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Starea, urea, or soybean meal as a protein source in growing and finishing cattle rations

Abstract

Use of urea in beef cattle rations, particularly in rations containing high levels of roughage (growing-type rations), has been limited by urea's toxicity, segregation and mixing problems, palatability, and poor use by animals. We compared soybean meal, Starea® (44% protein equivalent), Starea ® (60% protein equivalent), a milo-urea pellet, and a urea-infused milo berry material as protein (nitrogen) supplements in growing-type rations. Animals used in a nitrogen-balance study were then fed a 70% concentrate ration, receiving the same sources of protein.

Keywords

Cattlemen's Day, 1972; Report of progress (Kansas State University. Agricultural Experiment Station); 557; Beef; Starea; Urea; Soybean meal; Protein; Growing rations; Finishing rations

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Starea^(R), Urea, or Soybean Meal as a Protein Source in Growing and Finishing Cattle Rations

D. L. Tucker and L. H. Harbers

Introduction

Use of urea in beef cattle rations, particularly in rations containing high levels of roughage (growing-type rations), has been limited by urea's toxicity, segregation and mixing problems, palatability, and poor use by animals. We compared soybean meal, Starea^(R)* (44% protein equivalent), Starea^(R)* (60% protein equivalent), a milo-urea pellet, and a urea-infused milo berry material as protein (nitrogen) supplements in growing-type rations. Animals used in a nitrogen-balance study were then fed a 70% concentrate ration, receiving the same sources of protein.

Methods

Twenty-five steers of mixed breeding (10 Charolais-Brahman crosses, 10 Charolais-Hereford crosses, and 5 Angus-Hereford crosses) were allotted on a 2:2:1 ratio to five groups. Each group was randomly assigned one of the five rations (table 33). During a 56-day growth trial, the animals were individually penned in a slatted-floor barn, with access to block salt and water free choice. They were weighed at 28 and 56 days. After this 56-day trial, four animals from each group went on a nitrogen-balance study, and received the same rations. Following the nitrogen-balance study, they were grouped (five head per pen) and fed the same protein sources in a 70% concentrate ration (table 34) 72 days.

Results

Performance data for the growth and finishing trials are given in table 35. Results, because so few animals could be used, reflect only trends without statistically significant differences. Starea 44 appears to be as palatable as soybean meal (consumption data) and comparable as a protein supplement (gains and feed efficiency). The urea-infused milo berry material (E.M.) was less palatable and, hence, lowered consumption and gains. Milo-urea pelleted (M.U.P.) seems to be nearly equal to both soybean meal and Starea^(R)44 in a growing ration, but apparently it was used less efficiently in finishing rations. Animals in the

*Starea^(R)--an extruded milo-urea processed material

Starea^(R) 60 group were the most efficient and made highest average gains during the growth trial, which may be explained by the greater amount of supplemental nitrogen that group received. With supplemental nitrogen equal in the finishing phase, the Starea^(R) 60 group failed to perform so well as in the first trial.

Table 33. Growing rations in lbs./day/steer fed indicated protein sources.

Group	Corn silage *	Ground milo	SBM	St.44	MUP	B.M.	St. 60
1	24.57	3.00	1.50	--	--	--	--
2	24.20	3.00	--	1.50	--	--	--
3	24.13	3.00	--	--	1.50	--	--
4	22.01	3.00	--	--	--	1.50	--
5	25.15	3.00	--	--	--	--	1.50

* Corn silage fed ad. lib. These values are average daily consumption during the entire 56-day feeding period.

Table 34. Finishing rations in lbs./day/steer fed indicated protein sources.

Group	Corn silage *	Ground milo mix ^a	SBM	St.44	MUP	B.M.	St. 60
1	8.47	21.39	1.15	--	--	--	--
2	8.13	20.50	--	1.15	--	--	--
3	8.04	20.29	--	--	1.15	--	--
4	7.47	19.26	--	--	--	1.15	--
5	8.44	21.55	--	--	--	--	.80

* Average daily consumption - 72 days

^a Ground milo mix contained 98.73% ground milo, 0.5% salt, 0.75% ground limestone, 50 gm Vit. A (30,000 I.U./gm)/ton and 380 gm Aureomycin/ton.

Table 35. Growing and finishing data.

Indicated factor	1 SBM	2 Starea 44	3 MUP	4 B.M.	5 Starea 60
A.D.G. (56-day growing ration)	2.41	2.38	2.40	2.26	2.53
Feed efficiency (lbs. dry matter/ lb. gain)	6.53	6.56	6.43	6.29	6.19
A.D.G. (72-day finishing ration)	2.71	2.70	2.55	2.50	2.56
Feed efficiency (lbs. dry matter/ lb. gain)	8.76	8.70	8.83	8.56	9.18