RESPONSES TO ENERGY : PROTEIN RATIOS BY GROWING-FINISHING PIGS IN THE HUMID TROPICS

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Forth-eight Landrace x Largewhite x Duroc pigs were used in each of two trials to study the effect of diets with various energy : protein ratios on performance and carcass characteristics from (i) 20-50 kg and (ii) 45-80 kg. The eight treatments in both trials comprised a 2 x 4 factorial experiment; the factors being digestible energy (DE) of 12.6 and 14.2 MJ/kg diet and four crude protein (CP) levels at each dietary energy ievel. The diets were based on carsava meal or maize and groundnut meal, palm kernel meal, fish meal and rice bran. Daily feed allowance (g) was calculated in both trials from the formula: $110W_{kg}^{0.75}$.

Because pigs were fed on a common feeding scale, in both trials DE content of the diet significantly ($P < 0.001$) influenced performance of growth and some other parameters. In both trials growth rate (GR) of pigs was faster and feed conversion efficiency (FCR) improved linearly ($P < 0.05$) with decreasing energy : protein ratio (Table 1). Mean feed and digestible energy (DE) intakes were the same on all treatments.

TABLE 1 Influence of energy : protein ratios on growth performance of growing (20-50 kg) and finisher (40-85 kg) pigs

	Energy : protein ratio (kJ DE : g crude protein)				
Growing pigs	78.7	71.6	66.1	61.1	SE
Daily gain (kg)	0.493^{a*}	0.508^{ab}	0.531^{bc}	0.538^{c}	0.013
Feed conversion ratio	2.92^{a}	2.81^{a}	2.66^{b}	2.61^{b}	0.060
DE intake (MJ/day)	19.02^{a}	19.02^{a}	18.83^{a}	18.70^{a}	0.108
	Energy : protein ratio (kJ DE : g crude protein)				
Finisher pigs	96.6	86.2	78.7	71.6	SE
Daily gain (kg)	0.679^{a}	0.696^{ab}	0.734^{b}	0.723^{b}	0.020
Feed conversion ratio	3.42^{a}	3.27^{ab}	3.16^{b}	3.23^{ab}	0.092
DE intake (MJ/day)	30.76^{a}	30.22^{a}	30.83^{a}	31.06^{a}	0.56
Killing-out (%)	73.0^{a}	73.0^{a}	72.6^{a}	71.5^{a}	0.52
Carcass length (cm)	75.7^{a}	75.5^{a}	75.6^{a}	76.6^{a}	0.63
Eye muscle area (cm^2)	30.0^{a}	32.8^{b}	32.3^{ab}	34.1^{b}	0.84
Mean backfat (cm)	4.2^{a}	3.9^{a}	3.4^{b}	3.3^{b}	0.12

* Values with the same superscript are not significantly different ($P < 0.05$)

From 40 to 85 kg, killing-out percentage declined with decreasing protein : energy ratio but this was probably related to gutfill. Eye muscle area increased and backfat thickness decreased as the protein content of the diets increased.

It appears that an energy (kJ) : protein (g) ratio of about 66 for growing pigs, and 78 for finishing pigs optimises performance. This is in general agreement with similar measurements made in temperate climates.

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