Baled hay refused by sheep during trials, to left in photo, amounted to 16.4% of amount fed, as compared with 5.9% for cubed hay fed, as shown in piles to right.

BALED vs

for

Ewes and lambs fed cubed alfalfa wasted 10.5% less hay and gained 6.4 lbs more per pair than those fed an equal amount and quality of baled hay, in this 46-day test—resulting in a $3.05-per-ton feed value advantage for the cubes.

Ewes and lambs being fed baled hay in a rack, top photo, and cubed hay in a grain bunk, lower photo.

TABLE 1. PERCENTAGE CHEMICAL ANALYSIS OF ALFALFA HAY BALES AND CUBES, 90% DRY BASIS

	Hay form	
	Baled	Cubed
Modified crude fiber*	28.1	27.5
Crude protein*	19.2	19.5
Calcium*	.95	.95
Phosphorus*	.22	.24
Estimated TDN	49	49

* There were no significant differences at the 5% level.

TABLE 2. WEIGHT GAINS OF EWES AND LAMBS ON BALED AND CUBED ALFALFA DURING A 46-DAY FEEDING PERIOD

	Hay form	
	Baled	Cubed
Number of pairs	10	10
Age of ewes, years	1.5	1.6
Initial ewe weight, lbs	134.6[a]	140.9[a]
Final ewe weight, lbs	134.1[a]	145.3[b]
Ewe gain or loss, lbs	−0.5[a]	+4.4[b]
Initial lamb weight, lbs	9.0	9.6
Final lamb weight, lbs	30.7	32.8
Lamb gain, lbs	21.7[c]	23.2[d]

[a,b] Means bearing different superscripts approach significant differences ($P < .10$).
[c, d] Means bearing different superscripts are significantly different ($P < .05$).

TABLE 3. HAY CONSUMED AND REFUSED, 90% DM BASIS*

	Hay form	
	Baled	Cubed
Hay fed faily per pair during first 5 days, lbs.	5.3	2.6
Hay fed daily per pair, 46 days, lbs.	5.6	5.7
Hay refused† as % of fed	16.4%	5.9%
Hay actually eaten daily per pair, lbs.	4.7	5.3

* Actual dry matter of the hay sampled at beginning of trial = cube, 89.2%; bale, 88.9%.
† Hay weighed back that was left in the feed rack or on the ground.

TABLE 4. ESTIMATED COSTS OF HAULING, STORING AND FEEDING BALES OR CUBES PER TON OF 90% DRY HAY*

Cost item	Hay form		Savings with cubes
	Baled	Cubed	
Hauling and placing in storage	$3.00	$1.35	$1.65
Storage (building only)	.92	.75	.17
Feeding labor @ 1.50/hour	2.16	1.00	1.16
Feeding equipment	1.30	1.37	−.07
Weight of wire	.13	....	.13
Wasted feed (hay @ $29/ton)	4.76	1.71	3.05
Total with equal purchase price and moisture content	$12.27	$6.18	$6.09

* Assumptions: Diversified ranch with maxmium equipment use. Hay raised by sheepman, hauled 2 miles. Feeding: 1.44 man-hours per ton baled hay, two men using 1½ ton truck; .67 man-hour per ton cubed hay, one man with scoop tractor and feed wagon.

MAKING 1¼ inch cubes from windrowed alfalfa hay is a relatively new process offering the advantage of bulk handling and feeding for livestock. Few studies have been reported comparing cubes with bales for feeding sheep. This experiment was conducted at the M. & T. Corporation Ranch south of Chico, a diversified ranch operation with about 4,000 ewes on range, irrigated pasture, and stubble. Hay and grain are normally fed during November, December, and January. The objective of the trial was to determine gains, feed efficiency, and economic considerations of feeding alfalfa cubes as compared with hay bales to ewes and lambs.

Alternate windrows

Alternate windrows of alfalfa were either baled or cubed in the trial for assurance of hay equal in quality (table 1).

Twenty-head of mixed-age ewes with single day-old lambs were randomly assigned (within age of ewe and sex of lamb) to one of two groups. The ewes and lambs were individually weighed after an overnight stand without water at the start of the trial November 28, 1966, and final shrunk weights were taken 46 days later. Each group of ten ewe-and-lamb pairs was fed in adjoining corrals and had water and salt available at all times. Dry matter determinations were made on the two hay forms at the beginning of the trial and on the refused hay at the end of the experiment. The hay was weighed and fed daily to each group according to consumption.

Ewes fed baled hay lost 0.5 lb per head (over the 46 days) as compared with a

CUBED ALFALFA HAY ewes and lambs

MONTE BELL

gain of 4.4 lbs for the ewes fed cubes, as shown in table 2. Lambs in the cube-fed group gained 23.2 lbs as compared with 21.7 lbs for those fed baled hay. It took five days for the ewes to get used to the cubes and to eat an amount equal to those fed baled hay (table 3). During this time the bale-fed ewes looked full, whereas the ewes fed cubes were gaunt appearing.

Both groups were fed daily in feed bunks exposed to weather and the apparent consumption for the 46 days was similar, averaging 5.6 lbs for the bale- and 5.7 lbs for the cube-fed pairs daily. As waste feed built up, it was removed to another feed bunk out of the weather, but the ewes still had access to it. Rainfall during the test period was 4.8 inches.

The pairs fed baled hay refused 16.4% of the amount fed compared with 5.9% for the pairs fed cubes. Since they were fed the same amount, this resulted in an actual feed intake of 4.7 lbs daily per pair for the bale-fed and 5.3 lbs for the cube-fed groups. The difference in feed intake accounted for the differences between the groups in weight gain since the quality of the hay was similar. This much waste would not be expected where the amount of feed is restricted.

Hayracks

When the cubes were fed in conventional sheep hayracks, the ewes had difficulty reaching them. Sheep grain bunks were a little too shallow for the cubes but addition of false bottoms in the hay racks seemed to work satisfactorily.

Costs of hauling, storing and feeding baled hay were compared with estimated costs of cube handling in table 4 to offer an economic evaluation.

The test ranch is diversified and large purchases of special equipment (other than harvesting) were not needed to handle, store and feed the cubes. Also, tractors, feed wagons and dump trucks were used for other jobs when not required in the sheep enterprise (this set of conditions may not always exist in strictly range sheep operations).

Savings

The estimated savings with cubes in hauling, storing and feeding amounted to $3.04 per ton fed. The difference in waste was $3.05 per ton with a price of $29.00 per ton for 90% dry hay. The estimated over-all savings for cubes as compared with bales was $6.09 per ton in this test.

Evaluating gain is another way to figure the feeding value of the hay forms. If lambs are worth 25¢ and ewes 6¢ per lb, one ton of cubes produced $3.56 more meat value than did the baled alfalfa.

Cost studies of various other ranch feeding situations are needed to further evaluate the economics of feeding cubes to sheep.

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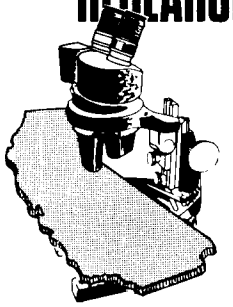
RESEARCH PREVIEWS



A continuing program of research in many aspects of agriculture is carried on at University campuses, field stations, leased areas, and many temporary plots loaned by cooperating landowners throughout the state. Listed below are some of the projects currently under way, but on which no formal progress reports can yet be made.

PLASTIC DRAINS

A series of plastic drain pipes installed at about the 3-foot level at the Imperial Valley Field Station shows promise of improving the leaching action of irrigation water on desert soils. Further work along this line is being conducted in the laboratory and in the field.

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GRAPE HARVESTING

Viticulturists at Davis are studying methods of defoliating grape vines as an aid to harvesting by vacuum machines. Both chemical and mechanical defoliants are being tested.

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IRRIGATION & MECHANIZATION

Water scientists are making detailed studies to determine what changes in irrigation techniques may be necessary for crops that are rapidly becoming mechanized. Precision-planted lettuce, for example, appears to respond better to sprinkler irrigation than to conventional furrow irrigation.

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HAY RESIDUE REMOVAL

As part of an intensive study of DDT residues on alfalfa hay, Davis toxicologists believe they are on the track of a commercially feasible method of removing the residue. Development work is continuing.

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LACEWINGS VS. BOLLWORMS

Green lacewing adults feed on honeydew secreted by aphids. Lacewing larvae ignore honeydew but prey on other insects and may even be cannibalistic. Biological control entomologists at Albany hope to make use of these factors by spraying cotton and other crops with an artificial honeydew to build up overpopulations of lacewing adults which will then lay eggs. When the eggs hatch it is hoped that the resulting voracious larvae will turn their attention to such pests as bollworms.