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The voluntary food intake of sows given native forages in a tropical environment

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Introduction

There is a wide range of forages available in the tropics which could be exploited in pig production systems. The intake of these materials depends upon their physicochemical properties and on the environment in which they are offered. The potential use of forages as alternative sources of food for pigs in a tropical environment could not only increase the utilization of local materials but also reduce the dependency on imported foodstuffs. The objective of the present study was therefore to investigate the possible use of three tropical forages for sows when presented in two forms, fresh or ensiled and to determine to what extent they could meet nutrient requirements during gestation.

Material and methods

The dietary treatments were: (A) *Leucaena leucocephala* (fresh); (B) *Leucaena leucocephala* (ensiled); (C) *Cynodon nlemfuensis* (fresh); (D) *Cynodon nlemfuensis* (ensiled); (E) *Pennisetum purpureum* var. 114 (fresh); and (F) *Pennisetum purpureum* var. 114 (ensiled). The forages were ensiled for 58 days with molasses added at 100, 30 and 30 g/kg for treatments B, D and F respectively. All food was offered *ad libitum* to 12 individually housed gestating sows of mean body weight 191 kg, during a 6-week period. Daily food intake was calculated as difference between the amount offered and that refused. Average food intake of the forages was measured on a dry-matter basis in three consecutive 24-h periods. A double 6 × 6 Latin-square design was used in which each sow received the six dietary treatments. The treatments were randomly assigned as follows: 3 days of forage offered followed by 6 days of concentrate (2·0 kg/day) and again another 3 days of forage. Thus each sow received all six forages over a 54-day period. The measurements of intake were made at 5, 11 and 24 h each day after each forage was offered.

Results

The chemical analysis and dry-matter intake of the forages on each treatment is shown in Table 1. There was a significant difference ($P < 0·05$) between treatments. The highest intake was for the *Leucaena* forage (Table 1). Irrespective of the forage type there was a tendency towards higher intake of the fresh rather than the ensiled form. It was observed that the highest intake occurred during the morning and night time when the temperature was low (25°C approx.).

Table 1 *Chemical composition and dry matter intake of* Leucaena leucocephala, Pennisetum purpureum *and* Cynodon nlemfuensis *fresh or ensiled when given to gestating sows*

	Treatments†					
	Fresh			Ensiled		
	A	C	E	B	D	F
Dry matter (DM) (g/kg)	422·5	400·3	304·3	411·8	286·3	246·3
Crude protein (g/kg DM)	140·0	94·3	88·4	141·8	134·2	97·0
Neutral-detergent fibre (g/kg DM)	697·9	815·1	796·8	630·0	12·7	854·3
DM intake (g/day)	0·955[a]	06·40[b]	09·20[b]	09·20[a]	04·95[c]	04·39[c]

[a,b,c] Values with different superscripts are significantly different ($P < 0·05$).
† Coded as in text.

Table 2 *Amount of protein contributed by the forages relative to the requirements of the gestating sows*†

	Treatments					
	Fresh			Ensiled		
	A	C	E	B	D	F
Dry matter (DM) intake (g/day)	0·955	0·640	0·729	0·920	0·495	0·439
Protein g/kg DM	140·0	94·3	88·5	141·8	134·2	97·0
Protein intake‡	133·7	60·43	64·52	130·4	34·2	20·20
Protein requirement	325·0	325·0	325·0	325·0	325·0	325·0
Proportion of requirement covered by forage§	0·430	0·290	0·272	0·436	0·212	0·141

† Based on ARC (1981).
‡ Provided by the forages.
§ Based on the DM intake of each forage.

Discussion

The high intake of *Leucaena* may possibly be attributed to its lower fibre content, greater palatability and high protein content when compared with the other forages. Tropical forages are roughly characterized by their low protein and high fibre contents (Perez, 1977). Forbes and Blundell (1989) have shown that pigs consumed higher amounts of forages rich in protein. Other factors such as odours, flavours, palatability, acceptability, particle size, age, consistency and moisture also have a significant effect on forage intake (McLeod, 1974; Esperance, 1986; Pond, 1987). In addition, under tropical conditions temperature is one of the main factors influencing food intake (Close, 1989).

These results suggest that some tropical forages are readily acceptable to sows and can contribute significantly to the nutrient needs during gestation (Table 2).

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