Effects of a Commercially Manufactured Feed Product on Performance and Carcass Characteristics of Finishing Feedlot Cattle

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Crossbred yearling beef steers (n = 48; mean body weight = 869 lb) were purchased in Madera, CA and shipped to a commercial feedlot near Pasco, WA where they were branded, implanted with Component TE-S (VetLife L.L.C., West Des Moines, IA), injected with multivalent clostridial (Vision® 7/Somnus with Spur®, Intervet Inc., Millsboro, DE) and respiratory vaccines (Vista® 5 SQ, Intervet Inc.), and treated for parasites (Safe-Guard®, Intervet, Inc. and Dectomax®, Pfizer Inc., New York, NY). Following a 12-hour period of rest, cattle were transported to a University of Idaho research facility in Moscow, ID where they were immediately weighed, blocked by body weight, and allotted to 10 pens equipped with constant flow water tanks and individual Calan gate feeders (American Calan, Northwood, NH). Cattle were then assigned randomly, within block, to 1 of 4 dietary treatments based on graded levels of a novel feed product (CRX-16; CHS Nutrition, Sioux Falls, SD). The control diet containing 0% CRX-16 was comprised of 81.7% dry-rolled corn, 8% alfalfa hay, 3.2% soybean meal, 4.3% supplement, and 2.8% cane molasses. Test diets consisted of CRX-16 fed at 15, 30, and 45% of the diet dry matter in place of corn. Diets were formulated to contain a minimum of 12% crude protein, 29 g/ton Rumensin (Elanco, Indianapolis, IN), 10 g/ton Tylan (Elanco), and 0.6% Ca (dry basis). Steers were adapted to their respective dietary treatment using a series of 4 transition rations. Diets were prepared using a commercial feed mixer (Harsh Feed Lot Mixer, Eaton, CO). Diets were delivered daily into the feedbunk in equal portions at 0745 and 1430 h. Steers were fed ad libitum on a timely basis ($\pm$10 min) in a manner which minimized accumulation of refused diet. Steers were slaughtered at a commercial beef processing facility (Tyson Fresh Meats, Wallula, WA) when at least 70% of cattle within a block displayed phenotypic characteristics of a steer grading USDA Choice. Mean HCW, dressing percent, loin area and fat thickness were 883 lb, 59.3%, 14.2 in^2, and 0.54 in, respectively. Mean USDA yield grade was 3.09 and 68% and 32% of the cattle enrolled in this study graded USDA Choice and Select, respectively. No statistical differences between dietary treatments were noted for carcass characteristics or feedlot performance despite a numerical improvement in feed conversion of 6.52% between control and CRX-16 diets (Table 1). The magnitude of variation for feed conversion was relatively high (13.5%). Results from our study suggest value of CRX-16 is equal to that of dry-rolled corn. Because high variation in animal growth potential may have precluded us from detecting considerable differences in feed conversion, further research should be conducted to determine if these observations are "real" or whether corn and the grain replacement product truly are not equal (Type II error). Furthermore, studies aimed at evaluating treatments intended to be employed at a commercial feedlot should be conducted using a larger sample size when the researcher decides to utilize cattle selected from the true population of animals.

TABLE 1. Effects of CRX-16 grain replacement product on performance of beef feedlot steers [a]

Item	Control	15%	30%	45%	SEM	Contrast, $P <$ PEL	LIN	QUAD
n	12	12	12	11	-	-	-	-
Body weight, lb								
Initial	940	939	938	935	-	-	-	-
Interim [b]	1134	1147	1156	1146	8.8	0.46	0.59	0.53
Final	1477	1494	1495	1500	36	0.51	0.55	0.81
Adjusted Final	1418	1435	1436	1440	35	0.51	0.55	0.81
DMI, lb								
Interim	24.4	25.7	25.7	24.2	0.7	0.26	0.88	0.03
Final	24.2	24.0	23.1	22.9	2.2	0.48	0.32	0.98
ADG, lb								
Interim	5.24	5.61	5.87	5.72	0.37	0.21	0.28	0.45
Final	3.94	4.09	4.14	4.07	0.48	0.45	0.61	0.55
Feed:Gain								
Interim	4.94	4.72	4.54	4.28	0.30	0.21	0.10	0.93
Final	6.24	5.99	5.70	5.81	0.33	0.24	0.25	0.55
Dietary NEg, Mcal/cwt [c]	61.6	64.2	67.5	67.3	-	-	-	-
Product value, % of dry-rolled corn [d]		127	129	115	-	-	-	-

[a] Dietary treatments consisted of dry-rolled corn based finishing diet with graded levels of CRX-16 grain replacement product (i.e., 0, 15, 30, and 45% of the diet dry matter as product)
[b] Interim performance after 38 days on feed
[c] NRC, 1996
[d] Replacement technique, a = [(control FG-treatment FG)/control FG] x 100; b = a/product inclusion in %