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# Starea, urea and soybean meal compared in wintering rations for cows on bluestem pasture

## Abstract

More urea, a form of nonprotein nitrogen, would be fed to ruminants except for inefficient conversion of urea-nitrogen to Microbial protein, toxicity, lack of palatability and urea segregating in mixed rations. As a supplement for cattle on high-roughage rations, urea should be fed with a readily available energy source for urea nitrogen to be converted to microbial protein by rumen microorganisms. Attempting to overcome some or all of those problems, Bartley and co-workers at Kansas State University (Feedstuffs. 27 Apr. 68; 40:9) developed an expansion-processed mixture of grain and urea (Starea). We tested Starea and soybean meal as protein supplements for beef cows grazing dry bluestem pasture during the winter.

## Keywords

Cattlemen's Day, 1971; Report of progress (Kansas State University. Agricultural Experiment Station); 546; Beef; Starea; Urea; Soybean meal; Bluestem pasture

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**K****S****Starea, Urea and Soybean Meal Compared in Wintering Rations for Cows on Bluestem Pasture**

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More urea, a form of nonprotein nitrogen, would be fed to ruminants except for inefficient conversion of urea-nitrogen to microbial protein, toxicity, lack of palatability and urea segregating in mixed rations. As a supplement for cattle on high-roughage rations, urea should be fed with a readily available energy source for urea nitrogen to be converted to microbial protein by rumen microorganisms. Attempting to overcome some or all of those problems, Bartley and co-workers at Kansas State University (Feedstuffs, 27 Apr. 68; 40:9) developed an expansion-processed mixture of grain and urea (Starea).

We tested Starea and soybean meal as protein supplements for beef cows grazing dry bluestem pasture during the winter.

#### Methods

Sixty-three nonlactating, pregnant Hereford cows were allotted into four groups on the basis of the adjusted weight of each's calf (calf weight adjusted for sex and age of calf). Each group was further subdivided into 2 groups for replication. Cows were fed one of four rations (Table 21) each morning six days per week receiving 7 days' feed during the 6 day feeding period. Rations, except the sorghum grain one, were isocaloric and isonitrogenous. When cows were expected to begin calving, they were given the lactation rations (Table 22). They had access to water, a salt-mineral vitamin mix (55.1% salt, 36.7% dicalcium phosphate, 8.2% vitamin A premix) fed free-choice, and pasture. Hay was fed only when snow cover prevented grazing. Cow weight data during the gestation portion of this trial were collected. Data being collected include cow weight within 24 hours following parturition, calf birth weight, birth date and weaning weight of calf.

#### Results

Upon initiation of this experiment, ammonia toxicity was apparent in the sorghum grain-urea ration, and one animal died. Lack of palatability remains a problem with feed weight-back per head per day 0.2 to 2.5 lbs. Weight change of the cows during gestation portion is given in Table 23. The most notable weight changes occurred in urea-sorghum grain (Group 3)

and sorghum grain fed animals (group 4), with little or no advantage indicated for urea in a ground sorghum grain ration under our conditions. Weight changes were similar for animals fed soybean or Starea supplements.

Table 21 Gestation Rations (Average Daily Feeding)

|         | <u>Nitrogen source</u> | <u>Sorghum grain</u> |
|---------|------------------------|----------------------|
| Group 1 | 1.00 lb. soybean meal  | 2.00 lb.             |
| Group 2 | 1.00 lb. Starea        | 2.00 lb.             |
| Group 3 | 0.13 lb. urea          | 2.87 lb.             |
| Group 4 | ----                   | 3.00 lb.             |

Table 22 Lactation Rations (Average Daily Feeding)

|         | <u>Nitrogen source</u> | <u>Sorghum grain</u> |
|---------|------------------------|----------------------|
| Group 1 | 1.00 lb. soybean       | 5.00 lb.             |
| Group 2 | 1.00 lb. Starea        | 5.00 lb.             |
| Group 3 | 0.13 lb. urea          | 5.87 lb.             |
| Group 4 | ----                   | 6.00 lb.             |

Table 23 Weight Changes of Cows During Gestation

|               | 5 Dec. 70 -<br>6 Jan. 71 | 6 Jan. 71 -<br>13 Feb. 71 | 5 Dec. 70 -<br>13 Feb. 71 |
|---------------|--------------------------|---------------------------|---------------------------|
| <u>Ration</u> | <u>(32 days)</u>         | <u>(38 days)</u>          | <u>(70 days)</u>          |
| Group 1       | -97#                     | +71#                      | -26#                      |
| Group 2       | -96#                     | +48#                      | -48#                      |
| Group 3       | -111#                    | +36#                      | -75#                      |
| Group 4       | -114#                    | +35#                      | -79#                      |