

545 The addition of narasin into a mineral mixture improves performance of grazing Nellore steers.

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Previous studies have demonstrated that narasin, a coccidiostatic and antibacterial agent, may improve performance of forage-fed cattle due to rumen fermentation changes. The objective of this trial was to determine the effects of narasin inclusion into a mineral mixture (MM) on performance of grazing steers. Two hundred and forty Nellore steers (12 ± 1 mo of age) were blocked by initial BW (177 ± 0.21 kg), and assigned to 30 lots (8 steers/lot and 10 lots/treatment). Sixty paddocks of *Brachiaria brizantha* with 1 ha each were used and each paddock was continuously grazed by 28 d, followed by 28 d of rest. A paddock rotation among treatments was designed every 28 d to minimize the effect of variation among pastures. Paddocks were assigned to receive 1 of 3 treatments: a control (no narasin; 0N), and an intake of 71.5 (13N) and 110 (20N) mg of narasin (Zimprova[®]; Elanco, São Paulo, Brazil) per day, corresponding to 13 and 20 ppm considering 2.5% the DMI of steers. Narasin was added in the MM by adjusting their concentration in each period, according to MM intake (MMI) in the previous period. The MMI was evaluated on a weekly basis, starting 28 d before the beginning of the experiment. Forage mass in the paddocks was measured by choosing two points upon entry and exit of the lot from each pasture. All data were analyzed using the PROC MIXED procedure of SAS and evaluated by period (every 28-d) and overall (d 0 to 84). No treatment \times period ($P = 0.85$) or treatment ($P = 0.23$) effects were observed for daily MMI (64, 61, and 58 g for 0, 13, and 20N, respectively; SEM = 2.19). Conversely, a treatment \times period interaction was observed ($P = 0.002$) for ADG, because ADG was greater ($P \leq 0.01$) for 13N and 20N in the 1st and 2nd periods and also greater ($P = 0.03$) for 20N vs 13N in the first 28 d of the study, whereas no differences ($P \geq 0.18$) were observed in the last 28 d. Moreover, overall ADG was also greater ($P < 0.01$) for 13N and 20N when compared with cohorts receiving 0N, without differences between 13 and 20N ($P = 0.65$; 0.493, 0.575, and 0.585 kg/d, respectively; SEM = 0.0150). In summary, narasin inclusion into the mineral mixture did not impact mineral intake and improved overall steers performance during an 84-day period.

Key Words: Grazing, narasin, performance
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546 Inclusion of zeolites(clinoptilolite) in finishing ration of feedlot beef cattle.

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The objective of this study was to evaluate the inclusion of zeolites (clinoptilolite) on performance of feedlot steers fed a high concentrate, steam flaked corn-based finishing diet for 138 d. It was hypothesized that the ion exchange capacities of zeolites may serve as a buffering agent within the rumen and improve performance in a dose dependent fashion. Cross-bred steers ($n = 320$, initial BW 412 ± 3.2 kg) were evenly distributed in a completely randomized block design with four treatments. Steers were blocked by weight and randomly assigned to one of the four experimental treatments (8 pens per treatment; 10 hd per pen) with pen as the experimental unit. Treatments consisted of zeolite included at 0, 0.5, 1 or 2% of the diet DM. Steers were individually weighed on days 0, 21, 49, 77, 105 and 138. Initial pen BW was used as a covariate in the statistical analysis and significance was determined at $P \leq 0.05$ and tendency level determined at $P \leq 0.15$. Final BW ($P > 0.68$) and feed efficiency ($P > 0.58$) were similar across all treatments. Dry matter intake ($P = 0.14$) and average daily gain ($P = 0.10$) tended to be greater for steers fed zeolites at 1% of the dietary DM. There were no differences ($P = 0.40$) in mortality and morbidity between treatments. These data indicate, that under the conditions of this experiment, the addition of zeolites to steam flaked corn-based finishing diets does not impact final body weight or feed efficiency and tended to improve DMI and ADG of feedlot cattle when zeolites were included at 1% of diet DM.

Key Words: zeolite, clinoptilolite, beef cattle
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547 Fatty acid profile of omasum from cattle fed with soybean oil, selenium and vitamin E.

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The objective of this study was to evaluate the concentration of fatty acid in the omasum when diets with 6% soybean oil and with or without supplementation of organic selenium and vitamin E were fed. Five cannulated steers with an average initial body weight of 398 ± 28.7 kg were subjected to a 5 x 5 Latin Square with 21 days periods: 14 days of adaptation to diets and 7 days of sampling. Diets consisted of 65% concentrate and 35% corn silage formulated to be isonitrogenous (14.4% CP). Steers were assigned to dietary treatments: without additional oil; 6% soybean oil; 6% soybean oil plus

vitamin E; 6% soybean oil plus selenium; 6% soybean oil plus vitamin E plus selenium. The additives were offered daily with 1500 IU vitamin E and 5 g selenium per animal. Digesta of the omasum were collected for long chain fatty acids analysis using gas chromatography. The model included the fixed effects of diet and period and animal as a random effect, and was analyzed using PROC MIXED of SAS (SAS Inst. Inc., Cary, NC). The soybean oil diet had lower concentration of lauric acid (C12:0) (0.13 and 0.35; $P < 0.01$), myristic (C14:0) (0.47 and 1.21; $P < 0.01$), pentadecanoic (C15:0) (0.20 and 0.60; $P < 0.01$), palmitic C16:0) (12.75 and 15.6; $P < 0.01$), palmitoleic (C16:1) (0.06 and 0.16; $P = 0.01$), heptadecanoic (C17:0) (0.22 and 0.34; $P = 0.02$), oleic (2.30 and 3.85; C18:1 c9) ($P < 0.01$), and linoleic (C18:2 c9,12) (2.11 and 3.09; $P = 0.01$) than the diet without additional oil. However, the soybean oil diet had higher concentrations of elaidic (C18:1 t9) (0.61 and 0.27; $P = 0.02$), CLA C18:2 t10, c12 (0.04 and not detected; $P = 0.01$) and polyunsaturated fatty acids (PUFA) (2.66 and 3.75; $P < 0.01$) than the diet without additional oil. The supplementation with selenium tended to increase the concentration of C18:2 c9,12 (2.40 and 1.72; $P = 0.07$) and PUFA (3.0 and 2.33; $P = 0.07$) compared to the diet without selenium. In conclusion, supplementation with soybean oil and selenium can contribute to the increase concentration of PUFA in the digesta of the omasum, which may positively impact the concentration of PUFA in the subcutaneous and intramuscular fat of beef cattle.

Key Words: CLA, Lipids, PUFA

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548 Effect of copper supplementation on pre- and postpartum primiparous beef heifer and progeny hematological parameters fed diets with or without supplemental sulfur. J. Hawley*, E. B. Kegley, and J. G. Powell, *Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville.*

To assess the effects of Cu supplementation on pre- and postpartum primiparous beef heifer and progeny hematological parameters fed diets with or without supplemental S, 36 primiparous beef heifers (20 ± 0.5 mo of age; initial BW = 398 ± 24.9 kg) of predominantly Angus breeding were stratified by BW, BCS, and anticipated calving date and assigned to 12 pens (3 heifers/pen) for a 260 d study. Pens were assigned randomly to 1 of 4 treatments (2 × 2 factorial): 1) 0.15% S and 6 mg Cu/kg; 2) 0.15% S and 12 to 14 mg Cu/kg [6 to 8 mg from Cu₂(OH)₃Cl]; 3) 0.55% S (from Na₂SO₄) and 6 mg Cu/kg; or 4) 0.55% S (from Na₂SO₄) and 12 to 14 mg Cu/kg [6 to 8 mg from Cu₂(OH)₃Cl]. Diets were formulated to meet nutrient requirements during late gestation, with the exception of Cu and S. A cracked corn and soybean meal based supplement delivered each treatment starting at 170 ± 16 d of gestation through 150 ± 16 d in lactation. Heifers grazed mixed grass pasture and were provided predominantly fescue hay in quantities to ensure

ad libitum access to forage. Heifer hematological parameters were assessed from blood samples collected d -113, -85, -57, -29, 0, 56, 85, 113, 142, and 150 ± 16 relative to parturition. Calf hematological parameters were assessed from blood samples collected 0, 31, 59, 86, 115, and 150 ± 6 d relative to birth. Orthogonal contrasts were used to determine the effects of Cu vs. S supplementation. Statistical significance was declared at $P \leq 0.10$. No differences ($P \geq 0.58$) were observed between treatments for heifer hemoglobin, hematocrit, white blood cell count, and red blood cell count. Supplementing heifers additional Cu decreased ($P = 0.10$; Cu main effect) the lymphocyte percentage and increased ($P \leq 0.10$; Cu main effect) the neutrophil:lymphocyte ratio when compared to heifers not supplemented additional Cu. Supplementing heifers 0.55% S decreased ($P \leq 0.10$; treatment × day) basophils at parturition when compared to heifers fed 0.15% S. Heifer pre- and postpartum Cu supplementation with or without supplemental S did not ($P \geq 0.31$) influence progeny hematological parameters. These results suggest that the pre- and postpartum primiparous beef heifer immunity related blood profile (lymphocyte percentage) could be altered with a concomitant increase in inflammatory reaction (neutrophil:lymphocyte ratio) by Cu supplementation at 12 to 14 mg/kg of diet.

Key Words: Beef cattle, Hematological parameters,

Mineral supplementation

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549 Influence of commercial yeast products in diets for beef cattle new to the feedlot environment.

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Two truckloads of male beef calves (n = 172; initial BW = 226 ± 24.5 kg) were purchased from regional livestock markets to evaluate the effect of commercial yeast products on health and growth performance during a 28-d receiving period. Within truckload, calves were blocked by initial BW, stratified by gender, and assigned randomly to pen (5 or 6 calves/pen; 15 pens/truckload). Pens within each weight block were allocated to 1 of 3 treatments; an unsupplemented control, or supplementation with 2 commercial *Saccharomyces cerevisiae* yeast products (Y1 or Y2) resulting in 10 pens/treatment. Each day, a mixture (0.14 kg/d for each calf) of 58% ground corn and 42% of the appropriate yeast product, or 100% ground corn (control) was added to the feedbunks immediately after basal diet delivery and hand mixed into the feed offered. The basal diet contained 40% corn, 20% cottonseed hulls, 19% dried distiller grains, 10% corn gluten meal, and 7% soybean meal. Data were analyzed using the MIXED and GLIMMIX

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