

キャッサバパルプは肉牛用飼料に適し、成分の季節・工場間変動も小さい

Cassava pulp is suitable as beef cattle feed and shows less variation in chemical contents among seasons and factories

タイ国内キャッサバ生産量の5割以上が生産されている東北部において、デンプン抽出残渣であるキャッサバパルプを飼料利用するための基本情報を得る。タイ東北部に位置する4つのデンプン抽出工場から異なる季節(雨期、冬期および夏期)に得られた、キャッサバパルプ化学成分の工場間差および季節間差は小さい(表1)。キャッサバパルプの粗タンパク質含量はキャッサバチップに近く、エネルギー価はビール粕に近い(表2)。肉用牛飼料にキャッサバパルプを混合することにより良好な増体成績を得られる(図1)。

More than half of Thailand's domestic cassava production come from the northeastern region. Useful information on cassava pulp—the major waste produced from starch factories—as cattle feed was obtained. Variations in any of the chemical components were very small among the seasons and among the starch factories (Table 1). Crude protein content and energy values of cassava pulp were close to that of cassava and brewers' grain, respectively (Table 2). Inclusion of cassava pulp in feed promoted daily weight gain in Thai native cattle (Fig. 1).

表1 キャッサバパルプの化学成分およびエネルギー価
Table 1. Chemical composition and energy values of cassava pulp

	Cassava pulp		Cassava chip ⁵	Dried brewers' grain ⁵
	Mean	SD		
DM (%)	18.4	3.9	89.8	91.3
Crude Protein (%DM)	2.2	0.5	2.3	25
Ether extract (%DM)	0.4	0.3	0.5	5.7
Neutral detergent fiber (%DM)	36.0 [†]	5.1	10.1	50.7
Non fibrous carbohydrate (%DM)	59.3 [†]	5.4	10.8	83.3
Hydrocyanic acid (ppm DM)	117	55	-	-
Calcium (%DM)	0.22	0.07	0.1	0.36
Phosphorus (%DM)	0.03 [†]	0.01	0.1	0.47
Potassium (%DM)	0.36 [†]	0.14	0.92	0.04
Magnesium (%DM)	0.09	0.02	0.09	0.23
Total digestible nutrient (%DM)	74.4	0.4	79	70
Metabolized energy (MJ/kgDM)	11.3	0.1	15.3	11.3

DM: dry matter, [†]significant difference among factories (P<0.05), [‡] interaction between factory and season (P<0.05). ⁵Data obtained from Nutrient Requirements of Beef Cattle in Indochinese Peninsula (2010)

表2 キャッサバパルプ混合比率の異なる発酵混合飼料の飼料構成および化学成分
Table 2. Feed formula, chemical composition and energy value of fermented total mixed ration containing 10, 30 and 50% of cassava pulp (dry matter basis)

Feed formula (DM basis)	Cassava pulp ratio		
	Low	Medium	High
Cassava pulp	10.0	30.0	50.0
Rice straw	50.0	30.0	10.0
Palm Kernel meal	23.5	23.5	23.5
Soybean meal	5.0	5.0	5.0
Rice bran	10.0	10.0	10.0
Urea	0.5	0.5	0.5
Vitamin & mineral premix	1.0	1.0	1.0
Chemical composition (%DM)			
Crude protein	9.9	9.7	9.7
Ether extract	5.9	5.9	5.9
Neutral detergent fiber	63.2	53.6	45.2
Non fibrous carbohydrate	10.5	22.9	33.7
Metabolized energy (MJ/kgDM)	9.6	11.4	12.4

DM: dry matter

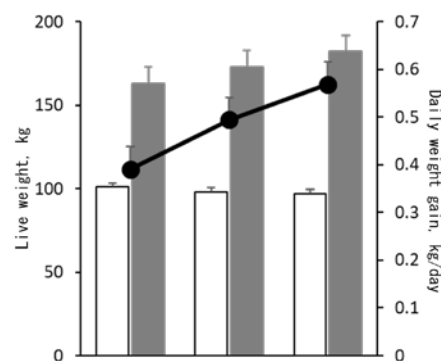


図1 キャッサバパルプ混合比率の異なる発酵混合飼料を摂取した肉牛の試験開始時体重(□)、終了時体重(■)および日増体量(●)混合比率増加にともない日増体量は直線的に増加(P<0.05)

Fig. 1. Initial (□) and final (■) live weight, and daily weight gain (●) of Thai native cattle fed fermented total mixed ration containing 10, 30 and 50% of cassava pulp (dry matter basis). Daily weight gain linearly increased with increasing cassava pulp inclusion (P<0.05).