

FR 41. INTENSIVE PRODUCTION OF « MARTINIK » HAIR SHEEP AT GRAZING IN MARTINIQUE (F.W.I.)

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Resumen

Producción intensiva de ovinos de pelo "Martinik" a pastoreo en Martinica

Para evaluar el potencial productivo del ovino « Martinik », se llevó a cabo una revisión global de los trabajos realizados entre 1978 y 1996 en condiciones experimentales. En la primera etapa se comparó el efecto de la irrigación (I) sobre pangola durante 4 años encontrándose un significativo ($P < .01$) incremento en la tasa de fertilidad (84 vs 75 %) y prolificidad (163 vs 143 %) respecto a no irrigación (NI). El sistema aumentó el peso vivo (PV), la productividad anual por hectárea (1093 vs 232 kg PV de ovejos destetados/ha/años) para I y NI respectivamente. El tipo de pastos pangola (PA) vs pasto estrella (PE) produjo mayor masa verde para PE pero no tuvo efecto sobre la fertilidad. La mortalidad predeste fue mayor para el rebaño de PE (22.3 vs 10.4 %, $P < .01$); la producción de leche en los primeros días de lactancia fue mayor para PA respecto PE (87.1 vs 71.7 kg, $P < .01$). La asociación de novillas vacunas y ovinos pastoreando juntos incrementó en 16 % la ganancia diaria en machos ovinos y 6 % para las hembras, evidenciando que esto se puede deber a menor parasitismo interno, lo cual fué constatado en observaciones de conteo de huevos y larva. Este sistema mixto aumentó en 23 % la producción de carne por hectárea.

Palabras claves: Ovino de pelo « Martinik », sistema de pastoreo intensivo, productividad por hectárea, condiciones tropicales, riego

Key words: Hair sheep "Martinik", intensive grazing systems, hectare productivity, tropical environment, irrigation.

Introduction

Local hair sheep are the main small ruminants in Martinique (F.W.I.) with more than 37 000 heads. Since 1978, the sustained market of fresh meat led breeders to organize production through a cooperative. In 1992, from the local hair sheep population, mainly composed of Black Belly, Pelibuey and Criollo sheep (Bastien *et al.*, 1991) breeders and researchers attempted to create a local breed named « Martinik », and to achieve a breeding program through a pedigree breeder association (Leimbacher, 1996). However, at the same time the development of this sheep production required also more informations on production abilities of this breed in intensive grazing systems. This paper reports an overview of the performances of « Martinik » hair sheep recorded from 1978 to 1996 in an experimental and extension farm belonging to the local council. In a first step the effect of irrigation on animal performances was estimated on pangola grass. Then, the performances of two flocks reared on 2 types of irrigated pastures were studied: pangola grass vs star grass. Finally, mixed sheep and cattle grazing system was studied in terms of animal production, internal parasite control and herbage production.

Materials and methods

Performances were recorded in a farm located in southern dry region of Martinique. The rainfall ranges between 1250 to 1500 mm/year with a marked dry season during 7 months. The liveweight (LW) of local hair sheep « Martinik » were 41.1 kg for female and 65.0 kg (Bastien *et al.*, 1991). The reproduction was conducted in 3 mating per 2 years with 3 seasons of mating: dry season (April), mild season (August) and wet season (December). Lambs were weaned at 85 days of age. Anthelmintic drenches were applied each two months for ewes and each month for suckling lambs. Irrigation was used to compensate rain deficiency, i.e. 50 to 100 mm/month during dry season.

Trial 1. Two flocks of ewes were reared during 5 years on irrigated or not irrigated grazing systems based on *Digitaria decumbens*: Irrigated system (I): stocking rate: 38-43 ewe/ha, age of regrowth: 32 d, 8 paddocks, nitrogen fertilization: 450 kg N/ha/year. Non irrigated system (NI): 10-12 ewes/ha, age of regrowth: 35 d, 7 paddocks, 150 kg N/ha/year

Trial 2. Two flocks of ewes were reared during 4 years in two grazing systems: *Digitaria decumbens*

(*D.d.*), 37 ewes/ha, age of regrowth: 25 d, 8 paddocks, 450 kg N/ha/year; *Cynodon nlemfuensis* (*C.n.*), 44 ewes/ha, age of regrowth: 25 d, 8 paddocks, 450 kg N/ha/year.

Trial 3. In order to compare the performances of lambs growing from weaning to 6.5 months of age reared or not with Brahman heifers, 5 grazing systems based on irrigated *D.d.* pasture (age of regrowth: 28d, 5 paddocks, 300 kg N/ha/year) were compared: ram lambs alone (RLA, 524 kg metabolic weight (MW)/ha) ; ram lambs grazing with heifers (RLM, 534 kg MW/ha) ; ewe lambs alone (ELA, 489 kg MW/ha) ; ewe lambs grazing with heifers (ELM, 536 kg MW/ha) ; heifers alone (HA, 522 kg metabolic weight/ha). Infection rate of lambs by strongles was monitored by Fecal Egg Count (FEC), Packed Cell Volume (PCV) and worm population observations. Drenching were applied each 6-7 weeks in each systems.

Results

Trial 1. The irrigation increased the fertility rate (84 % vs 75 %, $P < .05$) and the prolificacy rate (163 vs 143 %, $P < .01$). Despite this increase of the litter size, the mortality rate from birth to weaning decreased with irrigation (27.3 vs 17.3 %, $P < .01$). LW at birth adjusted to sex, litter size and lambing season, increased with irrigation (2.9 vs 2.6 kg, $P < .01$). LW at 70 d of age adjusted to sex, litter size and season of lambing were 11.5 kg and 10.7 kg, respectively for I and NI system. These differences between systems were more marked during the dry season rather than the other seasons of lambing. Irrigation increased annual productivity of ewes (26.8 vs 18.8 kg LW weaned lambs/year) and surface productivity (1093 vs 232 kg LW weaned lambs/ha/an) (Mahieu *et al.*, 1997a).

Trial 2. Herbage mass availability on *C. nlemfuensis* paddocks was higher than on the *D. decumbens* paddocks ($P < .01$) whereas the leaves to stems ratio for *C. nlemfuensis* was lower than for *D. decumbens*. Fertility and prolificacy rates were not affected by the type of forage. The mortality rate of lambs from birth to weaning was higher for *C. nlemfuensis* flock than for the *D. decumbens* flock (22.3 vs 10.4 %, $P < .01$). The milk production in 70 day of lactation of ewes reared on *D. decumbens* was higher than for *C. nlemfuensis* (87.1 vs 71.7 kg, $P < .01$). The daily weight gain (DWG) 10-30 and 30-70 days of age adjusted for sex, litter size and lambing season were 175 vs 147 g/d ($P < .01$) and 137 vs 120 g/d, respectively for lambs reared on *D. decumbens* and *C. nlemfuensis*. Annual surface productivity for *D. decumbens* was higher than that of *C. nlemfuensis* (1250 vs 960 kg LW weaned lambs/ha/an) (Mahieu *et al.*, 1997a).

Trial 3. Association of heifer to growing lamb increased the DWG of ram (+ 16%, $P < .01$) and ewe lambs (+ 6 % , $P < .01$). It was assumed that this improvement was due for a part to a lower infection rate by internal parasites, specially *Haemonchus contortus* as it might be noticed on FEC, PCV and worm population observations. These effects were more marked for ram than for ewe lambs ($P < .01$). DWG of heifers mixed with lambs was higher than for HA (515 vs 480 g/d, $P < .05$). Herbage mass availability was 394, 404 and 636 g DM/kg MW/d for RLA, RLM and HA respectively but the leaves to stem ratio was 0.52, 0.51 and 0.41 for RLA, RLM and HA respectively. The association of cattle to growing lambs increased by 23 % the total meat production per ha (Mahieu *et al.*, 1997b).

Discussion and conclusion

According to Evans *et al.*, (1991), our data showed that reproductive performances of « Martinik » hair sheep are slightly higher than for other hair sheep breeds of the caribbeans. Intensification of sheep grazing system by irrigation improves all the component of flock productivity particularly reproduction as it was shown for Pelibuey sheep (Fuentes *et al.*, 1984). However, season of lambing remains an important sources of variation of lactating performances and suckling growing rate, despite irrigation. Star grass is well known to be a very productive forage grass for cattle leading to 20 % higher milk yields than those of *D. decumbens* (Jerez *et al.*, 1984). However, in our conditions, it appeared that *C. nlemfuensis* is not adapted to sheep grazing, as it induced a high lamb mortality rates and a decreasing of ewe and surface productivity. In contrast, intensive grazing of irrigated pangola grass allows good milk production and preweaning growth performances, largely higher than that recorded in different dry systems in Martinique (Matheron *et al.*, 1991). Our results confirm that season of lambing is an important source of variation of suckling period and that excess in nitrogen fertilization induced a too large herbage mass that might affect the nutritive quality of forage ingested and an increase of the internal parasites incidences.

The third trial was carried out to set up system that will decrease adverse effects of intensification. To our knowledge, this is the first experiment to study intensive mix grazing of sheep and cattle together in humid tropical conditions. Our results confirm other results recorded in temperate region: i.e. an improvement of sheep and cattle production (Nolan and Connolly, 1977). In our conditions, it appeared that internal parasitism was a major

factor that governs sheep production confirming other results on goat and cattle in Guadeloupe (Aumont *et al.*, 1997). Mix grazing decreased the infection risk of sheep by *H. contortus*, so that it was assumed that it would be possible to decrease drenching rate. It also decreases herbage mass and improve nutritive value of available forage.

Further studies are required to optimize the intensification of hair sheep production in the West Indies. Alternate grazing of lactating ewes and growing cattle is now studied in Martinique in order to decrease infection rate of lambs and to improve nutritive value of available forage.

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