SHORT RESEARCH PAPER

Journal of Hill Research
14(1) : 61-64, 2001

Breed Difference in Utilization of Oat Fodder (*Avena sativa*) between Angora and Newzealand White Rabbits

D. De*, R. Chandra and A.Das

ICAR Research Complex for NEH Region, Sikkim Centre
Tadong 737 102, Sikkim

(Received 15 November 2000; revised version received 25 April 2001; accepted 7 May 2001)

Oat (*Avena sativa*) is one of the most important and recognized cultivated fodders in NEH region, particularly in Sikkim. There is an acute shortage of roughage in winter in this hilly state. Some tree fodders which remain green during this period (Gupta *et al.*, 1999) and oat fodder which is cultivated during rabi season and yields 55-69 tonnes per ha. In Sikkim (Balaraman *et al.*, 1990), play an important role to meet the demand of roughage in the scarcity period. The climatic condition of Sikkim and the ability of rabbit to convert available protein of cellulose rich fodder to meat at faster rate (Labas *et al.*, 1986; Bujarbaruah *et al.*, 1996) make the rabbit most suitable animal for meat production in this state. In this experiment, utilization of oat fodder in Angora and New Zealand white breed of rabbit was studied.

Ten adult rabbits each from two breeds i.e Angora (body weight 1.73±0.03) and New Zealand white (body weight 1.98±0.07) were taken for the experiment. The rabbits were housed individually in specially designed meshwire cages with facilities for feeding, watering and collection of faeces and urine separately. They were fed concentrate and oat fodder (50:50) based diet to study the difference in utilization of oat fodder at preblooming stage. Fresh drinking water was provided twice daily. Live weight gain (g/d) and feed conversion efficiency was calculated on the basis of total weight gain and DM intake in 30 days of experimental period. After a preliminary feeding of 23 days, a metabolic trial of 7 days collection was conducted. The daily record of DM consumption, faeces and urine voided were maintained for individual animal. Suitable aliquots were preserved using 25% (w/v) H_2SO_4 for N analysis. N content of feed, faeces and urine were analyzed following Micro Kjeldahl method. The pooled sample of feed and faeces were analyzed for proximate principles (AOAC, 1984). The generated data were analyzed statistically using Student's 't' test (Snedecor and Cochran, 1986).

The nutrient composition of oat fodder and concentrate mixture is presented in Table 1. Concentrate mixture, oat fodder and total DM intake was significantly ($P<0.01$) higher in Angora breed. DM intake (g/Kg $W^{0.75}$) was also higher ($P<0.01$) in Angora rabbits. This higher DM intake might be due to higher nutrient requirement for wool growth

* *Corresponding Author*

Table 1. Nutrient composition (% DM) of oat fodder and concentrate mixture

Parameter	Oat Fodder	Concentrate mixture
DM	13.71	86.86
OM	95.92	95.49
CP	8.40	14.73
CF	22.92	5.47
EE	2.16	3.56
NFE	62.44	71.73
Ash	4.08	4.51

Table 2. Feed intake and Nutrient digestibility of two breeds of rabbit

Parameter	Angora	New Zealand white
Feed intake (g DM/d)		
Conc. Mix.**	39.57±0.87	25.48±2.94
Oat fodder**	41.09±1.45	11.20±3.69
Total DM intake**	80.66±1.99	36.68±2.70
DMI/Kg $W^{0.75}$**	53.58±1.49	22.81±1.99
Digestibility of nutrients (%)		
DM	37.02±1.07	33.19±6.10
OM	40.34±1.03	35.18±6.02
CP	80.67±2.54	78.26±2.60
CF	30.10±0.32	29.37±0.32
EE**	80.03±1.23	58.52±5.32
NFE	33.90±1.61	26.49±7.33
Digestible nutrients intake (g/d)		
DDM**	29.88±1.21	11.74±1.82
DOM**	31.15±1.16	11.93±1.74
DCP**	7.49±0.29	3.69±0.32
TDN**	33.46±1.20	12.78±1.81
DCP intake (g/Kg $W^{0.75}$)**	4.97±0.18	2.31±0.26
TDN intake (g/Kg $W^{0.75}$)**	22.24 0.91	8.02 1.27
Nutritive value of Diet		
DCP %	9.29±0.31	10.17±0.62
TDN %	41.47±0.97	36.01±5.99

**P<0.01

Table 3. Nitrogen balance in rabbit fed oat fodder based diet

Parameter	Angora	New Zealand white
Nitrogen intake (g/d)		
Through Conc. Mix**	0.93±0.02	0.60±0.07
Through Oat fodder**	0.55±0.02	0.15±0.05
Total**	1.48±0.03	0.75±0.05
Nitrogen loss (g/d)		
Through Faeces*	0.29±0.04	0.16±0.02
Through Urine**	0.31±0.04	0.12±0.02
Total**	0.59±0.05	0.28±0.03
N-retained (g/d)**	0.89±0.05	0.47±0.06
N-retained as % of intake (NPU) ^{NS}	60.04±2.86	61.39±4.66
N-absorbed (g/d)**	1.19±0.05	0.59±0.05
N-retained as % of absorbed-N (BV) ^{NS}	74.75±3.07	77.82±3.93
Live weight gain (g/d)^{NS}	18.30±3.12	11.91±1.51
Live weight gain (g/Kg DMI)^{NS}	223.67±38.83	272.06±35.69

NS=Non significant; ** P<0.01; * P<0.05

and also for comparatively more live weight gain, though statistically nonsignificant, in Angora rabbit. In another study, when mash feed or mash feed with lucern hay was supplied to Angora rabbit DM intake (g/Kg $W^{0.75}$) was 78-80 (Kumar and Bhatt, 2000). In the present experiment. The DM intake in Angora rabbit was higher and in New Zealand white, it was lower than the recommended level for rabbit (NRC, 1966). However, digestibility coefficients (Table 2) of nutrients, except EE, did not differ significantly between breeds. Though, digestibility coefficients of nutrients were similar but due to higher DM intake, digestible nutrients (DDM, DOM, DCP, TDN) intake were also significantly (P<0.01) higher in Angora breed as compared to New Zealand white. But nutritive value (DCP % and TDN %) of the diet of the two breeds (Table 3) did not differ significantly. Nitrogen intake and losses (through faeces and urine) were significantly (P<0.01) higher in Angora breeds, but, nitrogen retained as percent of intake i.e. net protein utilization (NPU) and biological value (BV) did not differ significantly. This higher nitrogen balance in Angora breed might be due to higher nitrogen intake only. Live weight gain (g/d, g/Kg DMI) of two breeds was also similar. From this experiment it has been seen that oat fodder can be incorporated in the rabbit ration up to 50% as reported in case of lucern hay (Raharjo *et al.*, 1990). So, it can be concluded that ration containing oat fodder and concentrate mixture in equal proportion can meet the maintenance requirement of both the rabbit breeds and nutrient utilization efficiency was also similar in both the breeds.

REFERENCES

AOAC (1984) *Official Methods of Analysis*, 14th edn. Assoc. of Official Analytical Chemists, Washington, D.C.

Balaraman, N., Bhusan, B. and Mishra, K.C. (1990) *Research Support for Farm Production, vol. 2 Veterinary and Animal Sciences*, ICAR Research Complex for NEH Region, Sikkim Centre, Tadong, Gangtok.

Bujarbaruah, K. M., Das, A., Ghosh, S.S. and Rajkhowa, C. (1996) *Rabbit Farming for Meat, Furskin and Wool production in North Eastern Hill Region of India*, Research Bulletin No. 37, ICAR Research Complex for NEH Region, Barapani, Meghalaya.

Gupta, H.K., Gupta, J.J., Yadav, B.P.S. and Sahoo, S.K. (1999) Utilization of nevaro (Ficus hookeri) leaves in rabbit. *Indian Journal of Animal Sciences* **69(8)** : 643-644.

Kumar, S. and Bhatt, R.S. (2000) Feeding of lucerne hay to economise feed cost for angora rabbits. *Indian Journal of Animal Nutrition* **17(1)** : 90-93.

Labas, F., Condert, P., Rouvier, R. and Rochambeau. (1986) *The Rabbit : Husbandry Health and Production*, F.A.O Rome, pp. 235.

NRC (1966) *Nutrient Requirements of Rabbits*, National Academy of Science, National Research Council, Washington, D.C.

Raharjo, Y.C., Cheeke, P.R. and Paton, N.M. (1990) Effect of cecotrophy on the nutrient digestibility of alfalfa and black locust leaves. *Journal of Applied Rabbit Research* **13(2)** : 56-61.

Snedecor, G.W. and Cochran, W.G. (1986) *Statistical Methods*, Oxford and IBH Publishing Co., Calcutta, India.