

## UTILIZATION OF RAW SUGAR BY GROWING PIGS

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Sugar is used efficiently as an energy source in diets for growing and finishing pigs. In fact, Schumacher et al. (1986) found that backfat thickness was reduced in pigs fed sugar-based diets and suggested that sugar may be used more efficiently than cereals for protein deposition. This experiment was conducted to determine the effects of sugar and digestible energy (DE) concentration on efficiency of protein deposition.

A control diet was formulated using wheat and soya-bean meal (14.0 MJ DE/kg, air-dry basis). A sugar and soya-bean meal diet was formulated which contained 15.0 MJ DE/kg due to the higher digestible energy content of sugar (15.6 MJ/kg) compared with wheat (13.9 MJ/kg). Soya-bean oil was added to a third diet of wheat and soya-bean meal, so that it was iso-energetic with the sugar-based diet. This was done to separate the effect of energy concentration on energy utilization (Just 1982). All diets contained an estimated 0.64 g available lysine/MJ DE (air-dry basis). Ten male pigs per diet were fed restrictively over the 20-50 kg liveweight range, so that energy intake was limiting protein deposition. Nitrogen and energy retention for each pig was determined by analysis of the carcass following slaughter. Gain and feed conversion ratio (FCR) were calculated on an empty body-weight basis to correct for differences in dressing percentage due to sugar inclusion.

Energy was used more efficiently in the sugar-based diet compared with the wheat-based control diet (Table 1). However, protein deposition was not significantly improved ( $P > 0.05$ ). The addition of oil to the wheat-based diet increased energy utilization ( $P < 0.01$ ) and protein synthesis ( $P < 0.05$ ).

Table 1. Effect of sugar inclusion on nutrient utilization.

Treatment	DE (MJ/kg)	Gain <sup>+</sup> (g/d)	FCR <sup>+</sup>	Protein deposited (g/MJ DE intake)	Energy deposited (MJ/MJ DE intake)	Fat deposited (g/MJ DE intake)
1 Wheat	14.0	528	2.44	4.58	0.316	5.2
2 Sugar	15.0	513	2.37	4.76	0.368	6.4
3 Wheat-oil	15.0	525	2.27	4.88	0.364	6.2
LSD		-	0.16	0.30	0.035	1.0
Significance		ns	**	*	**	**

+ On an empty body-weight basis.

The results confirm that the efficiency of energy utilization increases with energy concentration (Just 1982). Furthermore, this increased energy utilization resulted in greater protein deposition. However, there was no evidence that sugar per se stimulated protein deposition to a greater extent than a wheat-based diet of similar energy density.

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