with 2 2-hydroxy-4-methylthio butanoic acid and FeGly (MAAC®) is a chelate of 1 mineral with 1 glycine. Pigs were fed the SS diet without added micro mineral for 2 wk and then randomly assigned to 1 of 4 treatment diets. Fecal and urine samples were collected for 5 d following a 5-d adaptation period. The inclusion of OMM increased ($P < 0.05$) the ATTD and retention rate of Zn, Cu, Mn, and Fe in pigs. No difference was observed between SS and CS diets, except pigs fed CS diets had greater ($P < 0.05$) ATTD of Zn than pigs fed SS diets. Compared with IMM, adding OMM increased ($P < 0.05$) the ATTD and retention of Cu, Mn, and Fe to a lesser extent in SS diets than in CS diets (interaction, $P < 0.05$). This may be due to the greater concentration of phytate in CS diets than in SS diets. Results indicate that organic forms of micro minerals have better digestibility and retention rates compared with inorganic forms.

Table 1. Apparent total-tract digestibility (ATTD) of Zn, Cu, Mn, and Fe in pigs fed diets containing inorganic (IMM) or organic micro minerals (OMM)

	Semi-synthetic		Corn-soybean meal		
	IMM	OMM	IMM	OMM	SEM
Zn					
ATTD, %	49.11	57.63	44.04	53.60	1.75
Retention, %	40.65	48.44	38.61	49.55	1.37
Cu					
ATTD, %	42.93	44.61	35.64	50.46	2.37
Retention, %	39.58	40.83	33.14	47.88	2.31
Mn					
ATTD, %	37.90	40.79	29.50	44.31	2.60
Retention, %	34.12	36.55	27.22	41.67	2.23
Fe					
ATTD, %	38.57	42.03	30.16	47.37	1.88
Retention, %	36.48	40.41	28.00	45.48	1.94

Key Words: apparent total-tract digestibility, micro mineral, pig

108 Retention and digestibility of Zn, Cu, Mn, and Fe in pigs fed diets containing inorganic or organic minerals. Y. Liu*[1], Y. L. Ma[2], J. M. Zhao[2], M. Vazquez-Añón[2], and H. H. Stein[1], *[1]University of Illinois, Urbana, [2]Novus International Inc., St. Charles, MO.*

The objective of this experiment was to measure the apparent total tract digestibility (ATTD) and retention rate of Zn, Cu, Mn, and Fe in pigs fed either inorganic micro minerals (IMM) or organic micro minerals (OMM). Thirty 2 barrows (BW: 38.4 ± 10.17 kg) were housed in metabolism cages and assigned to 4 treatments with a 2 × 2 factorial arrangement and 8 replicates per treatment. Semi-synthetic (SS) or corn-soybean meal (CS) diets were formulated with the inclusion of IMM ($ZnSO_4 \cdot 7H_2O$, $CuSO_4 \cdot 5H_2O$, $MnSO_4 \cdot H_2O$ and $FeSO_4 \cdot H_2O$), or OMM [$Zn(HMTBa)_2$, $Cu(HMTBa)_2$, $Mn(HMTBa)_2$ and FeGly] premix. The Zn, Cu, or $Mn(HMTBa)_2$ (MINTREX®, Novus International Inc., St. Charles, MO) is a chelate of 1 mineral