Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 886

1989

Influence of rumen bypass fat in cattle supplements on forage utilization

R.B. Hightshoe

R.C. Cochran

L.R. Corah

See next page for additional authors

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

 Part of the Other Animal Sciences Commons

Recommended Citation

Hightshoe, R.B.; Cochran, R.C.; Corah, L.R.; Harmon, D.L.; and Vanzant, E.S. (1989) "Influence of rumen bypass fat in cattle supplements on forage utilization," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. https://doi.org/10.4148/2378-5977.2289

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 1989 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.

Influence of rumen bypass fat in cattle supplements on forage utilization

Abstract

Incorporation of rumen bypass fat into a supplement to be fed with low quality forage did not affect total dry matter digestibility or ruminal dry matter fill. Similarly, no difference in digestibility was observed among types (animal vs. plant) or levels (low vs. high) of lipids used in this study. Rumen bypass fat apparently avoids the negative impact on forage utilization seen with conventional fats.

Keywords

Cattlemen's Day, 1989; Kansas Agricultural Experiment Station contribution; no. 89-567-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 567; Beef; Rumen; Forage; Supplements

Creative Commons License

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

Authors

R.B. Hightshoe, R.C. Cochran, L.R. Corah, D.L. Harmon, and E.S. Vanzant

This research report is available in Kansas Agricultural Experiment Station Research Reports: https://newprairiepress.org/kaesrr/vol0/iss1/886

INFLUENCE OF RUMEN BYPASS FAT IN CATTLE SUPPLEMENTS ON FORAGE UTILIZATION[1]

R.B. Hightshoe, R.C. Cochran,
L.R. Corah, D. L. Harmon, and E.S. Vanzant

Summary

Incorporation of rumen bypass fat into a supplement to be fed with low quality forage did not affect total dry matter digestibility or ruminal dry matter fill. Similarly, no difference in digestibility was observed among types (animal vs. plant) or levels (low vs. high) of lipids used in this study. Rumen bypass fat apparently avoids the negative impact on forage utilization seen with conventional fats.

Introduction

Historically, incorporation of energy-dense fat products into cattle rations has been limited to finishing rations and diets of high-producing dairy cows. Previously, beef producers with cattle on forage-based diets have been reluctant to utilize conventional fats in supplements because of negative influences on forage utilization. The recent development of commercial rumen escape (bypass) fat offers Kansas beef cattle producers a method of increasing energy density in supplements. Two trials were conducted to evaluate how incorporation of different levels and types of bypass fat in supplements would affect forage intake and digestibility.

Experimental Procedures

Forage intake trial: Twenty-four Angus x Hereford heifers averaging 764 lbs were blocked by weight and randomly assigned to one of six treatments: 1) Negative Control (no supplement), 2) Positive Control (soybean meal(SBM) + sorghum grain supplement), 3) Low Megalac® (SBM + sorghum grain + 17% Megalac supplement) 4) High Megalac (SBM + sorghum grain + 34% Megalac supplement), 5) Low Alifet (SBM + sorghum grain + 15% Alifet supplement), or 6) High Alifet (SBM + sorghum grain + 30% Alifet supplement). Alifet is a crystallized natural animal fat that contains 92% crude fat and is incorporated with a neutral, starch-based carrier. Alifet has a digestible energy value of 3.34 Mcal/lb. Megalac is comprised of the calcium salts of fatty acids of plant origin and has a crude fat content of 82.5%. Megalacs' digestible energy value is 3.1 Mcal/lb, and it contains 8 to 10% calcium. All supplements were fed at 0.30% of body weight on a dry matter basis. The level of SBM was adjusted to equalize the crude protein (CP) content of the fat supplements with that of the 26% CP positive control. Because of the different digestible energy values for each of the bypass fat

[1] The authors express sincere appreciation to Mr. Gary Ritter, Mr. Wayne Adolph, and the student employees at the Range/Cow-calf Unit for their invaluable assistance in conducting this trial.

products, supplements were balanced to equalize the energy within the two fat levels (High vs. Low). Heifers were housed in individual 6' x 8' pens. Poor quality prairie hay (4.3% CP) was ground to a length of 4 inches and fed at 130% of each animal's previous 7-day average intake. Forage and supplement offered and forage refusals were weighed and sampled daily, analyzed for dry matter, and stored for future analyses. The trial consisted of a 14-day adaptation period and a 7-day intake measurement period.

Digestion trial: Six Angus x Hereford steers averaging 1214 lbs were used in a 6x6 Latin square digestibility trial. Steers were randomly rotated through each of the six treatments outlined in the forage intake trial. All steers received mature brome hay (7.4% CP), which was limit fed at 1.5% of body weight. All supplements were fed at 0.30% of body weight on a dry matter basis. Diet digestibility was determined by total fecal collection. Ruminal dry matter fill was determined by ruminal evacuation.

Results and Discussion

All of the bypass fat supplements, as well as the SBM + sorghum grain supplement, stimulated increased forage dry matter intake compared with the unsupplemented heifers (Table 19.1). Animals fed the High Alifet supplement had higher ($P<.02$) forage dry matter intakes than those fed the High Megalac supplement. However, the forage intake of the High Alifet group was not different ($P>.10$) from that of the other supplemented groups. Total dry matter intake reflected a similar pattern with overall higher values being explained by supplement consumption. Total diet digestibility and ruminal dry matter fill were not different ($P>.10$) among treatments. Although further analysis detailing actual fiber digestibility values is necessary, it appears from the available data that the bypass fat products evaluated in this study do not decrease forage utilization. Further research is needed to determine under what conditions the Kansas beef producer can benefit from incorporating these energy-dense products into range supplementation regimens.

Table 19.1. Influence of Rumen Bypass Fat in Supplements on Forage Dry Matter Intake and Digestibility

Item	No Supplement	SBM + Sorghum Grain	Megalac		Alifet		SE[a]
			Low	High	Low	High	
Forage Intake, % body wt	1.56[d]	2.16[bc]	2.09[bc]	2.03[c]	2.14[bc]	2.29[b]	.07
Total Diet Intake, % body wt	1.56[d]	2.44[bc]	2.36[bc]	2.30[c]	2.41[bc]	2.56[b]	.07
Total Diet digestibility, %	55.3	55.9	56.4	57.5	56.4	56.7	1.2
Ruminal Dry Matter Fill, % body wt	1.21	1.27	1.16	1.28	1.34	1.23	.09

[a]SE = standard error.

[bcd]Means within a row without a common superscript differ ($P<.02$).