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Inspired Functional Ingredients to Innovate and Differentiate Your Brand

Products by Ecovatec Solutions Inc.



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Phospholipids (PL-20H)



EcovaPure™ PL-20H



Phospholipids (PL)

- PL-20H contains phospholipids, hydrolyzed egg proteins, triglycerides
- It is patented and an excellent emulsifier – better than egg yolk powder, egg yolk PL-30 powder or paste, and soy lecithin powder.
- Extremely soluble in water, extremely stable, almost colourless, odourless, shelf stable, and available in powder form.
- PL-20H quickly incorporates into liquids with very little agitation and stays miscible.
- Does not need to be heated to be incorporated into ingredients.
- Potential to be used in nanoemulsions

EcovaPure™ PL-20H



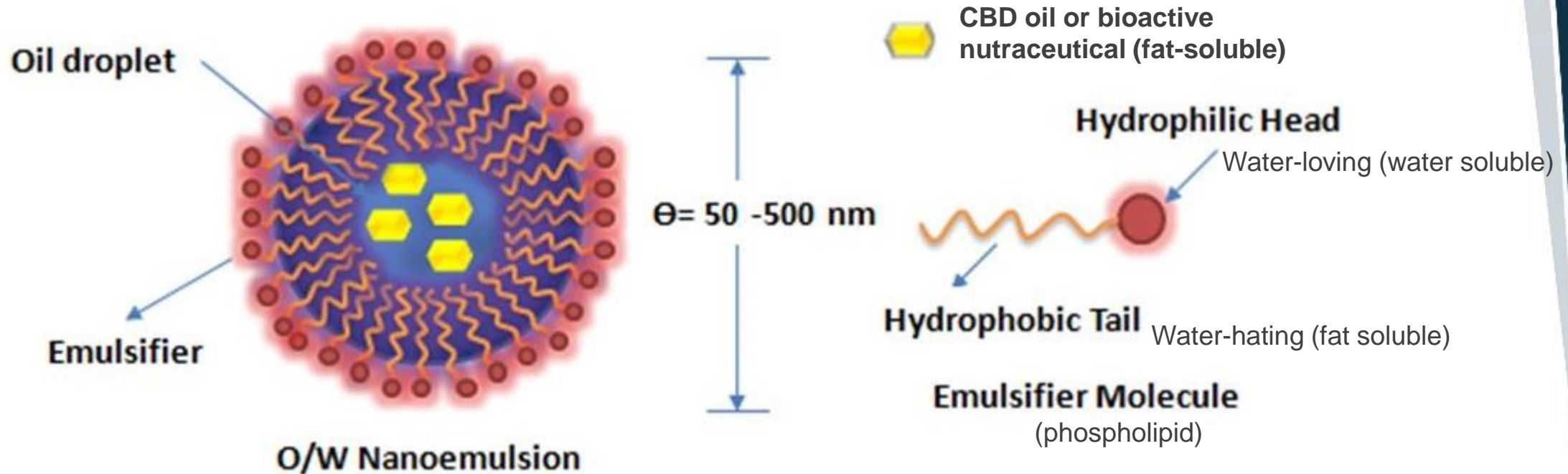
Nanoemulsions

- Many bioactive nutrients cannot be delivered to the body because they are fat-soluble and have little bioavailability. They can be delivered when they are encapsulated in fat droplets protected from water.
- PL-20H phospholipids encapsulate oil (in oil in water emulsion) or water (in water in oil emulsions)
- CBD oil can be added directly to product without use of a carrier oil, due to the long chain triglycerides already in the product
- The long fatty acids in the phospholipid make it good at encapsulating large molecules
- Emulsions stabilized by peptides, which may also improve bioavailability

EcovaPure™ PL-20H



Nanoemulsions



EcovaPure™ PL-20H



An external laboratory tested the emulsification properties of several emulsifiers.

The results will be discussed in the next slides.

Tested Emulsifiers:

- EcovaPure™ PL-20H
- EcovaPure™ PL-20
- PL30J, PL30C (solvent extracted phospholipid products from other manufacturers)
- Magic Flavors™ Egg Yolk Powder (MFEYP) (enzyme modified egg yolk)
- Soy Lecithin Powder (SLP)

EcovaPure™ PL-20H



The Ecovatec Advantage:

- Performance
- Value
- Flavor/Quality
- Labelling
- Health

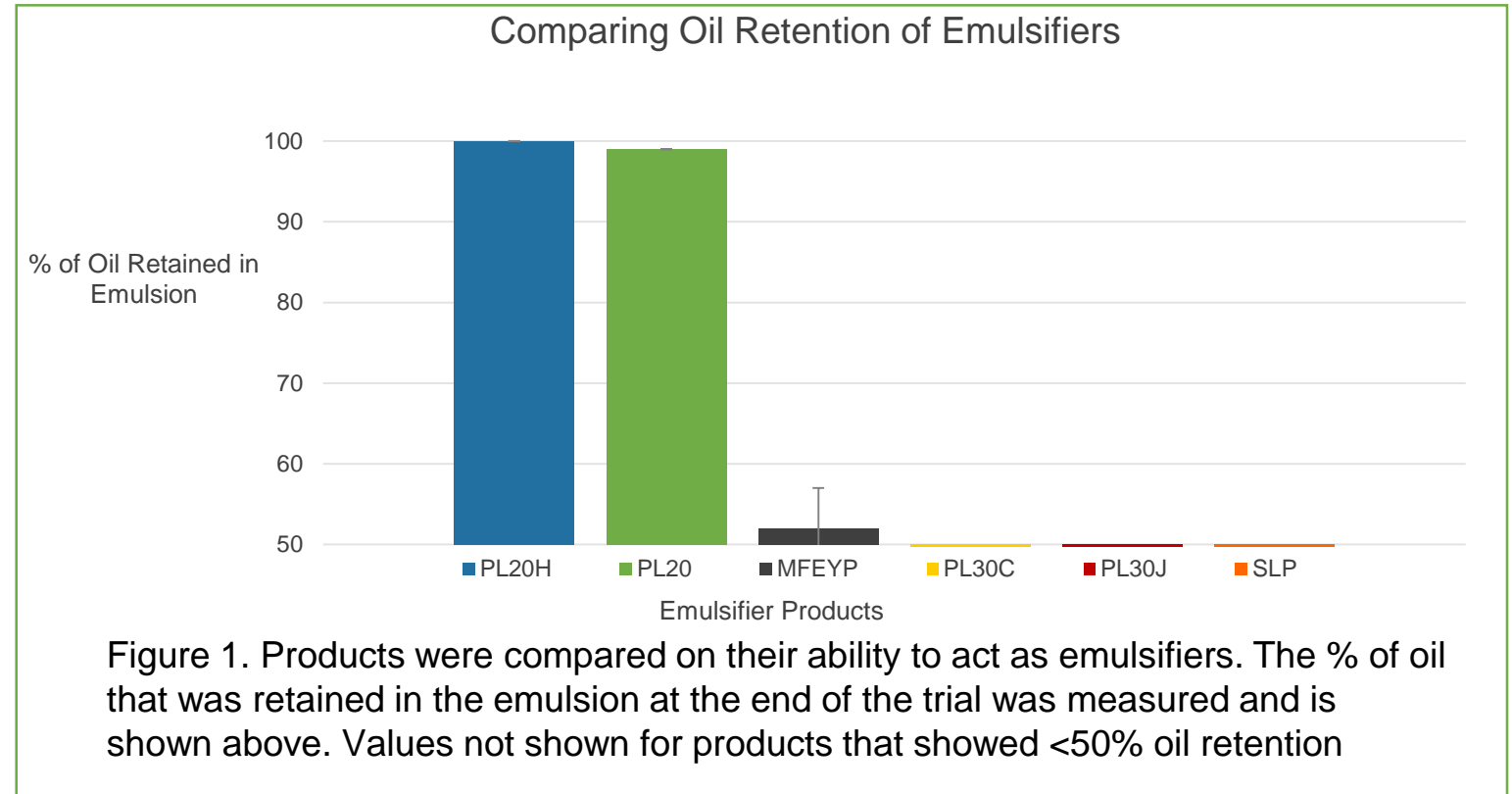
EcovaPure™ PL-20H



Performance:

Compared to other emulsifiers on the market PL-20 and PL-20H provides an all around **superior performance**.

The improved stability of the emulsion results in less breaking of products with heating or in very high ratio oil and water emulsions leading to a higher quality finished product.

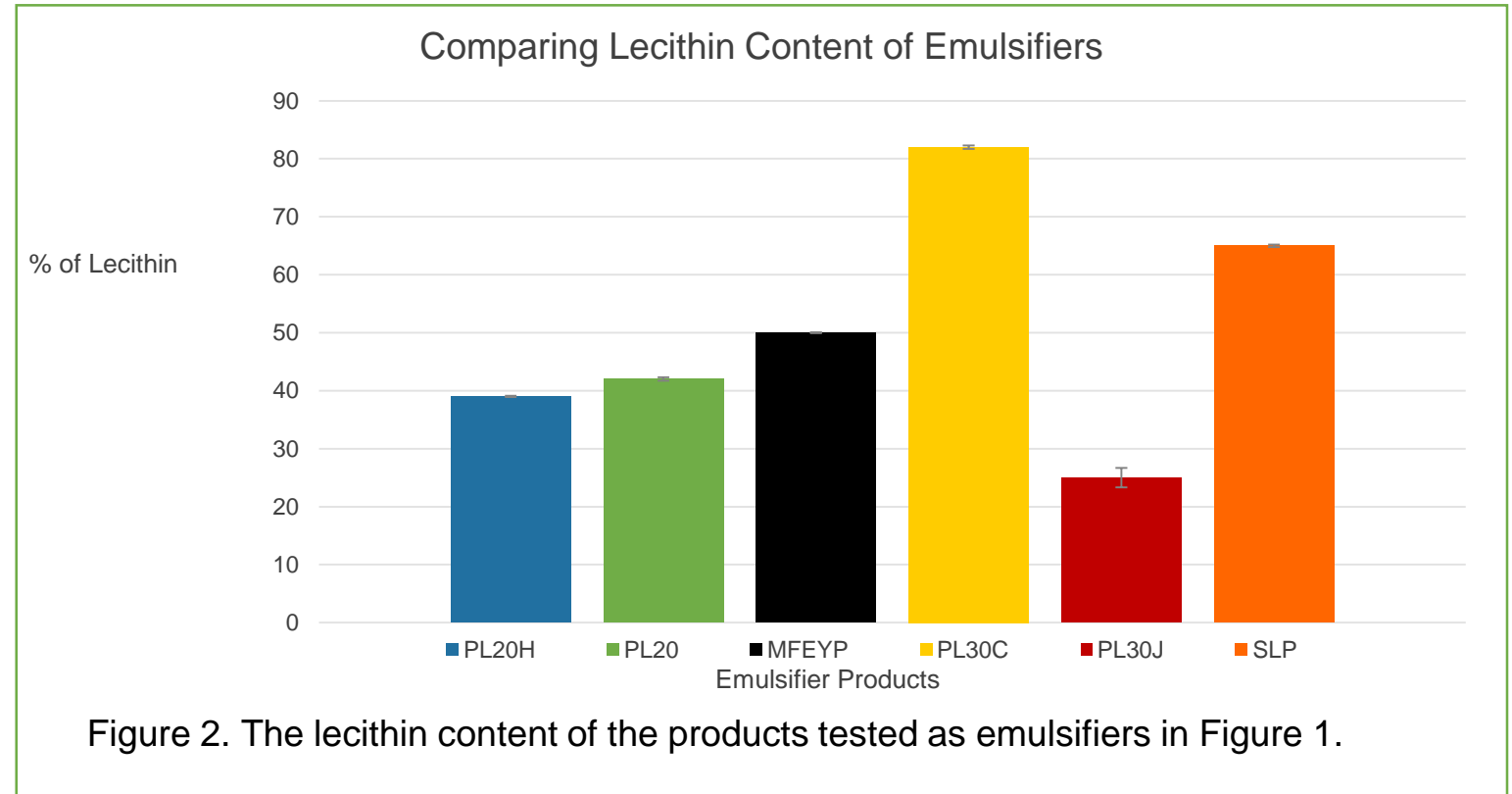


EcovaPure™ PL-20H



Value:

Being a high efficiency emulsifier, typically much lower amounts of emulsifier can be used with the same effect as the standard lowest cost emulsifiers. Also, easy storage, handling and measuring means less waste and less time when using this product versus some other commonly used emulsifiers.



EcovaPure™ PL-20H



Flavour/Quality:

Compared to many other commercial emulsifiers this product has a very **mild taste** and **light color** so as not to impart any negative attributes to the final product. In addition, the high effectiveness allows for a smaller quantity to be added further reducing any potential negative flavor impact in low flavored products.

Sample	Color				Heat Stability 10 seconds	Peroxide value mEq/kg
	L	a*	b*	Gardner Scale		
PL20	91.1 ± 0.01	2.34 ± 0.05	25.2 ± 0.02	4	✓	.1022±0.002
PL20 H	91.6 ± 0.01	3.33 ± 0.02	29.5 ± 0.05	4	✓	.1021±0.002
GRAN	75.6 ± 0.03	0.92 ± 0.05	51.5 ± 0.25	12	✓	.1021±0.000
PL30-C	89.6 ± 0.00	4.43 ± 0.02	28.4 ± 0.10	5	×	.1022±0.003
PL30-J	53.5 ± 0.92	19.8 ± 0.09	63.8 ± 0.85	17	×	.1024±0.003
CEYP	90.5 ± 0.05	1.88 ± 0.02	23.7 ± 0.02	4	✓	.1023±0.003
SLP	83.8 ± 0.01	4.02 ± 0.01	32.0 ± 0.05	6	×	.1023±0.004

EcovaPure™ PL-20H



Labelling:

- Being a natural egg yolk extraction this allows for its use in clean labelling applications.
- While PL-20 is fully natural product, PL-20H needs to be declared as a modified egg yolk product.
- Depending upon the application, if egg yolk is already incorporated within an existing label then need for substantive changes to the label is unlikely.
- GMO free, unlike the high percentage of soy products.

EcovaPure™ PL-20H



Health:

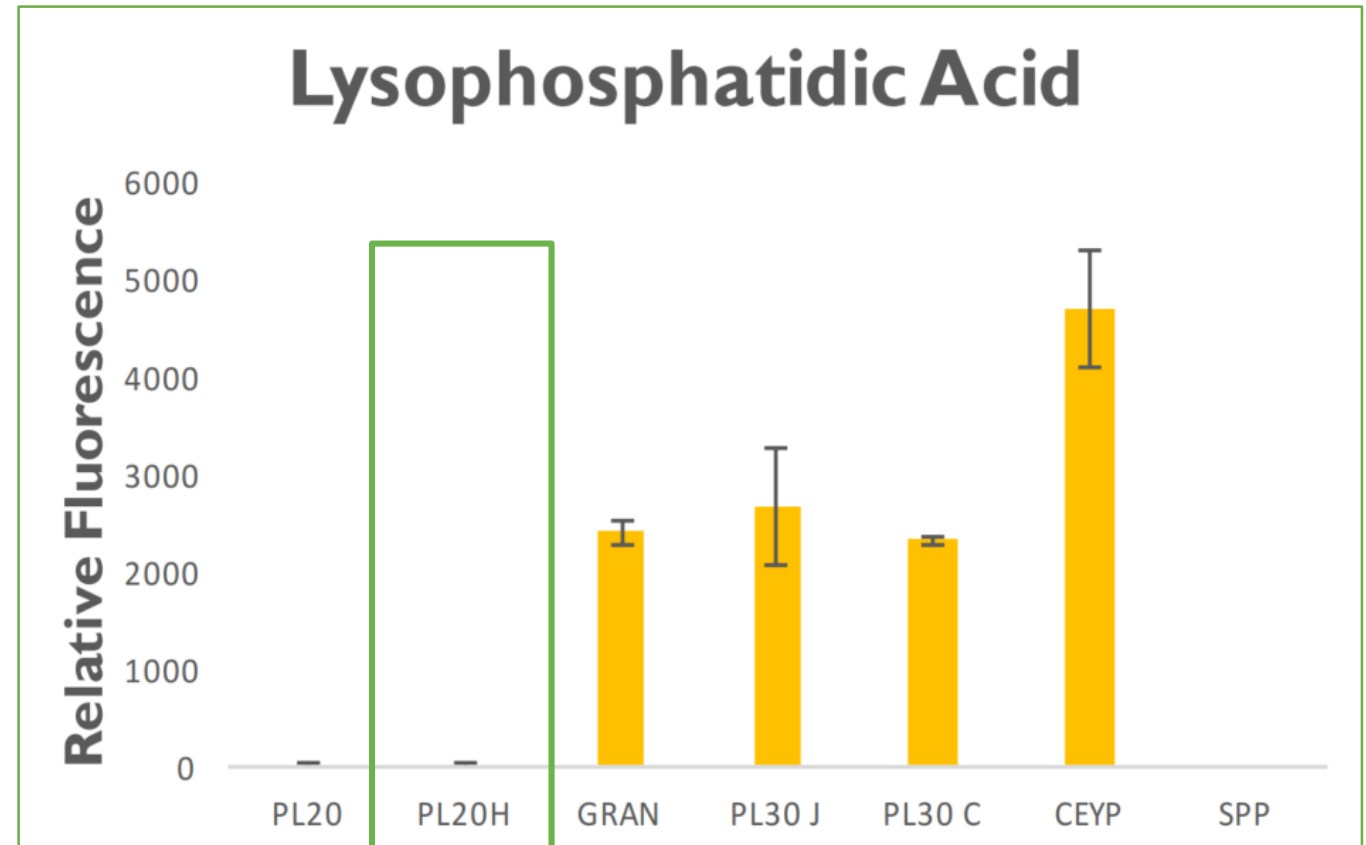
- EcovaPure™ PL-20 and PL-20H are **naturally high** in the phospholipid **phosphatidylcholine** which is recognized as a healthy component of any diet and has various health benefits (see PL-50)
- Our product is **not** modified with phospholipase A, which is used to modify other enzymatically modified egg products. Phospholipase A leaves the finished product with high quantities of lysophosphatidic acid (LPA). LPA is linked to:
 - Inflammation
 - Cancers (such as colorectal cancer)
 - Neurotrauma
 - Atherosclerosis
- **GMO free**, unlike the high percentage of soy products.

EcovaPure™ PL-20H



Health:

- No LPA!



EcovaPure™ PL-20H



Summary:

Area of Application	Description
Food Industry	Use as an alternative to enzymatically modified egg yolk and PL-30 as an emulsifier.
Cosmetics	Used in creams and lotions for emulsification, solubilizing, and wetting agent properties.
Agricultural	Egg PL is a natural insecticide when mixed with vegetable oil and water. It also acts as a natural plant growth enhancer.
Cannabis	Potential to be used in microemulsions, solubilizing CBD for applications in food and drink



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