

THE ENERGY CONCENTRATION OF RICE BY-PRODUCTS FOR SHEEP, PIGS AND POULTRY

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Rice hulls, rice pollard and broken rice are by-products of the rice milling industry; some of these are useful ingredients in formulated diets of ruminants and non ruminants. It is important to determine the extent to which the energy of these by-products is digested by the various classes of livestock.

Digestible energy (DE) and metabolizable (ME) energy of the by-products were measured on four adult sheep by total collection of faeces and urine for 7 d following a 10 d period on the diet. Faecal collections were made on four pigs (30-40 kg) for 5 d following a 3 d period on the experiment diet. For sheep and pigs, the experiment was repeated for broken rice and rice pollard. ME was determined on each by-product with five adult cockerels using the rapid method of Farrell (1980). Amino acid analyses were carried out on diets and on bulked excreta from the five adult cockerels used in the ME determinations. The amount of each by-product in a basal diet is given in Table 1, as are the DE and ME values.

TABLE 1 The metabolizable energy (ME) and digestible energy (DE) of rice by-products determined with sheep, pigs and poultry

		Mcal/kg dry matter		
		Broken rice	Rice pollard	Rice hulls
Sheep	DE	3.35 (8)*	4.03 (8)	0.63 (4)
	ME	3.27 (8)	3.83 (8)	
	Inclusion (%) [†]	35	35	20
Pigs	DE	4.13 (8)	4.18 (8)	0.89 (4)
	Inclusion (%)	50	40	20
Poultry	ME	3.48 (5)	3.46 (5)	0.53 (5)
	Inclusion (%)	50	50	40
* Number of measurements		† In basal diet		

Coefficients of apparent digestibility of lysine, threonine and methionine were 65, 66 and 87 for rice pollard, and 79, 71 and 91 for broken rice respectively. Low or negative digestibilities of amino acids were calculated for rice hulls.

The very high DE values for rice pollard for sheep and pigs reflect its high oil content (19%). Broken rice has the husk removed and is polished, thus its high DE for pigs. Because of substantial by-pass of the rumen, fermentation of the starch and protein in broken rice is reduced; this may explain why DE is lower for sheep than for pigs. Rice hulls are largely silica and lignin and low energy values would be anticipated. Because of the low inclusion (20%) in pig and sheep diets values for hulls given in Table 1 are approximations. For example, the value for pigs would be expected to be somewhat lower than for sheep although this is not the case.

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