



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

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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

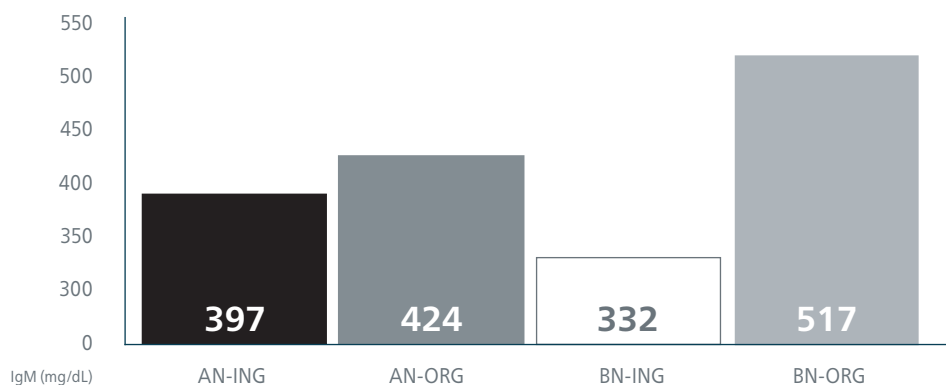
BREED: ANGUS AND BRANGUS **SIZE:** 160 HEAD

Colostrum quality of cows at parturition

VARIABLE	AN-ING	AN-ORG	BN-ING	BN-ORG	SE	P-VALUE
IgG (mg/dL)	10,211	11,638	11,048	11,638	1,022	0.33
IgM (mg/dL)	397.4	423.6	331.6	516.9	57.5	0.07
IgA (mg/dL)	575.6	633.9	575.6	530.7	82.6	0.22
Selenium (µg/g)	0.06 ^a	0.12 ^b	0.07 ^a	0.08 ^a	0.01	<0.001
Zinc (µg/g)	12.24	17.62	10.83	11.96	1.67	0.06
SCC (10 ⁶ cells/ml)	9.4	3.1	4.1	3.5	2.3	0.17

* Selenium creates both a trace mineral and breed effect in Angus cattle
* P-values correspond to trace mineral source and are independent of breed

Prenatal immunoglobulin M (IgM) colostrum concentrations in cows at parturition



Important Observations

- Colostrum from cows supplemented with BIOPLEX and SEL-PLEX organic trace minerals (ORG) contained 29% more Immunoglobulin M (IgM mg/dL) antibodies compared to cows supplemented with inorganic trace minerals (ING) (P= 0.07).
- BIOPLEX and SEL-PEX (ORG) supplemented cows demonstrated statistically significant higher levels of Selenium, and specifically, Angus cows had twice the level of Selenium (µg/g) compared to their inorganic (ING) counterparts (P ≤ 0.001).
- Somatic Cell Counts in colostrum were 67% lower in Angus cows fed BIOPLEX and SEL-PLEX (ORG) when compared to cows fed inorganic trace minerals (ING). Brangus cows fed BIOPLEX and SEL-PLEX (ORG) had 14.6% lower SCC compared to cows fed inorganic trace minerals (ING).