



Lambs were weighed individually for a record of progress during the trial.

Self feeder shown below was the type used in the feeding trials. Sheep ate most of the cubes seen on the ground, except after a hard rain.



In this trial, alfalfa hay cubes self fed to white face and Hampshire ewe lambs resulted in small but statistically significant increases in weight gains, along with increased feed consumption but with less waste feed than when comparable ewes were fed baled alfalfa hay daily. Suffolk ewe lambs gained equally well on either cubes or baled hay.

TABLE 1. CHEMICAL ANALYSIS OF THE HAY FED AND REFUSED

	Feed Analysis 100% Dry Basis								
	DM	C.Prot.	Ash	Fat	Fib. 2	NFE	Calcium	Phos.	TDN
Cube fed	90.1	20.9	9.5	1.8	29.0	38.9	1.44	.24	56.3
Cube refused	84.2 <sup>a</sup>	20.5	9.4	1.7	31.1 <sup>b</sup>	37.5 <sup>b</sup>	1.42	.26	54.4 <sup>b</sup>
Bale fed	90.6	21.9 <sup>d</sup>	9.8	1.8	28.9	37.8	1.77 <sup>c</sup>	.25	56.4
Bale refused	87.6 <sup>a</sup>	9.8 <sup>a</sup>	6.3 <sup>a</sup>	.7 <sup>a</sup>	53.9 <sup>a</sup>	29.4 <sup>a</sup>	.93 <sup>a</sup>	.18 <sup>a</sup>	35.1 <sup>a</sup>

<sup>a</sup>P < .001 } The comparisons tested were fed vs. refused bale or fed vs. refused  
<sup>b</sup>P < .05 } cube  
<sup>c</sup>P < .001 } The comparisons tested were cube fed vs. bale fed  
<sup>d</sup>P < .05 }

TABLE 2. WEIGHTS AND 98-DAY GAINS OF EWE LAMBS

	Breeds			Combined
	Romeldale × Columbia	Hampshire	Suffolk	
Hand fed baled hay				
No. ewe lambs	11 <sup>a</sup>	7	5	23
Initial weight, lbs.	109	127	132	119
98-day gain, lbs.	-2	-2	6	0
Self fed cubed hay				
No. ewe lambs	12	8	5	25
Initial weight, lbs.	114	120	132	119
98-day gain, lbs.	2	11	6	6**
Treatments combined				
No. ewe lambs	23	15	10	
Initial weight, lbs.	111	123	132	
98-day gain, lbs.	7	5*	6*	

<sup>a</sup> One lamb died and one was removed due to sickness  
\* P < .05  
\*\* P < .01

# CUBED ALFALFA

*for replacement  
ewe lambs*

MONTE BELL · JACK NOLAN · ALBERT VIERIA

**E**WES AND LAMBS gained more weight and wasted less feed when hand-fed cubed alfalfa hay as compared with baled alfalfa hay in an experiment reported in 1967. In this follow-up experiment, conducted at Chico State College, replacement ewe lambs of three breeds were used to compare the feeding value of hand-fed, baled vs. self-fed cubed alfalfa hay. The objectives of this trial were: (1) to repeat a cube vs. bale comparison with younger animals; (2) to see if self feeding cubes to sheep was practical; (3) to determine if breed differences were

related to the feeding method; and (4) to provide a livestock educational experience for the students.

Twenty-five Romeldale × Columbia, 15 Hampshire, and 10 Suffolk ewe lambs were randomly allotted within breed to one of two groups. One group was fed baled alfalfa hay from a feed rack daily, and in an adjoining dry lot the other group was fed cubed alfalfa from a metal self feeder. The amount of baled hay fed and the opening in the self feeder were adjusted when necessary to minimize waste.

The hay was in covered storage until fed and the refused portion of the baled hay was held in covered storage until completion of the trial. Cubes that were pulled out of the self feeder by the ewes were not collected until the end of the trial because it was found that lambs would eat them off the ground. The amount of cubes pulled out of the feeder was reduced by narrowing the feeder opening. Both forms of hay were weighed when they were put in the feeding facility. A core sample was taken for chemical analysis from each bale and grab samples were taken from each load of cubes.

The ewe lambs were individually weighed after an overnight stand without feed or water on November 27, 1967. Another shrunk weight was taken 14 days later and a final shrunk weight on March 4, 1968, 98 days after the initial weighing.

Although the hay came from different sources, chemical analysis (table 1) indicated a significant difference in favor of the baled hay compared with cubed hay only in percentage of crude protein and calcium. In the other elements analyzed including estimated TDN, there was no significant difference between the two hay forms. Hay with a crude fiber content of 29 per cent is only fair in quality.

### Differences

There were highly significant differences in all analyses between the fed, compared with the refused, baled hay—indicating the sheep were able to select the most nutritious parts of the baled hay whereas differences between fed, and refused (on the ground) cubes were small.

Weight and gains of the lambs are shown in table 2. The 98-day gains of the three breeds combined were small but significantly higher for the cube-fed group (6 lbs) than for the bale fed group which just maintained its initial weight. Unlike the other two breeds, the Suffolks gained equally well with both feeding methods. They were the largest breed in size, were observed by the feeder to be more aggressive, and possibly were able to get "first choice" at the baled hay rack.

The Hampshire and Suffolk lambs gained about the same and significantly more than the Romeldale × Columbias.

The ewe lambs did little more than maintain their weight over the 98-day period. The normal practice of feeding  $\frac{3}{4}$  lb of grain per head daily was not followed in the trial because the objec-



Experimental animals used in the feeding trials included Romeldale × Columba (left), Suffolk (center), and Hampshire (right) ewe lambs.

tive was to test the value of the hay. Also the final weights were taken after an 18-hour shrink to reduce fill differences between the two rations as much as possible.

There were no feeding difficulties associated with feeding cubes. The only loss was in the white face group fed baled hay. The weight taken after 14 days on feed indicated the lambs adapted to each ration in a short time.

Feed consumption (table 3) was less than the 3.4 lbs daily shown in the National Research Council feeding tables. Also, considering the hay quality, there was very little recoverable refused hay in either group. The feeder observed a considerable number of cubes on the ground around the self feeder; however, most of these were consumed when the self feeder opening was closed. Also there were times when the cubes would bridge, and fail to flow in the self feeder. These problems probably contributed to lower than expected consumption and gain.

Because of the small numbers involved and the extra time required to weigh the feeding, it was not possible to get a valid estimate of differences in hours of feeding labor between the two methods. The 6-ft metal self feeder cost \$180 and should be adequate for at least 60 head. Two 16-ft hay racks at \$16.00 each would be adequate for feeding baled hay to 60 head.

Figuring a ten-year life on the feeders and with labor at \$2.00 per hour, a savings of seven hours feeding labor would be needed for each 60-head unit to make up for the higher cost of the self feeder. The self feeders had an effective capacity of only 800 lbs. For cube feeding, feeders should be larger and have straighter sides.

At \$30.00 per ton for baled hay and \$40.00 per ton for cubed hay, the 98-

day feed cost per ewe lamb was \$3.52 and \$5.85 respectively. The extra 6 lbs gained by the ewes fed cubes would have to bring 39 cents per pound to pay for the additional feed cost and consumption.

*Fremont L. (Monte) Bell is Farm Advisor, University of California Agricultural Extension Service, Glenn, Colusa and Butte Counties; Jack T. Nolan is Associate Professor and Albert Viera is shepherd, Division of Agriculture, Chico State College. Chemical analyses were conducted at the University of California Agricultural Extension Service laboratory at Davis. Gerald A. Darling, student shepherd, and other Chico State College students assisted in this trial.*

TABLE 3. FEED CONSUMPTION AND REFUSAL 90% DRY BASIS

	Hand fed baled hay	Self fed cubed hay
Lbs. hay fed./head/day	2.40 lbs.	2.99 lbs.
Recoverable % refused	2.8%	.3%

Very little recoverable waste remained from either the baled or cubed hay over the 98-day

