DD Formula Containing Availa® Plus Reduced Prevalence of DD Lesions and Improved Growth Performance and Carcass Yield in Feedlot Cattle

Introduction:
The objective of this study was to evaluate the efficacy of the DD Formula containing Availa® Plus on incidence and severity of digital dermatitis (DD), growth performance, and carcass characteristics of growing-finishing feedlot heifers.

Experimental Design:
The study was conducted at a commercial feedlot with a history of DD. Following a 30 d starting period, 1120 growing-finishing heifers (Initial BW = 277 kg) were randomly allotted to 8 pens (140 heifers/pen; 4 pens per treatment). Heifers were fed the same basal diet and ractopamine (300 mg/hd/day) for the last 30 d prior to slaughter. Heifers were visually evaluated and scored for DD lesion incidence and severity using the M-stage system (M0 = no lesions, M2 = active, ulcerative lesions ≥ 2 cm in diameter, and M4 = chronic, non-active hyperkeratotic or proliferative lesions) four times throughout the study: d 70, 148, 189 (Phase 1) and d 248 (Phase 2).

Treatments:
CTM: Availa-Plus (60 ppm Zn, 20 ppm Mn, and 10 ppm Cu from amino acid complexes, 1 ppm Co from Co glucoheptonate, and 1.3 ppm I from potassium iodine) as part of the DD Formula
CON: Inorganic Zn, Mn, Cu, Co, and EDDI

Results:
• Baseline incidence of DD lesions was negligible and similar at initial evaluation (d 70) and increased throughout the trial with greatest prevalence observed after d 188.
• Heifers fed CTM compared to CON were observed to have:
  - Reduced overall rate of increase for prevalence of DD lesions (active M2 + chronic M4 lesions) compared to CON, \( P \leq 0.001 \)
  - Increased total weight gain (8 kg), \( P \leq 0.09 \)
  - Increased hot carcass weight (HCW; 5.9 kg), \( P \leq 0.10 \)
    • This treatment response for HCW was analyzed using pen as the experimental unit
    - An increase in individual animal HCW of 11.8 kg as a departure from overall centered mean value (95% confidence interval 5.40 to 18.7 kg)
    • This logistic regression analysis used individual animal data where HCW values were centered around the mean HCW before analysis to report results as departure from the overall mean HCW
    • HCW were centered since a value of “0” would never be observed
Results confirmed previous research indicating the increase in prevalence of active M2 + chronic M4 DD lesions observed with increasing days on feed was significantly mitigated when heifers were fed CTM compared to those fed CON. Providing CTM supplementation was also associated with improvements in growth performance and carcass yield compared to CON which would provide economic benefits to feedlot management. Interestingly, both HCW predictions are within the 95% confidence interval, suggesting that improvements in carcass weight due to CTM supplementation could range from 5.4 to 18.7 kg.
Effects of feeding a novel amino acid-complexed trace mineral supplement on productivity and digital dermatitis mitigation in growing-finishing feedlot heifers.
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Our objectives were to evaluate the efficacy of feeding a novel nutritional supplement providing trace minerals (CTM; zinc, manganese, and copper) as amino acid complexes and cobalt glucoheptonate compared to a supplement that provided a similar trace mineral profile from predominantly inorganic sources and organic iodine (Control; CON) on incidence and severity of digital dermatitis (DD) and related production parameters for growing-finishing feedlot heifers. The study was conducted on a commercial feedlot with a history of DD. Following a 30 d starting period, 1,120 growing-finishing heifers (Initial BW = 277 kg) were randomly allotted to 8 pens (140 heifers / pen; 4 CON and 4 CTM pens). Heifers were fed the same basal diet, with ractopamine (300 mg·hd⁻¹·d⁻¹ fed the last 30 d prior to slaughter. On d 189, heifers were sorted into terminal slaughter groups with total d on study being 323 (Heavier group) and 387 (Lighter group). Heifers were visually evaluated and scored for DD lesion incidence and severity using the M-stage system (M0, M2 and M4 lesions) four times throughout the study (d 70; d 148; d 189; d 248). Baseline prevalence of DD lesions was negligible and similar at initial evaluation (d 70) and increased throughout the trial with greatest prevalence observed post d 188. Feeding CTM reduced overall rate of increase for prevalence of DD lesions (active M2+chronic M4 lesions; \( P \leq 0.001 \)) compared to CON. Total weight gain for the entire trial was increased by 8 kg (\( P \leq 0.09 \)) and carcass weight increased by 5.9 kg (\( P \leq 0.10 \)) for CTM compared to CON heifers. Logistic regression analyses indicated an increase in individual animal carcass weight (HCW) of 11.8 kg (95% C.I. 5.40 – 18.7 kg) determined as a departure from overall centered mean value (HCWc) for CTM heifers compared to CON heifers. Results confirmed previous research indicating the increase in prevalence of active M2 +chronic M4 DD lesions observed with increasing days on feed was significantly mitigated in the CTM pens compared to CON pens. Providing CTM supplementation was associated with improvements in growth performance and carcass yield compared to CON pens which would provide economic benefits to feedlot management.

Key Words: digital dermatitis, feedlot, trace mineral supplementation

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