

DETERMINATION OF APPARENT (AME) AND TRUE (TME) METABOLISABLE ENERGY
IN DUCKS AND CHICKENS

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Estimates of bioavailable energy in feeds, used for the formulation of diets for ducks, are usually taken from tables of data derived from chicken bioassays, e.g. AME, Farrell (1978), TME, Sibbald (1976, 1983). Siregar and Farrell (1980), reported however the existence, of significant differences in the metabolisability of dietary energy and nitrogen (N) between chickens and ducks. An attempt has thus been made to determine TME and AME in feeds commonly used in feeding ducks and to compare the values obtained with those determined in bioassays on chickens. Some problems were encountered when AME according to Farrell (1978) and TME according to Sibbald (1976) assays were applied to ducks. Firstly, the AME technique was not practically feasible due to the peculiar feeding habits of ducks, which resulted in substantial errors in the estimation of feed intake and, secondly, it was not possible to collect excreta precisely. Reported here are the results of work undertaken to establish a reliable technique for the routine assessment of the energetic values of feeds for ducks; the results obtained are related to standard AME and TME assays on chickens.

Feeds selected were corn (Zea mays, 11.8% CP) and soybean meal (Glycine max, 43.8% CP). Drakes, which previously had been trained to consume a daily ration in excess of 70 g (up to 140 g) within a 1 h period, were force-fed with 70 g of feed and excreta were collected over periods of 24 to 38 h. Prior to the assay, the birds were fasted for a 24 h period.

An assay with a 30 h excreta collection period enabled the simultaneous determination of AME and TME (MJ/kg \pm SE) in corn (14.88 \pm 0.29 and 16.97 \pm 0.28) and soybean meal (11.80 \pm 0.31 and 13.28 \pm 0.34), respectively. Such an assay has also been satisfactorily adapted to mature trained cockerels, although the obtained AME (14.11 \pm 0.14 and 11.12 \pm 0.17) and TME (15.63 \pm 0.15 and 12.17 \pm 0.18) values for corn and soybean meal, respectively, were significantly ($P < 0.05$) lower than those derived from assays on ducks. However, when, in the assays on ducks, the period of excreta collection was extended to 38 h and dry mash was fed with water, significantly lower AME and TME values were obtained (for corn: 14.08 \pm 0.27 and 15.76 \pm 0.28; for soybean meal: 11.23 \pm 0.27 and 12.68 \pm 0.29, respectively). They were comparable to those determined in separate assays for AME and TME on chickens.

In ducks, values for individual estimates could differ inexplicably by more than 10% around the mean, irrespective of whether the feed was fed singly or as a component of the basal ration. Therefore, it was necessary to use eight drakes in an assay to achieve reproducibility of the results (AME and TME for corn: 14.24 \pm 0.16 and 15.71 \pm 0.19, respectively) similar to that obtained in the bioassay on five chickens (14.06 \pm 0.15 and 15.42 \pm 0.16, respectively). Correction of TME to zero N balance (TME_n) reduced both the final metabolisability value and animal-related variability for soybean meal (from 12.83 \pm 0.22 to 12.08 \pm 0.07) but had no effect on similar measures for corn.

It appears that TME values obtained from a single assay on ducks or chickens can be applied to formulate diets for both ducks and chickens.

FARRELL, D.J. (1976). Br. Poul. Sci. 19: 303.

SIBBALD, I.R. (1976). Poul. Sci. 55: 303.

SIBBALD, I.R. (1983). The TME System of Feed Evaluation, Agriculture Canada.

SIREGAR, A.P. and FARRELL, D.J. (1980). Br. Poul. Sci. 21: 213.