EFFECTS GF TRADITIONAL AND UNCONVFMICNAL TATTTNING DIETS ON FEEDLOT PERFORMANCE 0F KENANA BULL CALVES

O. A. ELKHIDIR, A. 1Vl.KHALAFALL.4H, Y. R. SULIE.HAN,'F. I. MURGOS.AND SHADIYA, A. OMER.

Central Animal Produc/ion Research Station, Kultu, P. O. Bax 89,Industrial Area, Khartoum North, Sudan.

SUMMARY

Two groups ofsix and seven Kenana bull calves were fattened on a treatment diet (A) ot'80 ‘X, cotton seed meal (CSM) and unconventional diet (B) of8O% concentrate mixture, respectively, from an average 68 kg initial live- weight to 152.9 t 1.0 kg slaughter weight. A brtter t"e:d lot performance was observed for calves fed the concentrate mixture diet. No significant differences were found between the two groups in structural tissue components of the carcass. It has been concluded that the traditional use of CSM for t'att<n‘ng cattle in the Sudan should be discouraged and incorporation of this feed should be minimized levels required to maintain the desired protein content in the diets.

INTRODUCTION

Livestock production in the Sudan is dependent on traditional methods cl‘ management, feeding and marketing. Consistenily cattle and sheep are brought by traders from rural areas to big towns where they are fattened on diets of oil cakes with little amounts of Sudan grass hay or fodder. This feeding practice lead to unnecessary and excessive use ofvalurtble crude protein hydrocarbon as energy source that induced tremendous increases in the prices of oil cakes. It is
therefore axiomatic that rational incorporation of oil cakes in animal diets

will improve the efficiency of utilization of these rich protein sources and reduce their present flaring prices.
This study was initiated to compare the ctliciency of utilization of a traditional dict ofcotton seed meal and Sudan grass hay with a diet formulated on scientific basis (several ingredients) when used in fattening Kenana bull calves.

Liveslock .'

For the purpose of the experiment thirteen Kenana bull calves (6 . 5'! 0 . 4 months old and 54.91'! .4 kg liveweighl) were acquired in lean condition from Um Bcnein Livestock Research Station to the Central Animal Production Research Station at Kuku. On arrival the calves were car tagged, injected with prophylactic doses of Terramycin and treated against ccto and endo – parasites using C-amatox and Thiobenzolc respectively.

Experimental :

As the bull calves werebrought in a lean condition they were allowal a three month preliminary period during which they were offered a diet of 28% dura grain, 25% cotton seed meal (CSM), 31 'Z; peanut hulls. 15% wheat bran and 1% common salt. At the end ofthe prcliminaiy period thacalvesrwere divided according to liveweight into two similar groups of six and seven animals each and cf 67.8 2.6 kg and 68.9! 2.5 kg liveweight respectively. The two groups were alloted at random, one to a traditional fattening diet ofiét) ')4, and 20%
sorghum hay (Treatment A), and the other to a diet of 80% concentrate compound and 20% sorghum hay(Treatment B). Green fodder (alfalfa) was offered weekly to the calves at the rate ofZ kg per head to avoid vitamin A deficiency. Ingredients of the experimental diets and their chemical analysis are shown in Tab'e l. The animals were fed in groups and the diets were offered ad libitum in one morning (08 00 h) and one evening meal (16 00 h).

Table 1 : Composition and chemical analysis of the experimental diets

Ingredients (g/kg as fed):	DIETS: Treatment (A)	Treatment (B)
Sorghum hay	200	200
Cotton seed meal	800	—
Concentrate mixture	—	800
Chemical analysis (g/kg DM) and energy concentration :		
Ash	61	54
Crude protein (CP)	261	140
Digestible CP	198	74
Metabolizable energy (MJ/Kg DM)	8.037	9.582

*N.B.The concentrate mixture was composed of 60% dura grain, 20% wheat bran, 19% cotton seed meal and 1% common salt. Both groups of animals had free access to salt licks containing (in addition to NaCl) Ca, 11.4g; P, 3. 0 g; Fe, 1.3 g; Mn, 45 mg; Co, 180 mg; 1, 185 mg and vitamin D, 39900 IU/Kg.

The experimental groups were housed separately in two adjacent pens each equipped with watering and feeding facilities and furnished with overhead bamboo shade. Throughout the experimental period the calves of both groups were weighed at weekly intervals before the morning meal.

Digestibility Trial: : -

Metabolizable energy (ME) and digestible crude protein (DCP) content of the experimental diets were determined by in vivo digestibility trials involving a group of three sheep for each diet. Each digestibiity trial was of seven days preliminary period followed by seven days collection period.Tlle ME values were calculated by the equation :

ME (MI/kg DM}=-"DOM X 4.4 X 4.184 X 0.82

Slaughter and Carcass: Analysis :

All calves were slaughtered when they reached a target liveweigltt of about IF3 lsg . The carcasses were prepared according to the method described by Gaili and Ncu.'(I980)_ The thoracic organs and abdominal viscera were removed but kidneys and laidneys fat were left until measuring warm and cold carcass wefghts. The carcasses were chilled at 2 to 4 c‘ overnight. They were then split longitudinally along the vertebral column into two symmetrical halves. The left side ofeach carcass was dissected into muscle, bone, fat and connective tissue. Where as the right side was kept for subsequent sale.

Statistical Analysis:

Differences between the experimental groups in growth and carcass analysis were examined for significance by Student t- test (Snedecor and Cochran, I967).

RESULT AND DISCUSSION

It has already been mentioned that the animals were acquired in lean condition The relatively long preliminary period allowed here was therefore designed to obliterate possible compensatory growth when the animals are placed on the experimental diets. The feedlot performance of the experimental animals is shown in Table 2. The treatment group A reached the slaughter weight in about I3 days later than those in treatment B. Consistently the live weight gain of theft:-rmer group was s3gnificantly($P < O. 05$) lower than the latter . However no substantial difference is observed between the two groups in feed conversion

Table 2 : Feedlot performance of the experimental animals

	Treatment (A)	Treatment (B)	SE
No. of animals	6	7	—
Initial L. Wt. (kg)	67.8	68.9	2.4 NS
Final L. Wt. (kg)	152.2	153.9	1.5 NS
Fattening period (days)	89.8	76.6	6.4 NS
L. Wt. gain (g/day)	939	1114	200*
DMI (kg/day)	4.686	5.463	—
ME (MJ/day)	37.66	52.35	—
DCP (g/day)	928	404	—
Kg DMI/kg L. Wt. gain	5.0	4.9	—

P < 0.05

efficiency. Whereas the average daily intake of ME and DCP showed very wide variation. Intake of the former nutrient was 39 °/0 higher t“ or treatment group B compared with that of treatment group A; but DC P intake was found 130% greater for the latter compared with former experimental group. ln this respect it is noteworthy that excessive intake of crude protein may lead to the use of protein hydrocarbon as energy source with the result that crude protein is subjected to deamination in the rumen and subsequent excessive release of ammonia that can be recaptured and synthesized into microbial protein i. e. it is a wasteful! process. Furthermore under tropical environment high levels of crude protein in the diets than is physiologically desirable is unacceptable as it adds to the heat load on the animal due to greater specific dynamic action of high protein diets. ’

Results of live weight gain and feed conversion deficiency found in the present work are greater than those reported by El Shade(l966) for a group of Sudan Zeb} Cattle fattened from 141. l kg to an average of 245. l kg slaughter weight. However the dressing percentage observed in this experiment (49 V?/9 , '< lower than that noted, by the author (54 %). This might be due to the heavier initial and slaughter weights of cattle used in

that experiment. Further more El Shafie et al (l976) observed a lower feed conversion efficicncy (6.8 kg feed‘, kg gain)
and about a similar daily live weight gain (see Table 2) for groups of western Baggara cattle fattened from atout 132.4 kg‘ to 222.8 kg slaughter »\'eZglttt These authors (El shafie ct al, i976) used different diets of variable ingredients and containing 11.6 to 14.8% crude protein.

Table 3 presents the slaughter and carcass analysis data of the experimental animals. The data revealed no significant differences between the two groups in most of the parameters stu/diodffiowever the calves on treatment B had a lower gut fill (P < 0. 05) and a higher percentage offat (P < 0.05) compared with thsse on diet treatment A. It seems that liveweight rather than type of food oifered is the factor that may affect the carcass composition of the animals Similar. results were reported by Khalafalla and El Khidir(I985) with sheep.

Table 3 : Slaughter performance of the experimental animals

	Treatment (A)	Treatment (B)	SE
No. of animals	6	7	—
Slaughter Wt. (kg)	152.2	153.9	1.5 NS
Warm carcass Wt. (kg)	74.5	75.4	1.5 NS
Chilled carcass (kg)	71.3	73.0	1.5 NS
Gut fill (% of L. Wt.)	15.8	13.0	0.9*
Dressing %	49.0	49.0	—
Muscles %	66.2	64.9	2.0 NS
Bone %	23.1	21.9	0.4 NS
Fat %	8.6	10.7	0.6*
Connective tissue %	2.0	2.6	0.2 NS

N. B. Tissues are percentages of chilled carcass weight.
* P < 0.05

The results indicated that the us: ofa traditional diet of 80 % CSM for fattening the Kenana bull calves stimulated a lower performance compared with the 80% concentrate mixture supplemented diet. It was also found that the cost per kg gain was l8% cheaper for the latter compared with the former diet treatment. Therefore it could be concluded that the excessive use of CSM for fattening livestock is not justifiable and that it should be used in as much as to meet the crude protein requirement of the animals. Such a practice is expected to reduce the
current high demands for CSM with suhs:quent favourable effect on its avaibility and price.

REFERENCES

El Shafie, S. A. (I966) . Further observation on fattening of Sudan Zebu cattle S. J. Vet. Sci. and? Anim. Hush, 7 :22 - 27.

El Slufle, s. A., Osmnn, AT 11., Khalil, 14. A. and Tawfik, 2. s. (1915). Pre-weaning and post-weaning growth and its relationship to feedlo; performance and carcass cluractetistics of bull calves. Sudan, J. Vet. Sci, and Anim, Hull). , 11:16 - 25.

Gaili, E. S. E. and Nour, A.F. Y. M. (I980). Development of body components in Kenana cattle. l. Development of camass and non - carcass components ofthe body. J. Agfic. Sci. , 94 : 257 - 262.

Khalafalla, A. M. and El Khidit, O. A. (I985). A note on intensive fattening of Sudan Deserllzmbs. Wld. Rev. Anlm. Pro:l., ll : 4| - 41.

Snedeeor, G. W. nnd Cochran, W. G. (I967). Sutisitical Meihods. Iowa State University Press, Amee, Iowa U. S. A.