LIQUID SUPPLEMENTS IN BEEF CATTLE PRODUCTION

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The idea of feeding molasses as a supplement to cattle has been known for some time, with the first usage having been recorded in Europe as early as 1850. The first recorded use of molasses and urea supplementation for beef cattle was in Iowa in 1949. Since that time, its usage has grown tremendously with over a million tons of liquid supplement fed last year. Most of this was used in feedlots; however, a good portion was fed as self-fed products to cows and growing cattle on a roughage ration either as fed hay or range grazing.

Both advantages and disadvantages become apparent with the use of liquid supplement. Some of the advantages are: that it can be self fed with very little or no effort required from the rancher as compared to the time and money spent feeding cattle a dry supplement; less labor is required to feed liquid supplement than to handle blocks or bags of feed; and liquid supplement is fed in a tank or bunk and not spread on the ground or blown away by wind.

Disadvantages are difficulty in controlling consumption level among individual animals with liquid supplements; cost of tanks and liquid handling equipment; difficulty in maintaining uniformity of product within and between batches; and low levels of energy in molasses which has about 85% as much digestible energy as corn. This low level of energy has led to restricted urea utilization, particularly in high roughage situations.

With the increase in the use of liquid supplements by commercial cattlemen a method of supplementation is desirable to meet nutritional requirements of cattle under range conditions and provide maximum use of this supplement. Previous research at Squaw Butte indicated that energy is the first limiting nutrient under most conditions in the high desert area. Liquid supplements are generally too low in digestible energy to meet the requirements of a supplement to grazing animals. This research was initiated to develop a higher energy supplement adaptable to range conditions.

EXPERIMENTAL PROCEDURE

Trial 1. Six yearling steers were place on a two acre crested wheatgrass pasture during the months of May, June, and July, 1972, to obtain basic figures on daily consumption of a liquid supplement. Fresh water and a salt and salt-bonemeal supplement were provided at all times. Animals were weighed every 28 days after an overnight restriction from water. A 15% protein liquid (urea-molasses) supplement was provided free choice in a lick wheel feeder. Measurement of supplement was taken each morning at 7:00 a.m.

Trial 2. Sixteen yearling steers were grazed on crested wheatgrass during the summer of 1972, for 63 days. There were four treatments with four head per treatment. The cattle received water, salt, and a salt-bonemeal mix free choice. The treatments were: no additional supplement; a barley-biuret mix; Sirlene[1/]-molasses (30% propylene glycol in molasses); and a stabilized animal fat[2/]-molasses mixture (25% propionate in molasses).

Trial 3. Twenty-four yearlings were assigned to four treatments and allowed to graze on eight irrigated pastures (clover-fescue mix) during the summer of 1973. Each treatment rotated between two pastures during the 102 day trial. All cattle received water and a salt mix with 5% copper sulfate at all times. Cattle were weighed every 28 days following an overnight shrink. Treatments were: no additional supplement; barley - three pounds of barley per head five days a week; vegetable oil[3/] - a liquid supplement (molasses based) with 20% stabilized vegetable oil; Sirlene - a liquid supplement (molasses based) with 20% propylene glycol.

RESULTS AND DISCUSSION

Intake of supplement in trial 1 was quite variable. Observations indicated all steers were consuming supplement, however, individual consumption could not be measured. There was an extreme variation in day to day intake. Intake on a group basis varied from zero to 5.6 pounds per head per day. Daily intake averaged 2.1 pounds per head per day.

In trial 2, Sirlene and propionate were added to the liquid supplements as a possible means of increasing the energy (Table 2). The average daily gain of the steers on crested wheatgrass pastures indicate Sirlene to be a possible energy source to liquid supplements. However, the figures were too low to assume positive results.

Table 1. Performance of steers supplemented on crested wheatgrass range

	Treatment			
	Control	Sirlene liquid	Propionate liquid	Barley-biuret
Initial wt	519	526	518	556
Final wt	693	710	690	733
A.D.G.	2.76	2.92	2.73	2.81

1/ Sirlene and biuret products of Dow Chemical Company and supplied by the Dow Chemical Company.

2/ Molasses and propionate mix is a product of Feed Service, Inc., Caldwell, Idaho.

3/ Vegetable-oil-molasses mixture is a product of Pacific Kenyon Corporation and supplied by them.

All forms of supplementation in trial 3 resulted in increased gains over controls (Table 2). The Sirlene supplement increased gains over controls by about 30%, while barley increased gains at about 10% and vegetable oil increased at about 6%. Intake was quite high (4.9 lb/head/day) on the Sirlene liquid. A realistic look at feed costs in relation to gain shows that none of the supplements increased gain enough to pay for the feed. (Costs used were $90/ton barley and $160/ton for liquids and 50¢/lb for value of gain). It is evident with these high supplement costs, that these were not the types or possibly the proper levels to provide economical supplementation on irrigated pastures.

Table 2. Performance and economics of supplementing yearling steers on irrigated pasture

	Treatment			
Item	Control	Barley control	Veg. oil liquid	Sirlene liquid
Number head	11	11	11	10
Initial wt (lb)	526	529	548	514
Final wt (lb)	698	719	731	745
A.D.G. (lb)	1.69	1.86	1.79	2.19
Intake (lb)	------	2.15	2.50	4.9
Cost/head ($)[1/]	------	9.86	20.40	39.98
Value of gain @ 50¢	------	9.00	5.50	29.50
Net loss on Supp. ($)	------	-.86	-14.90	-10.48

1/ Costs used were $90/ton barley and $160/ton for liquids and 50¢/lb for value of gain.

The increased use of liquid supplements indicates their acceptability as a practical means of supplementing. However, some managerial and nutritional problems must be worked out before their optimum value is reached. Liquid supplements are not always the best buy in terms of nutrients or cost, and one should keep these factors in mind before buying any supplement