

A Note on Nutritive Value of Pigeon Pea Mixture [*Cajanus cajan* (L.) Millsp.] Gotar and Wheat Straw Mixture in Cattle

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Pigeon pea is a major pulse crop grown alone or as a mixed crop in an area of 32.56 to 36.14 lakh ha with a production of 24.30 to 26.66 lakh tonnes of grains (Bhan and Mishra, 1998 & Rajasekhar *et al.*, 1998) in the country. The area under pigeon pea in Gujarat was 3.60 lakh ha in 1998-99 (Tyagi, 2000). The seed/grain to available dry fodder ratio is 1:1.5 to 2.0 in pigeon pea. This indicates that huge quantity of pigeon pea crop residues will be available for feeding of ruminants. The pigeon pea crop residues comprised of tender stems, pods cover, immature pods and seeds including leaves are locally known as *gotar*. Traditionally livestock owners feed mixture of *gotar* and straw to livestock because of their indigenous knowledge which proved to be scientifically beneficial as it improves digestibility due to associative effect of feeds (Maynard *et al.*, 1985).

Due to lack of information on nutritive value of different fodder combination, an effort was made to evaluate pigeon pea *gotar* and wheat straw mixture in 75:25 ratio for its nutritive value in cattle.

The experiment on nutritional evaluation of

pigeon pea *gotar* and wheat straw mixture was conducted on five bullocks with average body weight 343.16 ± 17.11 kg. Each bullock was fed 6.0 kg pigeon pea *gotar* and 2.0 kg wheat straw mixture daily in morning during the course of experiment. After completion of 14 days preliminary period, a metabolism trial of 7 days collection period was conducted following conventional method. During trial period bullocks were offered water four times every day. Daily representative samples of fodders offered their refusals, faeces and urine were collected and pooled for trial period. These pooled samples were analysed as per standard method (AOAC, 1980) for different constituents.

The proximate composition of pigeon pea *gotar* and wheat straw fed to bullocks is given in Table 1.

Data given in Table 1 suggested that pigeon pea *gotar* (straw) contained 11.13 per cent CP and 5.70 per cent EE on dry matter basis. Similar values for CP (10.90 per cent) and EE (4.60 per cent) in pigeon pea *gotar* were reported by Patel *et al.* (1963). The CP content of wheat straw was 3.01 per cent only. Bullocks on an average consumed 5.76 kg dry matter per day, 1.69 kg/100 kg body weight and 72.46 g/kg W^{0.75} and maintained their body weight. These data suggested that bullocks consumed sufficient amount of dry matter to meet their maintenance requirement. Patel *et al.* (1963) reported similar data for dry matter intake for bullocks fed pigeon pea (*tur*) *gotar* alone. Daily water consumption was found to be 23.76 litres per animal and 4.13 litres per kg dry matter intake.

TABLE 1

Chemical composition (per cent on dry matter basis) of fodders, digestibility coefficient and balances of nutrients of whole ration.

Constituents Particulars	CP	EE	CF	NFE	Ash	Silica	P	Ca
Pigeon pea <i>gotar</i>	11.13	5.70	23.68	47.39	12.10	5.07	0.16	1.49
Wheat straw	3.01	2.11	38.69	46.03	10.16	5.23	0.06	0.55
	CP	EE	CF	NFE	OM	DM		
Av. Digestibility coefficients	36.33 ±1.95	44.45 ±3.31	71.25 ±1.36	57.68 ±1.19	59.01 ±1.19	52.53 ±1.10		
Av. balance (g per day per animal)								
Nutrients Particulars	Nitrogen (N)		Phosphorus (P)		Calcium (Ca)			
Total intake	86.27	(100.00)	9.58	(100.00)	91.71	(100.00)		
	±2.79		±0.31		± 3.15			
Excreted through faeces	54.99	(63.74)	8.38	(87.47)	69.52	(75.80)		
	± 2.84		± 0.56		± 3.77			
Excreted through urine	23.61	(27.37)	0.04	(0.42)	1.25	(1.36)		
	± 1.40		± 0.01		± 0.14			
Total voided	78.60	(91.11)	8.42	(87.89)	70.77	(77.16)		
	± 3.72		± 0.56		± 3.79			
Balance	+ 7.67	(8.89)	+ 1.16	(12.11)	+ 20.94	(22.84)		
	± 2.91		± 0.45		± 1.97			

The average values for digestibility coefficients presented in Table 1 indicated that the digestibility of CF was the highest (71.25 per cent) and that of CP was the lowest (36.33 per cent). However digestibility coefficients of NFE, OM and DM were in between. Similar trend of digestibility coefficients of proximate nutrients was also observed by Patel *et al.* (1963) being highest for CF (76.80) and lowest for CP (11.80) in bullocks fed pigeon pea *gotar* alone. The average data for digestibility and balance of nutrients in bullock fed pigeon pea *gotar* and wheat straw combination are presented in Table 1.

In spite of lower digestibility of CP, nitrogen balance was positive (+7.67 ± 2.91). Daily consumption of CP and DCP by each bullock was 539.18 and 195.49 g, respectively. The DCP consumption was sufficient to meet maintenance requirement of bullocks having 350 kg body

weight (Sen *et al.*, 1978 and ICAR, 1985) as it is reflected in positive nitrogen balance and maintenance of body weight during the course of experiment. Calcium balance was also positive (+20.94 ± 1.97), while that of phosphorus was marginally positive (+1.16 ± 0.45). This may be due to lower amount of phosphorus in comparison to calcium in the experimental feeds which led to wider calcium phosphorus ratio. The major route of excretion of nitrogen (63.74 per cent), phosphorus (87.47 per cent) and calcium (75.80 per cent) was through faeces. Overall bullocks could retain 8.89 per cent nitrogen, 12.11 per cent phosphorus and 22.84 per cent calcium. Patel *et al.* (1963) reported negative balances of nitrogen, phosphorus as well as calcium in bullocks fed pigeon pea *gotar* and positive balances of these nutrients in bullocks fed *guar gotar* as a sole feed. This may be because of more DM intake, superior CP digestibility (61.00 Vs 11.80) and higher intake

of Ca and P by bullocks fed *guar gotar* in comparison to bullocks fed pigeon pea (*tur*) *gotar*. Hence these findings suggested that bullocks utilized the nutrients present in pigeon pea *gotar* and wheat straw more efficiently when these fodders are fed in combination than separately. The mixture of pigeon pea *gotar* and wheat straw in 75:25 ratio when fed to cattle provided 3.30 per cent DCP and 54.79 per cent TDN on dry matter basis. Hence it is worth to feed pigeon pea *gotar* alongwith cereal crop residues like wheat straw

as it can very well correct most of the deficiencies of cereal straws and can reduce the requirement of concentrate mixture of adult large ruminants at least for maintenance.

It is concluded that the said combination of pigeon pea *gotar* and wheat straw when fed to cattle is sufficient to meet their nutrient requirements for maintenance without supplementation of concentrate mixture.

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