Bulgarian Journal of Agricultural Science, 19 (Supplement 1) 2013, 98–101
Agricultural Academy

EFFECT OF ADDING OF PROBIOTIC „ZOOVIT“ AT FEEDING OF LAMBS FROM BREED SYNTHETIC POPULATION BULGARIAN MILK

N. DIMOVA, M. BALTADJIEVA, V. KARABASHEV, S. LALEVA, Y. POPOVA, P. SLAVOVA, J. KRASTANOV and G. KALAYDJIEV
Agricultural Institute, BG – 6000 Stara Zagora, Bulgaria

Abstract

DIMOVA, N., M. BALTADJIEVA, V. KARABASHEV, S. LALEVA, Y. POPOVA, P. SLAVOVA, J. KRASTANOV and G. KALAYDJIEV, 2013. Effect of adding of probiotic „Zoovit“ at feeding of lambs from breed synthetic population Bulgarian milk. *Bulg. J. Agric. Sci.*, Supplement 1: 98–101

In recent years, different probiotic products are exploring to replace prohibited nutrition antibiotics.

Adding of probiotics „Zoovit“ in the diet of lambs from SPBM stimulates metabolism and increases the intensity of growth as its maximum values are between 36th and 46th day of the birth of lambs. Differences in average daily gain between the two groups are statistically significant.

Key words: probiotic „Zoovit“, lambs, synthetic population

Introduction

Probiotics are beneficial live microorganisms that can be added to food or water as single and mixed cultures (Todorov et al., 2007).

In young animals, when the milk is their main food, stomach tissue structure is still unformed. Probiotics increase the speed of development of the rumen flora and fauna, enhance immunity (Aattouri et al., 2001), reduced the incidence of intestinal infections, restore an intestinal microflora and have a positive effect in cases of diarrhea (Kirov et al., 1991; Musa et al., 2009). In addition, probiotic supplements affect feed consumption, daily gain and absorption of nutrients (Chiofalo et al., 2004; Antunovic et al., 2006; Whitley et al., 2009) and thus reduce mortality and accelerated weaning of young animals. However, the mechanism by which probiotics improve the growth and health of the animals is not sufficiently studied (Koop-Hoolihan, 2001; Khalid et al., 2011).

The aim of this study was to determine the effect of probiotic product „Zoovit“ on weight development, health and some haematological parameters in suckling lambs from Synthetic Populatio n Bulgarian Milk (SPBM).

Material and Methods

The experiment was carried out in the experimental base of the Agricultural Institute – Stara Zagora with two groups of 27 lambs of SPBM. The animals were kept with their mothers and were included in experiment after leaving the individual boxes and moving them to the stalls. They are aligned by type of birth and age at the beginning of the experiment. Experimental group received 5 g.kg^{-1} probiotic „Zoovit“ along with concentrate feed. Besides ewes milk, to all lambs after 10 days lucerne hay are given. Control of live weight was on every 10 days. Animal health is monitored during the whole experience. At weaning, blood samples were taken to establish hematology parameters. Blood

samples were taken in the morning from *v. jugularis*, and as an anticoagulant was used heparin. Samples were analyzed for the following parameters: urea, creatinine, total protein, calcium, phosphorus, magnesium, AST, ALT, hemoglobin and erythrocytes. The results were processed with the software STATISTICA for WINDOWS, 2001.

Results and Discussion

Table 1 presents the weight development of lambs until they were included in the experience. Live weight at the beginning of the experience of groups was within 5.09–5.343 kg. Difference 284 g is in favor of the experimental group, but not statistically reliable and admissible in conducting such an experiment. The experiment lasted on average 56–57 days.

In Table 2 shows the trend of change in live weight and average daily gain of individual controls (measurements). Experimental group had a higher average daily gain by the 46th day, and its maximum values were between 36th and 46th day.

Pond and Goode (1985) found that lambs fed diets with Probios had improved weight gain during the first two weeks and from the 2nd to 4th week. Antunovic et al. (2005) reported that probiotic feeding improved daily gain and average body weight.

Similarly, Abas et al. (2007) reported that male lambs received probiotics had higher body weight gain than the control group.

Charts 1 and 2 show the changes in live weight and average daily gain during the experimental period. It is noteworthy that the most intensive growth was in both groups after the first month. In the first and second weighing difference between the two groups was 19.0 and 13.0% in favor experimental animals. Experimental group had a higher average daily gain, and this trend is most pronounced in the third and fourth weighing –

Table 1
Weight development of lambs before the experimental period

	Live weight at birth, kg		Days of including in the experiment, days		Live weight in the beginning of the experiment, kg		Average daily gain till including in the experiment, kg		Duration of the experiment, days
Animal Groups	x ± Sx	C	x ± Sx	C	x ± Sx	C	x ± Sx	C	x ± Sx
Experimental group	4.170 ± 0.197	21.98	6.481 ± 0.279	21.83	5.343 ± 0.205	19.56	0.181 ± 0.009	25.35	56.704±0.589
Control group	3.820 ± 0.165	22.02	6.778 ± 0.263	20.18	5.059 ± 0.140	14.11	0.168 ± 0.008	24.28	56.963±0.387

Table 2
Weight development of lambs during the test period

Items	I weighing		II weighing		III weighing		IV weighing		V weighing	
	x ± Sx	C	x ± Sx	C	x ± Sx	C	x ± Sx	C	x ± Sx	C
Experimental group										
Average daily gain, kg	0.229±0.011a	24.49	0.255±0.009	18	0.336±0.012a	18.21	0.352±0.012	17.38	0.321±0.013	20.65
Live weight, kg	7.633±0.227c	15.16	10.183±0.276c	13.82	13.543±0.333a	12.54	17.063±0.394a	11.77	20.273±0.419a	10.54
Control group										
Average daily gain, kg	0.194±0.013a	34.17	0.225±0.014	31.73	0.267±0.012a	22.92	0.321±0.011	17.47	0.328±0.009	13.99
Live weight, kg	6.999±0.191c	13.91	9.249±0.293c	16.15	11.919±0.389a	16.64	15.129±0.461a	15.54	18.409±0.504a	13.96

a – significance at $p < 0.001$; b – significance at $p < 0.01$; c – significance at $p < 0.05$

Table 3
Biochemical studies of blood samples

Parameters	Experimental group			Control group		
	n	x ± Sx	C	n	x ± Sx	C
Urea, mmol/l	15	2.913 ± 0.214	28.49	15	3.333 ± 0.188	21.81
Creatinin, mmol/l	15	55.213 ± 1.539	10.79	15	54.993 ± 1.642	11.56
Protein-total, g/l	15	43.400 ± 1.449	12.92	15	44.533 ± 1.689	14.68
Albumin, g/l	15	35.100 ± 0.870	9.59	15	35.987 ± 1.000	10.76
Ca, mmol/l	15	2.873 ± 0.036	4.87	15	2.621 ± 0.198	29.19
P, mmol/l	15	2.868 ± 0.110	14.85	15	3.140 ± 0.129	15.89
Mg, mmol/l	15	1.053 ± 0.029c	10.73	15	0.963 ± 0.032c	12.67
AST, mmol/l	15	96.333 ± 3.628	14.57	15	101.400 ± 4.048	15.45
ALT, mmol/l	15	23.667 ± 1.199	19.6	15	23.933 ± 1.017	16.45
Hemoglobin, g/l	4	99.750 ± 1.797	3.6	7	99.286 ± 3.380	9.02
Erythrocytes× 1012/l	4	10.058 ± 0.161	3.2	7	8.269 ± 1.030	33
Leukocytes× 109/l	4	12.663 ± 1.121	17.7	7	12.706 ± 0.820	17.1

a – significance at $p < 0.001$; b – significance at $p < 0.01$; c – significance at $p < 0.05$

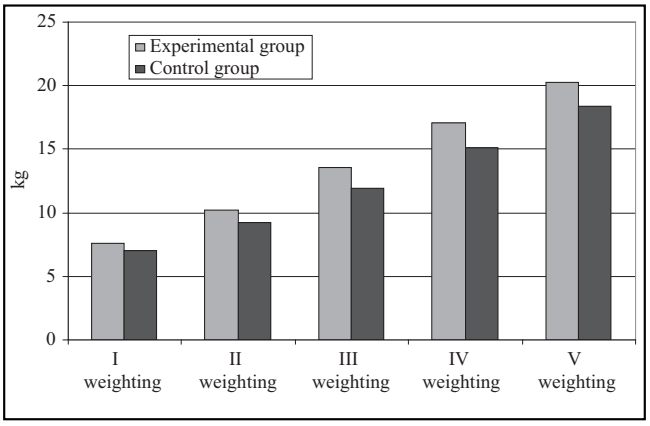

Fig. 1. Changes in live weight of lambs

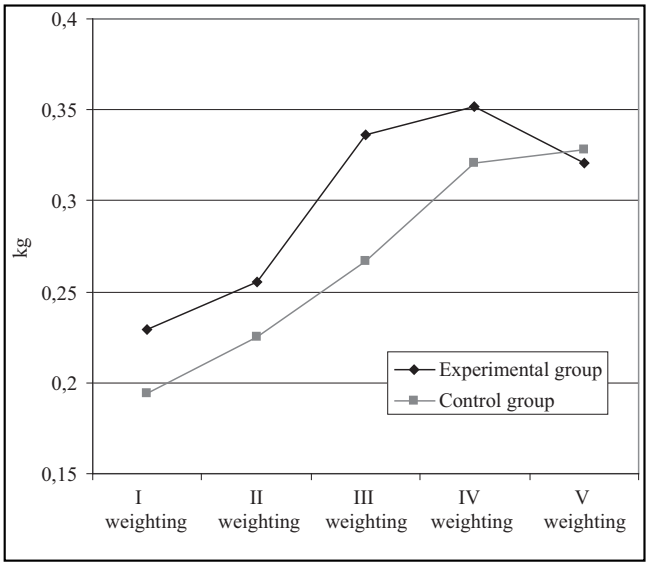

Fig. 2. Average daily gains in lambs

25.0 and 25.8%. At the end of the experimental period, the difference between the two groups is minimal – 7 g in favor of the control group.

The data in Table 3 shows that hematology parameters are the norm in both groups, which is a sign of good health. There were no significant differences in blood parameters with the exception of magnesium, which is higher in the experimental group ($p < 0.05$). Urea in the blood is an indicator of renal function (Oltner and Wiktorson, 1983). Experimental group had lower levels of

urea in the blood, indicating a better utilization of nitrogen from food. Similar results were seen in Antunovic et al. (2005) in weaned lambs received 0.1% probiotic and Antunovic et al. (2006), where the concentration of urea was lower in the experimental group (5.51:7.97 mmol / l).

There is a higher concentration of red blood cells in the experimental group 21.6%. Normal concentration of creatine indicates the optimal physical activity. Antunovic et al. (2006) noticed no change in creatinine in growing lambs with probiotics.

Conclusions

Because of the experiment and analysis, it was found:

Adding of probiotics „Zoovit" in the diet of lambs from SPBM stimulates metabolism and increases the intensity of growth as its maximum values are between 36th and 46th day of the birth of lambs. Differences in average daily gain between the two groups are statistically significant.

There were no significant differences in blood parameters between the two groups, except for magnesium.

Studies of the effect of probiotics on suckling lambs during the period are limited, and further research is needed.

References

Aattouri, N., M. Bouras, D. Tome, A. Marcos and D. Lemonnier, 2001. Oral ingestion of lactic acid bacteria by rats increases lymphocyte proliferation and interferon production. *Brit. J. Nutr.,* **87**: 367–373.

Abas, I., H. C. Kutay, R. Kahraman, N. Y. Toker, D. Ozcelik, F. Ates and A. Kacakci, 2007. Effects of organic acid and bacterial direct-fed microbial on fattening performance of Kivircik-Male yearling lambs. *Pak. J. Nutr.,* **2**: 149–154.

Antunovic, Z., M. Speranda, D. Amidzic, V. Seric, Z. Steiner, N. Doma-Cinovic and F. Boli, 2006. Probiotic application in lambs nutrition. *Krmiva*, **4:** 175–180.

Antunovic, Z., M. Speranda, B. Liker, V. Seric, D. Sencic, M. Domacinovic and T. Sperandat, 2005. Influence of feeding the probiotic Pioneer PDFM to growing lambs on performances and blood composition. *Acta Vet.,* **55**: 287–300.

Chiofalo, V., L. Liotta and B. Chiofalo, 2004. Effects of the administration of lactobacilli on body growth and on the metabolic profile in growing Maltese goat kids. *Reprod. Nutr. Dev*., **44**: 449–457.

Khalid, M. F., Shahzad, M. A., Sarwar, M., Rehman, A. U., Sharif, M. and N. Mukhtar, 2011. Probiotics and lamb performance: A review. *African Journal of Agricultural Research*, **6** (23): 5198–5203.

Kirov, N. and H. Chomakov, 1991. Microbiology. *Zemizdat.* Sofia.

Koop-Hoolihan, L., 2001. Prophylactic and therapeutic uses of probiotics: A review. *J. Anim. Diet Assoc.,* **101**: 229–238, 241.

Musa, H. H., S. L. We, C. H. Zhu, H. I. Seri and G. Q. Zhu, 2009. The potential benefits of probiotics in animal production and health. *J. Anim. Vet. Adv*., **8:** 313–321.

Oltner, R. and H. Wiktorsson, 1983. Urea concentrations in milk and blood as influenced by feeding varying amounts of protein and energy to dairy cows. *Livest. Prod. Sci.,* **10:** 457–467.

Pond, K. R. and L. Goode, 1985. The evaluation of Probios for wean- stressed lambs. Microbial Genetics Division, Pioneer Hi-Bred International, Des Moines, Iowa.

Todorov, N., I. Krachunov, A. Alexandrov and D. Djuvinov, 2007. Guide on Animal Nutrition. *Matkom*, Sofia.

Whitley, N. C., D. Cazac, B. J. Rude, D. Jackson-O'Brien and S. Parveen, 2009. Use of commercial Probiotics supplement in meat goat. *J. Anim. Sci.,* **87:** 723–728.