

## MONENSIN IN CATTLE AND SHEEP NUTRITION

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### Introduction

Chemical additives commonly classified as ionophores used in ruminant nutrition should improve the performance of animals by manipulating rumen function. The ionophore monensin is used as coccidiostat and in growing and fattening ruminants has a positive effect on feed conversion and rumen fermentation. Monensin may improve the efficiency of feed utilization by a change in rumen fermentation resulting in reduced deamination, partial non-direct inhibition of methanogenesis and an increase in the production of propionic acid. In wide scale of feed rations for ruminants the question of monensin effect in roughage or concentrated diets is very important as well as the ratio of these feeds in the ration. On the basis of our previous results (Baran et al., 1986) we tested the monensin effect in fattening bulls and in sheep rations with different levels of concentrates.

### Materials and Methods

In experiment with 24 growing lambs divided into 4 groups the effect of monensin (Flanco Prod. Co., Indianapolis) on performance and rumen fermentation was investigated. The lambs consumed for 113 days daily 1 kg of diet (dry matter DM) consisted of hay and concentrates in the ratio of 60:40 (diets 1 and 2) and 40:60 (diets 3 and 4). Monensin (Rumensin-premix) was added to diets 2 and 4 in the dose of 40 mg·kg<sup>-1</sup> DM. The results are the mean of 6 determinations.

In trial with fattening bulls (2 groups of 125 bulls each) was monensin administered at doses from 125 to 175 mg per head/day to experimental group for 330 days. Independently of this group monensin was given to 1500 fattening bulls.

### Results and Discussion

The mean values of rumen fermentation in lambs are given in the table 1. Monensin decreased the molar % of acetic acid and increased the molar % of propionic acid, but significantly increased the energy efficiency of VFA production in the rumen of lambs fed the roughage diets. In evaluating the results of our experiment with lambs we can say that monensin positively affected rumen fermentation but had no significant influence on nutrients digestibility, average live weight gains and feed conversion ration. In trial with fattening bulls monensin had a positive effect on the proportion of the rumen-produced VFA in favour of propionate which, in turn, favourably influenced the energy balance of nutrient conversion and efficiency. In monensin treated group the concentration of total and protein nitrogen significantly increased, but the levels of ammonia and non-protein nitrogen were not affected. Monensin

TABLE 1. THE MEAN VALUES OF RUMEN FERMENTATION IN LAMBS

Diet	1	2	3	4
VFA (mmol.l <sup>-1</sup> )	97.9	91.5	100.4 <sup>e</sup>	77.6 <sup>f</sup>
Acetate (molar %)	70.8 <sup>e</sup>	66.9 <sup>l</sup>	66.3 <sup>c</sup>	63.6 <sup>d</sup>
Propionate (molar %)	14.0 <sup>c</sup>	16.5 <sup>d</sup>	14.8 <sup>e</sup>	19.4 <sup>f</sup>
Butyrate (molar %)	12.6	13.7	16.1 <sup>a</sup>	14.4 <sup>b</sup>
A/P	5.1 <sup>c</sup>	4.0 <sup>t</sup>	4.6 <sup>c</sup>	3.3 <sup>d</sup>
E (%)	71.8 <sup>e</sup>	73.1 <sup>f</sup>	72.8 <sup>c</sup>	74.4 <sup>d</sup>
ADG (g)	70	90	110	120
FCR	12.3	10.0	8.0	7.9

VFA (Volatile fatty acids)  
E (Energy efficiency of VFA production)  
ADG (Average daily gain)  
FCR (Feed conversion ratio, intake/gain)  
a: b P < 0.05 c: d P < 0.01, e: f P < 0.001

positively affected the daily and total weight gains especially if the good quality roughages were included into the feed rations. In the table 2 are

TABLE 2. AVERAGE DAILY WEIGHT GAINS IN FATTENING BULLS

Diet./Groups	1	2	3	4
Feeding days	160	160	330	330
No. of bulls	125	125	125	125
ADG (g)	713	800	702	768
Increase (%)	-	12.2	-	9.4

ADG (Average daily gain)

the values of average daily gains in bulls after 160 and 330 days. Besides of positive effect of monensin on rumen fermentation and performance, the monensin use was allways economically profitable.

(Key Words: Ruminants, Monensin, Rumen Fermentation)

#### Literature Cited

Baran, M., K. Boda and P. Siroka. 1986. The effect of monensin on rumen fermentation in sheep fed on all-roughage and barley/roughage diets. *Anim. Feed. Sci. Technol.* 15:7-12.