

PALM KERNEL EXPELLER AS A SUBSTITUTE FOR GRAIN IN DAIRY COW RATIIONS

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Palm kernel expeller (PKE) is a by product of processing the Oil palm tree (*Elaeis quineensis*) and is the solid residue left after kernel oil has been extracted. The high oil content of PKE, means it can act as an energy dense source of concentrate so this experiment aimed to compare PKE with grain based concentrates in dairy cow rations.

Thirty five cows that calved in April-May 1991 were blocked according to parity, milk yield and milkfat %. Cows were randomly allocated to 5 treatments: 5 kg grain concentrate/day (5G), 4 kg grain concentrate plus 1 kg PKE (4G:1PKE), 3 kg grain concentrate plus 2 kg PKE (3G:2PKE), 2 kg grain concentrate plus 3 kg PKE (2G:3PKE), 5 kg grain concentrate plus 1 kg PKE (5G:1PKE). The grain concentrate consisted of 90% barley grain (11.9% crude protein (CP), 2.1% fat) and 10% cottonseed meal (44.4% CP, 4.1% fat).

The experiment was conducted over 4 weeks in September-October 1991. Cows took 2 weeks to adapt to their rations. Milk yield and composition data were analysed over the subsequent 2 weeks. Cows rotationally grazed 10 ha of clover-rye grass pastures during the day (1400 kg dry matter (DM)/ha on offer) and at night were offered maize silage at 9 kg DM and restricted to a feed pad without pasture. Cows were offered their supplement once a day after the morning milking in individual stalls and reject feeds were weighed daily. The PKE contained 16.3% CP, 62.1% neutral detergent fibre (NDF), 14.2% fat, 0.25% Ca, 0.57% P and 26.5 ppm Cu. Maize silage was 8.8% CP, 59.6% NDF, 0.30% Ca and 0.38% P and pasture was 21.9% CP, 25.3% NDF, 1.01% Ca and 0.44% P on a dry matter basis.

Feeding the PKE as a substitute for the grain concentrate increased milkfat% and 4% fat corrected milk (FCM) yield (P < 0.01) when fed at 2 or 3 kg/day (Table 1). It was concluded that PKE could replace grain concentrate in rations up to 2-3 kg/day with no deleterious effect on milk yield.

Table 1. Changes in milk yield, milk composition and intake of supplement at different ratios of barley grain concentrate (G) and palm kernel expeller (PKE)

	5G	4G 1 PKE	3G 2 PKE	2G 3 PKE	5G 1 PKE	SED	LSD P = 0.05
Milk (kg/day)	20.4	20.9	20.9	20.6	20.1	0.86	ns
FCM (kg/day)	18.4 ^a	19.9 ^{ab}	20.9 ^b	20.7 ^b	20.2 ^b	0.91	1.55
Milkfat (kg/day)	1.34 ^a	1.50 ^{ab}	1.64 ^b	1.63 ^b	1.59 ^b	0.09	0.19
Milkfat %	3.28 ^a	3.64 ^{ab}	3.96 ^b	3.99 ^b	3.99 ^b	0.20	0.35
Protein (kg/day)	1.28	1.34	1.37	1.30	1.30	0.07	ns
Protein %	3.16	3.21	3.28	3.18	3.25	0.11	ns
Lactose (kg/day)	1.95	2.04	2.09	1.98	1.98	0.09	ns
Lactose %	4.82	4.87	4.98	4.83	4.94	0.01	ns
Supplement intake (kg/day)	5.0	5.0	5.0	4.8	6.0		
Within rows, means with different superscripts are significantly different P < 0.05.							