

# Performance of Growing Steers Fed a Natural Supplement

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## Introduction

New markets are developing for “natural” cattle as consumers express interest in purchasing beef that has “never ever” been administered growth implants, fed or injected with antibiotics, or had certain additives used in the feed. At this writing, there is no legal definition of natural so individual companies are defining their own protocol for “natural” production. North Dakota Natural Beef LLP is marketing beef under the “Dakota Farms” label. This new business venture was developed in collaboration with NDSU and the Beef Systems Center of Excellence. This entity is just one potential market for feedlots that procure and feed cattle according to “natural” protocols.

“Natural” beef production does not allow the use of some of the practices associated with conventional management. Ionophores and implants are specifically prohibited, but we know from past research that these management practices improve efficiency and are economically sound. New feed additives are being developed with novel but potentially useful ingredients that qualify as “natural.” This study evaluated one new product on the market for feeding calves naturally.

## Materials and Methods

Steer calves used in this study were supplied by 26 members of the Eastern Dakota Feeder Calf club, with individual cattlemen providing 6 to 20 head each. Steers were delivered to the Carrington Research Extension Center on November 30, 2006. Steers selected for the study (n=162 of 212 consigned) were blocked by weight into four classes and allotted randomly to three treatments by ranch source within weight block. Twelve pens were used with 13 or 14 steers per pen. Treatments were: 1) control, no additives, 2) natural additive (Rumatec Starter®, Ralco Nutrition, Inc, Marshal, MN), and 3) ionophore, monensin sodium, (Rumensin®, Elanco Animal Health, Greenfield IN). The Rumatec Starter® supplement was formulated with diatomaceous earth, alpha-hydroxy propionic acid, cobalt carbonate, fenugreek, processed grain by-products, dehydrated brewers yeast, and mineral oil. This product was fed at 2 g per head per day diluted in 1/3 pound of a feedlot supplement that contained a standard vitamin and mineral complement. The ionophore was fed at 300 mg per head daily diluted in the same supplement base fed at 1/3 pounds per head daily. The control supplement was the same basic ingredients without additives and fed at 1/3 pounds per head daily also.

Upon arrival, steers were allowed to rest for 24 hours, weighed individually, and vaccinated for IBR, PI3, and 7-way plus somnus. The arrival weight was used to allot steers to respective treatment and pen. Calves were weighed again when sorting was completed for the initial weight in the study. Calves were weighed at 28-day intervals thereafter with the study lasting for 56 days. Totally-mixed rations were delivered once daily in the morning after bunks were read and adjustments made for subsequent feeding to achieve ad libitum intake. Amount of feed delivered to each pen was recorded daily. Feed ingredients were sampled and analyzed separately on a monthly basis. Daily gains, dry matter intake, and feed efficiency were calculated for the two, 28-day weigh periods. Calves were fed a growing diet consisting of approximately 60% concentrate containing 57 Mcal NEg/lb. The 14.4% crude protein ration was formulated (DM basis) with 32% dry-rolled corn grain, 18% corn silage, 16% chopped straw, 16% dry-rolled field peas, 15% wet distillers grain with solubles, 1% calcium carbonate, and 2% supplement.

Following this study, calves were transitioned to a finishing diet (85% concentrate, 62 Mcal/lb) and fed to market weight. Results of the finishing phase will be reported in the future.

Data were analyzed using SAS Mixed procedures with pen as the experimental unit. Significance is reported with P values at < 0.10.

## Results and Discussion

The large number of ranches consigning steers to this project and the number of steers per pen (13-14 head) provided an excellent sampling of North Dakota feeder cattle and added confidence to the results of this study. Table 1 gives average weights for the steers. Dry matter intake of newly weaned steers plays a huge part in their gain and future performance. In this study, dry matter intake (Table 2) with the natural supplement (20.24 pounds DM per day) was greater ( $P < 0.10$ ) during the first 28 days on feed than the ionophore (19.25 pounds) with the control intermediate (19.68 pounds). As a percent of body weight, calves on the natural supplement ate 2.74% of their body weight, control calves at 2.62%, and the ionophore calves ate 2.60%. Fenugreek as a feed additive has not been studied separately, but there is suggestion in historical writings that it may improve palatability and stabilize functions of the digestive tract. For the two-month growing period, there appeared to be a tendency ( $P < 0.13$ ) for the natural supplement to support greater feed intake.

**Table 1. Weights of steers fed a natural supplement.**

	Treatment			Std Err	P Value
	Control	Rumatec®	Ionophore		
Initial Wt., lbs.	750.2	740.2	738.8	8.76	0.37
Grow Period 1, lbs.	847.4	841.3	843.9	9.50	0.81
Grow Period 2, lbs.	952.2	953.3	944.4	11.34	0.69

**Table 2. Dry matter intake of steers fed a natural supplement.**

	Treatment			St. Err	P Value
	Control	Rumtec®	Ionophore		
Dry matter intake					
Period 1, lbs.	19.68 <sup>ab</sup>	20.24 <sup>a</sup>	19.25 <sup>b</sup>	0.37	0.09
Period 2, lbs.	20.59	21.12	20.32	0.73	0.31
Average (P1,2), lbs.	20.14	20.68	19.79	0.37	0.13

<sup>ab</sup>Values with different superscripts are significantly different,  $P < 0.10$ )

During period 1, numerically greater gains were observed for the ionophore treatment, followed by the natural supplement and the control treatment.(Table 3) During period 2, the natural calves gained more ( $P < 0.10$ , 3.86 pounds per day) compared to ionophore calves with control calves intermediate. Overall, no statistical differences in gain were detected ( $P = 0.23$ ) as natural supplement steers gained 3.74 pounds per day followed by ionophore at 3.61 and control at 3.54 pounds.

**Table 3. Average daily gain of growing steers fed a natural supplement.**

Item	Treatment			Std. Err	P Value
	Control	Rumatec®	Ionophore		
Period 1, lbs.	3.48	3.61	3.76	0.15	0.17
Period 2, lbs.	3.61 <sup>ab</sup>	3.86 <sup>a</sup>	3.46 <sup>b</sup>	0.15	0.03
Average (P1,2), lbs.	3.54	3.74	3.61	0.12	0.23

<sup>ab</sup>Values with different superscripts are significantly different,  $P < 0.10$ )

There were no differences detected ( $P > 0.10$ ) in feed efficiency during the 56 day trial. (Table 4) However, the ionophore calves appear to be numerically more efficient with 5.19 pounds of DM per pound of gain in period 1 compared to 5.62 for the natural supplement and 5.73 for the control calves. Calves in all treatments gained very efficiently using less than 6 pounds of DM per pound of gain. Ionophores are known to support improved feed efficiency.

**Table 4. Feed Efficiency (DM per gain) for growing steers fed a natural supplement.**

Item	Treatment			Std. Err	P Value
	Control	Rumatec®	Ionophore		
Period 1, lbs.	5.73	5.62	5.13	0.28	0.19
Period 2, lbs.	5.90	5.89	5.50	0.51	0.79
Average (P1,2), lbs.	5.71	5.55	5.48	0.27	0.76

**Implications**

Natural beef producers are searching for supplements that will provide economical cost of gains and similar animal performance to the ionophores on the market. The Rumatec Starter® compared in this trial appears to be useful for natural feedlots, providing positive feed intake and competitive gains and efficiencies. ■