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THE ENERGY AND NITROGEN METABOLISM
AND PERFORMANCE OF PIGS INFECTED
WITH OESOPHAGOSTOMUM DENTATUM

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ABSTRACT

Two experiments, in which energy and protein metabolism and growth were measured, investigated the effects of infection with the nodular worm Oesophagostomum dentatum on growing pigs.

In the first experiment, eight gilts were randomly assigned to one of two infection treatments (infected or uninfected). Each infection treatment was then randomly assigned to one of two planes of nutrition (high-plane or low-plane). Those being infected were dosed orally at 20 kg liveweight with 80,000 O.dentatum third stage larvae. Energy and nitrogen balances were repeated serially three times on each animal. Two open-circuit calorimeters were used, with the different treatments being distributed equally to each of these.

O.dentatum eggs appeared in the faeces 19-26 days after administration of the larval dose, increased to a maximum concentration ranging between 4,475 and 18,275 eggs per gram (epg) faeces after 7 weeks and fell to concentrations ranging between 250 and 11,775 epg faeces at slaughter. All uninfected animals remained worm-free.

Heat production (HP) and metabolizable energy intake (ME) were proportional to liveweight^{0.66} ($LW^{0.66}$). Therefore $LW^{0.66}$ was used as the base to reduce variability in the data caused by variation in liveweight (LW).

There were no significant differences between infected and uninfected pigs for intake, digestibility, metabolizability or retention of energy and nitrogen.

Regression analyses of ER vs ME allowed ME required for maintenance (ME_m) and the efficiency of utilization of ME for growth (k_g) to be

calculated. The pooled value for ME_m was $0.69 \text{ MJ.kg}^{-0.66} \cdot \text{day}^{-1}$ or $0.49 \text{ MJ.kg}^{-0.75} \cdot \text{day}^{-1}$.

The pooled value for k_g was 0.54 (calculated on the basis of $\text{MJ.kg}^{-0.66} \cdot \text{day}^{-1}$) or 0.56 (calculated on the basis of $\text{MJ.kg}^{-0.75} \cdot \text{day}^{-1}$). There were no significant differences between treatments for either ME_m or k_g .

In the second experiment, twenty-eight boars and gilts were assigned to one of two infection treatments (infected or uninfected). Those being infected were dosed at 20 kg liveweight with 80,000 O.dentatum third stage larvae. All pigs were individually fed once daily on the same feeding scale. They were weighed weekly and slaughtered at approximately 80 kg liveweight and the digestive tracts recovered.

O.dentatum eggs appeared in the faeces at approximately 3 weeks post-infection, rose to a maximum concentration ranging between 2,825 and 36,250 (average 19,907) epg faeces at 6-13 weeks and then declined to between 50 and 25,825 (average 11,060) epg fresh faeces at slaughter. All uninfected animals remained egg-free.

Average worm numbers recovered after slaughter were 4,255 per pig from infected animals. No worms were recovered from uninfected pigs.

No differences were found between infected and uninfected pigs for growth or carcass characteristics.

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