

A RAPID BIOASSAY FOR THE DETERMINATION OF METABOLIZABLE
ENERGY OF POULTRY FEEDSTUFFS

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There is a need in the Australian feed industry for a low-cost, readily-standardized, rapid method for the determination of the metabolizable energy (ME) of poultry feedstuffs. The following procedure allows assessment to be made within 48 h.

Cross-bred adult cockerels are housed in single cages which allow complete collection of excreta on pre-weighed plastic sheets, and are maintained on a basal diet prepared by pelleting 915 g maize, 80 g fish meal and 15 g bone meal with mineral and vitamin supplement. The birds are trained to eat their daily ration of about 100 g in 1 h. The dietary component to be assayed is incorporated into pellets with 50% of the basal diet and fed in place of the basal diet to five birds during a single 1 h period. Excreta are collected for the next 24 h and oven-dried at 80 °C for bomb calorimetry.

While testing this method no difference was observed in ME value of the basal diet or of basal diet/wheat pollard (50:50) when determined with cockerels accustomed to, or abruptly introduced to these diets. The mean (\pm S.E.M.) ME (MJ/kg) value for basal diet/sorghum (50:50) determined by the 24 h collection method with five adult cockerels was 13.68 ± 0.08 , which was statistically indistinguishable from a value of 13.83 ± 0.00 obtained with two cockerels adapted to the diet over a 3 d period and examined with continuous feeding for 5 d, or a figure of 13.72 ± 0.03 determined with four groups of five diet-adapted chickens (18 to 36 d) fed continuously and examined over a 5 d collection period. The same comparisons for basal diet/soybean (50:50) gave 11.75 ± 0.06 by the rapid method, 11.83 ± 0.20 using adapted continuously-fed cockerels examined over 5 d, and 11.65 ± 0.04 by the chicken group assay, there again being no statistical differences between the values obtained by the different methods.

A basic assumption of the proposed rapid method is that all excreta arising from the test meal are voided within 24 h. To test this, daily collections were continued from 24 h to 72 h after assaying a high-fibre diet (basal diet/wheat bran (50:50)). Rate of total excretion (kJ/d) for the period 24 to 72 h averaged 64.9 ± 2.7 and was not significantly different from that observed with the basal diet (62.1 ± 3.0). Thus it appears that all excreta originating from feed were voided within 24 h of once-daily feeding.

The method proposed for ME determination, although tested only with a limited number of dietary ingredients, promises to meet the criteria set out above. It is inexpensive and rapid. It is easily standardised, since the values for ME obtained do not appear to depend critically on the age of bird used. In studies with a variety of ingredients ranging from cassava leaf meal to fish and meat meals no difficulty has been experienced in getting the birds to eat at least 75 g/d of the test material incorporated as 50:50 pellet with the basal diet.

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