THE EFFECT OF SUBSTITLJTION OF COITONSEED CAKE BY BLOOD MEAL AS SOURCE OF PROTEIN IN RATION FOR FATTENING LAMBS

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SUMMARY

The effects oftwo rations containing either cottonseed cake or blood meal on the growth perfot mance and carcass characteristics were studied. The experiment involved 24 Shugor male lambs. about four months old. Fattened for 63 days. The two rations were isocalnric and isonitrogenous and contained, among other components‘ either cottonseed cake (A) or blood meal (B). The average livewei- ght gain and feed ctvnversiott efiiciettcy of the lambs were not significantly affected by the source of protein in the ofieretl diets. Howeter, the proportion ofthe gut fill was significantly (P < 0.05) increased by feeding the blood meal.All carcass par- ameters were not alfected by feeding or replacement ofcottonsecd cake in the ration.

introduction

In the Sudan oil seed cakes are the conventional source of protein supplem- ent in livestock rations. Bttt due to their currently high costs, unconventional protein sources are examined. In this respect Osman (i985); Sulieman et al (I986) and Mansour (I987) pioneered the UtlliLhlII0l\ of blood meal as a source of protein for fattening lambs in Sudan. The purpose ofthe present work was to evaluate the effect of replacingpcottonseed cake by blood meal for fattening , lambs.

MATEIUALS AND METHOD

Experimental animah and Experimental diets .' The experimental diets were formulated to contain similar caloric and crude protein values (Table l). In ration A cottonseed cake provided about 31 f?{, of the total nitrogen, whereas i_n ration B blood meal was used to replace the cotton- seed cake in ration A and contributed about I8 "g, ofthe total nitrogen in rationB. Twenty four Shugor male- lambs, about four months old, were purchased from a local market in the vicinity of El Huda Sheep Research Station. On arrival, the lambs were treated against certain endemic bacterial and parasitic diseases and were fed pioneer (hybrid Sorghum spp.) hay and wheat bran for ten days. Thereafter the lambs were distributed according to body weight into two similar groups of twelve lambs each designated A and B according to the experimental rations offered.

Table I Components and Nutritive values of the experimental diets (on as fed basis).

Dietary components %	Ration A	treatment B
Dura grains	20	40
Cottonseed cake	38	—
Blood meal	—	4
Wheat bran	40	54
Common salt	1	1
Lime	1	1
Nutritive value: *		
Crude protein %	18.8	18.7
Energy concentration, MJ/Kg DM	11.9	12.0

* Calculated from Bulletin 29 of the North of Scotland college of Agriculture, Agricultural chemistry Division (1982). Nutrient Allowances for cattle and sheep.

The lambs in each feeding group were individually penned and offered ad libitum their respective experimental rations for a one ~ week period to adiust to the experimental environment, before any measurements were taken. Following the adjustment period, certain measurements were taken on all the experimental lambs, which included initial, weekly and final liveweights-and feed intake.Water was freely offered during the experimental period which lasted for 63 days.

Carcass measurements :

At the end of the fattening period eight lambs (four from each experimental gr- oup) were slaughtered and some slaughter carcass measurements were taken, according toJackson (1967). -~ After splitting each carcass into two halves, the left side was jointed into whol- esale cuts (shoulder, rib, loin and gigot) and each joint was further dissected into carcass fat (containing intermuscular and subcutaneous fat, lymph nodes, blood vessels and nerves,) lean (muscular tissue) and bone (actual bone,tendons liga- ments and cartilage). On the other hand, and prior to tissue separation of the rib joint, the cross ~ sectional area of the muscle Longissimus dorsi at the 12 th rib was calculated. This was done for each carcass by measuring and multiplying the greatest widthtand height of the muscle at this site (Wood, and Mcfie 1980). Weights of offals and other slaughter by - products were also obtained after the lambs were slaughtered. '

Statistical analysis : _ .

The data were statistically examined by t- test as outlined by Steel and Torrie (1960) .

RESULTS AND DISCUSSION

Results of the feedlot performance of lambs on ration A and B are presented in Table 2. None of the parameters studied were significant ($P > 0.05$) with the exception of the gut fill which was significantly higher($P < 0.05$) _ for lambs fed on diet B. Lambs on ration B showed a better feed conversion efiiciency than those on ration A as they required l5 ‘X, less food per kg liveweight gain. The growth performance of lambs in ration B was remarkable compared with that reported by Mansour (I987) who used a ration containing 5 % blood meal and obtained a growth rate of 137 gm/day.

Table 2. Feedlot performance of the lambs fed the experimental rations.

Parameters	Ration treatment A	Ration treatment B	SED
No. of animals	12	12	—
Initial live weight, kg.	22.1	22.6	0.63 NS.
Final live weight, Kg,	32.4	34.6	1.08 NS.
Empty body weight (EBW),/Kg.	28.5	29.8	1.85 NS.
Gut fill, % EBW	11.52	16.39	1.88 *
Daily feed intake, Kg.	1.07	1.03	0.30 NS.
Daily live weight gain,/g	162.6	184.3	12.36 NS.
Kg food / Kg gain	6.71	5.76	0.41 NS.

Even at a higher supplementation rate (10%) of the blood meal his results on live weight growth (193 gm/day) were only similar to those of the present study. The better or improved response in this study could be partially attributable to

the nature ofthc ration used. In the present study the crude fibre content of ration B was about 5 f4, while it was about 18 f?{, in the ration of Mansour (1987). Mean values of the slaughter and carcass parameters of the lambs given the experimental rationsA and B are shown in Table 3. It is evident from the Table that all these mean values were similar.

Table 3. Slaughter and carcass characteritices of the fattened lambs.

Parameters	Ration treatment		SED
	A	B	
Slaughter weight, Kg.	31.7	33.5	1.85NS.
Warm carcass weight, kg.	14.2	14.4	1.41. NS.
Dressing %, relative to EBW	49.8	49.8	3.66 NS.
Carcass length, Cm	52.0	53.3	1.65 NS.
Gigot width Cm	6.3	6.0	0.94 NS.
Muscle Longissimus dorsi area, Cm^2	13.3	12.9	0.87 NS.
Back fat thickness, Mm	3	3	o.75 NS

In regard to tissue composition of.th: carcass, the results sivnvn in !?ble 4 indicated a close similarity in the values for bone, lean and fat in the two groups of lambs. However, the present lambs have deposited more carcass fat than those used by Mansour (1987) at all levels of blood meal supplementation. The fat values being 17.9 and 14.5“; in the present study and that carried out by'Mansour (1987) . respectively . This variation could, as well . be explained in relation to the higher quality of the ration used in the present study, as was mentioned earlier.

Table 4. Carcass tissue composition (percent of carcass weight) of the fattened lambs.

Tissue components	Ration treatment		SED
	A	B	
Lean	58.87	58.85	1.59 NS
Bone	24.05	22.30	1.40 NS
Fat	17.08	17.86	0.85 NS

In Table 5 the mean weights of some organs and body components are expressed in terms of proportions of the empty body weight of the slaughtered lambs. None of the values of these organs and body components are significantly diffe-

Table 5. Mean values of the weight of organs and body parts (% of EBW) of the fattened lambs.

Organs and body parts	Ration treatment		SED
	A	B	
Head (unskinned)	8.24	7.97	0.64 NS
Pelt + feet	13.8	13.4	1.14 NS
Lungs + trachea	1.76	1.81	0.25 NS
Heart	0.74	0.49	0.12 NS
Liver + gall bladder	2.44	2.66	0.33 NS
Spleen	0.39	0.30	0.10 NS
Kidney	0.29	0.37	o.05 NS
Gut + caul fat	1.70	1.82	0.46 NS
Peri - renal channel fat	0.67	1.36	0.31 NS
Empty digestive tract	8.19	8.70	0.49 NS
Testicles	1.20	1.25	0.29 NS
Tail	2.10	1.54	0.26 NS

on the basis ofthe results in this study, it could be concluded that blood meal, as a source of protein, could be used as an alternative to cottonseed cake for fattening lambs and might help saving some of costly oil cakes for exportation. However, more work needs to be done to evaluate the use or blood meal as a protein source at higher levels and its interaction with energy conecentration. It also equally important to cavluate the economics of its use for fattening lambs.

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