

Utilization of Unconventional Feeds in the Ration of Lactating Cows

P. M. Talpada, Z. N. Patel, B. H. Patel, M. B. Pande and P. C. Shukla
Animal Nutrition Department, Gujarat Agricultural University, Anand Campus, Anand

ABSTRACTS

A 3x3 latin square design with 8 weeks period was followed. In one such square three lactating Kankrej cows were used. In all the three treatments T_1 control (no byproduct); T_2 , 30 per cent level of byproducts (15% mango seed kernels, 5% *Cassia tora* seeds, 5% *Prosopis juliflora* pods and 5% sea weeds) and T_3 , 60 per cent level of byproducts (30% mango seeds kernels, 10% *Cassia tora* seeds, 10% *Prosopis juliflora* pods and 10% sea weeds) were used in the concentrate mixtures. Studies revealed that incorporation of byproducts mixture at 30 and 60 per cent level has no adverse effect on milk production and composition. Feeding of byproducts mixture at 30 and 60 per cent level concentrate mixtures was 12 and 10 per cent more economical respectively as compared to control. However, the differences were found to be nonsignificant. Looking to the over all results it can be suggested that byproducts up to 30% level (15% mango seed kernels, 5% *Cassia tora* seeds, 5% *Prosopis juliflora* pods and 5% sea weeds) can be incorporated as per availability in concentrate mixtures for low producing lactating cows. Extensive studies using large number of animals and longer period will be more useful.

(Received on Nov. 5, 1979)

INTRODUCTION

About 70% cost of rearing the cattle is feeding cost. Thus to make the dairy industry profitable it is essential that the cost of feeding be reduced. However, due to increase in cost of cakes, *chunies* etc., it is not possible to reduce the feed cost. Therefore, nutritionist are trying to use other cheaper ingredients i. e. Agricultural and other byproducts. Jayal and Johri (1976) used tomato pomace in the ration of ruminants and Taparia *et al.* (1978) fed *Cassia tora* seeds to buffalo calves. Such byproducts can be used for feeding the animals and at the same time the cost of feeding can be reduced. With this objective the present experiment was planned.

MATERIALS AND METHODS

A 3 x 3 latin square design with 8 weeks period was followed. In one such square three lactating Kankrej cows were used. The three treatments

TABLE 1

Per cent proportion of different ingredients in the concentrate mixtures.

Ingredients	Concentrate mixtures		
	T_1	T_2	T_3
G.N. Cake	20	20	21
Maize gluten	20	12	7
Wheat bran	20	10	0
C.S. Cake	10	5	0
Rice polish	10	0	0
<i>Puvad</i> seeds (<i>Cassia tora</i>)	0	5	10
<i>Prospis juliflora</i> pods	0	5	10
Sea weed	0	5	10
Mango seed kernel	0	15	30
Molasses	8	10	3
Tapioca waste	10	10	5
Salt	2	2	2
Urea	0	1	2
DCP (calculated)	16.4	15.8	16.5
TDN (calculated)	65.9	65.5	63.3

were 0, 30 and 60 per cent levels of byproducts mixture in T_1 , T_2 and T_3 respectively. The proportion of different ingredients used are presented in Table 1.

The DCP and TDN requirements were met by feeding 5.0 kg green NB 21 fodder, restricted quantity of concentrate mixture and mature pasture grass as per NRC (1971) recommendations for the lactating cows. The concentrate mixture was fed twice a day. The animals were offered water *ad lib*. Twenty-five grams of dicalcium phosphate was added in the concentrate mixture per day per animal.

The observations recorded during the experimental period were, daily milk yield, feed consumption and weekly milk

fat. C. Protein, phosphorus and calcium contents in milk were estimated.

The samples of milk were analysed by following AOAC (1970) methods. All the data were statistically analysed for the analysis of variance as suggested by Snedecor and Cochran (1968).

RESULTS AND DISCUSSION

Chemical composition of feeds:

Chemical composition of feeds and fodders used during the experimental period are given in Table 2.

Effect on production and composition of milk:

The average milk and F.C.M. yields are given in Table 3.

TABLE 2

Chemical composition of feeds and fodders used (on % D.M. basis).

Feeds Constituents	Concentrate mixtures			N.B. 21	Mature pasture grass
	T_1	T_2	T_3		
C. Protein	21.99-24.93	22.28-25.15	23.45-25.44	7.86- 9.36	2.18- 2.63
E. Ext.	2.82- 3.21	2.37- 3.01	2.60- 2.87	3.33- 4.09	1.84- 2.06
C. Fibre	6.99- 7.50	5.52- 6.49	5.59- 7.69	21.12-23.43	33.06-33.91
Ash	8.88- 9.00	9.87-10.08	10.08-10.48	13.54-14.51	8.33- 8.83
NFE	55.91-58.85	56.37-58.92	55.53-57.69	49.28-54.15	53.03-54.09
Silica	2.14- 2.43	1.99- 2.27	2.46- 2.67	5.40- 7.21	5.98- 6.71
P	0.60- 0.69	0.44- 0.52	0.30- 0.36	0.37- 0.57	0.030- 0.047
Ca	0.35- 0.39	0.73- 0.83	0.97- 1.04	0.39- 0.49	0.37- 0.43

TABLE 3

Effect of feeding byproducts mixture on the production and composition of milk.

Treatments Constituents	T_1	T_2	T_3	Treatments 'F' value	
Milk yield (kg/day)	5.68	5.74	5.62	0.02	NS
FCM yield (kg/day)	6.70	6.95	6.82	0.03	NS
Fat (%)	5.31	5.40	5.49	0.25	NS
Crude protein (%)	3.38	3.51	3.36	2.00	NS
Phosphorus (%)	0.10	0.11	0.10	1.33	NS
Calcium %	0.14	0.14	0.13	1.00	NS

NS = Non Significant.

The data on milk and F.C.M. production revealed minor variations between different treatments. These differences were statistically non-significant indicating thereby that incorporation of byproducts mixture up to 60% level in concentrate mixture of lactating cows has no adverse effect on milk production.

Similarly the milk composition data (C. Protein, P, Ca.) showed minor variations among the different treatments and were statistically non-significant.

Patel *et al.* (1970, 1972) reported that 10% mango seed kernels and 10% *Cassia tora* seeds respectively can be fed

to milch cows in concentrate mixtures without any adverse effect on milk and F.C.M. yield. Patel *et al.* (1971a) reported no adverse effect of *Cassia tora* seed on milk yield when fed to lactating cows at 15% level in concentrate mixture.

Effect on the economics of feeding:

The cost of feeding the ration were worked out considering the procurement prices of feeds and fodders used. The cost of feeding per kg milk and F.C.M. production were worked out. The average results are given in Table 4.

TABLE 4

Cost of feeding (Rs.) per kg milk and FCM Production.

Treatments Periods	Milk				FCM			
	T ₁	T ₂	T ₃	Treat'F' value	T ₁	T ₂	T ₃	Treat'F' value
P1	1.03	1.07	0.92	1.97NS	1.03	0.95	0.85	1.84 NS
P2	0.88	0.91	1.09		0.71	0.78	0.88	
P3	1.50	1.02	1.07		1.12	0.75	0.79	
Av.	1.14	1.00	1.03		0.95	0.83	0.84	

NS = Non Significant

It is revealed that feeding of by-products mixture at 30 and 60 per cent levels in concentrate mixtures is 12 and 10% respectively more economical as compared to control. However, the differences were statistically nonsignificant.

Patel *et al.* (1971b) observed that inclusion of byproducts at 25% level (10% mango seed kernel, 5% *Cassia tora* seeds and 10% tomato waste) in concentrate mixture of milch cows was 22% more economical as compared to control groups.

REFERENCES

- A.O.A.C. (1970) Official methods of analysis, 11th Ed., Association of Official Agricultural Chemists, Washington, D.C.
- Jayal, M.M. and S.B. Johri (1976). Agro-Industrial byproducts as livestock feeds. Dried and ground tomato pomace with concentrates for ruminants. *Indian Vet. J.* **53**: 793.
- N.R.C. (1971) Nutrient requirements for dairy cattle, National Research Council, National Academy of Sciences, Washington, D.C.
- Patel, B.M., C.A. Patel and P.C. Shukla (1971a). Evaluation of *Cassia tora* seeds in partial replacement of concentrate mixture from the ration of milch cows. *Indian J. Anim. Sci.* **41** (11): 1031.
- Patel, B.M., C.A. Patel and P.C. Shukla (1972) Study on the effect of feeding *Cassia tora* seeds to milch cows. *Indian J. Nutr. and Dietet.*, **9**: 16.

- Patel, B.M., C.A. Patel and P.M. Talpada (1971b). Study on feeding unconventional feeds to milch cows (Byproducts mixture). *Indian J. Nutr. and Dietet.* **8**: 81.
- Patel, B.M., P.C. Shukla and C.A. Patel (1970) Studies on feeding of unconventional feeds to milch cows-Mango seed kernel. *Ind. J. Nutr. and Dietet.* **7**: 363.
- Snedecor, G.W. and W.G. Cochran (1968) Statistical methods, 6th Ed. Oxford and IBH Publishing Co. New Delhi.
- Taparia, A.L., T.W. Talmale and V.V. Sharma (1978). Utilization of *Cassia tora* seeds in growth rations of buffalo calves. *Indian J. Anim. Sci.* **48**: 804.