

SUMMARY ANALYSIS OF POST-WEANED RABBIT TRIALS WITH DIETARY MANNAN OLIGOSACCHARIDE

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Introduction

In commercial rabbitries, enteric disorders after weaning are a continuing problem, and the decline in use of antibiotics had led to interest in alternative growth promoters. This summary article presents data from several growing (weaned) rabbit experiments comparing diets supplemented with either MOS (Bio-Mos[®], Alltech, Inc., Nicholasville, Kentucky, USA), an antibiotic (positive control, pCON), or no additive (negative control, nCON).

Materials and Methods

Caged rabbit feeding trials were conducted in Brazil (Scapinello et al., 2001), France (Girard et al., 1997; Guillou and Arveux, 2000), Hungary (Bersenyi and Gippert, 1995; Tibor, 1995), Portugal (Fonseca, 1999; Medeiros Mourão and Carvalho Pinheiro, 2003), and the United States (Reed, 1994). New Zealand White (Bersenyi and Gippert, 1995; Reed, 1994; Scapinello et al., 2001; Tibor, 1995), Hybrid Hyla (Fonseca, 1999), Vitaline (Guillou and Arveux, 2000), and an unidentified strain of broiler rabbits (Medeiros Mourão and Carvalho Pinheiro, 2003) were utilized. Primarily mixed sexes were used, but one report (Gillou and Arveux, 2000) had males only and one report (Tibor, 1995) listed male and female results separately. Dietary antibiotics used in the pCON diets were oxytetracycline (Fonseca, 1999) or zinc bacitracin (Medeiros Mourão and Carvalho Pinheiro, 2003). Data were analyzed by Paired t-test.

Results

Table 1. Body weight gain, feed conversion ratio, and mortality of rabbits fed nCON or MOS diets.

Days on Test	Wtd Avg	Diet		MOS Relative Change Versus nCON, %
		MOS, %	nCON	
Body weight, kg (n = 20; P = 0.001)				
38.4	0.148	1.357 ^b	1.419 ^a	+4.57
FCR, kg/kg (n = 20; P = 0.001)				
38.4	0.148	4.175 ^a	3.963 ^b	-5.08
Mortality, % (n = 19; P = 0.004) ¹				
38.5	0.147	17.80 ^a	9.07 ^b	-49.04

¹By arcsine transformation, P = 0.001.

Table 2. Body weight gain, feed conversion ratio, and mortality of rabbits fed pCON or MOS diets.

Days on Test	Wtd Avg	Diet		MOS Relative Change Versus pCON, %
		pCON	MOS	
Body weight, kg (n = 9; P = 0.723)				
37.4	~0.146	1.496	1.486	-0.67
FCR, kg/kg (n = 9; P = 0.297)				
37.4	~0.146	3.041	2.984	-1.87
Mortality, % (n = 9; P = 0.092) ¹				
37.4	~0.146	8.81	6.28	-28.72

¹By arcsine transformation, P = 0.104.

Discussion

Based on 20 comparisons, MOS diets improved (P = 0.001) body weight gain and feed conversion ratio by 4.57 and 5.08%, respectively, compared to nCON diets (Table 1). In 19 comparisons, MOS diets decreased (P = 0.004) mortality by 49.04% relative to nCON diets. Using 9 comparisons, no significant difference was found between pCON and MOS diets for weight gain (P = 0.723) or feed conversion ratio (P = 0.237), indicating statistical equivalence (Table 2). The 28.72% decrease in mortality with MOS vs pCON diets approached significance (P = 0.092).

Conclusion

Supplementing post-weaning rabbit diets about 5 1/2 weeks with approximately 0.146-0.148% (range 0.1 to 0.2% in the diet) MOS significantly improved body weight gain (4.57%), feed conversion ratio (5.08%), and mortality (49.04%) relative to negative control (nCON) diets. The MOS diets were statistically equivalent to antibiotic positive control (pCON) diets with regard to rabbit body weight gain and feed conversion ratio, but MOS diets tended to improve mortality to a greater extent (28.72%) than pCON diets. These patterns of responses in rabbits are similar to those previously reported in analyses of worldwide broiler chicken (Hooge, 2003a) and turkey (Hooge, 2003b) pen trials, and broiler commercial field trials (Sefton and Hooge, 2004), when using MOS supplemented diets compared to nCON or pCON diets.

References

- Bersenyi, A., and T. Gippert. 1995. Effect of Bio-Mos[®] supplementation upon the production traits of growing rabbits. In: Proc. First Egyptian Hungarian Poultry Conf., Alexandria, Egypt. September 17-19. pp. 52-56.
- Fonseca, A. P. 1999. Effects of dietary mannan oligosaccharide in comparison to oxytetracycline on cecal fermentation and performance of rabbits. Masters Thesis. Technical University of Lisbon, Lisbon, Portugal.
- Girard I. D., P. Geliot, and P. Spring. 1997. Effects of mannanoligosaccharide on performance of fattening rabbits. In: Proc. International Symposium on Non-Digestible Oligosaccharides: Healthy Food for the Colon? December 4-5. Alltech, Inc. Tech. Report 51.1011. 1 p.
- Guillou, D., and P. Arveux. 2000. A natural alternative to antibiotic growth promoters in rabbit production: experience with Bio-Mos in France. Alltech, Inc. Tech. Report 51.1012. 1 p.
- Hooge, D. M. 2003a. Broiler chicken performance may improve with MOS. Feedstuffs 75(1):11-13.

6. Hooge, D. M. 2003b. Dietary MOS may have application in turkey diets. *Feedstuffs* 75(18):11-13, 42.
7. Hooge, D. M. and A. E. Sefton. 2004. Performance evaluation of dietary mannan oligosaccharide for broiler chickens: ten years of field trials analyzed. *Proc. XXII World's Poult. Congr.*, June 8-13, Istanbul, Turkey (accepted).
8. Medeiros Mourão, J. L., and V. M. Carvalho Pinheiro. 2004. Influence of Bio-Mos® on the performance of fattening rabbits. Universidade Trás-os-Montes e Alto Douro (UTAD), Vila Real, Portugal. 24 pp.
9. Reed, T.E. 1994. Effect of two levels of Bio-Mos (mannanoligosaccharide) on weight gain and mortality of weanling rabbits. Poster presentation at 10th Annual Symposium on Biotechnology in the Feed Industry, Lexington, Kentucky. Alltech, Inc. Tech. Report 51.10. 2 pp.
10. Scapinello, C., H. Garcia de Faria, A. C. Furlan, and Michelin, A. C. 2001. Efeito da utilização de oligossacarídeos manos e acidificantes sobre o desempenho de coelhos em crescimento. *Rev. Bras. Zootec.* 30(4):1272-1277.
11. Tibor, G. 1995. Effect of Bio-Mos on performance and mortality of growing rabbits. Poster presentation at 11th Annual Symposium on Biotechnology in the Feed Industry, Lexington, Kentucky. Alltech Inc. Tech. Report 51.101. 1 p.
12. USDA (United States Department of Agriculture). 1966. Commercial rabbit raising. *Agric. Res. Service, Agric. Handbook No. 309.* p. 47.