

RELATIONSHIP BETWEEN ENERGY INTAKE AND NITROGEN RETENTION IN THE FINISHER PIG

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There is uncertainty about the form of the relationship between nitrogen (N) retention and metabolizable energy (ME) intake in growing pigs given diets adequate in protein (Williams 1980; Agricultural Research Council 1981). Clarification of this relationship would greatly assist the selection of feeding strategies for the efficient production of pig carcasses of specified composition.

A closed system of urine collection (Colebrook and Black 1980) was used to determine N retention in 18 entire male pigs weighing 73.8 ± 1.7 kg and fed a homogenised liquid diet containing, in each kg, 191.7 g dry matter, 49 g protein ($N \times 6.38$) and 4.9 MJ of ME. This diet was shown in a previous experiment to contain sufficient protein for maximum N retention in pigs weighing 75 kg. Two pigs were allotted to each of eight feeding levels which varied by equal increments from $0.236 \text{ MJ ME/kg}^{0.75}/\text{day}$ to ad libitum (approximately $1.8 \text{ MJ ME/kg}^{0.75}/\text{day}$). These intakes were maintained for 10 days prior to a 7 day N balance period. Two additional pigs were fasted over 7 days and N losses measured. The relationship between N balance and ME intake was analysed by a piece-wise linear regression (Hudson 1966).

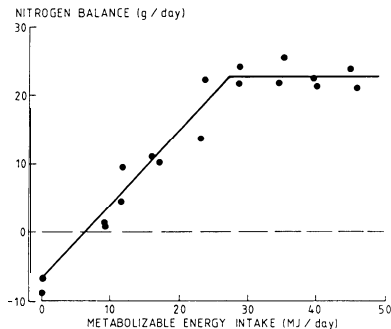


Fig. 1. Relationship between N balance and ME intake for pigs weighing 73.8 kg.

The relationship between N balance (y , g/day) and ME intake (x , MJ/day) was linear ($y = 1.07x - 6.63$; $RSD = 2.26$) as ME intake increased to 27.6 (95% C.L.: 24.4 to 31.4) MJ/day, but thereafter N balance remained constant at 22.8 (95% C.L.: 21.3 to 24.2) g/day (Fig. 1). It appears that the continuing linear response tentatively proposed by Agricultural Research Council (1981) for pigs of 60 kg may not hold, although there is support for the linear concept in lighter pigs (Williams 1980). Our findings are in agreement with those recently reported by Campbell et al. (1984) for pigs grown from 48 to 90 kg. The effects of liveweight on the form of the relationship between N retention and ME intake needs closer definition.

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