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C.L. Drake

D.L. Good

R.R. Schalles

P.A. Hahn

See next page for additional authors

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Preliminary investigations with adapted rumen microorganisms (ARM) for fattening beef cattle

Abstract
The use of rumen microorganisms is not new but neither is it a common practice. We used a product developed by W.R. Grace and Company in an attempt to reduce the "adaptation period" of cattle placed on a finishing ration. The adaptation response is believed to correlate with changes in microbial populations in the cattles rumen. Microbes that efficiently metabolize one type of diet, like forage, do not survive on a high grain diet. However, the multitude of microbes in the rumen includes types that help digest grain. When they increase until they dominate the rumen population, the adaptation period is complete.

Keywords
Cattlemen's Day, 1970; Report of progress (Kansas State University. Agricultural Experiment Station); 536; Beef; Adapted rumen Microorganisms (ARM); Finishing ration

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Authors
C.L. Drake, D.L. Good, R.R. Schalles, P.A. Hahn, and O.D. Jr. Myrick

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Preliminary Investigations with Adapted Rumen Microorganisms[1] (ARM) for Fattening Beef Cattle

C.L. Drake, D.L. Good, R.R. Schalles
P.A. Hahn[2], O.D. Myrick, Jr.[2]

The use of rumen microorganisms is not new but neither is it a common practice. We used a product developed by W.R. Grace and Company in an attempt to reduce the "adaptation period" of cattle placed on a finishing ration. The adaptation response is believed to correlate with changes in microbial populations in the cattles rumen. Microbes that efficiently metabolize one type of diet, like forage, do not survive on a high grain diet. However, the multitude of microbes in the rumen includes types that help digest grain. When they increase until they dominate the rumen population, the adaptation period is complete.

Using artificial rumens and live animals, nutritionists have predicted changes that occur in the rumen during dietary shifts. So it is theoretically possible to preadapt rumen microbes in the laboratory to any combination of dietary factors. Thus, placing cattle on a high concentrate ration and simultaneously inoculating them with rumen microbes pre-adapted in the laboratory to high concentrations of grain should reduce the adaptation period. Treated animal's feedlot performance should exceed the performance of untreated animals.

Procedure:

One hundred straight and crossbred steers were randomly allotted to 20 pens of 5 head each. Adapted rumen microorganisms (ARM) were fed to each treatment group using vermiculite as a carrier and different levels of ARM with varying concentrate-to-roughage ratios were studied. Controls were handled in the same manner but were not inoculated with ARM. ARM was fed once daily for 3 days at the start of the trial. Steers used had previously been on pasture and had not received grain.

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1 Adapted Rumen Microorganisms and partial financial support were provided by W.R. Grace & Co., Washington Research Division, Clarksville, Md.

2 W.R. Grace & Co., Washington Research Center, Clarksville, Md.

The design of the 111-day trial follows:

Lot no.		Lot no.	
55-56	Control for lots 19-24	19-20	13% Silage, 87% concentrate 0.1 Normal level ARM
53-54	Control for lots 25-26	21-22	13% Silage, 87% concentrate Normal level ARM
51-52	Control for lots 27-28	23-24	13% Silage, 87% concentrate 3 x Normal ARM
49-50	Control for lots 29-30	25-26	25% Silage, 75% concentrate Normal level ARM
		27-28	35% Silage, 65% concentrate Normal level ARM
		29-30	45% Silage, 55% concentrate Normal level ARM

In all lots concentrate levels below 87% were increased every five days in this manner: 55-65-75-87%

Results:

At the end of the trial all but one lot of steers receiving ARM gained 3 to 7.8% more and were 0.1 to 5.9% more efficient in feed conversion than controls ($P<.05$). Little variation was observed in carcass data and founder did not differ among lots.

Discussion:

Inoculation with ARM was effective in this trial and another trial is in progress to study different methods of administrating ARM. It appears the greatest response will be in the slower gaining animals with less response in healthy fast gaining animals.