


RESEARCH IN ANIMAL BREEDING



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RESEARCH IN ANIMAL BREEDING AT SOUTHEAST EMBRAPA CATTLE

Southeast Embrapa Cattle was established in 1975, in São Carlos, State of São Paulo, Brazil, superseding the São Carlos Breeding Farm, an experimental station of the Ministry of Agriculture created in 1935, where Charolais and Zebu cattle were used in a crossbreeding program to develop the Canchim breed. Besides that, Charolais cattle, Arabian horses and several breeds of swine were also raised in this farm.

Since its foundation, Southeast Embrapa Cattle has directed its research in animal breeding towards the improvement of beef and dairy cattle. These studies are carried out by a research team of animal breeders (molecular and quantitative genetics), with the support of scientists of other areas, such as animal behavior, animal health, animal nutrition, animal production, animal reproduction, economy, forages and pastures, meat quality, and soil and plant nutrition. The Research Center is located in a 2,668-hectare farm, with research facilities which comprise laboratories (animal health, animal nutrition, animal reproduction, chemistry and residues, meat, molecular genetics, seeds, and soil, feedlots, library, pastures, and beef and dairy management units. Research is performed in collaboration with state research institutes and universities, and also involves training of graduate students.

DAIRY CATTLE

As far as dairy cattle is concerned, at the beginning (1978-1992), the Center supported two projects coordinated by Embrapa Dairy Cattle: Progeny test of crossbred bulls and Crossbreeding strategies for milk production in the Southeast region. Later, research focused mainly on characterization of high-grade and purebred Holstein cows raised on an intensive dairy production system and of crossbred Holstein x Zebu cows for production traits. Research contributed to improve the use of crossbreeding cattle for milk production in the central region of Brazil.



BEEF CATTLE

Research projects on beef cattle have followed four basic lines: 1) characterization of the Canchim beef cattle breed both as a straightbreed and for crossbreeding purposes; 2) study of selection objectives and selection criteria; 3) development and study of strategies for utilization of new Canchim lines; and 4) study of strategies for utilization of animal genetic resources, and nutrition and management practices to produce high-quality beef.

The Canchim is a composite of $5/8$ Charolais + $3/8$ Zebu beef cattle breed. Its formation was started in the 1940's at the São Carlos Breeding Farm, to create a new breed of beef cattle with genes of an European breed that would provide it with potential for high productivity, and genes of Zebu breeds that would give it the ability to live in the tropics. Southeast Embrapa Cattle has studied the Canchim breed in order to know both its potential as a pure breed as well as for crossbreeding, with respect to reproductive, maternal ability, growth, productive, carcass and parasite resistance traits, seeking for quantitative and molecular selection criteria to improve its productivity. Results of these studies have contributed to improve the management of the breed, to its better use both as a pure breed and in crossbreeding programs with Zebu, mainly Nelore, and to its development and improvement through the establishment of selection

criteria looking at the production system as a whole.

As soon as the first information on Canchim cattle was obtained, some private breeders begun the formation of their own herds, and today there are several herds with different genetic basis, contributing to the diversity of the breed. In addition, Southeast Embrapa Cattle started in 1988 the formation of new Canchim lines, employing a mating scheme different from that used originally and Charolais bulls and Nelore cows of several lines, to broaden the genetic basis of the breed. A diallel crossbreeding between old and new lines is now under study to investigate effects of the introduction of new lines on the existing Canchim.



A crossbreeding project with Nelore, Canchim, Aberdeen Angus and Simmental breeds started in 1997 is now close to its end. It involved the cow-calf phase under two degrees of intensification, in two breeding seasons, the backgrounding of male and female calves under different feeding and management strategies, and the finishing of males and reproduction of females. Studies on fertility, growth rate, parasite resistance, maternal ability, carcass and meat quality,

nutritional requirements, cow-calf behavior, heterozygosity and genotype effect for several genetic markers were or are still being carried out. Effects of forage usage intensification on soil are also taken into account. These studies have contributed to a better utilization of natural resources for beef production under some degree of intensification.



Nowadays, the objective of the crossbreeding project is to increase the proportion of *Bos taurus* in the animals in order to produce high-quality beef, but still maintaining a high degree of adaptability, so that sustainable production systems may be achieved. Therefore, a study is evaluating Canchim, Bonsmara or Aberdeen Angus sired calves out of Aberdeen Angus x Nelore or Simmental x Nelore cows. Also, management strategies are under study to produce crossbred Aberdeen Angus x Nelore and Senepol x Nelore finished males.

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