial Insemination Centre for two more years and their semen is used for the fertilisation of low or medium performing ewes.

It should be noted that the Extension Services of the Ministry of Agriculture make big and continuous efforts in order to convince sheep breeders to pay more attention in the feeding of their animals, because, in many cases, sheep are not fed properly. It was found that proper feeding by itself can double the average annual marketable milk yield of many Karagouniko breed flocks in this area. Poor feeding reduces the importance of application of whatever genetic improvement programme in nucleus

population, though there are many perspectives of increasing milk yield with better feeding.

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