

THE FUTURE OF NANO EMULSION TECHNOLOGY

A game-changing solution for the
food and beverage, and dietary
supplements industries.

caps^oil
food tech | by Prodalim



The food and beverage and dietary supplements industries are changing.

Today's consumers demand foods and beverages that deliver more than just sustenance. They're looking more holistically at all aspects of well-being, and pushing for products that go above and beyond to provide nutrition and functionality, as well.

On the dietary supplements side, pill fatigue has set in for many consumers, so they're seeking out solutions outside the standard formats of capsules, soft gels and tablets.

These two converging trends have caused a sharp increase in product launches touting fortification and functionality.

Many health-focused ingredients in line with these consumer trends are part of the lipid family. Using these oil-based ingredients, such as omega-3, MCT and fat-soluble vitamins like A, D, E and K, comes with inherent challenges, whether it's poor performance or lowered dosage.

Capsoil Foodtech's game-changing technology can help! We've developed an innovative production process to create ultra-fine powders from natural oils.



Our game-changing process creates four distinct benefits.

1

Self-emulsifying nano emulsion

Our powders are built as a complete system, meaning our customers don't need to add any additional ingredients to the powders to make them soluble. The emulsion formed is also stable, with a particle size of 150-200nm. Capsoil Foodtech powders will even self-emulsify in cold water.

- Particles are built with emulsifier at nano level NOT at the formulation level
- Capsoil powders require no addition emulsifiers
- The powder is easily self-emulsified even in cold water
- Each particle is a nano-delivery system



2 High load of oil

Unlike conventional powders where the oil is poured over a carrier, which limits the oil content, our process starts directly with the oil. With this process, Capsoil Foodtech powders can have up to a 60% oil load, much higher than the 12 - 20% load of other powders on the market today. During our process, the oils are also less exposed, making Capsoil Foodtech powders less sticky with a better flow.

Existing technology

- Oil absorption into cracks
- 12 - 20% oil in powder
- Particle size: 5-7 micron
- Sometimes sticky and not free flowing

Capsoil Foodtech powders

- Encapsulates the nano-drops
- Up to 60% oil in powder
- Particle size: 150-200nm
- Free flowing dry powder

3 Clean production process

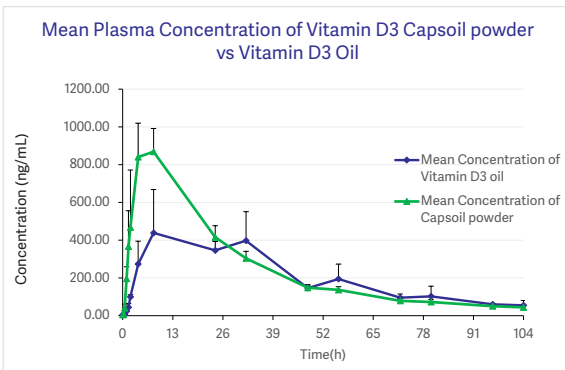
We don't use any solvents, chemicals or enzymes, and all reactions take place at room temperature, making our process clean with a low carbon footprint. The composition of the finished powder is the same as the starting oil, meaning what you start with is what you end up with at the end.

- No solvents, no chemicals, no enzymes
- Cold process (low carbon footprint)
- Process allows for minimal loss of nutrients

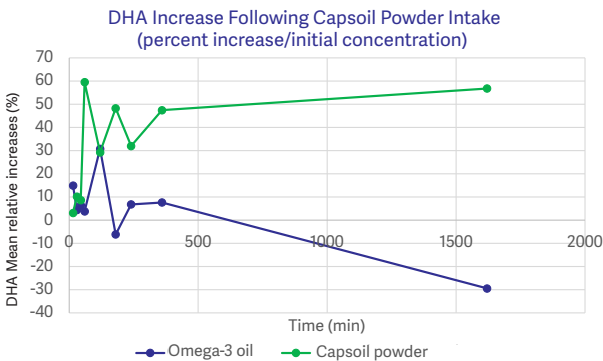
4

Better bioavailability

Better bioavailability is possible because of the small particle size of the emulsion. The smaller the particle, the larger the surface area, making the oil more available to the biological system. In our studies, the improved bioavailability of Capsoil Foodtech powders was tested with both vitamin D and omega-3. We compared the bioavailability of the converted powders to the starting oil-based ingredient.



- Bioavailability of Capsoil Foodtech's vitamin D₃ was tested in a pre-clinical study
- Capsoil's vitamin D₃ powder was compared to a vitamin D₃ oil
- All measures improved following intake of Capsoil Foodtech's product including C_{max}, T_{max} and AUC



- Each group of rats was administered the same amount of DHA in a single dose of oil or powder
- C_{max} in plasma is 46% higher in the powder vs. the oil
- T_{max} in plasma is 45 minutes for the powder, compared to 90 minutes for the oil
- DHA blood levels were kept high up to 24 hours after powder digestion



What can you do with Capsoil Foodtech powders? The possibilities are endless.

Taking advantage of Capsoil Foodtech's technology allows our customers to innovate quicker and shorten their time on the bench during application development. Enriching foods and beverage with oil-soluble ingredients like vitamin D, MCT or omega-3 is easily within reach and gives these products the health halo consumers are searching for.

Our dietary supplements customers can effortlessly expand their format options to include gummies, stick packs or shots. There's also the potential to create new nano formulations and combinations of oil-based ingredients that weren't previously possible.

Discover all the ways Capsoil Foodtech's technology can create value in your products.

info@capsoilfoodtech.com
www.capsoilfoodtech.com