
EVALUATION OF THE MILK PRODUCTION OF SAANEN GOATS IN BRAZIL

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SUMMARY: The objective of this research was to evaluate the production of milk and goat production systems of the Saanen breed in Brazil. Dairy goat farming is being established in the Brazilian semiarid as a profitable agricultural activity with aptitude for the north-eastern semiarid, where it is not required a lot of investments and large areas for development of this activity, and for these reasons, it is one of the alternatives suitable for generation of employment and income in rural areas, especially for small and medium farmers who live in agrarian reform settlements and traditional rural communities. Thus, it is necessary to increase the milk production of goats through the use of animals from specialized breeds, as the Brazilian genetic material is heterogeneous and not specialized for this activity.

Keywords: Crossbreeding. Goats. production systems.

AVALIAÇÃO DA PRODUÇÃO DE LEITE DE CABRAS DA RAÇA SAANEN NO BRASIL

RESUMO: O objetivo dessa pesquisa foi avaliar a produção de leite e sistemas de produção de caprinos da raça Saanen no Brasil. A caprinocultura leiteira vem-se consolidando, no semiárido brasileiro, como atividade agropecuária rentável com vocação para o semiárido nordestino, não necessitando de muitos investimentos e ou grandes áreas para seu desenvolvimento e, por esses motivos, é uma das alternativas indicadas para geração de emprego e renda no campo, especialmente para pequenos e médios agricultores que residem nos assentamentos de reforma agrária e em comunidades rurais tradicionais. Dessa forma, é necessário incrementar a produção leiteira de caprinos mediante a utilização de animais de raças especializadas, uma vez que o material genético brasileiro é heterogêneo e pouco especializado para essa atividade.

Palavras-chave: Caprinos. Cruzamentos. Sistemas de produção.

INTRODUÇÃO

Dairy goat production in Brazil is being on the increase as a profitable activity that has developed significant improvements in productivity in the last three decades. A further monitoring by technicians responsible for the improvement of livestock has been required in Brazil due to the recent increase in goat herds. An effective way to improve the productivity is by the study of the lactation curves of dairy goats (CAVALCANTE et al., 2013).

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According to Silva et al. (2007), the milk produced by goats is considered an ideal food for humans, especially for the elderly and children, due to its high digestibility, as well as being an option for people allergic to cow's milk protein. Dairy goat farming has increased significantly as a result of the initiative of producers with greater business insight and government programs, as in the states of Rio Grande do Norte and Paraíba (SARMENTO et al., 2006).

Brazil is the 15th bigger world producer of goat milk, which accounts for 1.15% of the world production (BRASIL, 2012). However, in Brazil, the goat milk is being produced in lower quantities, since dairy goats are more demanding about nutritional aspects, husbandry and installations. According to Souza et al. (2010), dairy goat farming is undergoing structural changes in its traditional system of management, due to the increase of the rural population and reduction of the size of rural properties, which can modify the production system.

Goat farming in the Brazilian Northeast is an important socio-economic activity both in the production of meat and milk. However, despite there are sires or crossbred animals of specialized breeds in milk production, as Saanen and Alpine Brown, in almost all herds, factors related to the raising environment have shown rules in one or more aspects related to weather, nutrition, health and management (GUIMARÃES et al., 2009).

Therefore, a suitable environment is one of the most important factors to animals in a production system (NEIVA et al., 2004). This means that livestock production is included in the environmental context, which has prospects of climate changes becoming more frequent, that can cause changes in management systems, especially in regions where environmental conditions are more severe for animal production (RIBEIRO et al., 2006).

Genetic potential, seasonality of production, quality of forage, weather, husbandry, among other factors can interact inside and outside the property limiting the increase in productivity and the supply of goat milk (GONÇALVES et al., 2008). Research involving characterization of production systems of a region based in the local reality can contribute to the development of high technologies that can make possible the sustainability of production systems. Thus, the aim of this review was to evaluate results of research about milk production rates and goats production systems in Brazil, especially for the Saanen breed.

DAIRY GOAT FARMING

Goat farming is linked to humans since the beginning of civilization, in which this activity contributed for fixing people on the first nuclei of settlements, providing products such as meat, milk and leather. Although this activity is developed in every continent, it is observed that this sector has not had support from the public sector, when compared to production sectors such as dairy and beef cattle, pork and poultry (DUBEUF, 2001; CARNEIRO, 2006).

According to recent data from the Municipal Livestock Production 2012, from the Brazilian Institute of Geography and Statistics - IBGE (2013), the national goat herd with dairy aptitude, meat or mixed, is 8,646,463 heads, wherein the Northeast region stands out with just over 90% (7,841,373 heads) of all animals in the country. In 2011, Brazil stood out as the second largest producer of goat milk in the American continent and the twentieth in the world, with a production of 148,149 tons (FAO, 2011).

The production of goat milk has been an activity of great economic importance, both in developed and in those developing countries. This phenomenon is explained by the bottleneck in the production of cow's milk by milk production quotas, and the search for a market that enables greater freedom of production, in order to add greater value to the product (milk) than that offered by the market of

bovine milk (GUIMARÃES, 2008).

The milk produced in the main Brazilian dairy regions (Northeast, Southeast and South) receive different destinations, such as government programs of school meals and to combat child malnutrition in poor population, pasteurisation plants and/or production of fine cheeses for the rich population. The advantages are the increased production and consumption of goat milk, improvement of the HDI (Human Development Index) and the promotion of family agriculture. This activity is usually developed by small farmers and/or family-type production systems (HOLANDA JUNIOR, 2008).

SAANEN BREED

The Saanen breed was originated in the Saanen valley, in Switzerland, and it has a wider distribution around the world compared to any other goat breed (BELANGER, 1990). Saanen goats are physically characterized by having a uniformly white or light cream coat, short and thin hair, may be somewhat longer in the midline and the lower body (RIBEIRO, 1998). Their head has an almost straight profile, erect and short ears, large and clear eyes, with or without horns, beards and earrings (SÁ, 1990).

It is considered as an animal from medium to large size, with adult males weighing from 80 to 100kg and females between 50 to 80 kg (RIBEIRO, 1998). Saanen goat has a good conformation for dairy production, with a globular udder, well connected to the abdomen and ceilings well developed and parallel between themselves (SÁ, 1990). This breed is considered one of the best producers of milk, and in 2012 their average milk production in France was 996 kg in 313 days (DOUGUET, 2012).

According to Facó et al. (2011), the Saanen breed has the largest number of information in the Dairy Goat Breeding Program (PMGCL) conducted by Embrapa Goats and Sheep and partners (FACÓ et al. 2011). The PMGCL was started in late 2005 at the initiative of Embrapa Goats and Sheep, decentralized unit of the Brazilian Agricultural Research Corporation (Embrapa), under the Ministry of Agriculture, Livestock and Supply (MAPA), having as partners the Brazilian Goat Breeders Association (ABCC) and their sub-delegated associations.

The main plan of action of this program was the implementation of the 1st Progeny Test of Dairy Goat Breeders in Brazil (FACÓ and LOBO, 2008). Another fundamental action plan was the establishment of the National Zootechnical Archive of Dairy Goat. In mid 2010 the database of the zootechnical archive of this breeding program had information of official dairy controls from 22 herds of dairy goats of the states of São Paulo, Minas Gerais, Rio de Janeiro, Espírito Santo and Bahia (FACÓ et al., 2011), providing information for studies about dairy goats breeding.

MOLECULAR MARKERS

The interference of genetic variability in the DNA sequences of organisms (genetic polymorphism) can be detected using various molecular biology techniques, which allow obtaining a large number of molecular markers, covering almost the entire genome of the organism. This development has been followed by statistical methods that enable the handling of a large amount of data (FERREIRA and GRATTAPAGLIA, 1998; EXCOFFIER and HECKEL, 2006).

The study of the genome of organisms has been allowed thanks to molecular markers available on the market, which make possible the observation of information about the diversity and genetic variability, kinship relations, degree of random mating, stimulate genetic affectivity of short or long distance dispersion, the variance of reproductive success of both sexes and temporal distribution of populations in relation to gene flow (FRANKHAM, 2002).

Thus, combining genetic markers with demographic attributes it is possible to inform both the variation within local populations and among them. According to Oliveira (2007), the use of molecular markers in genetic characterization of goats in Brazil has proven to be a powerful tool as for the characterization of individuals and/or groups of goats without defined breeds as to maintain the genetic identity of indigenous breeds.

CROSSBREEDING AND MILK PRODUCTION OF GOATS

Crossbreeding is one of the most used strategies of breeding in animal production, especially in dairy or beef cattle, pig and poultry production (CABRITA, 2013). These are used for a long time ago, but in the case of milk production, this practice has started been explored recently (GAMA, 2002; SORENSEN et al., 2008). Crossbreeding is basically the mating of individuals from different breeds with the aim of exploring the degree of heterosis (hybrid vigor) to characterize the average of the offspring in relation to the average of the parents.

The existence of hybrid vigor can be considered when the average performance of the offspring is higher than the average performance of the two pure breeds of their parents. The heterosis will be more intense, the greater the distance between genetically different breeds or strains involved in the crossbreeding (MIRANDA and FREITAS, 2009). Aiming at increasing the efficiency of milk production in cows, crossbreeding has been widely used in recent years.

One reason for this greater use of crossbreeding is the advantage of heterosis in various productive and reproductive aspects, such as the dairy production for protein and fat, metabolic, members and nails diseases, reproduction, mastitis, among others, fertility, kidding ease, longevity, etc (SORENSEN et al., 2008). Unfortunately, the information available in dairy goats are much more limited and with little research at level of crossbreeding. In most research, the crossbreeding system in goat farming was used for introduction of exotic breeds crossbreeding with local breeds in an attempt to achieve production increases.

Studies carried out by Gaddour and Najari (2009) demonstrated that the traits of interest in improving are at the level not only of milk production, average daily production and length of lactation (in days), but also the weight of goats at birth, besides the production of goats milk, the use of local breeds with the addition of meat production, which also becomes an aspect that can be improved. Besides these traits, it is intended to also improve the productivity of animals according to their prolificacy, levels of production and mortality at birth of goats (GADDOUR et al., 2012).

CHARACTERIZATION OF THE PRODUCTION SYSTEMS

According to Paredes and Saldarriaga (1980), the production systems are a complex of elements that work together to achieve a set of objectives and products based on it through interconnected processes, comprised by a boundary delimiting the system from the outside that is constituted by the environment. For Carmo and Salles (1998), a production system consists of the combination, in space and time, of quantities of labor and various means of production such as land, machinery and equipment, improvements and inputs to obtain different agricultural production, plant or animal.

Nogueira and Simões (2009) claim that domestication of plants and animals made possible the emergence of the first systemic forms of production, however the early production systems had the environmental ecology as reference for its development. For Elloumi (2006), the systemic approach in agricultural research should be based on two pillars. The first says that production systems cannot be

understood as a simple juxtaposition of objects, but in constant interaction and evolution. And the second says that conductors of the production system use reason to make their decisions based on the goals they want to achieve (SILVA et al., 2013).

According to studies by Dal Monte et al. (2010), production systems are differentiated by the adopted technologies and the specialization of production with a view to entering the market. At studying the goat and sheep production systems in the semiarid region of the state of Paraíba, Costa et al. (2008) found the predominance of small farms up to 50 hectares, with the use of family labor as the main source of work, which also it was reported by Dal Monte (2008). Among the production systems, the authors also observed that the extensive farming was the most used.

Regarding the feeding of animals, little use of conservation techniques and storage of fodder for the dry season was observed in the studies developed by Dal Monte et al. (2010) and Guimarães et al. (2009), a fact that raises the cost of production, especially in the dry season, due to increased need for concentrates to supplement the animals, characterizing the lack of preparation on the part of most farmers to face the reality of the region in the period of shortage of fodder.

In studies by Oliveira et al. (2007) on farms in Bahia, they found that 47% of farmers were supplying concentrate according to the level of production of animals, which the authors said was beneficial to ameliorate feed wastage and reduce costs without compromising production with offering short or beyond the animals' needs. Also with regard to animal feed, Costa et al. (2008) in their study of farms in the Cariri region (state of Paraíba) reported that the most commonly used forages were *Opuntia ficus-indica*, *Pennisetum purpureum* and *Cenchrus ciliaries*.

FINAL CONSIDERATIONS

Dairy goat in Brazil has been achieving greater economic importance, especially the Southeast region, where animals with milk aptitude are being raised. This is attributed in large part to high prices achieved by goat milk. Indeed, it is necessary to increase milk production through the use of animals of specialized breeds and new management strategies should be adopted to minimize the stress on farm animals, promoting thermal comfort by increasing the production and quality of products of animal origin.

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