1973

Adapted Rumen Microorganisms (ARM) for feedlot cattle

Jack G. Riley
K.K. Bolsen
D.L. Good

Follow this and additional works at: https://newprairiepress.org/kaesrr

Part of the Other Animal Sciences Commons

Recommended Citation
Riley, Jack G.; Bolsen, K.K.; and Good, D.L. (1973) "Adapted Rumen Microorganisms (ARM) for feedlot cattle," Kansas Agricultural Experiment Station Research Reports: Vol. 0: Iss. 1. https://doi.org/10.4148/2378-5977.2806

This report is brought to you for free and open access by New Prairie Press. It has been accepted for inclusion in Kansas Agricultural Experiment Station Research Reports by an authorized administrator of New Prairie Press. Copyright 1973 Kansas State University Agricultural Experiment Station and Cooperative Extension Service. Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned. K-State Research and Extension is an equal opportunity provider and employer.
Adapted Rumen Microorganisms (ARM) for feedlot cattle

Abstract
Two trials using 200 mixed breed steers were conducted to determine effects of 0, 3, 6, or 12-ounce drenches of Adapted Rumen Microorganisms (ARM) on subsequent feedlot performance. An 85 percent concentrate ration was fed for 90-days before drenching with ARM. Steers receiving the 12-ounce treatment in trial gained 14.4 pounds more per head during the next 60-day feeding period. The 3 and 6-ounce treatments were less beneficial. The 12-ounce treatment in trial 2 produced a highly significant (P < .01) 15% increase in rate of gain and a 12.5% increase in efficiency compared with the control group.

Keywords
Cattlemen's Day, 1973; Report of progress (Kansas State University. Agricultural Experiment Station); 568; Beef; Feedlot; Adapted Rumen Microorganisms (ARM); Gain

Creative Commons License
This work is licensed under a Creative Commons Attribution 4.0 License.

This research report is available in Kansas Agricultural Experiment Station Research Reports: https://newprairiepress.org/kaesrr/vol0/iss1/1403
Adapted Rumen Microorganisms\textsuperscript{1}
(ARM) for Feedlot Cattle

J. G. Riley, K. K. Bolsen, and D. L. Good

Summary

Two trials using 200 mixed breed steers were conducted to determine effects of 0, 3, 6, or 12-ounce drenches of Adapted Rumen Microorganisms (ARM) on subsequent feedlot performance. An 85 percent concentrate ration was fed for 90-days before drenching with ARM.

Steers receiving the 12-ounce treatment in trial 1 gained 14.4 pounds more per head during the next 60-day feeding period. The 3 and 6-ounce treatments were less beneficial.

The 12-ounce treatment in trial 2 produced a highly significant \((P < .01)\) 15\% increase in rate of gain and a 12.5\% increase in efficiency compared with the control group.

Introduction

Most veteran cattle feeders have observed that after approximately 90-100 days of full feeding or at 800-900 pounds, Feedlot cattle's rate of gain and efficiency often drop. There are several theories for the "90-day slump" including differences in genetic background, previous treatment, and ration adequacy. Studies at W. R. Grace's Washington Research Center in Clarksville, Md., indicate that the slump may be due, in part at least, to a decreasing ratio of acetate to propionate in the rumen. If so microbial inoculation of rumens of cattle on feed 90 days might stimulate increased gain and efficiency.

Experimental Procedure

Two hundred mixed breed steers were fed a ration composed of 15\% sorghum silage and 85\% concentrate (rolled milo and supplement) 90 days. In trial 1, 100 steers then were randomly allotted to 20 pens of 5 each and drenched with Adapted Rumen Microorganisms (ARM) (table 1). Fifty of the other 100 steers (trial 2) received a 12-ounce drench of ARM and the other 50 served as controls. Individual weights were taken two consecutive days at both the beginning and the end of each trial and 30 days after drenching. All groups were fed the same ration twice daily. Carcass weight and grade were collected for each steer. None was fed antibiotics or stilbestrol.

\textsuperscript{1}Adapted rumen microorganisms, partial financial support, and technical assistance were provided by W. R. Grace and Co., Washington Research Center, Clarksville, Maryland. Represented by O. D. Myrick, Jr. and P. H. Hahn.
Table 1. Experimental Design - Trial 1

<table>
<thead>
<tr>
<th>No. pens</th>
<th>No. steers</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>40</td>
<td>control</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>3 ounces ARM</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>6 ounces ARM</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>12 ounces ARM</td>
</tr>
</tbody>
</table>

Results

Feedlot performance is shown in Table 2. Steers drenched with 12 ounces of ARM gained significantly (P<.01) more than the undrenched controls. Steers receiving 6-ounce treatment gained 10.1 pounds more each than control steers for the 60-day feeding trial, somewhat less than the 14.4 and 20.0-pound increase of those on the 12-ounce treatment in trials 1 and 2, respectively. Gain and efficiency for the 3-ounce treatment indicated that dosage was not enough to stimulate performance.

The 6-ounce treatment resulted in 4.3% less feed per pound of gain compared with 7.6 and 12.5% for the 12-ounce treatments in trials 1 and 2, respectively. Differences in carcass weights or grades were not significant. Our results agree with those of W. R. Grace and Co.
Table 2. Performance of Steers Drenched with Indicated Quantities of Adapted Rumen Microorganisms (ARM)

<table>
<thead>
<tr>
<th>Trial No.</th>
<th>Treatment, oz</th>
<th>Initial wt., lb</th>
<th>Final wt., lb</th>
<th>*lb. gain, lb</th>
<th>A.D.G., lb</th>
<th>Daily D.M. Intake, lb</th>
<th>Lbs. feed/lb. gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>905</td>
<td>1038</td>
<td>133</td>
<td>2.22</td>
<td>22.01</td>
<td>9.92</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>902</td>
<td>1028</td>
<td>126</td>
<td>2.10</td>
<td>22.64</td>
<td>10.78</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>903</td>
<td>1046</td>
<td>143</td>
<td>2.39</td>
<td>22.68</td>
<td>9.49</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>903</td>
<td>1050</td>
<td>147</td>
<td>2.46</td>
<td>22.57</td>
<td>9.17</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
<td>922</td>
<td>1053</td>
<td>131</td>
<td>2.18</td>
<td>22.56</td>
<td>10.35</td>
</tr>
<tr>
<td></td>
<td>49**</td>
<td>914</td>
<td>1065</td>
<td>151</td>
<td>2.51</td>
<td>22.75</td>
<td>9.06</td>
</tr>
</tbody>
</table>

* Adjusted to equal dressing percentage
** 1 steer died during trial
Beef Cattle Commercial Feedlot Studies 1, 2

The Livestock and Meat Industry Council initiated a program of purchasing a large group of steers to be used for experimental purposes on topics relevant to the beef cattle feeding industry of Kansas. Objective of the project is to investigate aspects of commercial feedlot operations that are current, or potential, problems: nutrition, health, disease, internal and external parasites, shrinkage, transportation, marketing, management, pollution control, etc. Scientists in various disciplines submit subprojects specifying particular objective(s) and procedure.

The first project used a group purchased in February and sold in June. A second project is in progress.

Results of the first project follow.

---

1 Financial support was provided by the Livestock and Meat Industry Council, Inc. (LMIC)

2 General Project co-ordinating committee includes
   Dr. Ed Smith, Chairman--Animal Science & Industry
   Dr. Jack Riley--Animal Science & Industry
   Dr. Don Good--Animal Science & Industry
   Dr. Steve Armbruster--Animal Science & Industry
   Dr. Ralph Lipper--Agricultural Engineering
   Dr. Charles Pitts--Entomology
   Dr. John McCoy--Agricultural Economics
   Dr. Homer Caley--Veterinary Medicine
   Dr. Roy Millerett--Veterinary Medicine
   Dr. Keith Huston--Agricultural Experiment Station