

# MECHANICAL RUMEN STIMULATORS

## *. . . their use in dairy cattle*

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This article reports results of trials with mechanical rumen stimulators—Rumen Reticulators—in lactating dairy cows. Results reported here indicate that these rumen stimulators have no effect on feed intake or milk fat production in dairy cows.

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NATHAN E. SMITH

**C**ONCENTRATE FEEDING to dairy cows has been increasing in recent years. Increases in feeding of concentrates and decreases in roughage usually result in increased milk production. However, certain problems often develop in relation to feeding high concentrate-low roughage rations to dairy cows. Among these are tendencies toward decreased milk fat production and increased occurrence of digestive upsets, resulting in lowered feed intake. Rumen motility is decreased and fermentation and digestion of food is altered on high concentrate-low roughage rations. It has been suggested that a certain amount of roughage in the ration is necessary for maintenance of these rumen functions.

### Device

A device designed to physically stimulate rumen activity—the Rumen Reticulator—has been introduced to the dairy cattle industry. The device is a 4½-inch rod with four tentacles on each end, and is made entirely of non-toxic plastic. It has been suggested that this plastic unit would act in stimulating rumen activity similar to stimulation by roughages, thus correcting some of the problems with feed intake and milk fat production encountered when feeding high energy

rations to dairy cows. Trials have been conducted at the University of California, Davis, to test the effects of the rumen stimulators on feed intake and milk production of dairy cows.

### Nine cows

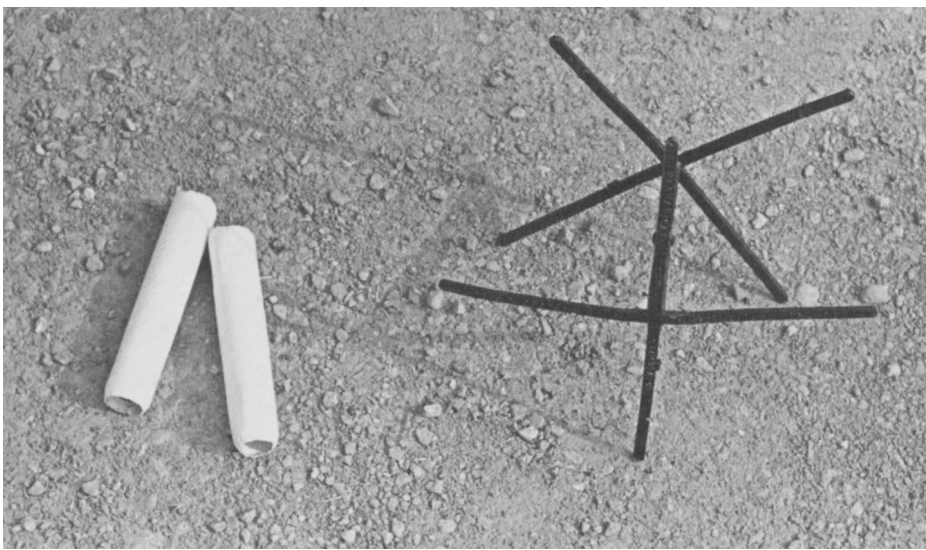
In one trial, nine lactating Holstein cows were divided into three groups (groups A, B, and C) of three cows each. The cows were fed ad libitum, and weekly feed intakes were recorded. They were milked twice daily with milk weights recorded and milk samples collected at each milking. During the first three weeks of the trial the cows were fed a mixed, milled diet containing 60 per cent alfalfa hay and 40 per cent concentrate. At the end of this 3-week preliminary period all of the cows were switched to a milled diet containing 10 per cent alfalfa hay and 90 per cent concentrate. At this time, two rumen stimulators were given to each of the cows in group A. The cows were fed the high concentrate diet for 9 weeks. After 5 weeks on the diet, two rumen stimulators were given to each of the cows in group B. At the end of the 9-week period on the high concentrate diet the cows were switched back to the 60 per cent roughage diet and fed the high roughage diet for an additional 3-week period.

The weekly feed energy intake of the cows is presented in graph 1. The energy intake of all cows decreased rapidly when they were switched from the high

roughage to the high concentrate diet. After about 2 to 3 weeks on the high concentrate diet the cows were consuming feed energy at rates similar to those observed initially on the high roughage diet. The rumen stimulators had no effect in preventing the decrease in energy intake when the diets were first switched nor was there any effect on energy intake noted during the period of recovery immediately following this decrease (group A vs groups B and C). There was also no significant effect of the rumen stimulators on energy intake when they were given after the cows were accustomed to the high concentrate diet (group B vs group A).

### Milk fat

Weekly milk fat production of the cows is presented in graph 2. The production of milk fat from all cows decreased rapidly after changing from the high roughage to the high concentrate diet. The lowest levels of milk fat were reached after about 4 to 5 weeks on the high concentrate diet. At this time, the average milk fat test for all groups had dropped from about 4.0 per cent during the preliminary period to about 1.75 per cent. Milk fat production increased rapidly after the cows were switched back to the high roughage diet. Rumen stimulators did not prevent the decrease in milk fat production (group A), nor did they have any effect on recovery of milk fat production when given to cows



Wrapped paper containers for Rumen Reticulators, to left, dissolve after being passed down cow's throat and into the rumen, where the tentacles straighten out as shown to right.



Approximate size of extended Rumen Reticulator is indicated above as it is hand-held above the 4-inch fistula into the cow's rumen.

after the low level had been reached (group B). There were no significant differences in milk fat production between groups, nor were there any effects of rumen stimulators on total milk production.

In another trial, three rumen-fistulated, lactating Holstein cows were fed a mixed, milled diet containing 40 per cent alfalfa hay and 60 per cent concentrate. The cows had been fed this diet for several weeks before the trial was conducted. Management of feeding and milking was similar to that of the first trial. Two stimulators were placed in the rumen of each of the cows and were left there for 4 weeks before they were removed. Data

**EFFECTS OF RUMEN STIMULATORS ON FEED INTAKE AND PRODUCTION AND COMPOSITION OF MILK IN FISTULATED DAIRY COWS**

|                             | Periods of trial with stimulators* |       |       |
|-----------------------------|------------------------------------|-------|-------|
|                             | Before                             | With  | After |
| Dry matter intake (lb/wk)   | 253                                | 237   | 233   |
| Milk production (lb/wk)     | 308                                | 294   | 283   |
| % milk fat                  | 3.54                               | 3.51  | 3.61  |
| Milk fat production (lb/wk) | 10.91                              | 10.31 | 10.24 |

\* Before stimulators = 2 weeks; with stimulators = 4 weeks; after stimulators = 2 weeks.

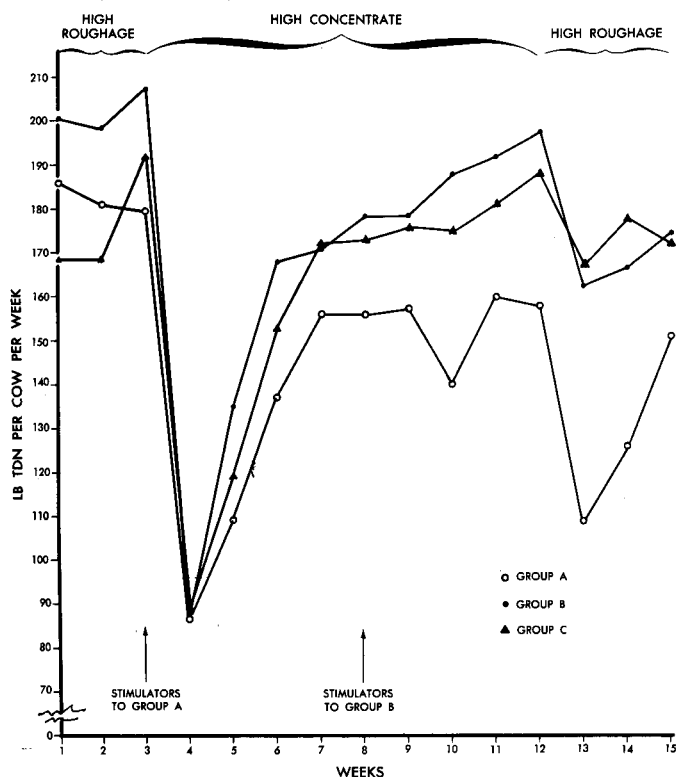
are shown in the table regarding feed intake, and milk and milk fat production for the 2-week period before the stimulators were placed in the rumen, the 4 weeks while the stimulators were in the rumen, and the 2-week period after they were removed. The stimulators did not

affect feed intake, milk or milk fat production, nor the percentage of fat in the milk.

Data from these trials indicate that the Reticulator has no effect on feed intake, milk or milk fat production in dairy cows. Although these are limited trials, it does not appear that the device will serve as an acceptable stimulator substitute for roughage in diets fed to dairy cows.

*Nathan E. Smith is Assistant Research Nutritionist, University of California, Davis. The Rumen Reticulators for the tests were supplied by Dr. Raymond M. Cerniga, D.V.M., Porterville.*

**GRAPH 1. EFFECTS OF RUMEN STIMULATORS ON FEED ENERGY INTAKE OF DAIRY COWS.**



**GRAPH 2. EFFECTS OF RUMEN STIMULATORS ON MILK FAT PRODUCTION OF DAIRY COWS.**

