

## Breeding Program as a Tool for Education and Training of Young

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**ABSTRACT:** The major part of technicians with knowledge in the productions systems for goats and sheep are concentrated in Northeastern and South regions of Brazil. However, in recent years, the goats and sheep industries expanded to other areas of Brazil that suffer with the absence of professionals trained with these animals. GENECOC is a breeding program coordinated by Brazilian Agricultural Research Corporation, Embrapa Goats and Sheep, and has among the objectives to assist in training of human resources with specific skills on the animal breeding and production systems of meats goats and sheep. The program had supported the training of 36 students, being 14 graduate students and the development of 16 master projects and 6 PhD theses and it also has abroad actions. A breeding program with its dynamic process can help the education of the young preparing them to their professional life.

Keywords:

animal breeding

GENECOC

goats

sheep

### Introduction

The population of goats and sheep in Brazil were estimated in 2012, respectively, in 8,646,463 and 16,789,492 heads (FAOSTAT, 2013). These figures are concentrated in the Northeastern and South regions of the country. The first one has about 93% and 54% of national stocks of goats and sheep, respectively. These two regions always were traditional production areas of these two species in Brazil. On account this, universities and educational institutions in these regions pay special attention to these production systems and have specific courses related to these species in your syllabus. Thus, the major part of technicians with knowledge in the productions systems for goats and sheep are concentrated in these regions. However, in recent years, the goats and sheep industries expanded to other areas of Brazil, mainly to Center-West and Southeast that suffer with the absence of professionals trained with these animals. The problem is aggravated with the lack of knowledge regarding the new challenges in this new border of production.

The inequality between the increase in the production systems of goats and sheep and the number of expert technicians in these species in Brazil is higher in the animal breeding issue. The country has many professional with high level of education and training in genetics and breeding of dairy and beef cattle but it is possible count in the hands the number of experts in goats and sheep

breeding. Thus it is necessary educates the new young generation of students to be prepared to the new challenges of production of goats and sheep in Brazil.

### Materials and Methods

The Breeding Program for Meat Goats and Sheep (GENECOC; <http://srvgen.cnpc.embrapa.br/pagina/english/principal.php>) was released in 2003 (Lôbo et al, (2010)) and it is a genetic advisory service to producers and breeders of goats and sheep, provided by Embrapa Goats and Sheep, a research unity of Brazilian Agricultural Research Corporation (EMBRAPA), a governmental institution that coordinates the Brazilian National Agricultural Research System. GENECOC is funded by Embrapa research resources and by membership fees paid by the associated breeders.

The breeders associated with the program register a login and password to access the Flock Management System (SGR), network software that allows the recording, storage and management of information generated in their flocks (Lôbo, (2013)). Data collection is related to different periods of production, as the breeding season, birth, weaning, yearling, finishing, etc. The breeder has at his disposal, real-time reports that provide information on reports of females not pregnant, number of services per conception, fertility; prolificacy; estimates of births, lambing/kidding interval; age at first lambing/kidding; productivity indexes and productive efficiency of females; weaning rate and kilograms of lambs/kids weaned per the number of females exposed; survival rates for each stage of the exploitation, i.e., production, growing and finishing; gestation length; weights and weight gains.

The information collected allows the implementation of genetic evaluations, which are available through Expected Progeny Differences (EPD) for age at the first lambing/kidding, lambing/kidding interval, gestation length, lambing/kidding day (for those who make the breeding season), scrotal circumference, prolificacy, litter weight at weaning, weights and weight gains for the different ages. The EPD's generated by these evaluations are provided in the form of individual summaries for flock and also available online in the management system for livestock, so the breeder can use them in the tools available for selection.

Thus, the aims of GENECOC are: 1) to encourage, assist and support the producers in the bookkeeping zootechnical of their flocks; 2) to optimize the use of genetic resources available to breeders, while respecting the environmental

aspects and requirements of these resources; 3) to proceed genetic evaluations of rams/bucks, ewes/does and young animals, goats and sheep, purebred and crossbred for productive and reproductive traits; 4) to provide information of these evaluation in the form of Expected Progeny Differences (EPD); 5) to provide information for the selection of animals with adequate muscle development, good weight gain, good ability to slaughter and appropriate adult size, reducing maintenance costs, and efficient reproductive capacity, fertility and sexual precocity; 6) to promote integration between flocks of different regions of the country, popularizing the use of genetic resources and promoting the development of the activity; and finally, 7) to assist in training of human resources with specific skills on the animal breeding and production systems of meats goats and sheep. GENECOC welcomes graduate students for internships beyond supports the development of master and PhD projects of students of animal science, veterinary and biology courses. As Embrapa has cooperation terms with universities and other education institutions, GENECOC is a favorable environment to receive their students interested in the field of genetics of goats and sheep.

The students are educated and trained in the basic theory of genetics and animal breeding, and experience the daily life of a breeding program. By maintaining close contact with the technical staff and breeders participants of the program they know the main production systems in the country and experience the challenges of the exploration. They also are trained in the methodologies of genetic evaluation and in the application of selection indexes among other skills. As GENECOC has the SGR, the trainees also learn the basic procedures of programming and the theory of creation and maintenance of databases.

### **Results and Discussion**

In the last ten years GENECOC had supported the training of 36 students, being 14 graduate students and the development of 16 master projects and 6 PhD theses. The origin universities of these young were Federal University of Ceará, State University of 'Vale do Acaraú', Federal University of 'Vale do Jequitinhonha e Mucuri', Università degli Studi di Firenze (Italy), Federal University of Viçosa, Federal Rural University of the Semi-Arid. The students have attended the courses of animal science, veterinary and biology.

GENECOC also has contributed in action abroad. Nowadays, the program has collaboration projects in Ethiopia, with partnership with International Center for Agricultural Research in the Dry Areas (ICARDA), USA, with the Tennessee State University and Alabama Cooperative Extension System of Alabama A&M and Auburn Universities, and Colombia, with some support to 'Asociación Nacional de Caprinocultores y Ovinocultores de Colombia'. Especially in Ethiopia, technician of this country were trained in the use of SGR, methodologies of genetic evaluation, statistical analysis of data, etc.

A daily life of a breeding program has many challenges. The description of production system, the development of breeding objectives and selection criteria, the estimates of economic weights and animal breeding values, beyond the dynamic of recording, storage and management of information are challenging and the participation of the students in this process is important. Many students only experience the academic life in a university and after conclude their studies they do not have a sufficient background to perform an adequate work in the practical activities that are wished by private sector. This aspect is particularly important in Brazil, especially in goats and sheep industry. In this way, GENECOC is contributing to reduce this inequality. A holistic awareness is developing in these students and many them are spreading this knowledge out to others regions of the country and abroad too.

The program has been impacting on the individual formation of some students. Nowadays, GENECOC has one researcher of its team that was a trainee as a graduate student and after that developed her master and PhD projects into it and then passed on a national public contest to be Embrapa researcher. Other former trainees also are professors in some federal universities of Brazil what it is contributing to the development of the goats and sheep industry and helping to spread the knowledge about the genetics of these species. One of the major consciousnesses that these new professionals are spreading is related to the optimization of the use of the genetic resources respecting the animal welfare and the environmental, social, cultural and traditional aspects related to them.

### **Conclusion**

The education and training of students outside the academic life of universities are important to their development. A breeding program with its dynamic process can help the education of the young preparing them to their professional life.

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