

# Effect of Sow Diet Trace Mineral Source on Colostrum and Milk Composition and Growth of Piglets



C. Rapp<sup>1</sup> and J. Morales<sup>2</sup>,  
<sup>1</sup>Zinpro Corporation, Boxmeer, The Netherlands,  
<sup>2</sup>PigChamp Pro Europa S.L., Segovia, Spain



## Introduction

- Transfer of IgG from sow to piglet is essential for good health and growth of piglets.
- Trace mineral amino acid complexes have:
  - Enhanced immune response and improved growth in beef cattle and poultry.
  - Increased Ig in colostrum of dairy cows.
- No data in swine.

## Objectives

Evaluate whether feeding trace mineral amino acid complexes to the sow enhances immunity and increases growth of suckling pigs.

## Materials & Methods

- 40 multiparous crossbred sows
- Sows allocated to 1 of 2 treatments at weaning based on parity number, backfat thickness, and BW.

### Treatments

**ITM:** 110 ppm Zn from ZnO  
 40 ppm Mn from MnO  
 15 ppm Cu from CuSO<sub>4</sub>

**CTM:** 60 ppm Zn from ZnO  
 50 ppm Zn from Availa®Zn  
 20 ppm Mn from MnO  
 20 ppm Mn from Availa®Mn  
 5 ppm Cu from CuSO<sub>4</sub>  
 10 ppm Cu from Availa®Cu

- Sows maintained on their respective treatments over one gestation and lactation period.
- Piglets were:
  - Cross-fostered at 2 d of age.
  - Weaned at 28 d of age.
  - Not provided creep feed.



## Statistics

- GLM procedure of SAS
  - Sow reproduction, litter growth
- PROC MIXED of SAS
  - Repeated measures
  - Milk, colostrum, immunoglobulins
- Chi-square
  - Mortality
- Experimental unit = sow/litter
- LS means presented

## Results

### No differences between ITM and CTM:

- Lactation feed intake, backfat thickness, sow body weight, and numbers of total pigs born, pigs born alive, and pigs weaned,  $P > 0.44$
- Concentration of protein, fat, and lactose in colostrum and milk,  $P > 0.25$

### Sows supplemented with CTM had:

- Decreased number of mummified fetuses,  $P = 0.04$
- Tended to have fewer stillborns,  $P = 0.10$
- Increased litter weaning weight,  $P = 0.05$
- Tended to have greater homogeneity of piglet weaning weights,  $P = 0.11$
- Decreased somatic cell counts in colostrum and milk,  $P = 0.05$
- Numerically greater IgG in colostrum ( $P = 0.35$ ) and piglet serum ( $P = 0.22$ )

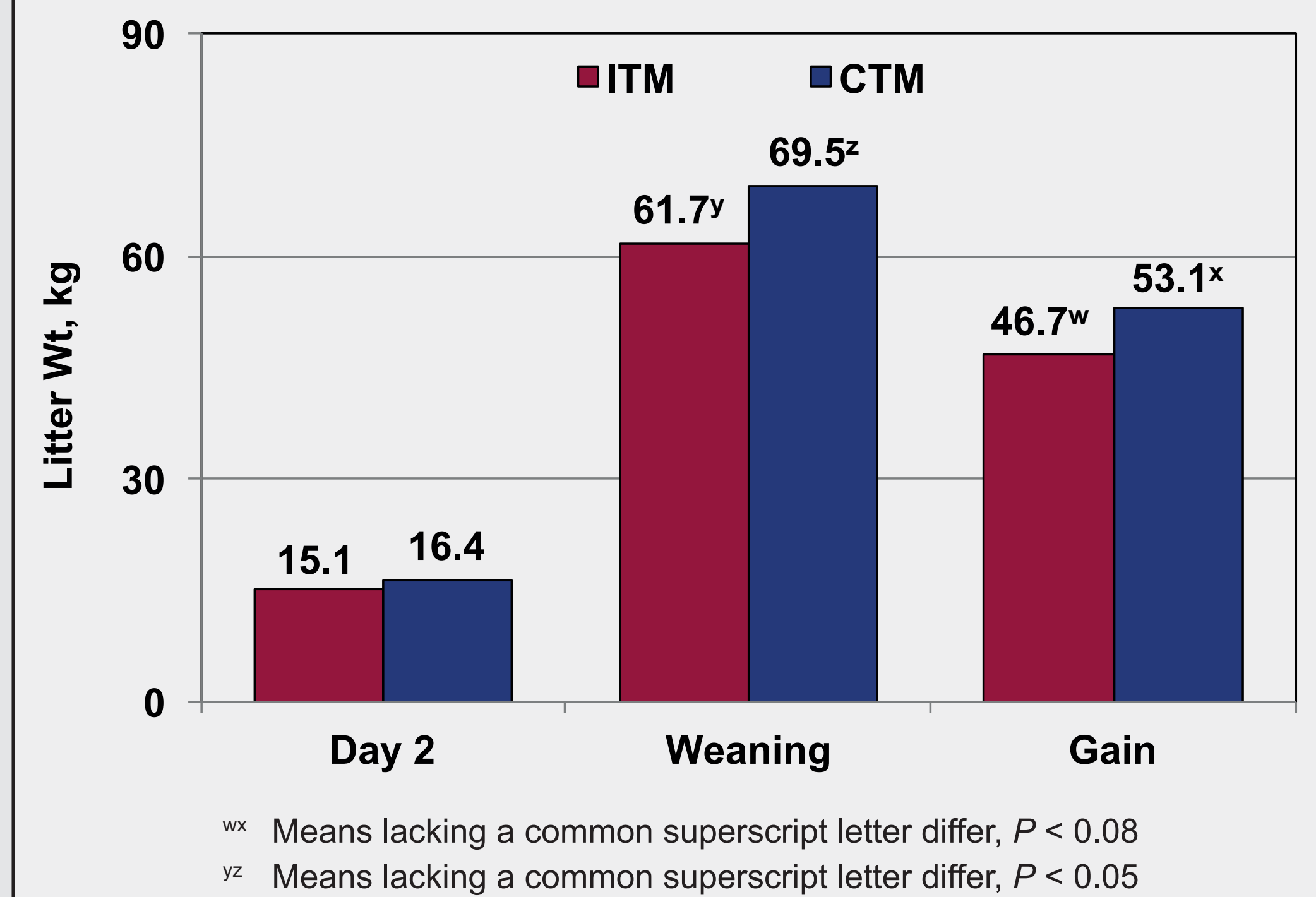
## Diet Characteristics

Item	Gestation	Transition	Lactation
Net energy, MJ/kg	9.33	9.52	9.79
		as-fed, %	
Crude protein	12.50	13.30	17.07
Ether extract	3.20	4.08	3.90
Crude fiber	8.00	5.22	4.67
Calcium	0.90	0.85	0.90
Total phosphorus	0.57	0.61	0.61
Available phosphorus	-	0.36	0.39
Lysine	0.60	0.72	1.00
Methionine	0.22	-	-
Methionine + Cysteine	-	0.52	0.65
Threonine	-	0.57	0.70
Tryptophan	-	0.16	0.21
Valine	-	0.63	0.87

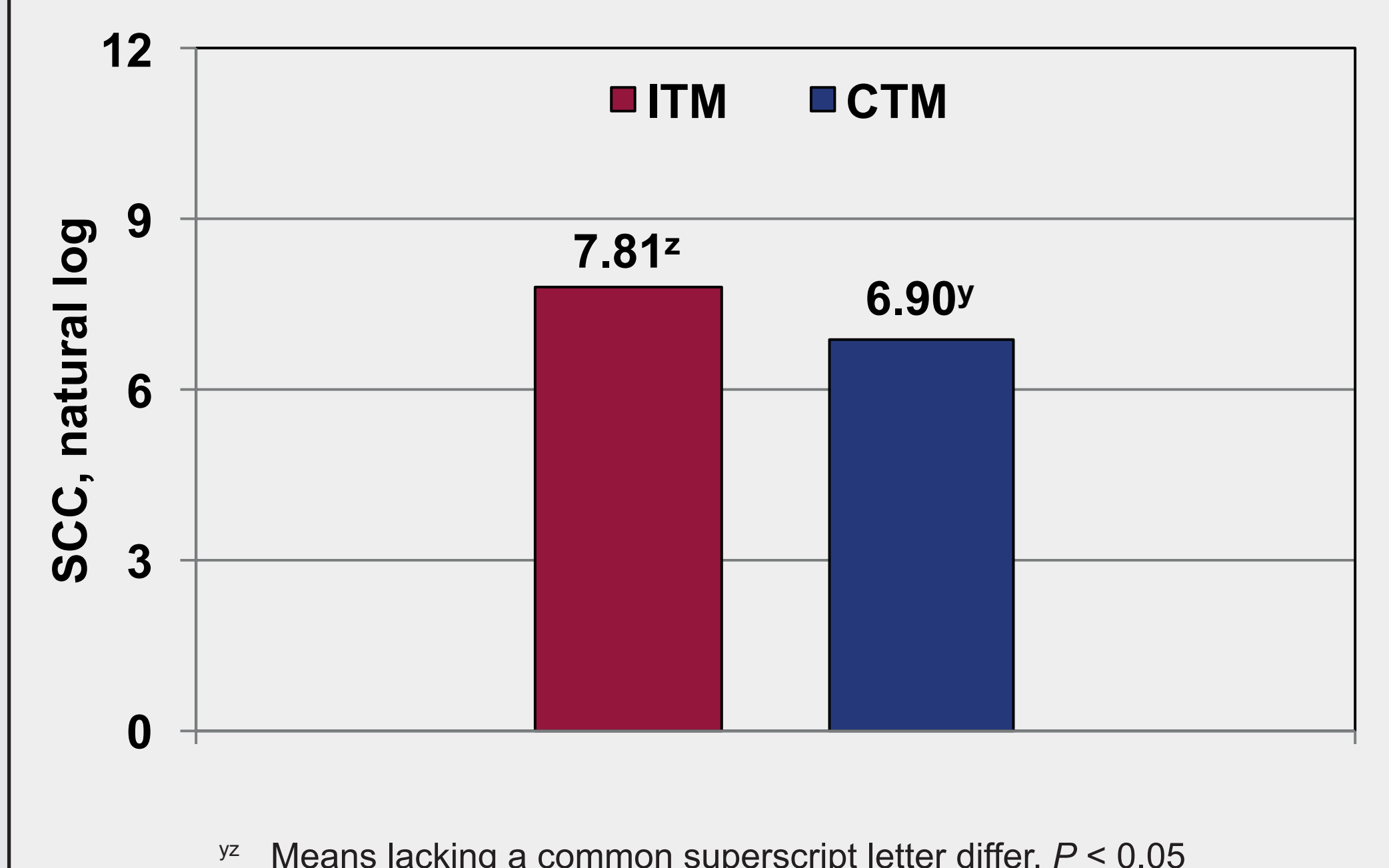
## Litter Characteristics

	ITM	CTM	P Value
At birth, n			
Born alive	10.27	11.31	0.45
Stillborn	0.93	0.38	0.10
Mummified	0.33	0.00	0.04
Total born	11.53	11.69	0.92
Body weight, kg	1.52	1.58	0.51
BW homogeneity, %	85.5	85.4	0.99
After cross-fostering			
Initial number, n	10.00	10.63	0.20
Mortality, %	7.0	9.4	0.39
At weaning			
BW, kg	6.74	7.10	0.21
BW homogeneity, %	83.3	85.5	0.11
Weaned, n	9.33	9.75	0.48

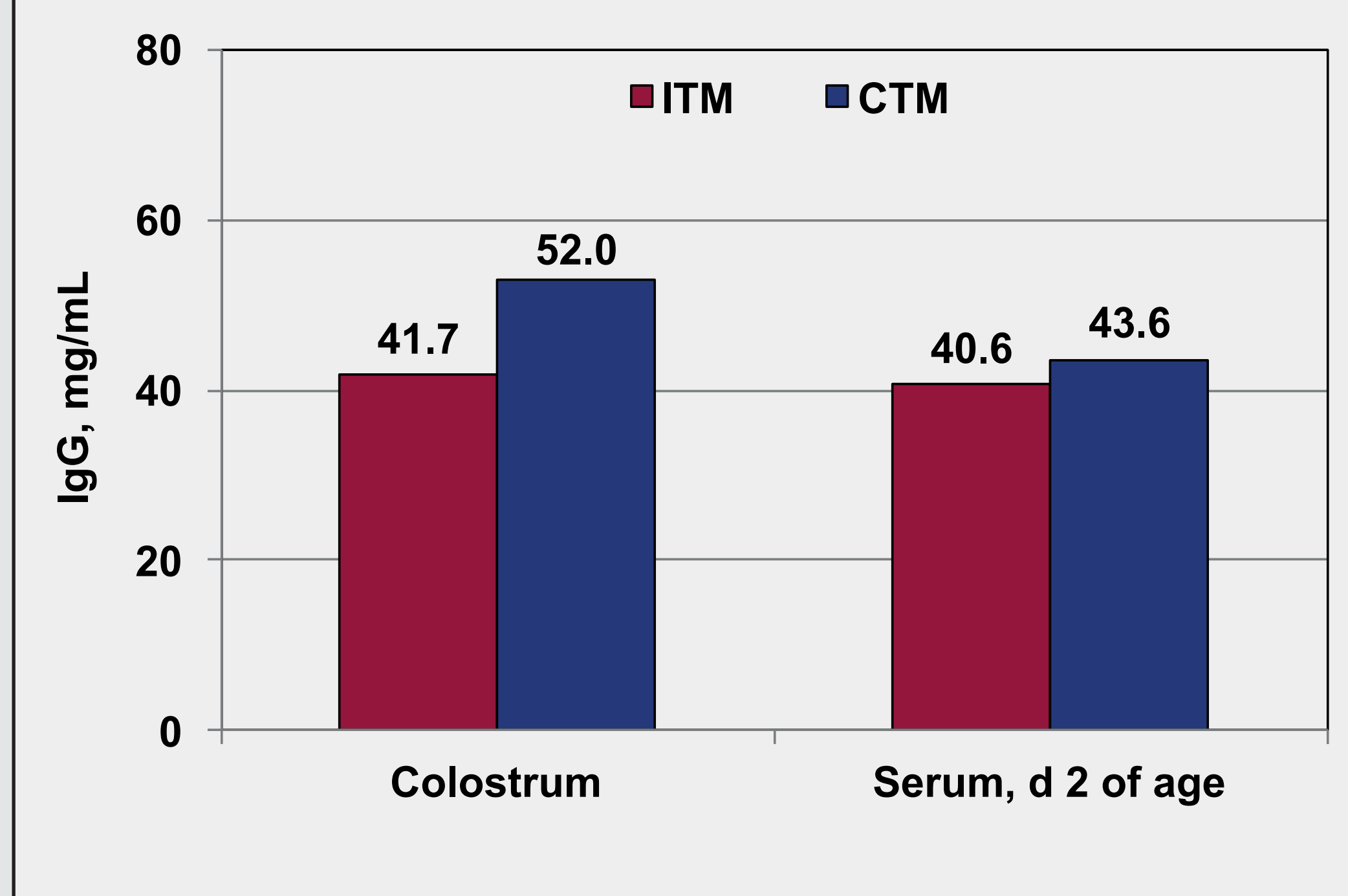
## Litter Weight



## Somatic Cell Count



## IgG Concentration



## Conclusions

- Sows supplemented with trace mineral amino acid complexes had decreased somatic cell counts and increased litter weaning weights.
- Reproductive response to trace mineral amino acid complexes should be interpreted with care due to low numbers of sows in the study.