

Effects of trace mineral supplement sources during gestation and lactation in cows and subsequent calf immunoglobulin concentrations, growth, and development - Calf

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Objective:

Evaluate the response of Angus (AN) and Brangus (BN) cows and their calves to either inorganic (ING) or organic (ORG) trace mineral sources. Cattle supplemented with organic trace minerals received Cobalt, Copper, Manganese and Zinc in the form of BIOPLEX® and Se in the form of SEL-PLEX® (Alltech, Nicholasville, KY). Cattle supplemented with inorganic trace minerals received them as salt sulfates and Na selenite, respectively. Additionally, mineral supplementation levels varied between treatment groups. ORG trace mineral sources of Copper, Manganese and Zinc were fed at 25%, 13% and 29% less, respectively, in the pelleted feed and 45%, 32% and 46% less, respectively, in the free choice mineral as compared to the ING trace mineral treatment.

Experimental Design:

TREATMENTS:

AN-ING
Angus + Inorganic minerals

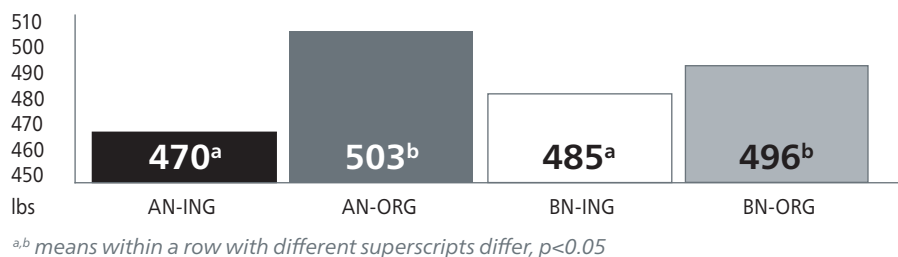
AN-ORG
Angus + BIOPLEX and SEL-PLEX minerals

BN-ING
Brangus + Inorganic minerals

BN-ORG
Brangus + BIOPLEX and SEL-PLEX minerals

BREED: ANGUS AND BRANGUS
SIZE: 160 HEAD

Calf 205-day adjusted body weight, lbs

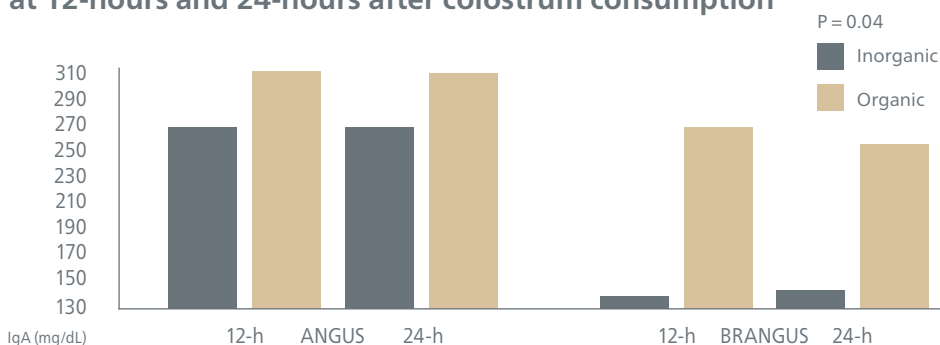


Performance Results: Calves

VARIABLE	AN-ING	AN-ORG	BN-ING	BN-ORG	SE	P-VALUE
Birth weight, lbs	78.0	80.0	79.1	79.1	0.7	0.92
Weaning weight, lbs	467	500	483	494	4.0	0.01
ADG, lbs/day	1.93	2.07	1.98	2.03	0.02	0.01
205-d adjusted BW, lbs	470	503	485	496	4.0	0.01

* P-values correspond to trace mineral source and are independent of breed

Calf serum immunoglobulin (IgA) antibody concentrations at 12-hours and 24-hours after colostrum consumption



Important Observations

- Calves fed a BIOPLEX and SEL-PLEX (ORG) trace mineral sources showed a statistically significant increase in average daily gain, weaning weight and 205-day adjusted body weight compared to calves fed inorganic trace mineral sources (ING) ($P \leq 0.01$).
- BIOPLEX and SEL-PLEX (ORG) supplemented calves were on average 22 lbs heavier at 205-day adjusted body weight compared to inorganic sources (ING) ($P \leq 0.01$). Specifically, Angus calves supplemented with BIOPLEX and SEL-PLEX (ORG) minerals were 33 lbs heavier at 205-day adjusted body weight than Angus calves supplemented with inorganic sources (ING).
- Immunoglobulin A (IgA mg/dL) antibody measurements for calves supplemented with BIOPLEX and SEL-PLEX (ORG) demonstrated a statistically significant 40.5% increase in calf serum at 24 hours after colostrum consumption compared to inorganic sources (ING) ($P = 0.04$).