Multiparous Holstein cows (n = 60) were used to determine effects of supplementing hydroxy forms of Zn, Cu, and Mn compared with 2 other common supplementation strategies on oxidative metabolism, cytological endometritis, and performance of transition cows. After a 1-wk pretreatment period, cows were assigned randomly to 1 of 3 dietary treatments from 21 d before expected calving through 84 d postcalving. Dietary treatments administered by daily top-dressing included (1) inorganic sulfate forms of Zn, Cu, and Mn (ITM); (2) a blend (75:25) of sulfates and organic complexes of Zn, Cu, and Mn (ITM/OTM); and (3) hydroxyl trace minerals (HTM) of Zn, Cu, and Mn. The resulting dietary concentrations of supplemental Zn, Cu, and Mn were similar among treatments and averaged 40, 10, and 27 mg/kg, respectively, before calving and 59, 15, and 40 mg/kg, respectively, after calving. Total concentrations of Zn, Cu, and Mn averaged 80, 16, and 62 mg/kg during the prepartum period and 102, 23, and 75 mg/kg, respectively, during the postpartum period. Overall, effects of treatment on milk yield and milk composition were not significant. Cows fed HTM during the prepartum period had higher body weight (BW) than those fed ITM during the prepartum period than those fed the other treatments; however, BW change, body condition score, and body condition score change were not affected by treatment. Plasma total antioxidant capacity was lower in cows fed HTM than ITM but was not different from cows fed ITM/OTM. Cows fed HTM tended to have lower concentrations of plasma thiobarbituric acid reactive substances than those fed ITM during the whole study period, but plasma thiobarbituric acid reactive substances were not different between HTM and ITM/OTM. Plasma haptoglobin was lower in cows fed HTM than ITM/OTM at 1 wk postpartum. Endometrial cytology 7 d postcalving and cytological endometritis as assessed on 1 d between 40 and 60 d postcalving was not affected by treatment. In conclusion, supplementation with HTM sources of Zn, Cu, and Mn modulated plasma variables related to oxidative metabolism compared with supplementation with ITM; however, HTM and ITM/OTM resulted in similar responses. Furthermore, the source of trace minerals did not affect performance or uterine health in this experiment.

**Key words:** trace minerals, oxidative stress, cytological endometritis