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Dairy sheep and goat development project in the South of Brazil. An economic alternative and a social need[1]

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SUMMARY – This paper describes the sheep and goat sectors in Brazil and provides the background and elements of a research and training programme that is launched in the state of Rio Grande do Sul.

Key words: Sheep, goat, dairy, Brazil.

RESUME – *"Projet de développement en ovins et caprins laitiers dans le Sud du Brésil. Une alternative économique et une nécessité sociale". Ce travail décrit les secteurs ovin et caprin au Brésil et fournit le contexte et les éléments d'un programme de recherche et de formation lancé dans l'état de Rio Grande do Sul.*

Mots-clés : *Ovin, caprin, laitier, Brésil.*

Introduction

Goat and sheep research in Brazil must be analysed taking into consideration the continental dimension (8,512,000 km^2), geographic situation (of 5°N and 34°S latitude), climatic, cultural, economic differences and the farming tradition of the country.

The southern region, with a surface area of 580,000 km^2, includes three states (Rio Grande do Sul, Santa Catarina and Paraná) and shares the southern border with Uruguay and Argentina. It is characterized by a temperate weather, with minimum average temperatures of 5 to 8°C and top average temperatures of 28°C. Rainfall distribution is quite uniform, with frequent summer deficits.

The northeast region is one of the five physiographic regions of Brazil, located between latitude 1° and 18°30'S and longitude 34°30' and 48°20'W, accounting for 18.2% of the surface area of Brazil, with a territorial area slightly larger than 1.5 million km^2, and including 9 states. This area includes the Brazilian semiarid zone, taking up 75% of the northeast region and 13% of Brazil. There is a wide range of soils, usually flat, with frequent rock outcrops, low water holding capacity and a reduced amount of organic matter.

Along the coast, the weather is warm and humid, with an annual average rainfall of up to 1800 mm. The interior of the country has a hot and dry weather with an annual average rainfall between 250 and 1000 mm, irregular and concentrated.

There are only two annual seasons: winter (rainy season), with an average duration of two to four months, and summer, which is the dry season. Temperatures show little variation, with an annual average of around 25°C.

Sheep

Historically, sheep breeding takes place in two production areas, which are the result of totally different realities. The southern region, which for more than 60 years has focused on the production of

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wool sheep, and the northeast region where hair sheep has always been reared. The sheep census kept during the last decade has made no distinction between production aptitudes and geographic locations, as shown in Fig. 1.

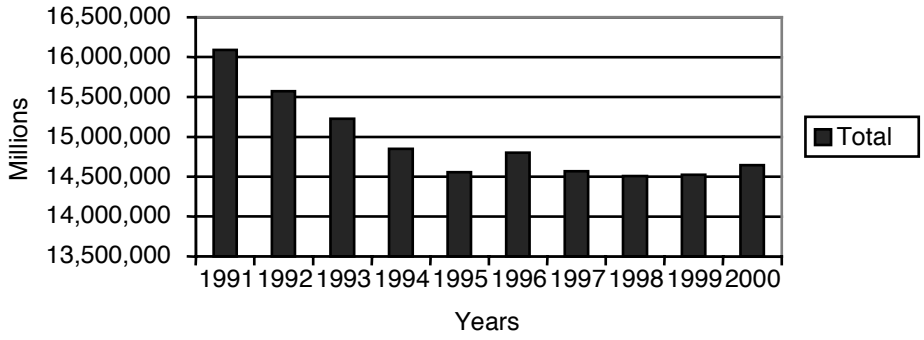

Fig. 1. Annual evolution of total number of sheep head in Brazil over the period 1991-2000.

Table 1 presents the variation per region, during the last ten years, emphasizing the southern and northeast regions.

Table 1. Variation in the sheep census in Brazil, per region (totals and %) over the period 1991-2000

Region	1991		1995		2000	
	No.	%	No.	%	No.	%
North	260,691	1.6	315,474	2.1	386,796	2.6
Northeast	*6,894,265*	*42.8*	*7,066,358*	*48.5*	*7,422,686*	*50.6*
Southeast	410,504	2.5	412,716	2.8	421,809	2.8
South	*8,081,826*	*50.2*	*6,185,473*	*42.4*	*5,645,682*	*38.5*
Mideast	440,088	2.7	579,371	3.9	766,957	5.2
Total	16,087,374	100	14,559,392	100	14,643,930	100

Wool sheep

Dual purpose breeds and fine wool producers

Wool sheep breeders are located in the state of Rio Grande do Sul, in the southernmost part of the country, on the border with Uruguay and Argentina. Some attempts have been made to introduce these breeds in the southeast region (São Paulo, Paraná and Santa Catarina) for different reasons, although in most cases these have not lasted too long.

From the 1950s to the beginning of the 1990s, wool sheep production was the main rural activity on the farms located in this region.

The breeds used were: Corriedale (55%), Ideal (25%), Romney Marsh (15%) and Australian Merino (5%). The breeding system was shepherd-like, extensive and mixed with cattle, with flocks made up of over 500 ewes. In most cases, these were family-run sheep farms, having agriculture as their only activity and with little public or private technical support.

The largest census of the State was 12.5 million in the 1980's and 32,000 tons of wool were marketed through the cooperative system (FECOLÃ) during the 1970-1971 campaign. The sector became unstructured as a result of many factors, such as, the negative world situation of wool fibre production in the early 90s, the exchange rates with other countries, economic losses of Brazilian

breeders, and a new economic situation that quickly arouse in the country (1994), mainly because of the extreme and technically fragile productive and economic sector.

The lack of technical support for breeders, which could have alerted them about the signals coming from the international markets, and could have also introduced them to other technical alternatives to keep them working in the sector, was a setback in this situation. Nowadays, the total census is supposed to be 4.8-5.0 million, with less than 30% active breeders and the loss of an excellent quality genetic material obtained after many decades of work and high financial investments. Besides, the cooperative system became unstructured, and 12 wool marketing cooperatives disappeared, some of them with WTO-recognized standards which enabled them to export and to have international recognition.

Specialized breeds for meat production

Parallel to this situation experienced by the wool production sector since the end of the 80s, a process started to increase and encourage the production of meat producing genotypes.

Animals were imported, firstly from the United Kingdom, and later from The United States, France, Germany and Holland. The breeds used in this process and which are kept until today are: Suffolk, Hampshire Down, Texel, and Ile de France. Few animals of Border Leicester, Poll Dorset and Polypay breeds were imported.

There are many differences in the production of these breeds if compared to the wool types. The main are:

(i) Distribution mainly in non-traditional regions.

(ii) They take up significantly smaller areas.

(iii) Very small flocks (on average 50 purebred ewes in production).

(iv) The main economic activity of most owners is not in the primary sector.

(v) They are in position to use private technical support services as well as to make investments to improve the environment and imports.

(vi) They have spread in almost all regions of the country.

After these years, the current situation of meat sheep breeding in Rio Grande do Sul is the following:

(i) Lack of clear productive goals, which can justify and make this venture sustainable.

(ii) The genetic pool of purebred animals is concentrated in a few farms.

(iii) Lack of dissemination of the advances that would have been obtained in the elite breeding stocks throughout the different layers of the production pyramid.

(iv) Lack of knowledge about the main economic and productive indicators which are essential to any and each productive process which aims to become industrialized in the modern meat market.

(v) Non-existence of technical programmes which integrate in a structured and complementary way wool (Corriedale base) with meat genotype.

(vi) Lack of production and commercial chains for sheep meat aiming at an integrated production of meat from the quality and quantity perspective.

Conclusions

Nowadays, in the southern region, neither of the two sectors, wool and meat, show in the short-

and long- term quite good perspectives for the breeders. Thus, it is most necessary and urgent to structure other productive alternatives for the species (milk, leather) with the objective of making sheep breeding an alternative source of income.

Hair sheep

In the northeast tropical region of the country there are from 9.0 to 9.5 million head. The breeds are Santa Inês, Morada Nova, Somalis and Rabo Largo, most of them being of first class.

Due to different (economic, social, political) circumstances, sheep breeding in the northeast region, as well as in the north and mideast, has made great progress in the last few years. So, sheep and goats are the main source of nutrition of the families living in these socially depressed regions.

Besides, there is a centre of sheep production intensification, investing important financial resources. Unfortunately, this investment is not always well directed, due to a lack of clear objectives, and technical support, having few possibilities of success.

The organization of this sector is socially important and necessary to secure food in a region with a strong demand for animal protein, which have a water deficit and thus, limited forage production.

The breeding of non-wool producing sheep is also characterized by the non-existence of an organized way of processing and marketing the sheep meat, which in most cases is in the hands of small slaughterhouses, lacking the basic sanitary standards, and displaying the product without standard and quality control.

Conclusions

There are genotypes perfectly adapted to the tropical conditions, and uncontrolled and irresponsible crossing of these genotypes should be avoided, as practised in the case of wool genotypes of the meat-like breed.

These works need a technical background since they do not have a clear productive objective and mainly because they are compromising the national genetic patrimony, as in the case of the breed Santa Inês which, if evaluated genetically in the right way, will become in a few years the principal nation-wide sheep breed.

Goats

The Brazilian goat population is slightly over 8 million head, 93% of which is located in the northeast region.

The evolution of the total number of head of goats in the last ten years is shown in Fig. 2.

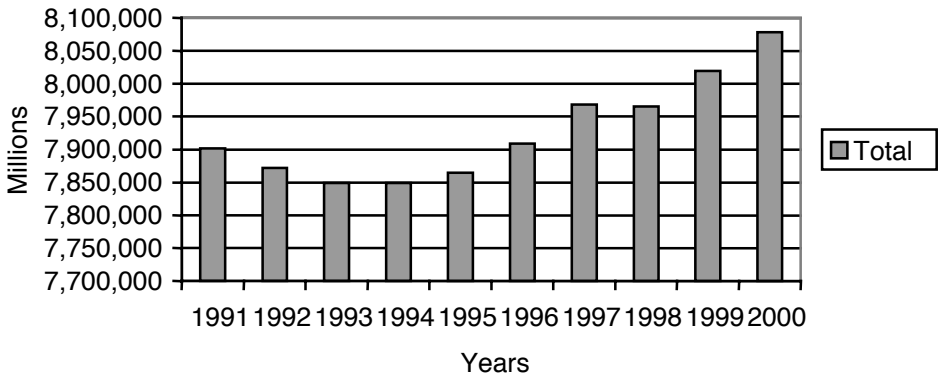

Fig. 2. Annual evolution of total number of head of goats in Brazil over the period 1991-2000.

Table 2 presents the variation in the number of head per region during the last ten years, emphasizing the southern and northeast regions.

Table 2. Variation in the number of head of goats in Brazil per region (totals and %) over the period 1991-2000

Region	1991		1995		2000	
	No.	%	No.	%	No.	%
North	130,926	1.6	114,056	1.4	93,480	1.1
Northeast	*7,265,831*	*91.9*	*7,319,988*	*93.0*	*7,556,711*	*93.5*
Southeast	197,960	2.5	195,151	2.4	193,178	2.3
South	*243,662*	*3.0*	*168,130*	*2.1*	*150,175*	*1.8*
Mideast	63,643	0.8	67,818	0.9	84,409	1.0
Total	7,902,022	100	7,865,143	100	8,077,954	100

The goat sector has to overcome problems in the northeast, such as geo-climatic difficulties, long periods of draught, soil type, degradation of the "Caatinga" ecosystem (a region covered with brushwood), need of investments, and even social and cultural aspects.

The main limiting factors of the activity are: (i) size and structure of the farms; (ii) the technical and economic levels of farming; (iii) educational level of breeders; and (iv) the migration of labour in rural areas.

According to the National Programme of Goat Research of the CNPC (Centro Nacional de Pesquisa de Caprinos) of Embrapa, goat production in the northeast is: (i) extensive, with animals being lost; (ii) in native feeding grounds (caatinga); (iii) supplementary feeding is not provided during the dry season; (iv) the farms do not have delimiting fences; and (v) various grasses are grazed.

The goat farming systems practised in the northeast are basically the extensive (traditional), followed by the semi-extensive (advanced) system.

The system is characterized by: (i) use of larger areas; (ii) use of WSB (Without Specific Breed) and Native (Moxotó, Canindé, Marota, Repartida) animals; (iii) the caatinga is the source of feed; (iv) lack of feeding supplementation, except during periods of critic draught; (v) little sanitary care; and (vi) there are almost no facilities.

The main characteristics of the more intensive farming system are: (i) use of smaller areas; (ii) crossbred and purebred animals of Alpine (Saanen and Alpina) and African (Anglo-Nubian and Bhuj) origin and most recently the Boer breed; (iii) use of supplementation, use of cultivated feeding grounds, protein sources and leftovers from bean and corn culture; (iv) sanitary measures are adopted (vaccination and parasite control); and (v) they have facilities. Some results are shown in Table 3.

In the states located in the southeast region (Rio de Janeiro, Minas Gerais, São Paulo) pilot projects have been developed for dairy goats. These projects have taken advantage of the traditional dairy cattle breeding activity in these regions, and have developed important works in qualifying and quantifying production, but they are far away from being considered on an industrial scale.

Conclusions

The Brazilian goat sector devoted to meat and leather production is located in the northeast region, and in order to undergo sustainable development it should solve some problems, among them: (i) insufficient and high cost of financial funds; (ii) insufficient educational background of technology users; (iii) stock market, communication and diffusion of price lists; (iv) inappropriate marketing, processing and stocking; (v) organization of breeders; (vi) prejudice towards the consumption of some products and by-products; (vii) lack of money and conditions in the public

teaching and research area; (viii) lack of government policies for the sector; and (ix) fragile productive infrastructure which tends to breakdown easily due to climatic adversity.

Table 3. Average of some productive and reproductive parameters of goat breeds and/or types of Brazil

Parameters	Breed and/or type†				
	WSB	AN	A	CA	BO
Birth weight (kg)	2.0	2.8	2.8	1.9	3.0
Weight at weaning†† (kg)	10.2	12.8	13.8	9.1	18.0
Weight at 196 days (kg)	12.2	16.8	17.3	11.7	23.2
Weight gain (g) birth-weaning	73.0	89.2	98.2	64.7	141.7
Weight gain (g) weaning-196 days	23.8	47.6	41.6	22.6	62.0
Dressing percentage (%)	42-44	44-47	43-44	41-44	47-52
Fertility (%)	83.4	81.2	80.1	86.0	87.3
Prolificacy	1.4	1.5	1.6	1.3	1.8
Death up to weaning (%)	13.8	14.0	18.6	12.7	7.0

†WSB: Without specific breed; AN: Anglo Nubian; A: Alpine; CA: Canindé; BO: Boer.
††Weaning at 112 days.

Project background and objectives

Why and what for?

The situation experienced in the last few years by the wool sheep production sector, as well as the lack of concrete options for the meat sheep sector, has been commercially and productively used to yield other alternatives for protein of animal origin. This idea has passed through the media on to the breeders, most of the time unaware of the causes, who have regarded sheep production without interest, in view of the lack of income from the two traditional options offered by sheep production.

A similar opinion is observed among students who have also picked up this misinformation. They see, frequently in the media, other more interesting professional alternatives – considered a synonym of "financial and professional success" – which not always correspond to the production reality and which are not viable for most breeders.

In the southern region, teaching and research have not, in general, considered other productive potential for sheep and goats, mainly the production and marketing of milk.

This situation can be reversed based on this production reality as well as on the educational and scientific need to propose new alternatives which prove to be technically and economically viable, by creating new incentives and technical and productive challenges to the breeders. The previous analyses were initiated aiming at the structuring of modules and the production and industrialization of sheep and goat milk. This will stimulate students who can create, at this stage of their professional training, a link with the animal production sector, and more specifically with the sheep and goat production and management sector.

To whom?

The breeders living in the state regions are in most cases descendants of European emigrants, who for many years made their living from intensive animal farming (poultry, pigs and dairy cattle) and who lived in small and medium size areas located near industrial inhabited centres.

These breeders, with this tradition, are the target of this proposal, since the knowledge about these type of production and mainly the possibility of using family labour, as well as the infrastructures already built, will make the implementation of experimental modules easier.

From the beginning of the process of building up this proposal, it will be extremely necessary that the dairy industry is totally integrated. Preference will be given to small and medium sized industries located in the above-mentioned regions, since these normally have industrial unemployment and cooperative management structures, which make them permeable to this kind of venture because they have a better understanding of the producer needs.

Objectives

Objectives concerns: (i) teaching; (ii) research; and (iii) social.

The idea is to set up a production module which, besides meeting the teaching needs, will generate, as a result of the research papers, production indicators and proposals economically and financially viable and technically appropriate for this region. This will be transferred to the potential breeders interested in promoting more income alternatives to their farms, taking advantage of their know-how and the potential of sheep and goat milk.

The production objective is the breeding of milk sheep and goats:

(i) Sheep – the main products will be dairy ones from farmhouse and/or industrial cheese.

(ii) Goats – milk production.

Location

For this work, part of the area and buildings of the Experimental Campus that the University has on BR 290 (Highway) in the city of Eldorado do Sul will be used.

Breeds

Initially, the proposal is open to any genotype already in the country or that can be introduced, obviously complying with to the sanitary standards.

Based on the alternatives that already exist in the country, Lacaune and Bergamácia breeds will be used in the case of sheep, whereas in the case of goats the breeds used will be Alpina, Saanen and Toggenburg.

Teaching and research infrastructure

The integrated participation of different sectors of the Department of Zootechny, together with Forrageiras, Clinica de Pequenos Ruminantes e Engenharia Agrícola (Clinic of Small Ruminant Agriculture Engineering) will be vital in the elaboration, implementation and execution of a project of this type.

The tasks will be set with the same final objectives, but each teacher will be directly responsible for his/her major (Reproduction, Nutrition, Genetic improvement, Forage, Health), for elaborating the technical proposals which better suit the Project as a whole, as well as for developing the proper lines of research.

Working groups can be set up according to the interest shown by the students already at this stage of the pre-project, and according to activity areas.

This multi-subject integration is generally practised in different projects, but the different and relevant point in this Project is that it will be necessary to integrate other teaching areas apart from agriculture.

The participation of the Paediatric Sector of The Medicine School will be vital, since they can get from this Project good information on the product needed by patients with cow's milk intolerance, in view of the fact that allergy to cow's milk is the first cause of digestive allergies among children in our country.

The Nutrition College will also participate and, among other things, will be responsible for generating information about the best alternative uses of the Project products in human nutrition, mainly in institutions supplying food to the marginal population, mainly city kindergartens.

The Economics College will also contribute to the project, helping in structuring costs and production, aiming to guide the research sector towards the bottlenecks in profits, to make it self-sustainable and elastic so that it can adapt to the oscillations of the highly unstable macro-economy.

They also have the responsibility of elaborating the bases for a system of integrated production together with the industry and trade sectors, which will make the setting-up of a productive chain to support the proposal possible from the very beginning of the process.

Supporting institutions

Contacts will be made with institutions from: (i) government teaching and research sectors; (ii) embassies, consulates and agricultural attachés; and (iii) non-governmental organizations from other countries where this type of production accounts for an important part of the animal production sector.

For this reason, the possibility of including this proposal within the activities of the FAO Subnetwork on Genetic Resources in Sheep and Goats will surely be necessarily important to qualify this Project and to make it viable. Making the adaptation of similar experiences possible as well as the intense and productive exchange of technicians from other countries where these activities have been developed successfully.

This has the objective of establishing technical links which will lead this project with its peers from those countries, and will make successful technology possible.

Final comments

We consider that a proposal of this type has all the conditions so as to meet the teaching and research objectives.

The social side involves helping in moments of great political instability so that producers in rural areas can keep on with their activities, without compromising not only the present generation but also and principally the generations to come who, if faced with these circumstances, will most certainly abandon rural activities.

The possibility of producing a type of food which can make up part of the diet of the marginalized sectors of society also makes this Project a professional challenge and an invaluable social contribution.

It is also essential to consider that small ruminants world wide have played an invaluable role in helping producers to remain in their places of origin, reducing the risk of migration to large urban centres, which would worsen the chaotic social situation we are now experiencing.