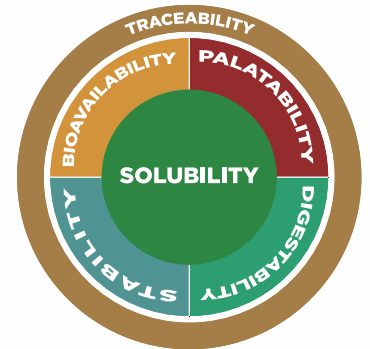


THE ABILITIES OF INTELLIBOND TRACE MINERALS

SOLUBILITY

Trace Minerals and Solubility Characteristics

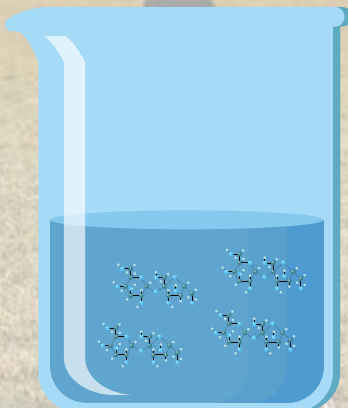
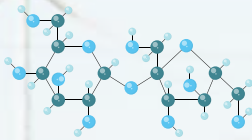
- Ionic bonds involve transfer of electrons. When ionically bonded salts dissolve, they also dissociate due to the weak nature of the ionic bond.
- Covalent bonds involve sharing of electrons. A covalently bonded molecule can dissolve, but not necessarily dissociate due to the stronger nature of the covalent bond.
- Dissociated, free metal ions such as Cu^{2+} and Zn^{2+} occurring in the rumen and feed have the opportunity to:
 1. Degrade other vulnerable feed components such as vitamins and lipids: **STABILITY**
 2. Reduce preferential intake of mineral: **PALATABILITY**
 3. Bind to antagonists and become unavailable: **BIOAVAILABILITY**
 4. Decrease fiber digestibility: **DIGESTIBILITY**



COVALENT

TABLE SUGAR (sucrose) - $\text{C}_{12}\text{H}_{22}\text{O}_{11}$

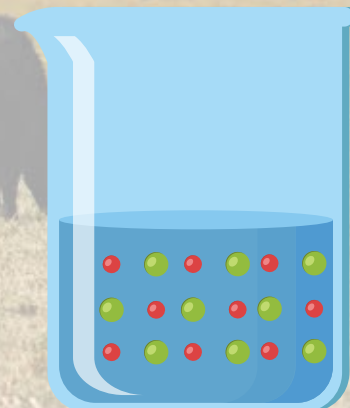
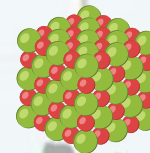
Covalent bonds keep atoms together when the substance dissolves.



IONIC

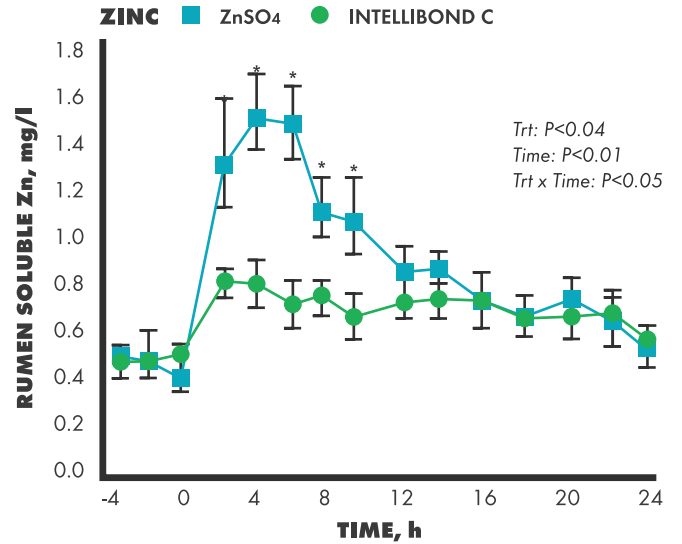
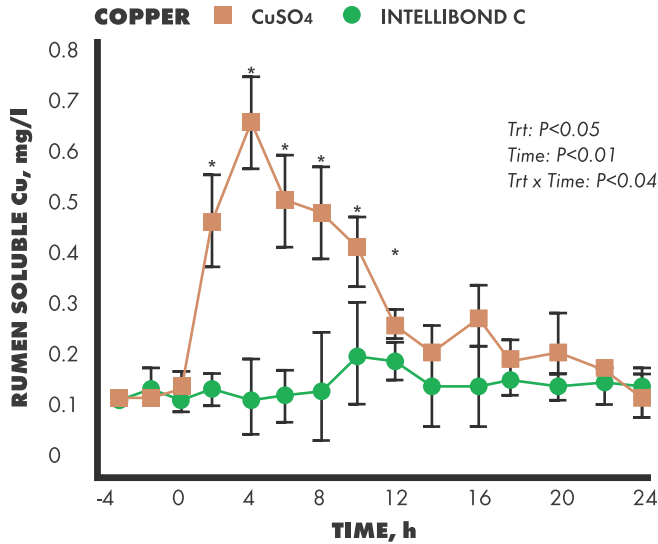
TABLE SALT (sodium chloride) - NaCl

Ionic bonds allow atoms to dissociate when the substance dissolves.



RUMEN SOLUBILITY

Copper sulfate and zinc sulfate are more soluble in the rumen than IntelliBond C and IntelliBond Z. Over time, copper and zinc sulfate becomes less soluble as the copper and zinc become bound to antagonists (Caldera et al., 2019).



SOLUBILITY THROUGHOUT THE DIGESTIVE TRACT

IntelliBond has low solubility at a higher pH, which avoids negative interactions in the rumen. IntelliBond is more soluble in a low pH environment (such as the abomasum) and allows for a slower, more stable release throughout the gastrointestinal tract (Spears et al., 2004; Cao et al., 2000).

