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FEED UTILIZATION BY STEERS WITH CHRONIC CRYPTOSPORIDIA INFECTION

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Summary

The effect of chronic cryptosporidia infection on feed utilization by yearling steers was evaluated. Two control and two infected steers were fed a corn silage based diet. Infected steers had shown evidence of cryptosporidia infection over a 6-month period prior to determining feed digestibility. Digestibilities of dry matter (58.1 vs 54.0 ± 3.9%), NDF (51.7 vs 54.6 ± 2.5%), ADF (35.8 vs 34.8 ± 7.1%) and crude protein (45.0 vs 45.9 ± 5.3%) were unaffected ($P > .10$) by parasite infection for control and infected steers, respectively.

(Key Words: Steers, Digestibility, Cryptosporidia.)

Introduction

Cryptosporidia is becoming recognized as an important gastroenteric infection in beef and dairy cattle. Cryptosporidiosis can cause severe diarrhea in calves and leaves them susceptible to secondary respiratory infections. In cases of cryptosporidia bovis infection, we expect immunity to develop as in coccidiosis infection. We have found cryptosporidia mura in stools of calves received in the feedyard. In two studies, we have observed calves that chronically shed oocysts. Infected calves did not exhibit clinical symptoms of infection.

Generally, when cattle are chronically infected with cryptosporidia mura, the abomasum is enlarged and the pH abomasal chyme is elevated. This may affect the digestive process, especially protein digestion. This experiment was designed to determine if digestibility of components of a corn silage based diet were affected in chronically infected steers.

Materials and Methods

Two Angus steer calves were observed to chronically shed cryptosporidia over a 83-day fecal sampling period. These steers were matched by size

with two steers not shedding oocysts. All steers originated from the same ranch. During the digestibility study, a stool sample indicated control steers were negative and infected steers were positive for cryptosporidia organisms.

When steers were 12 months old, they were adapted to a corn silage diet (Table 1) and individually housed in stalls in the Animal Science Complex. Steers were fed once daily. After ad libitum intake was stabilized, intake was held constant for measuring digestibility components.

Digestibility was estimated by including chromic oxide in the diet at 6,500 mg per head per day by topdressing a ground corn-Cr₂O₃ premix. Marker was fed for 10 days prior to and during fecal collections. Fecal grab samples were collected over a 3-day period beginning immediately prior to feeding and again 8, 16, 27, 35, 43, 54, 62 and 70 hours later. Feces were dried at 55 °C, ground through a 1-mm screen and composited for N, NDF, ADF and Cr analysis. Digestibility coefficients were estimated by ratio technique.

Results and Discussion

There were no differences in intake or dry matter, ADF, NDF or N digestibility. However, there were only two steers in each group. Only marked differences in digestibility could be detected in this situation.

Chronic cryptosporidia infection did not affect utilization of corn silage diet. No differences in animal appearance or performance were noted. While chronic cryptosporidia infection had no apparent detrimental effect on steer performance, infected individuals provide a continual source of the parasite. No therapy currently exists to control cryptosporidia. Dry matter intake was relatively low in this study. Performance of cattle in various production situations should be evaluated to help establish the economic importance of this type of parasitic infection.

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TABLE 1. DIET FED DURING DIGESTIBILITY STUDY^a

Item	%
Corn silage	90.58
Soybean meal, 44%	7.24
Trace mineralized salt	.24
Calcium carbonate	.38
Dicalcium phosphate	.10
Cr ₂ O ₃ premix	1.46

^a Percent, dry matter basis.

TABLE 2. FEED UTILIZATION BY CRYPTOSPORIDIA INFECTED AND NONINFECTED STEERS^a

Item	Uninfected	Infected	SEM
Dry matter intake, lb	14.3	17.6	1.70
Digestibility			
Dry matter, %	58.06	54.00	3.9
ADF, %	35.75	34.80	7.1
NDF, %	51.70	54.60	2.5
Crude protein, %	44.95	45.85	5.3

^a Dry matter basis.