

Effect of inclusion of ajar seed kernel in the diets of kids on their performance

D DEORI¹, K K BARUAH², B N SAIKIA³, B PHUKAN⁴ and J PHUKAN

Assam Agricultural University, Khanapara, Asom 781 022 India

Received: 20 July 2008; Accepted: 27 September 2010

ABSTRACT

An investigation was carried out to observe effect of replacing maize with ajar seed kernel (ASK) on the performance of Assam local goat kids. Assam local goat kids (20), 4–5 months of age, mean body wt. 6 kg were randomly divided into G–1 (fed concentrate mixture containing maize as cereal grain), G–2, G–3, and G–4 (fed rations containing 25, 37.5 and 50% ASK, respectively replacing maize). All the groups received para grass *ad lib*. Feeding trial was continued for 91 days followed by a 7–day digestion trial. The average DMI/100 kg and per kg 0.75, daily gain and feed conversion ratio were 3.40 ± 0.50 , 3.39 ± 0.23 kg; 60.03 ± 0.63 , 58.96 ± 0.24 g/d; 32.11 ± 0.64 , 37.67 ± 0.41 g; 7.40 ± 0.08 , 7.46 ± 0.16 kg, respectively and significantly higher in 1 and 2 than other groups. Similarly digestibility of organic nutrients, energy and N-balance were higher in the corresponding groups. However, no significant difference was observed in dressing percentage. Overall observation revealed satisfactory performance of Assam local kids on feeding ajar seed kernel 25% replacing maize.

Key words: Ajar seed kernel, Daily gain, Feed efficiency, Goat, Kids, Nutrient utilization

The increasing cost and wide gap between the availability and requirement of cereal grains is pressurizing to find out alternative feed resources. In Asom, the population of Ajar tree in 24 061 km² forest area is 3.279 million cubic metres, which can produce 13 116 metric tones of seed per year (FSI 1995). Ajar seed contains 10.03% CP, 7.42% DCP and 65.87% TDN, and is palatable to goats when used at 25% (w/w) to replace wheat bran (Baruah *et al.* 1994, 1995). The per cent of protein in ajar seed kernel was higher than whole seed 13.81 vs 10.94 and CF was lower 7.97 vs 17.81 (Saikia and Baruah 2003). Hence the present investigation was carried out to study the effect of feeding ajar seed kernel as replacement of maize on the performance of kids.

MATERIALS AND METHODS

Ajar seed was collected from different places of Asom and separated manually into kernel and hulls. Assam local kids (20) weaned at 3 months of age, were selected from the university goat farm and reared on standard feeding for 1 month. During this period they were dewormed, vaccinated against enterotoxaemia, and treated for ectoparasites. After this, kids were distributed into 4 groups of 5 animals in each

group on the basis of body weight and fed ration (Table 1) for 13 weeks. These iso-nitrogenous concentrate mixture containing 18% CP and 79, 75, 73 and 70% TDN were compounded containing ajar seed kernel at 0, 25, 37.5 and 50% replacing maize. Kids in different groups were offered their respective concentrate mixture and para grass (*Brachiaria mutica*) *ad lib*. Body weights of kids were recorded at weekly intervals in the morning before feeding and watering. All the experimental goats were fed individually under the same managemental condition. A metabolism trial of 7 days was conducted during 13th week of feeding for assessing nutrient utilization. After the metabolism trial, all the animals were sacrificed to study the carcass characteristics. Representative sample of concentrate mixture, residue, faeces for proximate principle and urine for nitrogen were analyzed (AOAC 1990) and fibre fractions (Goering and Van Soest 1970). Gross energy (GE) was determined with the help of an oxygen bomb calorimeter. Data were analyzed statistically according to Snedecor and Cochran (1980).

RESULTS AND DISCUSSION

The percentage of kernel and hulls in ajar seed ranged from 44: 56 to 46: 54. Similar observations were reported in rubber and tamarind seed (Ranjhan 1991). The chemical composition of seed, kernel and hulls of ajar is given in Table 1, and percentage composition of concentrate mixture is

Present address: ¹ Programme Coordinator, KVK, Tawang.

² Director, NRC on Yak, Dirang, West Kameng, Arunachal Pradesh.

³ Professor, ⁴ Professor and Head, ⁵ Research Assistant, Department of Animal Nutrition.

Table 1. Chemical composition of ajar seed, ajar seed kernel and hull (%DM)

Particulars	Ajar seed (As)	Ajar seed kernel (Ask)	Ajar seed hull (Ash)
Dry matter	86.77	87.99	83.20
Organic matter	95.90	94.48	96.04
Crude protein	10.93	13.30	7.48
Ether extract	0.93	1.72	0.74
Crude fibre	17.40	7.55	27.60
Nitrogen free extract	66.64	71.91	60.22
Total carbohydrate	84.04	79.46	87.82
Neutral detergent fibre	40.41	34.21	48.38
Acid detergent fibre	24.78	16.35	36.73
Total ash	4.10	5.52	3.96
Gross energy (kcal/g)	4.37	4.46	4.20
Tannic acid	2.93	1.23	3.14

shown in Table 2. The CP and EE were higher while fibre portions were lower in kernel than that of hulls. These values were similar to those reported by Saikia and Baruah (2003). Mean body weight, DM intake (DMI), digestibility of nutrients, plane of nutrition and nitrogen retention are given in Table 3. Mean DMI decreased linearly with increasing level of ajar seed kernel in the diet. Similar trend was also observed when maize was replaced at 75% level with ajar seed in crossbred goat (Saikia and Baruah 2000). The average daily gain in body weight was similar in groups 1 and 2 (0

Table 2. Percentage composition of concentrate mixture fed to different groups of kids

Ingredients	Concentrate mixture				Para grass
	CM-1	CM-2	CM-3	CM-4	
Crushed maize	50.0	25.0	12.5	0	
Wheat bran	16.0	16.0	16.0	15.0	
Crushed gram	7.0	9.0	11.0	14.0	
Deoiled ground nut cake	24.0	22.0	20.0	18.0	
Ajar seed kernel	0	25.0	37.5	50.0	
Mineral mixture	2	2	2	2	
Salt	1	1	1	1	
<i>Chemical composition (% on DM basis)</i>					
CP	18.26	18.10	17.84	17.80	9.20
EE	2.81	2.62	2.18	2.10	2.27
CF	12.00	13.00	14.00	14.50	34.00
NFE	58.77	57.14	56.78	56.39	44.43
NDF	20.12	30.50	32.30	34.20	41.12
ADF	10.10	18.10	19.10	20.11	25.16
Total ash	8.16	9.14	9.20	9.21	10.10
GE Kcal/kg	4.45	4.34	4.22	4.10	3.67
Calculated tannic acid (/kg)		0.31	0.46	0.61	

and 50% level of ajar seed) and significantly lower at 75 and 100% replacement. Digestibility of all organic nutrients decreased significantly when ASK replaced 75 or 100% of maize. The feed efficiency decreased significantly in ASK

Table 3. Mean feed intake, body weight gain, feed/gain ratio, digestibility, nutritive value and plane of nutrition in different groups

	G-1	G-2	G-3	G-4
<i>Growth, feed intake and feed/gain ratio</i>				
Number of kids	5	5	5	5
Initial body wt (kg)	6.30±0.58	6.32±0.13	6.32±0.11	6.34±0.07
Final body weight (kg)	9.22±0.62	9.20±0.16	8.84±0.11	8.48±0.08
Body wt. gain (kg)	2.92±0.06	2.88±0.04	2.52±0.04	2.14±0.05
ADG (g)	32.11±0.64 ^a	31.67±0.41 ^a	27.72±0.04 ^b	23.54±0.56 ^c
Feed Intake (g/d)	333.49±28.75	308.41±4.26	287.00±6.74	248.25±8.55
DM intake/100 kg b.wt. (g/d)	3403.94±50.94 ^a	3394.10±2.32 ^a	3164.93±44.40 ^b	2896.2±51.20 ^c
Feed efficiency (kg feed/kg gain)	7.40±9.08 ^a	7.46±0.16 ^a	8.38±0.02 ^b	9.56±0.5 ^c
DM intake/kg metabolic b.wt. (g/d)	60.03±0.63	58.96±0.24	54.93±0.88	49.56±1.07
<i>Nutritive value of completes diets (on DM)</i>				
DCP (%)	10.92	10.23	9.45	8.49
TDN (%)	72.17	69.52	63.45	57.40
<i>Digestibility of nutrients (%)</i>				
DM	73.22±1.14 ^a	72.24±0.68 ^a	67.25±1.25 ^b	61.05±1.00 ^c
CP	74.28±1.18 ^a	73.10±1.01 ^a	67.35±0.91 ^b	62.76±1.06 ^c
EE	79.94±1.22 ^a	77.53±1.13 ^b	74.16±1.38 ^{bc}	64.10±1.46 ^d
NFE	82.79±1.29 ^a	80.80±0.66 ^a	74.94±1.07 ^b	68.81±1.24 ^c
CF	61.00±0.34 ^a	59.88±0.84 ^a	51.79±0.39 ^b	45.73±0.34 ^c
NDF	65.68±1.81 ^a	64.13±1.41 ^a	58.17±1.44 ^b	49.63±1.26 ^c
ADF	54.31±1.76 ^a	53.77±1.07 ^a	48.62±1.41 ^b	43.55±1.69 ^c
GE	74.67±0.04 ^a	73.27±0.06 ^a	66.57±0.03 ^b	60.97±0.02 ^c
N retention (g/d)	52.47±1.12 ^a	51.19±0.91 ^a	45.84±0.62 ^b	40.63±0.20 ^c
Dressing percentage	44.78±0.50	43.28±0.45	41.78±0.78	40.74±0.24

incorporated diet where 75 or 100% replacement of maize. Apart from others higher CF and ADF content could have diluted energy concentration of concentrate mixture. The finding of the present study with respect to feed efficiency corroborated with those of Saikia and Baruah (2000) who did not observe any difference in feed efficiency by replacing 50% maize by ajar seed. An obvious effect of lower digestibility of CP and other organic nutrients was on DCP and TDN value of composite ration which decreased significantly ($P < 0.05$) in animals fed CM-3 and CM-4. As a result animal grew at lower rate in G-3 and G-4 than those of G-1. The effect of feeding ASK containing feed on dressing percentage was negligible. Based on our results, it may be suggested that the Assam local kids can be fed ajar seed kernel at 25% level as replacement of maize without any adverse effect on the performance.

REFERENCES

- A O A C. 1990. *Official Methods of Analysis*. 16th edn. Association of Official Analytical chemists, Washington, D C.
- Baruah K K, Saikia B N, Gohain A K, Das P C, Buragohain S C and Kalita C. 1994. Studies on chemical composition and palatability of ajar seed on goats. *Indian Veterinary Journal* **71** (6): 605–06.
- Baruah K K, Buragohain S C, Borkakoty S, Saikia B N. 1995. Evaluation of nutritive value of ajar seed in goat. *Indian Veterinary Journal* **71** (4): 405–07.
- F S I. 1995. *The State of Forest Report*. Govt of India, Forest Survey of India, Ministry of Environment and Forest, Kaulagharh Road, Dehradun.
- Goering H K and Van Soest P S. 1970. Forage fibre analysis, ARS *United State Department Agriculture Handbook*, No. 374, Superintendent of documents, US, Govt Printing office, Washington, D C.
- ICAR.1998. *Nutrient Requirement of Livestock and Poultry*. Indian Council of Agricultural Research, New Delhi.
- Ranjhan S K. 1991. *Chemical Composition and Nutritive Value of Indian Feeds and Feeding of Farm Animals*. ICAR, New Delhi.
- Saikia B N and Baruah K K. 2000. Performance of Beetal a” Assam local kids on feeding Ajar seed (*Lagerstromia flos reginae*) as replacement of maize. *Proceedings of 7th International Conference on Goats*. May 15–21, 2000, France.
- Saikia G and Baruah K K. 2003. Chemical composition and energy content of ajar seed and its fractions. *Indian Veterinary Journal* **80** (12): 1258–60.
- Snedecor G W and Cochran W G. 1980. *Statistical Methods*. 7th edn. Iowa State University Press, Iowa.