DETERMINATION OF AME OF WHEAT USING GNOTOBIOTIC CHICKENS

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Recent studies[1] indicated that low wheat Apparent Metabolisable Energy (AME) values are due to the interaction of a wheat component with a variable factor associated with the broilers resulting in some birds being poor starch digesters. The study reported here assessed the variability of the gut microflora of broilers during growth and during an AME trial of two irradiated wheat based diets (A and B).

Three groups (I,II,III) of chickens were grown in conventional conditions to 39 days of age. They were used to determine the AME of wheats A and B. The gut microflora of individual birds from each group was assessed weekly. A group of gnotobiotic chickens maintained at the CSIRO SPF-Poultry Unit, Maribyrnong was also used to assay the trial diets.

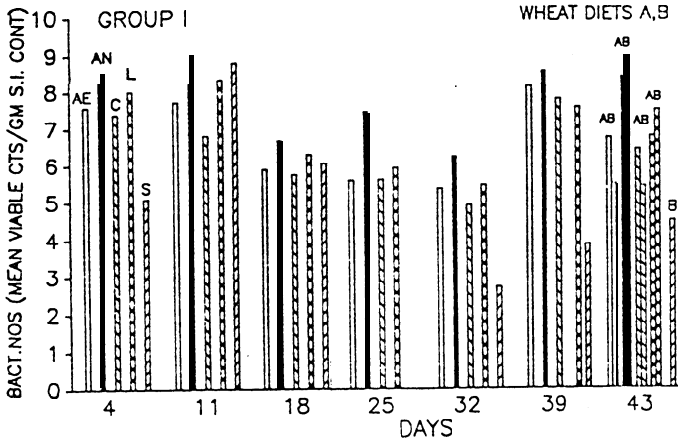

Fig.1.Profile of the microflora of Group 1 chickens

AE=aerobes
AN=anaerobes
C ="coliforms"
L ="lactobaccilli"
S ="streptococci"

Table 1. AME of trial wheats

Conventional Bird Type/Main.diet,Group	Wheat A AME(MJ/KG)	Wheat B AME(MJ/KG)
Comm.Birds/Norm diet, GpI:	12.8	13.2
Irr.diet, GpII:	13.3	14.4
CSIRO Birds/Irr.diet,GpIII:	14.3	14.6
Gnotobiotic CSIRO Birds/Irr.diet	15.5	16.0

The populations of microorganisms assayed varied greatly between individual birds, groups of birds and with time (Group 1 data is shown in Fig.1). Whilst the differences were significant between groups of birds for all classes except Lactobaccilli-like organisms it was not possible to conclude if any particular class of microoganism influenced the wheat AME. The highest AME values were obtained using the gnotobiotic birds although the level of significance was low (p=0.2,Table1). The results suggest that the presence of a gut microflora depresses the energy metabolising ability of the birds.

1.ANNISON,G. and JOHNSON,R. (1989) Aust.Poult.Sci.Symp.Uni.Syd.

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