

THE EFFECT OF ANTIBIOTIC, MANNAN OLIGOSACCHARIDE AND ESSENTIAL OIL MIXTURE ON THE LAYING HEN PERFORMANCE

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INTRODUCTION

Medical and consumer pressure and interest is resulting in the systematic removal of antibiotics from animal feeds, especially in Europe that planned to be removed completely by the year 2006(Gill, 2002). Eventually, the poultry industry has to face the situation and look for substances which can replace the functions of antibiotic growth promoters in the feed. However, mannan oligosaccharides has been replaced for this purpose and also proven their efficacy in scientific and industrial experiments(Shane, 2001). Essential oils are volatile oils obtained from plants, by steam and/or water distillation generally. Besides antibacterial activity in addition antifungal, bactericidal, anticoccidial and antioxidant activities have also been demonstrated(Hertrampf, 2001). It is proven that improved hepatic functions, digestion and metabolism, growth, feed efficiency and livability in experiments have been conducted in the last few years (McCartney, 2002).

MATERIALS AND METHODS

Four hundred and eighty 54 week-old Nick Brown laying hens were assigned to four dietary treatments. Each treatment consisted of 4 replication of 10 cages (three hens per cage). The experiment lasted for 20 weeks from 54 to 74 week of age. Individual body weight of all hens was taken at initiation and at termination of experiment to determine the average body weight. Addition level of antibiotic (KAVILAMYCIN (Avilamycin)),mannanoligosaccharide (BIO-MOSS) and essential oil mixture (HERYUMIX) for kg feed were 10 mg, 1 g. and 24 mg respectively.

HERYUMIX contains totally six different essential oils: Oregano oil (*Origanum* sp.), Laurel leaf oil (*Laurus nobilis*), Sage leaf oil (*Salvia triloba*), Myrtle leaves oil (*Myrtus communis*), Fennel seeds oil(*Foeniculum vulgare*, Citrus peel oil(*Citrus* sp.)

Table 1. Composition of diets

Ingredients %	Layer diet
Corn	58.07
Soybean cake	18.34
Sunflower cake	10.00
Wheat and bone meal	5.00
Fish oil	0.97
Ground limestone	6.81
Dicalcium phosphate	0.11
Sodium chloride	0.25
Trace mineral mixture*	0.10
Vitamin premix*	0.25
DL-methionine	0.10
Analyzed composition (%)	
Dry matter	88.76
Crude protein	17.99
Crude fat	3.88
Crude cellulose	4.85
Crude ash	11.98
Total calcium	3.53
Total phosphorus	0.67
ME (kcal/kg)	2763

All dietary growth promoters were supplemented to standard layer diet (Table 1) and control group were fed on standard diet. Diets were isonitrogenous (17.50 % crude protein) and isocaloric (2750 kcal ME/kg). Diets in mash form and water were provided for *ad libitum* consumption. A photoperiod of 17 hours / day was given. Egg production and broken-cracked eggs were recorded daily during 54 to 74 week of age. Random samples of 30 eggs for 2 consecutive day from each treatment were weighted to determine average egg weight.

Mortality was recorded daily. Data were analysed using the general linear models procedure of SAS (Sas institute 1986) significance was based on a 5 % probability level.

RESULTS

The effect of dietary treatments on laying hen performance are show in Table 2. Antibiotic, mannan oligosaccharide and essential oil mixture supplementation in diet increased hen-day egg production significantly than that of control. Mannan oligosaccharide addition to diet had decreasing effect on daily feed consumption while essential oil mixture addition increased feed consumption slightly. All performance enhancer feed additives improved feed efficiency when compared to control. Also all dietary treatments decreased cracked-broken egg rate than that of control. Antibiotic and mannan oligosaccharide increased final body weight of hens significantly. Mortality of hens were not effected by the treatments (Table 3).

Table 2. The effects of treatments on laying hen performance

	Control	Antibiotic	Mannan Oligosaccharide	Essential Oil Mixture	Pooled SEM	Probability
Egg production, hen-d, %	75.505 ^c	77.047 ^b	78.922 ^a	79.639 ^a	0.357	0.0001
Egg weight, g	65.565 ^a	65.657 ^a	65.010 ^b	65.446 ^a	0.101	0.0001
Cracked-broken egg, %	3.586 ^a	2.253 ^a	2.639 ^{bc}	2.772 ^b	0.142	0.0001
Feed consumption (g)	103.916 ^a	103.893 ^a	102.919 ^a	104.478 ^a	0.609	0.3377
Feed conversion rate	2.093 ^a	2.045 ^{ab}	2.001 ^b	1.999 ^b	0.019	0.0021

Table 3. Initial and final body weight mortality of hens through experiment

	Control	Antibiotic	Mannan Oligosaccharide	Essential Oil Mixture	Pooled SEM	Probability
Body Weight, g (54 wk of age)	1918.83 ^c	1934.42 ^b	1922.25 ^a	1932.92 ^b	12.914	0.783
Body Weight, g (74 wk of age)	1601.00 ^c	1649.83 ^b	1669.75 ^b	1553.83 ^b	17.527	0.0001
Mortality, %	7.49	5.83	0.83	2.50	2.50	0.2694

CONCLUSION

This Experience indicates that Mannan Oligosaccharides and specific blend of essential oils is able to produce benefits comparable to traditional growth promoting antibiotics in the performance of laying hens.

REFERENCES

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