

SCIENTIFIC PAPER

Use of the Sorbifauna probiotic in the growth of confined lambs

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ABSTRACT: A study was conducted under production conditions, in order to evaluate the effect exerted by the inclusion of the Sorbifauna probiotic on the growth of confined lambs. Eighty Pelibuey lambs were divided into two experimental groups of 40 animals each: control (C) and probiotic group (PG) through a completely randomized design. The variation of the live weight (LW) and the mean daily gain (MDG) were determined. The data were processed by means of the SPSS® program, version 15.0 for Windows®. The probiotic exerted a significant effect ($p < 0,05$) on the LW of the lambs, from 60 days of age until weaning (6,94; 7,23; 7,82 and 8,44 kg vs. 7,74; 8,56; 9,30 and 9,54 kg after 60, 75 and 90 days and at weaning, for C and PG, respectively). The LW values for the males and females differed significantly ($p < 0,05$) between the treatments, from 60 days of age and until weaning (8,62 vs. 9,74 kg for the males and 8,26 vs. 9,35 kg for the females, in C and PG, respectively). Significant differences ($p < 0,05$) were also observed in MDG (123,7 vs. 101,1 g/animal/day) and in mortality (2,6 vs. 8,6 %) with the best performance in the PG treatment. It is concluded that the inclusion of the Sorbifauna probiotic from 60 days of age, had a marked effect on lamb growth, independently from the sex.

Key words: weight gain, weight at weaning, weight at birth

INTRODUCTION

The banning of antibiotic use as growth promoters has been a challenge for animal feeding, which has increased the need to find alternative methods for controlling and preventing the colonization of pathogen bacteria (Frizzola *et al.*, 2011). The modulation of the intestinal microbiota with new additives in the feeding, such as the probiotics and prebiotics, functions in favor of health and is a current issue in animal rearing. In this kind of compounds the lactic bacteria are the most used ones (Salmeron *et al.*, 2009), and there is sufficient information about the impact of such additives on the concentrate feeds for host animals (Gaggia *et al.*, 2010).

Since 2002, the Pasture and Forage Research Station Indio Hatuey develops a research program about the effects exerted by probiotics from the French firm Sorbial S.A.S. on the nutritional value of the diets and on the animal response, which have as basis a mixture of selected strains of *Lactobacillus acidophilus* and *Lactobacillus rhamnosus* (Bernardeau *et al.*, 2002). In this sense, a positive effect of the probiotic was found in lambs since they began to eat the roughages permanently

(after 60 days of age), because the digestion of low nutritional quality pastures was favored (López *et al.*, 2012).

However, a response of the probiotic use in this species and animal category under conditions of total confinement, where the energetic balance and the utilization of the supplied feedstuff are very different from the grazing conditions, is not known. Therefore, the objective of this research was to evaluate the effect of the inclusion of the Sorbifauna probiotic (of national production) on the growth of confined lambs.

MATERIALS AND METHODS

Location. The research was developed during the period from February to March, 2012, in areas of Farm No. 7, Entrepreneurial Base Unit (UEB) Gonzalo, belonging to the Livestock Genetic Enterprise of Matanzas (Pedro Betancourt municipality, Matanzas province, Cuba).

Experimental procedure. The selection of the lambs at the time of birth was made according to the weight at birth, type of parturition (single or

double) and the sex, to create two homogeneous groups of 40 animals each. The mothers and their lambs remained in total confinement the first 30 days postpartum, moment from which the dams were incorporated to grazing during four hours per day (8:00 a.m. to 12:00 m.). The lambs were kept confined until weaning (105 days) and received King Grass (*Pennisetum purpureum*) forage (1 kg/animal/day), as well as grass hay (0,5 kg/animal/day), twice a week during the first month, and every day afterwards. Concentrate feed was given to the two groups (200 g/animal/day) and in the case of the experimental group, the Sorbifauna probiotic too (30 g/animal/day). In the diet analysis the values of chemical composition reported by Cáceres *et al.* (2002), for the different feedstuffs used, were taken into consideration.

Design and treatments. A completely randomized design was used, with 40 replications (lambs) for each treatment: I) control (C); II) probiotic group (PG).

Measurements. The live weight (LW) was measured with a dynamometer of $10 \pm 0,02$ kg, every 15 days since birth until weaning (105 days), to determine the mean daily gain (MDG) in each measurement interval. The variation of the live weight per sex in the two groups was also determined, as well as the mortality during the period.

Statistical analysis. The data were processed through the SPSS® program, version 15.0 for Windows®. A variance analysis (ANOVA) was used and the difference between means was determined through the comparison test for two paired means.

RESULTS AND DISCUSSION

The live weight of the lambs (table 1) did not show significant differences between the treatments during the first 30 days after birth, because during their first month of life they are fed with dam's milk

Table 1. Performance of LW in the lambs.

Indicator (kg)	Control	Sorbifauna	SE \pm
	X	X	
LW at birth	2,42	2,54	0,06
LW at 30days	5,38	5,83	0,13
LW at 60 days	6,94	7,74	0,21*
LW at 75 days	7,23	8,56	0,23*
LW at 90 days	7,82	9,30	0,26*
Weight at weaning	8,44	9,54	0,27*

Asterisks in the same row differ for $p < 0,05$

until weaning (Galina *et al.*, 2004), independently from the incorporation of solid feedstuffs in the troughs to help in the development of the digestive system to prepare the animals for the digestion of pastures, forages and grains, from which the nutrients for growth and productive functions are obtained (Caro *et al.*, 2006).

The difference between the values of live weight, from 60 days after birth until weaning (table 1), indicates that the animals that consumed the probiotic made a better utilization of the diet. When using this probiotic in lambs under grazing conditions, López *et al.* (2012) found a marked effect on the LW in the last weeks of lactation, as a result of an improvement in the degradation of the fiber contained in the diet (Chen *et al.*, 2007; Gutiérrez, 2011); this improvement is produced from the increase of the activity of the microbial enzymes present in the rumen, which favor the fermentative processes and a more efficient use of the generated energy (Kumaga *et al.*, 2004). The productive results were higher than the ones found by López *et al.* (2004) and León *et al.* (2006), under conditions of grazing and supplementation with

Table 2. Performance of the LW of the lambs with regards to sex.

Indicator (kg)	Males			Females		SE \pm
	Control	Sorbifauna	SE \pm	Control	Sorbifauna	
LW at birth	2,4	2,7	0,08	2,4	2,4	0,13
LW at 30 days	5,45	6,11	0,28	5,30	5,56	0,31
LW at 60 days	6,99	8,02	0,38*	6,90	7,48	0,41
LW at 75 days	7,24	8,84	0,41*	7,21	8,28	0,46*
LW at 90 days	8,02	9,49	0,45*	7,63	9,11	0,53*
LW at weaning	8,62	9,74	0,46*	8,26	9,35	0,57*

Asterisks in the same row differ for $p < 0,05$

leucaena foliage and molasses-urea; but they were similar to the ones informed by Fonseca (2003), Herrera and Pulgarón (2005) and López *et al.* (2008), with the utilization of feeding variants of good nutritional quality, in a system with natural pasture plus leucaena.

Table 2 shows the live weight of the lambs with regards to sex. The values differed significantly ($p < 0,05$) between the treatments since 60 days after birth and until weaning, with a better performance in the group that received the probiotic in both sexes, which coincides with the results obtained by Flores and Pérez (2011), Gutiérrez (2011) and López *et al.* (2012),

On the other hand, significant differences were observed ($p < 0,05$) in the MDG between the treatments (table 3) in favor of the PG, which is ascribed to the positive effect of the probiotic in the consumption of roughages, after a higher digestion and absorption of this kind of low nutritional quality diet (López *et al.*, 2008); this is associated to the higher development of the rumen, the increase in the pH and the presence of a higher quantity of physiological groups of bacteria, along

Table 3. Performance of the MDG and mortality.

Treatment	MDG (g)	Mortality (%)
Control	101,1	8,6
Sorbifauna	123,7	2,6
SE \pm	1,22*	0,03*

Asterisks in the same column differ for $p < 0,05$

with the establishment of protozoa (Perón and Ruiz, 1972). The mortality percentages were lower in the PG group, which could be determined by the use of the probiotic. According to some authors (Van Eys and Den Hartog, 2003; Coeuret *et al.*, 2004; Galina *et al.*, 2009), this additive prevents pathogen microorganisms –such as, *Salmonella* and *Escherichia coli*– from colonizing the digestive tract or, at least, reduces their concentration to levels that are not capable of producing toxins which affect animal health.

It is concluded that the inclusion of the Sorbifauna probiotic in the diet, since 60 days after birth, had a marked effect on the growing of lambs and on the decrease of mortality in this category.

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