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Sibbald I R. A bioassay for true metabolizable energy in feedingstuffs.
Poultry Sci. 55:303-8, 1976.
[Animal Research Institute, Agriculture Canada, Ottawa, Ontario, Canada]

Feedingstuffs are put in the crops of fasted cockerels and the excreta are collected; other fasted birds serve as negative controls. Feeds and excreta are assayed for gross energy. The data enable estimations of bioavailable feed energy independent of metabolic and endogenous losses. [The *SC1*® indicates that this paper, cited over 185 times, is among the most cited published in this journal.]

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This paper would not have been written if the practice of combining data into a summary, with means and standard errors, had been followed. Fortunately, a colleague, K. Price, observed that the apparent metabolizable energy (AME) value of a feedingstuff measured with an individual bird varied from day-to-day in a "saw-tooth" manner.¹ The variation was not apparent in summarized data because the birds were out of phase, but the probable cause was variation in feed intake. Theory taught that AME values increase curvilinearly with feed intake, but published experimental results were not confirmatory.

Fasted birds were given various quantities of wheat, and the excreta they subsequently voided were collected. Wheat and excreta were assayed for gross energy content. The AME value of wheat increased with intake because the regression of excreta energy on wheat energy input (IE) was linear with a positive intercept at IE = 0. The slope was used to estimate the true metabolizable energy (TME) value of wheat.² TME differs from AME inasmuch as it is corrected for the metabolic and endogenous energy losses estimated by the intercept.

Subsequent experiments confirmed the findings and led to the TME bioassay described in the subject paper. The paper aroused immediate interest because it provided a relatively simple and rapid way to estimate bioavailable energy. Among the kudos and criticism, development work continued. The assay technique was modified, and a correction to zero nitrogen balance was shown to be necessary. Simultaneously, the assay was extended to amino acids and lipids. A modification of the assay is used to measure the bioavailability of, and the bird's requirement for, minerals.

The paper won the 1977 Tom Newman Memorial International Award, and the TME system of feed evaluation led to the 1979 AFMA Nutrition Research Award of the Poultry Science Association. A recent bulletin describes the current assays.³

Perhaps the most important lesson learned from the work is the need to examine raw data and not to rely on data summaries.

1. Sibbald I R & Price K. Variation in the metabolizable energy values of diets and dietary components fed to adult roosters. *Poultry Sci.* 54:448-56, 1975. (Cited 10 times.)
2. Sibbald I R. The effect of level of feed intake on metabolizable energy values measured with adult roosters. *Poultry Sci.* 54:1990-7, 1975. (Cited 55 times.)
3. ———. *The T.M.E. system of feed evaluation: methodology, feed composition data and bibliography.* Ottawa: Research Branch, Agriculture Canada, 1986. 114 p. Technical Bulletin 1986-4E. Animal Research Centre Contribution 85-19.

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