

A Commercial Drought Feeding Trial with Sorghum Silage for Sheep

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INTRODUCTION

Following the growth of large areas of sweet sorghum and its conservation as silage in the under-twenty-inch annual rainfall Mitchell grass downs area of Western Queensland, a number of trials have been undertaken to test the feeding value of the stored product.

Preliminary trials were conducted by Moule (Personal Communication) at "Inverness", Muttaborra, feeding from troughs in yards with no access to paddock feed. He found that sheep of approximately 70lb. live weight fed a daily ration of 31b. of sorghum silage plus 2oz. of meatmeal maintained their weight for two months, but not their strength. Ewer (Personal Communication) fed dry sheep at Terrick Terrick Station, Blackall, also in yards, using sorghum silage alone and supplemented with either sheep nuts or ammonium nitrate. The sheep fed silage alone for seven months were very weak at the end of the period. The group receiving ammonium nitrate were somewhat stronger, while those receiving sheep nuts came out of the trial period in the best condition. Seven pounds of silage per head per day were fed.

Wynn (Personal Communication) fed aged rams of an average live weight of 105lb. in yards without access to paddock feed for a period of three months from October to December, 1957, at "Thylungra", Quilpie. The rations included 12lb. sorghum silage; 6lb. silage plus 2oz. poona cowpea grain; 6lb. silage plus 4oz. sheep nuts; and 6lb. silage plus 2oz. of specially prepared nuts per head per day. All rations gave satisfactorily maintenance, the sorghum silage plus poona cowpea grain giving the best performance.

Ewer and Robins (1958), in feeding trials in crates at the Queensland University Farm at Moggill, showed that a mineral supplement of bone flour/salt gave much better utilisation of silage produced on the farm and so this supplement was added to one of the rations in the present series of trials. Subsequent trials with silage from crops grown and ensiled in the Mitchell grass downs area showed that this latter silage contained ten times the amount of phosphorus contained in the Moggill silage and no response to mineral supplement was obtained.

Worsening conditions in the Blackall district in 1958 caused the Australian Estates Company to move stock to agistment. It was decided to feed a trial flock of ewe weaners at Terrick Terrick Stud while the remainder of this group went to agistment in the Central Highlands.

The feeding trial was based on sorghum silage, which had been ensiled in trenches during the 1955-56 seasons from crops grown on the property. The trial was designed to approximate what could be ordinary commercial sheep husbandry in times of drought.

MATERIALS AND METHODS

Only four small paddocks were available at the time and it was decided to stock the paddocks at the normal rate of stocking for the Mitchell grass downs in the district, namely one sheep to

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four acres. At this rate the four groups comprised 80, 30, 30, and 30 sheep respectively. The Mitchell grass at this stage was mainly stubble which had been "blackened" by mould growth following earlier light rain. A composite sample of the stubble from the four trial paddocks showed a crude protein content of only 0.31 per cent. This is an extremely low figure.

Ewe weaners were used in the trial. The sheep had been shorn in April and the trial commenced on 15th July, 1958.

The introduction to feeding followed the sequence—

1st day—sheep yarded;

2nd day—sheep fed on lucerne hay at 1½lb. per head;

3rd day—sheep fed at ¾lb. lucerne hay per head plus 2lb. sorghum silage with a sprinkling of molasses per head;

4th and 5th days—sheep fed 3lb. silage and 2oz. of poona cow-pea grain per head;

6th day—sheep were eartagged, weighed, divided into four groups, and turned out on to their respective rations already placed in the paddocks.

A common bore drain watered each of the four paddocks.

Unfortunately, the initial weights of the four groups differed, but the subsequent weighings showed a consistent response. All sheep were weighed weekly, immediately prior to feeding, without any control of water intake from the bore drain.

Fleece testing was carried out by officers of the Queensland Department of Agriculture and Stock.

RATIONS

Rations were fed to the four groups as follows:—

Group 1—80 sheep—3lb. sorghum silage plus 2oz. poona cowpeas per head per day;

Group 2—30 sheep—3lb. sorghum silage plus 2 ozs. sheep nuts per head per day.

Group 3—30 sheep—4lb. sorghum silage plus ½oz. bone flour/salt mixture per head per day;

Group 4—30 sheep—3lb. silage plus 1oz. lucerne hay plus 1oz. sheep nuts per head per day.

Group 3 acted as the control group.

The rations were fed twice weekly—on Tuesdays and Fridays—the supplements being mixed with the silage immediately after excavation from the trenches. The mixture was tipped on the ground and confined between 6 x 1 hardwood weatherboards pegged about 18 inches apart.

The sorghum silage had a crude protein content of 4.5%, the sheep nuts 17%, and the poona cowpeas 26% crude protein.

RESULTS

The results of the feeding trial and subsequent fleece assessments are given in Table I.

TABLE I.

Group	No. Sheep	Ration Per Head Per Day	No. of Food Units Per Head Per Week	AVERAGE LIVEWEIGHT			WOOL PRODUCTION PER HEAD				Food Costs Per Head Per Week Pence	Cost of Ration Per Food Unit
				Initial 15/7/58 lb. oz.	Final 3/10/58 lb. oz.	Live Wt. Increase lb. oz.	Greasy Wt. lb.	Final Wt. lb.				
1	80	3 lb. silage	3.3	45 8	49 15	4 7	3.57 a*	1.99	7.8	1.03		
2	30	2 oz. cowpeas 3 lb. silage	3.3	45 6	48 5	2 15	3.66 a	2.10	6.3	1.91		
3	30	2 oz. sheep nuts 4 lb. silage	3.6	42 5	45 12	3 7	3.18 c	1.84	5.3	1.47		
4	30	$\frac{1}{2}$ oz. bone flour/salt 3 lb. silage 1 oz. lucerne hay 1 oz. sheep nuts	3.2	42 11	46 10	3 15	3.34 b	1.91	6.3	1.96		

Costs of foders used were : Sorghum silage, £1/6/- per ton; lucerne hay, £34/11/5 per ton; bone flour/salt, £2/2/5 per bag of 84 lb.; sheep nuts, £2 per bag of 125 lb.; poona cowpeas, £52/14/5 per ton.
a* is significantly better than b and c, and b is better than c.

DISCUSSION AND CONCLUSIONS

It can be seen that a ration of 41b. of sorghum silage per head per day plus a mineral supplement was adequate for the maintenance of young sheep of 45lb. live weight for a period of at least three months. There is, however, no evidence that the bone flour/salt mixture had any effect on consumption or utilisation. Another grazier in the Blackall district was able to maintain a similar group of young sheep over a similar period with sorghum silage without supplement.

The main aim of our silage work in Western Queensland is to provide a maintenance ration only to ensure survival during drought. If, in addition, an increase in wool weight is required, a supplement of protein would appear to be necessary. For pregnant or lactating ewes, preliminary trials show that a protein supplement is necessary. The whole question of levels of protein supplementation requires further study to determine the economics of such a practice.

A ration of lucerne hay at 1½lb. per head per day which would provide 3.7 food units per week would have cost 39d. per week.

Maize grain fed at 3.5 food units per week purchased at 15/6 per bushel would cost 15d. per head per week.

During the two weeks prior to weighing on 12th September, very low temperatures down to 26°F. were recorded together with cold winds.

In the present trials, the feeding period was curtailed by rain and it would have been more interesting had the period continued for six months or longer. However, short-term droughts could be handled in this way and it would appear that the conservation of quick-growing summer fodder crops for ensilage is well worth while in these drought-prone Mitchell grass downs areas.

ACKNOWLEDGMENT

The Management and Staff of the Australian Estates Co at Blackall provided the facilities for the work, the supervision of the feeding trial and the weighing. The Sheep Husbandry Branch of the Queensland Department of Agriculture and Stock carried out the fleece analyses and the biometrical work associated with them. To these, the authors extend their thanks.

REFERENCES

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DISCUSSION

J. F. Kennedy (Qld.)—What was the quality of the silage?
Answer.—4.5% crude protein. The normal range of sorghum silage from Western Queensland varied from 2.8—6% crude protein. Its moisture content was 70-75%.

H. J. Lee (S.A.), pointed out the need for a control in this type of study though there were considerable problems concerned with controls in such work, especially under commercial conditions.

Dr. Skerman pointed out that the 4lb. silage alone was the control treatment.

B. Truscott (N.S.W.) suggested that in the economic sense, the cost of agistment could be used as a type of control.

J. F. Kennedy (Qld.) suggested that the losses on neighbouring properties often provided evidence similar to that from a control.