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Intensive grazing system for small ruminants in the Tropics: The French West Indies experience and perspectives☆

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Abstract

The French West Indies and Caribbean authorities have the objective of increasing small ruminant production to match market demand and develop local economies. This paper highlights research results obtained in the French West Indies over the last 25 years in small ruminant farming. The accumulated knowledge enabled the design of an intensive grazing system whose main characteristics are: (i) three mating periods a year, each one involving half the flock, in order to achieve an 8-month interval between parturitions; (ii) rotational grazing of pastures (1 week in, 4–5 weeks out); (iii) irrigation during the dry season, according to the grass requirement and rainfall shortage; and fertilisation from 0.5 to 1 kg N per day per ha; (iv) stocking rate of up to 40 suckling ewes or 60 suckling goats per ha, or from 1200 to 1600 kg live weight (LW) per hectare for weaned lambs and kids. The average live weights of weaners were 27.9 and 16.3 kg LW per female per year, for ewes and goats, respectively. The yearly post weaning output reached 1482 and 1132 kg LW/ha, for sheep and goats, respectively. The constraints to production are highlighted and some proposals for improved small ruminant farming are suggested.

Keywords: Sheep; Goat; Caribbean; System of production; Local breeds

1. Introduction

About 6.65 million small ruminants are raised in the Caribbean (FAO, 2007), and they serve as important resource for the improvement of livelihoods and regional economies. The small ruminant to human population ratio reaches 19.7 heads for 100 inhabitants, which is similar to the ratio observed in India (17.3 heads for 100 inhabitants) and illustrates the importance of this sector in many countries in the region. However, most Caribbean countries are still deficient in small ruminant meat (FAO, 2007).

In these small island countries, production systems are almost totally dependent on grassland resources (Devendra and McLeroy, 1982), and coupled with the increasing human population, which predictably have increased the demand for land, both for housing and agriculture. It is therefore imperative to improve productivity while avoiding environmental degradation. In similar conditions reported by Devendra and McLeroy (1982) and Humphreys (1991), emphasis was placed on grazing forages and crop residues, rather than on grain feeding. These authors argued that semi-intensive management systems may increase livestock production from pastures.

In other to increase meat production for the growing population without adverse effect on the environment, the West Indies governments, regional universities, and research and development institutes work together to promote small ruminant farming. In Guadeloupe and in Martinique, meat productive abilities of the native

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goats and hair sheep have been investigated for over 25 years in intensive grazing systems. Most of the studies were conducted at the animal production research unit of INRA based in Guadeloupe (F.W.I.). Concurrent works were also carried out occasionally, within private farms by way of different surveys (reproductive, feeding and marketing systems), on-farm performance assessments (either during suckling or fattening periods) and breeding programme support.

This paper presents the major components of the animal and pastures management, recapitulates the main results obtained with native breeds of small ruminants and intensive grazing systems, and points out the main challenges of such systems (opportunities and weaknesses). Finally, global framework aimed at building productive and adapted systems.

2. Scope of small ruminant production in the Caribbean

In a recent collaborative program of scientific and technical aid to the Organization of East Caribbean States (OECS), INRA researchers have been asked to evaluate the small ruminant industry and study the feasibility of technical advancement (Alexandre et al., 2005). The major factors are discussed below.

2.1. Socio-economic environment

The small ruminant populations are raised on marginal lands beside the dominant colonial crops (sugar cane, banana, etc.), mainly in the driest areas (4–6 months of drought yearly). Agrarian structures were inherited from the colonial era and are characterised by the co-existence of large farms (50–2000 ha and over) mainly devoted to exportable products, some afterwards were converted to cattle farm like in Martinique, and numerous small or micro-sized farms devoted to mixed crop-livestock farming (JSDNP, 2001; Agreste, 2006). Since the 1960s in Martinique, the closing down of sugar plants collapsed the sugar cane industry. Besides, the difficulties in the international market of banana resulted in a marked decrease of the areas devoted to banana in Martinique and Guadeloupe (Agreste, 2006). In general, there is a decrease in the local agriculture and so small ruminant farming is often promoted as a means to maintain an agricultural activity.

Small ruminants are used primarily for subsistence, for cash flow in cases of sudden needs for the farm or household (Alexandre et al., 1991; Mahieu, 1996). Only a small proportion of farms are commercially oriented. Most of the Caribbean countries import large amounts of sheep meat, and to a lesser extent goat meat (Table 1). Certainly, a gap exists between supply and demand, therefore, there is a need for increased efficiency in the use of existing resources and elaboration of adapted strategies that can increase productivity, improve profitability and ensure sustainability.

2.2. Climate constraints

The climate in the West Indies is oceanic tropical. Fig. 1 shows seasonal variations of rainfalls and forage production in Grande-Terre, which is representative of most of the small ruminant farming areas in the Caribbean. The grass production follows the same pattern as the water supply, so it varies on average from less than 800 kg DM/(ha month) during the driest months,

Table 1
Year 2003 production and import of goat and sheep meat according to the country in the Caribbean (FAO, 2007)

2003 Country	Population (inhabitants)	Goat meat (ton)		Sheep meat (ton)	
		Production	Import	Production	Import
Antigua & Barbuda	67,500	109.50	NA	49.20	121.00
Barbados	276,600	28.63	3.00	139.30	1 395.00
Cuba	11,185,000	NA	NA	NA	NA
Dominica	75,850	42.00	9.00	22.40	34.00
Dominican Republic	9,184,000	750.00	NA	384.00	39.00
Grenada	89,300	23.88	8.00	68.00	22.00
Haiti	8,530,000	6532.50	NA	775.00	NA
Jamaica	2,642,000	1559.00	426.00	8.05	4800.00
Netherland Antilles	255,500	33.12	NA	33.35	348.00
St. Kitts Nevis	35,000	68.68	NA	67.20	82.00
St. Lucia	160,150	51.80	72.00	90.00	1337.00
St. Vincent & The Grenadines	116,800	24.00	1.00	54.60	26.00
Trinidad & Tobago	1,104,200	44.93	603.00	25.20	805.00

NA: not available.