

## Effect of supplementation of Manno-Oligosaccharide and b-glucans on maize based meal on commercial broilers

R.C.Shendare<sup>1</sup>, M.A. Gongle<sup>2</sup>, A.B. Rajput<sup>1</sup>, B.V.Wanjari<sup>1</sup>, S.M. Mandlekar<sup>3</sup>

Department of Poultry Science,  
Nagpur Veterinary College, MAFSU, Nagpur

### Abstract

A study with 200 vencobb broilers was carried out to compare the effect of the use of Manno-Oligosaccharide & b-glucans of *Saccharomyces cerevisiae* cell wall or growth promoter (AGRIMOS®) feed in the diet @ 1Kg/ton of feed to the broiler. Diets were based on maize meal. A completely randomized experimental design was used, and the obtained data were evaluated by analysis. The following parameters were measured: feed intake, daily weight gain, feed conversion ratio, and mortality. After 6 weeks of fattening, the average live weight of broilers in the experimental group was 1821.11g, while the average live weight of broilers in control group was 1712.22g (P<0.01). Supplementation of Manno-Oligosaccharide & b-glucans preparation influence the achievement of higher live weights of broilers from the experimental group ( 5.37% ), compared to the control and enhanced feed conversion ( 8.45 % ). It was concluded that the effect of the inclusion of Manno-Oligosaccharide & b-glucans in the diet shows significantly higher body weight gain & improvement in feed efficiency as compared to the control diet.

**Keywords:** Broiler diets, alternative growth promoters, additives in broiler diets.

### Introduction

Probiotics are products containing carbohydrates, which main component is mannose. These products are commonly use to reduce the colonization of the intestinal tract by enteropathogenic bacteria. Probiotics are mainly represented by mannanoligosaccharides (MOS) and fructo-oligosaccharides (FOS), present in the cell wall of yeasts, such as *Saccharomyces cerevisiae*. They exert their action by maintaining or reestablishing the conditions of eubiosis in the digestive tube, and thus, the normal microbial flora and the balance of the gastrointestinal tract (Santin et al., 2001).

These oligosaccharides are usually represented by the mannanoligosaccharides, and have the ability to bind to the fimbria of pathogenic bacteria, favoring the competitive exclusion by probiotics, as well as the population of the intestinal mucosa by eutropic microorganisms. Manno-Oligosaccharide prebiotics can be used as substrate by bacteria, some authors attribute increase in mineral retention and better bone mineralization in broilers when fed these products (Bradley & Savage, 1994). As eutropic bacteria and mannanoligosaccharides are added, balance conditions become

permanent, preventing the establishment of *Salmonella*, *E. coli*, *Clostridium*, among others, and increasing the number of beneficial lactic-acid producing bacteria, thus maintaining eubiosis (Oyofe et al, 1999).

This study aimed at evaluating the live performance of broilers fed diet containing Manno-Oligosaccharide & b-glucans and to compare them with growth promoters presently used in the poultry industry.

### Materials And Methods

A total number of 200 Vencobb commercial broilers, of both sexes, equally distributed into two groups (100 birds per pen), with rice husk litter and equipped with feeders and drinkers. Broilers were submitted to two treatments : (T0) control feed, (T1) feed containing Manno-Oligosaccharide & b-glucans of Nutri-tech Division, Venky's (India) Limited, Pune India feed @ 1Kg /ton.

The chicks were reared on deep litter system under standard managerial practice through out the experimental period. Broiler starter mash containing 22.15% CP and 2918 kcal ME per kg feed upto three weeks and finisher ration containing 20.10% CP and 2966 kcal ME per kg feed was fed

adlibitum from third to sixth week to both the groups. Birds and feed residues were weekly weighed to measure feed intake, weekly weight gain, and feed conversion ratio was calculated. Mortality data were recorded daily. The trial was conducted for 42 days. The statistical analysis data body weight gain, feed intake, feed conversion ratio, and mortality was carried out. The data was analyzed as per Snedecor Cochran (1990). Formulation of diet with proximate principles are mentioned in table - 1 & 2.

**Table 1 : Percent composition of experimental diets**

Ingredients	Starter mash	Finisher mash
Maize	52	57
Soya DOC	29	26
Rice Polishing	10	12
Fish meal	7	3
Min. Mix. + Vit. Mix.	2	2
Total	100	100

**Table 2 : Chemical composition of experimental mash (%) on dry matter basis.**

Particulars	Starter mash	Finisher mash
Moisture	8.75	8.45
C.P.	22.15	20.10
E.E.	5.00	4.40
C.F.	4.20	4.00
N.F.E.	61.65	63.60
Total ash	7.00	7.90
M.E. Kcal/kg (calculated)	2918	2966

### Results and Discussion

Results are presented in table 3 & 4.

**Table-3 Weekly Average Live Body Weights**

Weeks	Live body weight	
	Control ( T0)	Treatment (T1)
0 day	45.059	48.68
1st week	117.77	124.9
2nd week	277.22	283.18
3rd week	570	603.14**
4th week	886.66	938.36**
5th week	1373.33	1473**
6th week	1712.22	1821.11**

\*\* Values within the row differs significantly ( $P < 0.01$ ) with their co.

**Table-4 Feed Consumption Feed Conversion Ratio, feed efficiency Mortality of Birds**

Sr.	Parameters	T0	T1
1.	Total Feed Consumption (kg)	3694.3	3551.69
2.	Feed Conversion Ratio	2.15	1.950
3.	feed efficiency (%)	46	51
4.	Mortality (%)	3	1

Table-3 indicates that diet containing MOS & b-glucans should higher weight during the trial. Though the difference was nonsignificant in the initial weeks but during 3rd week onward the difference being significant. This clearly indicates that supplementation of MOS & b-glucans is beneficial & improves body weight Daily weight gain was significantly higher in birds fed MOS & b-glucans (1821.11g) as compared to those fed the control diet (1712.22g). From the table it is clear that improvement in supplemented group was (5.37%) then control group.

Gibson & Roberfroid (1995), evaluating the use of indigestible carbohydrates, such as plant and yeast cell wall- classified as MOS complexes (glucomannanproteins, and particularly mannanoligosaccharides), found that carbohydrates can bind to the fimbria of bacteria, thus inhibiting the colonization of the gastrointestinal tract by pathogenic microorganisms. These findings are similar to those found with the use of growth promoters, which also reduce pathogen colonization, thereby improving poultry performance (Miles et al, 1989).

Record of feed consumption from table - 4 shows comparatively less feed consumption by MOS & b-glucans group over control group. The figure being 3.69 & 3.55Kg respectively and differences were found in feed conversion ratio ( 8.45 % ). Due to less feed consumption & higher body weight in MOS & b-glucans group better FCR was recorded (1.95). The improvement being 8.45 % over the control group. Low mortality (1%) in treatment group over control group (3%) indicates beneficial effect of supplementation MOS & b-glucans .

The best results presented by the birds fed MOS & b glucans are probably due to an improvement of the integrity of the intestinal mucosa and reduction of the stress on the mucosa caused by the presence of mannanoligosaccharides, thereby increasing the absorption and utilization of the dietary nutrients (Crumplen et al, 1989; Bradley & Savage, 1994).

Birds fed growth promoter presented higher feed intake and daily weight gain. We speculate that these results may be due to the elimination of undesirable microorganisms from the gastrointestinal tract. These microorganisms decrease nutrient absorption, increase the rate of passage of the digesta, and interfere with intestinal cell wall turnover rate and the thickness of the intestinal mucosa (Visek, 1978; Miles et al, 1989).

### Conclusion

Taking into consideration the conditions under which this experiment was carried out, it is possible to conclude that the inclusion of growth promoter Mannan-oligosaccharide & b-glucans shows significantly higher body weight gain & improvement in feed efficiency and less mortality as compared to the control diet.

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## Camel death plague puzzles scientists

An unprecedented number of camels across North Africa and the Middle East died last year, researchers have discovered. The several thousand deaths have baffled scientists who are probing toxins, antibiotic pollution, viruses and even climate change as possible causes. In Saudi Arabia alone, between 2,000 and 5,000 perished inexplicably, it was revealed in *Science* last week. The ships of the desert are being sunk in unusual, and worrying, numbers, the journal warned. "The numbers of deaths we are seeing at present are unprecedented," said camel researcher Bernard Faye, who is based at the French Agricultural Research Centre for International Development. "A great many animals are dying and it is not at all obvious what is the cause. The problem is that there is a real lack of good epidemiological evidence, and until we can get that we will struggle to find the causes of these deaths and to find ways of stopping them." There were several outbreaks of sudden deaths among camels - which are exploited for their milk and meat and as beasts of burden in North Africa and Asia - in many countries last year. However, the worst occurred in Saudi Arabia. At least 2,000 dromedaries perished in a region south of Riyadh, the Saudi capital. Unofficial estimates put the death toll as close to 5,000. Initial reports blamed infectious disease, but after Saudi vets sent blood samples to international laboratories it was announced that the animals had been killed by contaminants in their fodder. Two particular contaminants were pinpointed: the antibiotic salinomycin, a supplement used in chicken feed that is toxic to camels, and a fungal species with mycotoxins that can cause nerve damage. However, the Saudi government has shared little information about its investigation and evidence pinpointing fodder contaminants is disputed by experts. "Neither mycotoxins nor any known disease could have killed 5,000 camels in that short span of time," said Ulrich Wernery, scientific director of Dubai's Central Veterinary Research Laboratory. Camels are associated with hardiness, their ability to survive on small amounts of drinking water and blood-cooling systems that let them work in intense heat. But recently reports of camel deaths across the region have increased dramatically - on top of the Saudi outbreak. Changes in types of fodder may be linked to immune problems, it is suggested. Other scientists argue that climate change may be increasing numbers of disease-bearing insects, while others argue that changes in the use of camels, which are exploited less for transport and more for milk and meat today, may be making them more susceptible to disease. "It is a puzzle, and until we get more information we are not going to get close to finding an answer," said Faye. *Source: China Daily/Agencies.*