

## THE MEANING OF BIOLOGICAL VALUE

Y. WEBB\*

Biological value (B.V.) is measured by feeding rats a ration in which the test protein is the sole protein of the ration (Mitchell 1923). In this paper the limitations of B.V. as a description of the usefulness of a product is discussed.

B.V. declines when protein is increased in the test diet; the rate of decline is not constant either within or between protein sources. Further, on low levels of inclusion the feed is unpalatable and intakes are low. Where intake is insufficient to provide the energy requirement of the rat, body protein is catabolized and nitrogen excreted.

The age of rats affects the B.V. rating of protein; for example, lysine is essential for growth of the young rat but not for the adult (Neuberger and Webster 1945; Mitchell 1947). Therefore, if dietary intake is low, and rats maintain rather than gain weight, their lysine requirements may correspond closely to that of adult rats and B.V. of the test protein may be over-estimated.

The carbohydrate source, as well as affecting palatability, affects growth of gut bacteria which supply nutrients.

TABLE 1: Effect of carbohydrate source at 76% of diet with 10% protein intake

Diet	Carbohydrate	B.V.
i) soya protein + 0.2% methionine	glucose	67
ii) "	cornstarch	70
iii) "	dextrin	81
iv) "	sucrose	73

A survey of the literature illustrates a wide variation of values for any particular protein at any particular level of intake. The value obtained depends on the animal's metabolic rate and genetic strain, stress, coprophagy, sex, duration of the feeding trial, turnover rates of cells, nutrients and water in the gut, environmental temperature, relative humidity and amount of dietary fibre.

There is a tendency to quote B.V. as a single figure without qualification. However, if sufficient information is collected on the factors that affect B.V. it may be possible to devise a better test for description of the usefulness of dietary products.

### REFERENCES

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\* Department of Paramedical Studies, Queensland Institute of Technology, Brisbane, Queensland. 4000.