



Dairy Technical Bulletin

Successful Custom Premix Inclusion for QLF Liquid Supplements

Lisa Davis, MS QLF Dairy Product Manager

Liquid feeds complement a precision feeding strategy by delivering trace minerals, vitamins, and specialty additives to the TMR and evenly distributing these nutrients throughout the ration. The liquid feed industry utilizes specialized micro-ingredients which have specific concentration, particle size, chemistry, and handling characteristics that are compatible within required manufacturing processes, transportation, and storage conditions. Specialty additives and premixes which are easily utilized into dry feeds may not be compatible with liquid feeds. For instance:

- A high concentration of carrier creates difficulty with mixability, suspension characteristics, labor, and manufacturing efficiency.
- Large particle sizes of carrier or specialty additives may get caught in plant screening procedures or settle out of a liquid feed in storage tank.
- Some carriers or specialty additives are chemically incompatible with liquid feeds, resulting in finished feed that is foamed, thickened, or both.

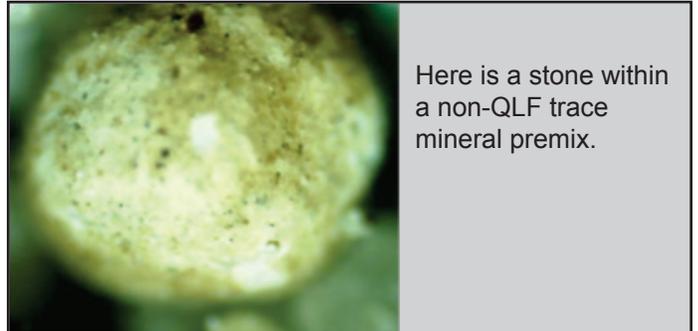
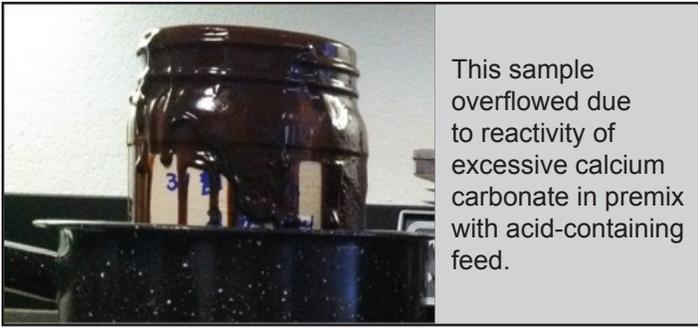
Consequently, any specialty additive or trace mineral premix desired for liquid feed must undergo a thorough evaluation process to discern effects on several areas such as cost, formulation, manufacturing efficiency, feed quality, and handling.

Creating a custom trace mineral premix that is liquid-feed friendly optimizes plant efficiencies, product quality, and handling. Work with your supplier to make sure the premix is in “water soluble” form (appropriate for fluid applications such as milk replacer or liquid feeds). Here are characteristics for a successful custom premix into Liquid Feeds:

- Small, uniform particle size
- Highly concentrated to achieve premix feeding rates of ≤ 14 grams/hd/day (0.5 oz/hd/day)
 - Using QLF’s standard dairy trace mineral package and liquid vitamins, complete VTM supplementation for lactating dairy cows is delivered in 10-12 grams/day.
- Sulfate Trace Minerals
- Minimum carrier (<2.5% of premix)
- Suggested Carriers: calcium carbonate, salt, or soluble sugar
- No added silica, quartz, or sand for flow agent – large particles can settle out and are hard on pumps
- Spheres or egg-shaped particles are very difficult to suspend
- No live organisms/ probiotics
- Use water-soluble vitamin forms or supplement vitamins through QLF liquid sources



Here are some pictures which illustrate the concerns which can happen with mineral premixes that are incompatible with liquid feeds or contain large amounts of carrier:



Here is a premix that settled out of suspension due to large, heavy carrier particles. Clear particles in bottom of jar show presence of quartz or silica crystals.

