

THE RESPONSE OF MALE AND FEMALE PIGS TO CHANGE IN FEEDING LEVEL BETWEEN
20 AND 45 KG LIVEWEIGHT

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The influence of level of feeding of a protein-adequate diet on the partition of energy between fat and protein and therefore on body composition, and to a lesser extent growth performance, is determined largely by the form of the relationship between energy intake and the rate of protein deposition. Experimental data for pigs to 20 kg indicate that the rate of protein deposition is linearly related to energy intake (Close et al. 1979). However, similar information is unavailable for the older pig. The present experiment investigated the performance and rate of protein retention of entire male and female pigs fed a protein-adequate diet at five levels of intake ranging from 2.4 times energy for maintenance (M) to *ad libitum* between 20 and 45 kg live weight.

Over the four restricted feeding treatments (2.4 - 3.9 M) the performance of both sexes was similar. Growth rate and protein retention improved linearly ($P < 0.001$) with increasing energy intake, while the feed conversion ratio (FCR) and body fat increased in a curvilinear fashion (Table 1). However, although the *ad libitum* energy intake of both sexes was the same, (4.6 M) their growth performance and body composition were markedly different. For entire males, raising energy intake from 3.9 to 4.6 M (*ad libitum*) increased growth rate and the rate of protein deposition by 15 and 10% respectively but had no significant effect on FCR or body fat content. The same increase in energy intake for females improved growth rate by only 6.5%, had no further effect on the rate of protein deposition but increased markedly, FCR and body fat content.

TABLE 1 Effects of level of feeding from 20 to 45 kg on the performance, rate of protein deposition and body fat content of male (m) and female (f) pigs

		Level of feeding (XM)				<u>Ad lib</u> (4.6 M)	LSD ($P < 0.05$)
		2.4	2.9	3.4	3.9		
<u>Daily gain (g)</u>	m	419	557	679	779	900	27
	f	409	540	699	780	832	
<u>FCR</u>	m	2.4	2.54	2.54	2.63	2.58	0.14
	f	2.41	2.60	2.48	2.58	2.77	
<u>Rate of protein deposition (g/d)</u>	m	65	87	114	127	145	4.8
	f	64	87	115	128	126	
<u>Body fat at 45 kg (g/kg)</u>	m	181	227	243	257	265	10.6
	f	184	235	253	263	306	

For entire males the rate of protein deposition was linearly related to energy intake over the full range of feeding levels tested (2.4 to 4.6 M). For females however, maximum protein deposition occurred at the energy intake provided by highest restricted feeding treatment (3.9 M), and the extra energy consumed when the diet was offered *ad libitum* was all partitioned to fat. In view of the adverse effects on body fat and feed utilization of exceeding the energy intake at which protein retention is maximised, it may be necessary, even during this relatively early period of development, to pen the sexes separately and to feed them according to their different propensities for muscle growth.

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