THE EFFECT OF PROBIOTIC SUPPLEMENTATION ON GROWTH AND NITROGEN UTILIZATION IN BROILERS

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CERTIFICATE

This is to certify that the thesis entitled "THE EFFECT OF PROBIOTIC SUPPLEMENTATION ON GROWTH AND NITROGEN UTILIZATION IN BROILERS" submitted in partial fulfilment of the requirements for the degree of MASTER OF VETERINARY SCIENCE IN ANIMAL NUTRITION to the TAMIL NADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY, MADRAS is a record of bonafide research work carried out by Thiru. B. MOHAN under my supervision and guidance and that no part of this thesis has been submitted for the award of any other degree, diploma, fellowship or other similar titles or prizes and that the work has not been published in part or full in any scientific or popular journal or magazine.

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ABSTRACT

Title : THE EFFECT OF PROBIOTIC SUPPLEMENTATION ON GROWTH AND NITROGEN UTILIZATION IN BROILERS

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The effect of probiotic supplementation on growth and nitrogen utilization in broilers and its effect on serum and yolk cholesterol in layers were studied in two broiler and one layer feeding trial.

In broiler trial one, at end of 8th week the 0, 75, 100, 125mg probiotic supplemented birds had a weight gain of 1204.0, 1271.9, 1267.8 and 1210.3g respectively, and feed efficiency of 2.30, 2.26, 2.26, 2.31 respectively. The 75 mg probiotic supplemented group birds retained significantly (P < 0.01) more nitrogen than control birds. Faecal E.coli count was reduced to $4.6 \times 10^4$ CFU/g in 100 mg probiotic
supplemented birds compared to $15 \times 10^4$ CFU/g in control birds. The haemoglobin level was significantly ($P < 0.05$) reduced in all the three probiotic supplemented groups. Serum cholesterol was found to be lower in probiotic supplemented birds (94.0 mg/dl) compared to 132.2 mg/dl in control birds. Probiotic supplementation did not markedly influence the weight of internal organs. Probiotic supplemented birds had taller and broader villi and intestinal glands in the duodenum and jejunum, the intestinal glands were also more in number compared to control birds.

In the second broiler feeding trial the probiotic plus antibiotic supplemented group birds had the maximum weight gain of 1148.5g. The group receiving antibiotic alone gained 1144.3g and those receiving probiotic alone gained 1128.4g compared to a weight gain of 1045.0g in control birds. The feed efficiency was best in antibiotic supplemented birds (1.74) compared to 2.01 in control birds. Similar to the first trial the mean serum cholesterol was significantly ($P < 0.01$) lower in probiotic supplemented birds (87.5 mg/dl) compared to 118.4 mg/dl in control birds. Nitrogen retention was best in antibiotic (48.5%) followed by probiotic (46.5%), probiotic plus antibiotic supplemented group (46.2%) compared to 40.2% in control. While the apparent metabolizable energy was best in probiotic plus
antibiotic (2.956 Kcal/g) followed by antibiotic (2.867 Kcal/g), probiotic supplemented birds (2.848 Kcal/g) than control birds (2.778 Kcal/g). Caecal histology showed better development of caecal tonsils and villi in the free and attached walls of caecum.

In the layer feeding trial 100 mg probiotic supplemented birds laid 5.6% more eggs than control birds, the eggs were also heavier (50.7g Vs 49.2g) and there was a reduced incidence of thin shelled eggs (6.7% Vs 19.7%). At the end of 10 weeks layer trial period the mean serum cholesterol level in control birds remained same as the initial value (170.2 mg/dl). While in probiotic supplemented birds the initial value of 176.5 mg/dl at 28th week was significantly (P ≤ 0.01) reduced to 114.3 mg/dl at the end of 37th week. The yolk cholesterol was also reduced significantly (P ≤ 0.01) in the 100 mg probiotic supplemented birds (14.69 Vs 11.28 mg/dl). Similarly the total egg cholesterol content was reduced significantly (P ≤ 0.01) in the 100 mg probiotic supplemented group (172.6mg) compared to control group (216.8mg). The glucose absorption test showed that there was quick absorption and extended retention/utilization of glucose in probiotic supplemented birds.