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A typology of goat farming in Reunion Island prior to the implementation of a breeding scheme adapted to the French overseas departments

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Introduction

In September 2008, The '*Office de développement de l'économie agricole d'outre-mer*' carried out an assignment in the five French overseas departments and territories to evaluate the demand for genetic improvement of breeding goats (Boué et al., 2008). This expertise concluded with an original proposal: testing the implementation of a common breeding scheme adapted to the 5 territories. As Reunion Island offers a favourable context for such a project, it was proposed to locate the selection nucleus there. For this purpose, a first assessment of the diversity of livestock systems was undertaken to understand farmer practices and breeding management orientations. We present here A typology of goats' livestock systems stemming from a study realized in 2009 (Bouyssière, 2009) is thus presented in this paper.

Material and methods

A survey was carried out on farms whose breeders were members of professional organisations or were enrolled in a flock monitoring scheme with the extension services and potentially interested in a selection programme. 39 farmers were interviewed about (i) farm and goat flock structures (ii) livestock practices (iii) breeding practices and interests in a selection programme.

To elaborate the farm-typology we performed a Multiple Factor Analysis (MFA) and a Hierarchical cluster analysis (HCA), with R® software, using a selection of 21 variables from the 2 first items. The differences between types were checked by analysis of variance.

All the data were codified in qualitative variables and organized in 4 tables: 1. farmer, 2. farm, 3. goat flock, 4. livestock practices. The HCA was realized on the 5 first axis of the MFA which represent 60% of variance.

Results

The HCA brings out 4 main types of goat farms (table 1). T1 and T2 are almost off-land goat farming where animal feeding is based on non-cultivated fodder picking, sugar cane by-products and commercial concentrates. Some of the farmers have less than 1 ha of forage cane or meadow. Very few are practicing grazing and their overall characteristic is not to be self-sufficient in terms of animal feeding.

Table 1 *Some characteristics of the 4 goat farm types (mean ± standard deviation)*

Types	Nb Farms	AA (ha)	AWU	Nb Goats	FA (ha)	Goats LU/total LU
T1 Indoor feeding/multiple-job-holding	12	0.5 ± 0.4	1.3 ± 0.5	18 ± 10	0.4 ± 0.4	1.0 ± 0
T2 Indoor feeding/diversified farms	9	13.1 ± 17.8	1.4 ± 0.5	30 ± 18	0.7 ± 0.6	0.6 ± 0.5
T3 Grazing/diversified farms	13	10.1 ± 7.0	2.0 ± 1.0	45 ± 36	7.6 ± 7.2	0.4 ± 0.4
T4 Specialized goat breeders	5	2.5 ± 1.2	1.4 ± 0.5	65 ± 22	2.5 ± 1.2	1.0 ± 0
P value		0.015	0.08	0.004	0.001	$P < 0.001$

T1 and T2 differ over status. T1 are multiple-job-holding farmers as they have others sources of income than farming. Their flock has a small size. T2 have diversified production farms with crop and animal production and a variable Agricultural Area (AA) size.

T3 are medium farm size with a higher number of workers (AWU). They are more or less diversified with a forage area (FA) between 20% and 100% of the AA. They nearly all have a second livestock production enterprise predominantly based on beef cattle. The common characteristic of that the forage system is based on grazing; therefore they have the lowest stocking density in livestock unit (LU) per ha. T3 has the higher proportion of farmers who are self-sufficient in terms of feeding.

T4 are limited size farms (AA from 1.2 to 3 ha) whose farmers specialize in goat farming. The entire AA is dedicated to forage crops. They have big flocks (medium size of 65 goats). Their forage system is based on mowing meadow often in association with forage cane. None of them are practicing grazing.

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Conclusion

In the context of the Reunion Island, goat meat production provides farmers with a good remuneration. Flexibility of flock management and the ability to use grazing with indoor feeding explains why there is goats keeping across a diversity of farming systems. Goats are also bred on landless holding. Farmers under all systems expressed interest in genetic improvement. Thus, the second step of this study is to analyse relations between the different farming systems and genetic resource management.

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