

Efficacy of GalliPro - a microbial feed additive for broilers

*B. Lund, S. Hansen & P. Kürti**

Chr. Hansen A/S, 10-12 Bøge Alle, 2970 Hørsholm, Denmark

E-mail: Bentet.lund@dk.chr-hansen.com

Abstract

Four feeding trials were conducted in 2003 to 2005 at different locations in EU (UK, Spain, Czech Republic and Hungary) in order to document the effect on animal performance of a new microbial feed additive comprising a probiotic *B. subtilis* strain as the active ingredient. The trials, which involved over 7000 male Ross broilers showed that this strain of *B. subtilis* increased final body weight 1-7% when added to feed at a dosage between 500 –1000 g product per tonnes of feedstuff corresponding to a CFU/g in the range of 8×10^5 to 1.6×10^6 .

Introduction

A probiotic is a live microbial feed supplement that beneficially affects the host animal by improving its intestinal microbial balance (Fuller, 1989). Probiotics is a potential alternative to the now banned antibiotic growth promoters for chickens in EU. In the development process of this new probiotic feed additive the key issues related to an EU approval has been addressed concerning safety (European Commission, 2000a) and efficacy (European Commission, 2000b). Efficacy trials have aimed to document “improved animal production” meaning performance. Efficacy, possible mode of action and usage of Bacilli as probiotics have been reviewed by Kritas & Morrison (2004), Mazza (1994), Sanders et al.(2003) and Stavric & Kornegay (1995).

This short communication presents part of the efficacy documentation on the product conducted during the period 2003 to 2005 at various sites in Europe reflecting different production managements.

Materials and methods

The feeding trials involved Ross 308 chickens reared under traditional management practice, using diets based mainly on wheat or maize and soybeans Stocking density was about 32-36kg per m² in floor pens and the slaughter age varied from 35 to 42 days. The trials were conducted in order to apply for authorisation as microbial feed additive in EU, according to the EFSA guidance (2005). Efficacy trials were performed at the following trial facilities :

1. Scottish Agricultural College, UK in 2004 using the following feed composition:12.0 ME, MJ/kg, 60.1% wheat, 34.0 % soybean meal %, 1.9% vegetable fat and 4.0 % premix in starter feed and 12.8 ME, MJ/kg, 30.6% wheat, 30.6% soybean meal %, 4.0 % vegetable fat and 3.8 % premix in grower feed.
2. Imasde Agropecuaria, S.L., Spain using the following feed composition:12.6 AMEn, MJ/kg, 41.4% wheat, 15% maize, 35% soybean meal 47%, 4% animal fat and 4% premix in starter feed and 13.5AMEn, MJ/kg, 58.3% wheat, 31.3% soybean meal 47%, 6.8% animal fat and 3.6% premix in grower feed
3. MTD, s.p., Ústřašice, Czech Republic in 2004 using the following feed composition:12.7 ME, MJ/kg, 35.9% wheat, 17% maize, 10% barley, 29.3% soybean meal, 2% fish meal, 2% vegetable oil and 3.8% premix in starter feed, 13.0 ME, MJ/kg, 30.9% wheat, 12.0% maize, 20.0% barley, 29.0% soybean meal, 3% animal fat and 4.1% premix in grower feed and 3.0 ME, MJ/kg, 29.0% wheat, 10.0% maize, 30.0% barley, 23.3% soybean meal, 3.1% animal fat and 3.6% premix in finisher feed and

4. The Institute of Small Animal Research (KATKI) at Gödöllő, Hungary in 2003 using the following feed composition: 12.7 ME, MJ/kg, 45.0% maize, 20% wheat, 18.5% soybean meal, 13.5% fullfat soybeans and 3.0% premix

In all trials no antibiotic growth promoters, coccidiostat or other growth promoting feed additives than the tested was included. Medication was negligible. Trials were performed with males, except in trial 4 where the sex was mixed.

Results and Discussion

The beneficial effects of GalliPro as a growth promoter were documented in all four trials (Table 1), also in trial no.1 where the gain of the control birds were above Ross 308 broiler performance objectives (Aviagen, 2005). As it appears from table 1, the addition of *B. subtilis* increased final body weight (significantly in three and numerically in one trial) between 1 and 7%. The FCR was improved numerically in three out of four trials, and in the fourth trial where the bodyweight gain was improved about 5% the feed conversion was significantly decreased by about 1 % point. The mortality rates were low in all trials and hence there was no apparent effect on this parameter (data not shown).

Based on the performance results and on cost-benefit calculations, supplementing chicken feed with a dosage of *B. subtilis* (DSM 17299) between 8×10^5 to 1.6×10^6 CFU/g feed showed a potential economical benefit for the chicken producers.

Table 1. Results of chicken performance (live weight gain and feed conversion ratio, FCR)

Trial no.	035 inclusion rate and corresponding spore count CFU/g feed	No of chickens per treatment	Trial period age in days	Bodyweight at slaughter and improvement compared to control			FCR and percentage improvement compared to control	
				g	g	imp. %	kg/kg	%
1	0	400	35	2159	-	-	1.56	-
	$500 \sim 8 \times 10^5$	400	35	2275*	+116	+5.4	1.57*	+0.6
	$1000 \sim 1.6 \times 10^6$	400	35	2261*	+102	+4.7	1.59*	+1.3
	$4000 \sim 6.4 \times 10^6$	400	35	2272*	+113	+5.2	1.58*	+1.3
2	0	560	35	1974	-	-	1.80	-
	$500 \sim 8 \times 10^5$	560	35	1995	+19	+1.0	1.78	-1.1
	$1000 \sim 1.6 \times 10^6$	560	35	1995	+19	+1.0	1.75 ^o	-2.8
3	0	1500	35	1906	-	-	1.887	-
	$500 \sim 8 \times 10^6$	1500	35	1936*	+30	+1.5	1.881	-0.4
4	0	280	42	2272	-	-	1.94	-
	3.6×10^5	280	42	2407*	+135	+5.9	1.86	-4.1
	3.6×10^6	280	42	2438*	+166	+7.3	1.86	-4.1

* $P < 0.05$; ϕ : $P = 0.056$

Conclusion

Broiler chicken trials in for European countries with a total of over 7000 Ross broilers showed that GalliPro increases final body weight. As feed additive the probiotic *B. subtilis* (DSM 17299) shows a significant beneficial effect on broiler performance

References

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