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Management of local genetic resources: the case of the Creole breeds of Guadeloupe

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Few studies deal with the management of local breeds in the tropics, although they are in an urgent need for preservation and improvement. The Creole breeds of cattle, goat and pig of Guadeloupe offer a great interest, because of their productivity and natural resistance to diseases related to ticks, in cattle, genetic variability for resistance to strongyles, in goat, and meat quality and heat tolerance in pig. Our experiments on the characterisation and preservation of these breeds aim to understand their adaptation traits, and to implement sound breeding programs for both production and adaptation. Experimental nucleus herds gather about 250 goats, 90 cows, and 25 sows, managed to maintain the consanguinity as low as possible. The number of known generations and the inbreeding coefficient are of 12 and 2.3% in goat, 3 and less than 1% in cattle, and 16 and 13% in pig. The goat nucleus is closed, while the cattle and pig stocks are open to sires from private herds, where the population is managed by professional organisations. Cryopreservation is also implemented. In goat, 256 embryos from 16 donors are stored by the French National Cryobank, and 2,500 doses of semen from 32 bucks are stored locally in a Biological Resource Centre. In cattle, 8000 doses of semen from 21 bulls are stored. Collections of DNA and other biological samples are also maintained for experimental studies. More than 7,500 samples are stored, with an increment of about 900 samples per year. Subpopulations representative of the diversity of each breed are characterised for a panel of markers. Researches of QTL for production and adaptation traits are also undertaken. Through these activities, combining *in situ* and *ex situ* methods for research and breeding purpose, INRA is highly committed in the characterization, preservation and improvement of local genetic resources valuable for the humid tropics.

Relatedness among cryo-bank bulls of the Yakutian Cattle breed as estimated with microsatellite data

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The Yakutian Cattle are the unique last remnants of the Siberian Turano-Mongolian cattle, with 1,200 purebred animals left, and are well adapted to the extreme sub-arctic conditions. Semen of 6 Yakutian bulls is stored in a cryo-bank. However, due to the traditional free herding style of Yakutian Cattle in summer pastures, with several randomly mating bulls within a herd, pedigree records of these 6 bulls are not available. We analysed 30 autosomal microsatellites in order to clarify genetic relatedness between these bulls and provide recommendations for the use of their semen in conservation and breed management. Pairwise relatedness among the bulls was computed using MER v3.0 program. In addition, we studied the value of the cryo-bank bulls for the preservation of genetic variation of the contemporary Yakutian Cattle by calculating allelic and gene diversity estimates and mean molecular coancestries. Although our simulation results indicated that 30 loci are insufficient for an unequivocal determination of relatedness among individuals, the data suggested four cryo-bank bull-pairs as potential half-sibs. We propose a breeding scheme based on the rotation of breeding females and that the cryo-bank bulls are divided into three groups. Based on the mean molecular coancestries, the cryo-bank bulls were less related to the cow population compared with the contemporary breeding bulls. They added to the allelic variation in the contemporary population by 3% and in the male subpopulation by 13%. No significant increase in gene diversity was recorded. Our results clearly demonstrate the importance of *ex situ* cryo-banking of genetic material in the conservation of rare domestic animal breeds.