

# EFA Powders: Stable Microencapsulation

## What are EFA Powders?

Bioriginal Food & Science Corp. has recently joined forces with Kievit, a company based in The Netherlands which specializes in powder technologies, to produce microencapsulated essential fatty acid (EFA) oils (eg: fish, flax and borage) in a dispersible, stable powder form. Kievit is well known for the microencapsulation of specialty food ingredients for use in a wide range of food applications which include beverage, bakery, infant formula, soups and sauces, enhanced nutrition and vending industries. Microencapsulation of the Bioriginal EFA oils is a process by which fine oil droplets are immobilized within a proprietary matrix to form a dry, free flowing, stable powder.

## Why Microencapsulation?

The purpose of microencapsulation can be broken down into 2 benefits:

- to enhance the stability of the encapsulated EFA oil
- to offer an alternative method for incorporating EFA oils into food applications

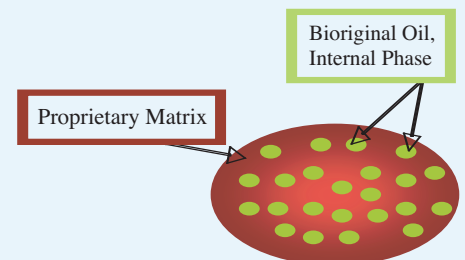
Enhanced oil stability is achieved through reducing the molecular mobility of the oil which results in a reduction in the interactions of the oil with oxygen and other reactive ingredients such as minerals or light, all of which are factors that contribute to the deterioration of the oil through oxidation effects.

As the oil is now delivered in a stable powder form, the potential application possibilities are greatly increased. Combinations of EFA oils with other components, which would usually be detrimental to the oil quality, now become possible. In addition, certain industries prefer to work with dry components as they usually have longer shelflife, and handling is generally easier compared to the liquid alternatives.

## EFA Powders

- DHA-Rich Fish
- Borage
- Flax
- EPO
- Omega-3-6-9 (combination of fish, borage and olive oils)

## Microencapsulation



## Microencapsulation Benefits

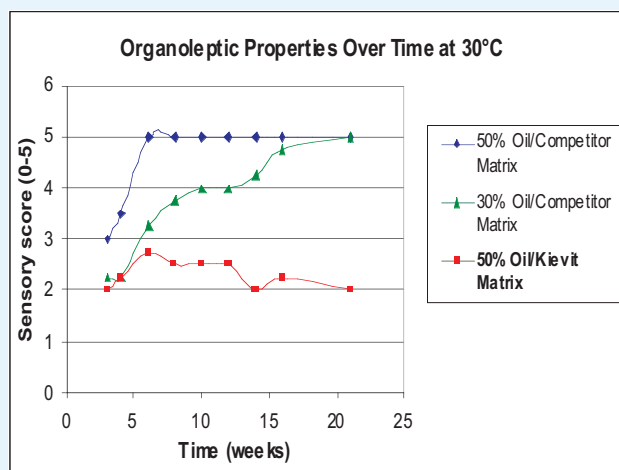
- Stabilizing the encapsulated oil by protecting the inner oil against light, oxygen, heat and humidity
- Separating reactive or incompatible components from the encapsulated oil, such as hydrophilic materials, thus allowing the powdered oils to be dispersible in water-based products
- Protecting the EFA concentrations in the encapsulated oil
- Controlling the release of the encapsulated oil
- Transforming liquid oils to easily handled solid ingredients which greatly expands functionality

## Expertise Guarantees Stability

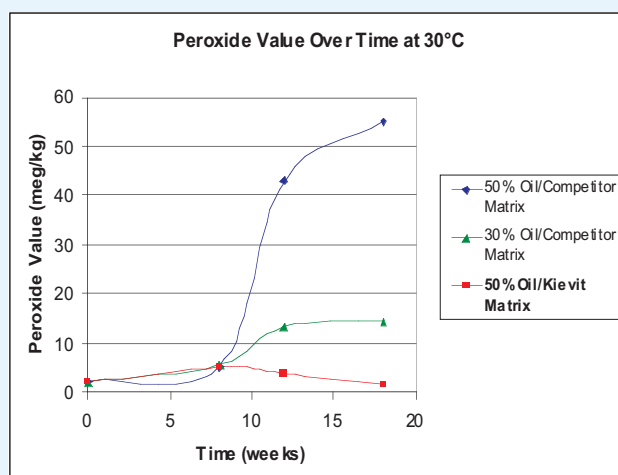
All of Bioriginal's EFA Powders offer a shelf life of 18 months from the date of manufacture. The guaranteed shelf life is based on the amount of lipid oxidation that occurs under a given set of conditions. Lipid oxidation is a process whereby unsaturated fatty acids are broken down by the action of oxygen and free radicals. Bioriginal's EFA powders contain a proprietary natural antioxidant composition specifically formulated to quench oxygen radicals from damaging the oil within the powder. Quenching oxygen radicals prevents the development of rancid flavors, undesirable odors, changes in color and texture, and thus, increases shelflife and overall consumer acceptance.

In addition to the antioxidant system used to help stabilize the oil in the powder, Bioriginal's EFA oils are also shielded from lipid oxidation by utilizing a carefully optimized recipe which combines oil load together with a proprietary matrix composition. Multiple accelerated stability studies were completed in attempt to optimize the organoleptic properties and peroxide value of the extreme oil load with the proprietary matrix composition. In Figure 2, the superiority of the sensory properties, such as taste and smell, of Bioriginal's EFA powders is well below the unacceptable limit of 5. Figure 3 identifies Bioriginal's EFA powders as top-quality in regards to maintaining a peroxide value much lower than the maximum limit of 10, and also much lower than the competitor's matrices.

### Figure 2: Organoleptic Properties of EFA Powders



### Figure 3: Peroxide Value of EFA Powders



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