



Impact of MIN-AD[®] on Blood Levels of Magnesium and Calcium During the Transition Period

Introduction

Low levels of magnesium (Mg) in the blood of dairy cattle during the transition period are often a problem contributing to milk fever. Consequently, high levels of Mg, usually in the form of magnesium oxide (MgO), are often fed during this time. It has been demonstrated that MIN-AD can replace MgO and limestone in beef feedlot diets as a source of supplemental Mg and calcium (Ca). However, beef feedlot diets promote low rumen pH while transition diets in dairy cattle typically result in higher rumen pH values compared to feedlot steers or lactating dairy cattle. Because MIN-AD dissociates very slowly when the pH is above 6, the bioavailability of MIN-AD in transition diets has been questioned. Serum Mg levels are closely related to dietary intake and bioavailability of Mg and, consequently, are a good indicator of bioavailability.

Experimental Design

Royal Farms Dairy, Garden City, KS has been feeding high levels of MgO and limestone to their transition cows to reduce milk fever problems following calving. The trial was conducted using a switch-back design with two periods on their standard program and two periods where MIN-AD was the sole source of supplemental Mg. Each treatment period lasted 10 days.

The standard supplementation program for Mg and Ca prior to the initiation of this trial consisted of 1.5 lbs of a liquid supplement containing 25% MIN-AD + 0.12 lbs of MgO + 0.30 lbs of limestone per head per day. This was fed for the first ten days of the trial. During the second treatment period, the cows were fed a liquid supplement with 31% MIN-AD at 2.25 lbs per day; there was no supplemental MgO or limestone. This program provided supplemental Mg and Ca levels that were similar to the standard program. After 10 days on the MIN-AD treatment, the dairy switched back to the standard program for 10 days. During the fourth and final treatment period, a liquid supplement containing 19% MIN-AD was fed at a rate of 1.5 lbs with .55 lbs of MIN-AD per head per day added by hand. Again, this resulted in Mg and Ca supplementation equivalent to the standard program.

Blood samples were collected from approximately 20 cows about seven days after the start of each treatment period. Serum Ca and Mg levels were analyzed by St. Catherine Hospital, Garden City, KS using colorimetric procedures.

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Results

Serum levels of Mg and Ca in samples taken at least one week after the start of each supplementation program are shown in Table 1.

Table 1. Serum Levels of Magnesium and Calcium (mg/dL) in Close-up Dairy Cows

-----Treatment-----					
	Period 1	Period 2	Period 3	Period 4	
Mineral	MIN-AD + MgO + Limestone	MIN-AD	MIN-AD + MgO + Limestone	MIN-AD	S.E.
Calcium	8.1	8.3	8.2	8.4	0.08
Magnesium	2.0	2.1	2.1	2.2	0.04

Levels for both Ca and Mg were similar ($P>.10$)

Summary

Replacing supplemental MgO and limestone with MIN-AD resulted in similar serum levels of Mg and Ca. Furthermore, analysis of serum samples for the two months following the end of this study with MIN-AD as the sole source of supplemental Mg indicated that Mg and Ca levels remained at the desired levels.