Feeding Grapefruit Silage

Is It Worth While?

Bruce Taylor
Animal Science Department

Dried citrus pulp has been used with success in many cattle feeding operations, but information is meager on the value of this citrus by-product fed as silage.

To study this possibility, the Arizona Agricultural Experiment Sttaion ensiled grapefruit by-product with Bermuda straw and fed the mixture (60% grapefruit : 40% Bermuda straw) in a steer fattening trial.

The citrus by-product was furnished by the Yuma-Mesa Fruit Growers Processing Plant at Yuma. It consisted of small, whole grapefruit, rinds, pulp and seeds. The material was ensiled in a trench with alternate layers of Bermuda straw, the latter being necessary to absorb the juice.

Five Lots of Angus Fed

Forty yearling Angus steers, averaging approximately 500 pounds, were divided into five lots and fed as follows:

1. Milo grain fed at 1% of body weight plus alfalfa hay, free choice.

2. Milo grain, as in 1, plus one part alfalfa and three parts citrus silage, plus .5 lb. cottonseed meal.

3. Same as 2, plus dicalcium phosphate.

4. Same as 2, plus cobalt.

5. Same as 2, with milo grain increased to 1.5% of body weight.

The trial was conducted at the Yuma-Mesa Experimental Farm by C. B. Roubicek, E. S. Erwin, L. M. Rosenblatt, and Frank Pritchard.

The results of the trial are shown in Table 1.

Observations

1. The grapefruit silage was quite unpalatable with the whole grapefruit being the part least acceptable to the steers. In the beginning, the steers ate the Bermuda straw first, then the small pieces of rind, but refused the whole grapefruit.

Early in the trial it was apparent that the steers had a craving for salt. The replacing of block salt with ground rock salt increased both the consumption of salt and of the silage.

2. The silage in this trial was worth 43% of the value of alfalfa hay when used as two-thirds of the roughage portion of the ration. The calculated T.D.N. of the silage was 22.67%. Thus, when fed in limited amounts, the value of the grapefruit silage is similar to hegari silage but unpalatability limits its use.

Minerals Added

3. The addition of phosphorus in lot 3, or of cobalt in lot 4, did not improve steer gains significantly over gains made by steers in lot 2 receiving the same ration with no mineral additions.

4. Increasing the concentrate level in lot 5 resulted in improved gains, but all steers sold at the termination of the experiment at the same price. Yield and grade data were not obtained, but live grades did not differ between lots with all steers of choice conformation grading choice in finish.

5. These data suggest that the problem of unpalatability is the limiting factor in using grapefruit silage as prepared and fed in this trial. Cutting or slicing the material to eliminate the whole fruits would, no doubt, help as would feeding smaller amounts of the silage at more frequent intervals than A.M. and P.M. feeding.

Table 1

The Value of Grapefruit Silage as Part of The Roughage in a Steer Fattening Ration — December 30, 1957 to May 25, 1958
8 steers per lot — 147 days

Lot number	1	2	3	4	5
Body weight change (lb.):					
Initial	516	518	487	498	480
Final	913	862	844	848	848
Total gain	397	344	357	350	368
Average daily gain	2.70	2.34	2.43	2.38	2.50
Feed per steer, daily (lb.):					
Alfalfa hay	16.28	5.34	5.49	5.48	5.20
Citrus silage	—	15.43	15.78	14.96	13.70
Rolled milo	8.27	7.90	7.65	7.70	9.41
Cottonseed meal	—	.50	.50	.50	.50
Dicalcium phosphate	—	—	.05	—	—
Cobalt carbonate				*	
Dry matter consumed (lb.)	21.68	15.82	15.83	15.66	16.55
Feed per 100 lbs. gain (lb.)	909	1246	1213	1204	1150
Cost of feed per 100 lbs. gain less cost of silage	$18.22	$14.19	$13.56	$13.90	$15.00
Value of silage per ton		$12.23	$14.36	$13.45	$11.75

**Cobalt carbonate added to cottonseed meal at rate of 66 gm. per ton.*

Table 2

The Chemical Composition of 60% Grapefruit : 40% Bermuda Straw Silage, by weight

	Percent
Dry matter	25.00
Crude protein	1.53
Ether extract	0.70
Crude fiber	5.86
N-free extract	14.76
Ash	3.13
Phosphorus	0.023

Table 3

Feed Costs Per Ton

Alfalfa hay	$30.00
Rolled milo	$60.00
Cottonseed meal	$60.00
Dicalcium phosphate	$88.00

Trade names used in this magazine do not endorse products named nor imply criticism of similar ones not mentioned.