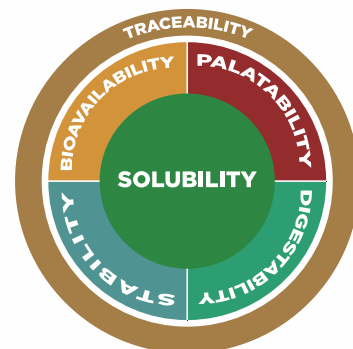


THE ABILITIES OF INTELLIBOND TRACE MINERALS

DIGESTIBILITY

Trace Minerals and Rumen Microbe Function

- Weak ionic bond from sulfates causes dissociation of metal when exposed to moisture (rumen fluid) and release free metal ions.
- These free metals have the ability to negatively affect microbe function.
- It is not the sulfate portion that is harmful to rumen microbes, it's the free metal ions like copper and zinc that are highly oxidative and antimicrobial – which is why copper sulfate and zinc sulfate are used as antimicrobial agents in applications such as footbaths.

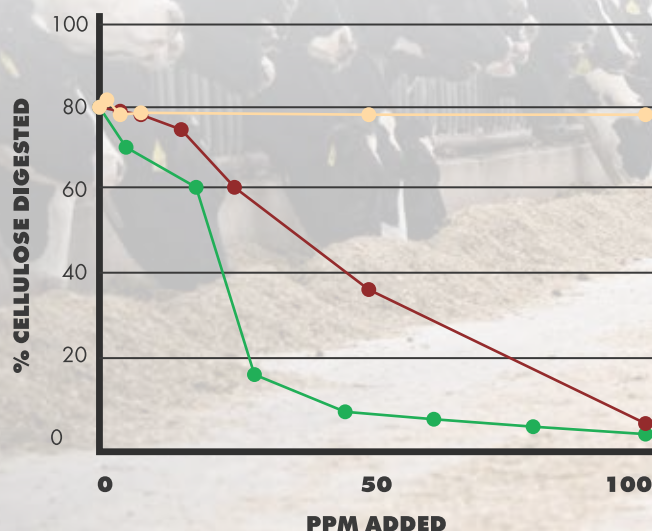


MICROBIAL REQUIREMENTS

Sala (1957) found that when rumen fluid was included in the in-vitro system, any additional zinc actually decreased cellulose digestion. This indicates that zinc content of the basal diet is likely enough to supply rumen microbes with the zinc needed to maximize cellulose digestion.

Effect of Trace Minerals on Cellulose Digestion in Rumen Fluid

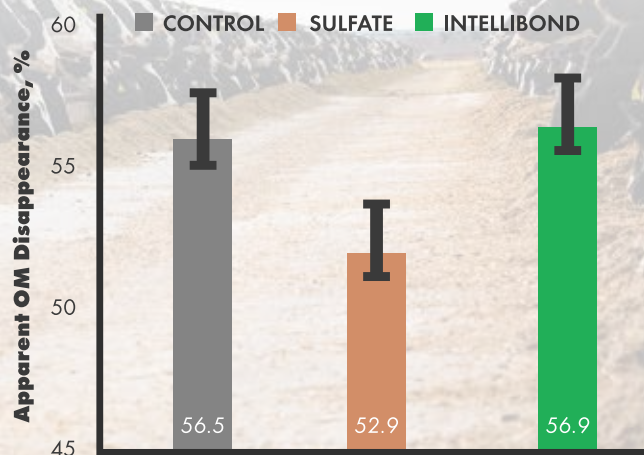
■ COPPER SULFATE ■ ZINC SULFATE ■ MANGANESE SULFATE



SULFATES REDUCE RUMINAL DIGESTION

Copper, zinc, and manganese sulfate reduced apparent Organic Matter disappearance (6-7%) compared to no added trace minerals and IntelliBond copper, zinc, and manganese in a 48h in vitro fermentation system (Micronutrients Trial#2019R131CACZM, 2019).

Apparent Organic Matter Disappearance (24 observations/trt)



TRACE MINERAL SOURCE EFFECTS FIBER DIGESTIBILITY

Recent studies have shown that ruminants fed copper sulfate, zinc sulfate, and manganese sulfate have lower NDF digestibility compared to cows fed a ration containing IntelliBond trace minerals at iso-levels.

TRACE MINERAL SOURCE EFFECTS FIBER DIGESTIBILITY

Digestibility Test Method ■ In Situ ■ uNDF240 In Vivo ■ Total Tract In Vivo

