

THE EFFECT OF COMBINED PROBIOTIC PREPARATION ON PERFORMANCE PARAMETERS OF PIGLETS ON ALBANIAN FARM CONDITIONS

F. SHYTAJ¹, E. DELIA²

¹Ministry of Agriculture, Food and Consumer Protection, ALBANIA

²Department of Animal Production, Faculty of Agriculture and Environment, Agricultural University of Tirana, ALBANIA.

etlevade@yahoo.com

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SUMMARY

A combined probiotic preparation of *Lactobacillus plantarum* ATCC 14917 1x10¹¹ CFU/kg, *Lactobacillus fermentum* DSM 20016 1x10¹¹ CFU/kg and *Enterococcus faecium* ATCC 19434 1x10¹¹ CFU/kg was supplemented to a basal ration with 1, 1.5 and 2g/kg feed and the effects on growth performance, on thirty six weaned piglets (28 days) were studied for six weeks experimental period. The supplementation of combined probiotic improved slightly daily weight gain (DWG) and feed conversion ratio (FCR), kg feed/kg weight gain. A positive effect of the probiotic on feed conversion ratio (FCR), kg feed/kg weight gain and vitality was observed. Body weight gain was improved with graded levels (1.0 and 1.5g/kg feed) of the probiotic preparation respectively 3.5% and 2.5%, compare to control group without significance. The FCR (kg feed/kg weight gain) was improved with graded levels by up to 11.54%, 10.58% and 6.42% compare to control group. The tendency for increasing of probiotic dose has not positive effects on performance parameters. Because of the low dose-response between 1 and 1.5g/kg feed, the level of 1g/kg feed seems to be the optimal dose.

Key words: Combined probiotic, weaned piglets and performance parameters.

INTRODUCTION

Probiotics have been defined by Collins and Gibson (1999) as "a live microbial feed supplement which beneficially affects the host animal by improving its intestinal balance". The best studied probiotics are the lactic acid bacteria, particularly *Lactobacillus spp* and *Bifidobacterium spp*. Different studies have reported immune stimulating abilities for different bacterial species, in vitro cytokine production of macrophages was stimulated by *Bifidobacteria* Marin et al. (1997).

Probiotics blocked the activity of undesirable bacteria through:

- Production of organic acids given from the carbohydrates of dietary leads to blockage of

Escherichia coli and *Salmonella spp* according Reinheimer et al (1990).

- Acidification also favors the intestinal peristaltic
- Improves the index of food gain, kg feed / kg gain weight.
- Lower overall cost / each production unit.

Probiotics also are neutralizing of toxic products by:

- Reducing the absorption of toxic substances such as NH₃, amines.
- Reduce the bio-transformation of bile salts and fatty acids into toxic products Vanbelle et al (1989).
- Produced metabolites capable neutralize certain bacterial toxins Mitchell and Kenworthy (1976)

Why we have chosen weaning period:

According to Jonsson and Conway (1992) the moment of weaned of piglets is more difficult because:

- Piglets are deprived from immunoglobulin and other protective agents present in the milk of sow.
- The changing of feed. It is exactly the moment when the digestive enzymes in piglets have just begun to carry out their digestive activity, while pathogenic microorganisms are more easily developed by using solid foodstuffs.
- Weaned moment is accompanied by nutritional stress. Piglets have difficulties in taking of solid feed during the first 24-48 hours after they are weaned.
- The weaned stress does the piglets more sensitive to the inappropriate environmental and microclimate conditions.

MATERIAL AND METHODS

Thirty six piglets (White x Duroc) of five litters were transferred after weaning (28 days) to flat decks and randomly allocated in 4 groups with 9 animals for each group. The farm is located in Lac and operates as a closed cycle. The basal diet (see Table 1) was supplemented with 1g, 1.5g and 2g/kg of the probiotic preparation (three experiment groups) or without supplementation (control group). The diets were offered ad-libitum and animals had free access to water. The probiotic preparation included the following strains: *Lactobacillus plantarum* ATCC 14917 1x10¹¹ CFU/kg, *Lactobacillus fermentum* DSM 20016 1x10¹¹ CFU/kg and *Enterococcus faecium* ATCC 19434 1x10¹¹ CFU/kg.

Diet composition (g/kg feed)		Nutrient concentration (g/kg feed)	
Maize	600	ME (MJ/kg)	12.75
Soya bean meal	250	Crude protein	190
Sunflower meal	80	Crude fibre	45.40
Meal milk pulver	40	Calcium	8.90
Limestone	10	Phosphorus	5.90
Monocalcium phosphate	10	Lysine	11.30
Vitamin-mineral premix ^a	5	Methionine+Cystine	6.50
L-Lysine	2		
NaCl	3		

^a Contents in 1 kg: 1,200,000 IE vit. A, 120,000 IE vit. D₃, 4000 mg vit. E, 200 mg vit. B₁, 600 mg Vit. B₂, 2500 mg Niacin, 400 mg Vit. B₆, 4500 µg Vit. B₁₂, 20,000 µg Biotin, 1800 mg Pantothenic acid, 160 g Na, 50 g Mg, 10,000 mg Zn, 7500 mg Fe, 7500 mg Mn, 150 mg J, 70 mg Co and 40 mg Se.

Table 1. Diet composition and calculated nutrient concentration.

Parameters	Probiotic Dose (g/kg feed)				
	0	1	1.5	2.0	
Production	n ¹				
Initial BW, kg	9	4.9 ± 0.32	5.1 ± 0.43	5.03 ± 0.34	5.00 ± 0.21
Sixth weeks		16.67 ± 2.05	17.26 ± 2.73	17.09 ± 2.42	16.68 ± 1.43
DWG, g ²		280.2 ± 33.8	289.5 ± 34.9	287.1 ± 31.6	278.0 ± 33.4
FCR ³		3.12 ± 0.43	2.76 ± 0.38	2.79 ± 0.34	2.92 ± 0.40

¹ Number of animals/every group

² DWG for whole experimental period.

³ FCR for whole experimental period.

⁴ Significant differences, indicated with different superscripts.

Table 2. Effects of probiotic preparation on performance parameters (Mean ± SD).

During the sixth weeks experimental period, body weight (BW), daily weight gain (DWG) and feed conversion ratio (FCR), kg feed/kg body weight gain were measured weekly. Data are presented as arithmetic means with standard deviations (Mean \pm SD). One-way analysis of variance and Student's t-test ($P < 0.05$) were performed to test the differences between levels of the probiotic in the diet.

RESULTS AND DISCUSSIONS

The results of combined probiotics preparation on growth parameters are presented in Table 2. Body weight gain was improved with graded levels (1.0 and 1.5 g/kg feed) of the probiotic preparation respectively 3.5 % and 2.5 %, compare to control group without significance. The FCR (kg feed/kg weight gain) was improved with graded levels by up to 11.54%, 10.58% and 6.42% compare to the control group. The tendency for increasing of probiotic dose has not positive effects on performance parameters. Because of the low dose-response between 1 and 1.5 g/kg feed, the level of 1g/kg feed seems to be the optimal dose. This point towards a high variation in the response of the individual animals to this type of feed additives (Jadamus 2001).

CONCLUSION

The supplementation of the combined probiotic preparation induced slightly the performance parameters. Feeding probiotic preparation slightly increased daily weight gain and feed conversion ratio. However, the differences were not always significant. Possibly this was due to

the combined probiotic preparation. At the end, we recommend the level of 1g/kg feed combined probiotic as the optimal dose.

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