Plant-based lecithin is in the mix for “clean label” products

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Oil and water definitely do not mix… so food formulators have always looked for ingredients that will help blend them together and make smooth, stable formulations. These emulsifiers can come from plant-based or synthetic sources. But with growing scrutiny on food product ingredients, synthetic emulsifiers like mono- and diglycerides can be especially problematic for brands.

Enter lecithin, which is rapidly becoming a go-to source for food formulators looking for this functionality in product applications, while also maintaining a label-friendly ingredient list. But because some lecithins are modified (such as hydrolyzed, acetylated or hydroxylated lecithin), there is a bit of confusion about these ingredients and how label-friendly they are.

Lecithin has enjoyed a long history as a food emulsifier. It was first used in 1846 by a French chemist as a generic term referring to a variety of naturally occurring compounds in animal and plant tissues. Lecithin is a mix of phospholipids such as phosphatidyl choline, and is typically extracted from plant and animal sources such as egg yolks, fish, rapeseed (canola), soybeans and sunflower.

While lecithin has a number of functions in food formulas, it is most often noted for its emulsification properties and is used in many food applications, ranging from salad dressings and sauces to bakery items and even chocolate. Lecithin effectively binds the water and fat elements in a food product to homogenize everything, according to Mufan Guo, a senior scientist for Cargill’s Texturizing Solutions Business Group. “If you have a gravy or sauce, it makes it work better, so it is a very functional emulsifier.”

Among its other properties, lecithin can help stabilize emulsions, which leads to improved shelf life. It can reduce ingredient stickiness, so it is often used as a releasing agent for bakery items or for a non-stick effect in cooking spray. Lecithin also has an “instantizing” functionality that can be used, for example, to help nutritional powders dissolve quickly in water, according to Tim Bauer, a product line director for Cargill. “When you take a scoop of protein powder, you don’t want it to have lumps or fish eyes. Lecithin helps the ingredient disperse quickly,” he explained.

On top of this functionality, lecithin is a source of choline, which is present in the form of phosphatidylcholine (PC). Choline was recognized as an important nutrient in 1998 and has an established Daily Reference Intake (based on Adequate Intake) level of 550 mg/person/day for adult males; 425 for adult females 19 years or older.[1] Lecithins with a certain level of PC content (e.g., PC-enriched lecithins) are used in dietary supplements.

It is no surprise that product formulators are increasingly looking to plant-based lecithin as a great label-friendly functional ingredient. Lecithins extracted from canola, soybeans and sunflower are now gaining popularity in food production and provide very similar functionality to generally-recognized as-synthetic emulsifiers such as mono- and diglycerides, Guo noted.

Comparable functionality

Given their similar functionality and label-friendly attributes, which of the plant-based lecithins is the best choice among the three? They all have specific attributes, so it very much depends on the application and priorities of the customer, Guo explained. Things to consider include how important label-friendly ingredients are for the product, as well as the price and taste sensitivities. "The functionality is pretty similar," she said. "In most applications, it is a one-to-one replacement, and there are probably not too many issues. But canola lecithin does have a cleaner taste, so if a customer has more sensitivity in flavor notes, I might recommend the canola lecithin."

Because it has such a mild flavor, canola lecithin works especially well in bakery, convenience foods, dairy and ice creams. Canola-based lecithin does not have to be declared as a major food allergen in the U.S. and is available as a Non-GMO Project Verified ingredient.[2] In addition, under specific circumstances prescribed in U.S. regulations, de-oiled lecithin may be used in organic products.

Sunflower lecithin is one of the newer plant-based options, which has label-friendly appeal because it provides a non-GM option, is not a major food allergen, plus has a very positive perception. It does, however, tend to be a more expensive option.

Soy-based lecithin is traditionally the most-used plant-based lecithin and can be a cost-effective option. However, there are some concerns about soy as a major food allergen and as a genetically modified ingredient.[3,4] Food formulators can choose a non-GM soy lecithin to eliminate the GM concern, or choose sunflower or canola lecithin to eliminate both concerns.

Soy lecithin—a cost-effective choice

All things considered, however, if a customer has no issues with soy in their product, it is a cost-effective choice, said Guo, "and then we also have more specialty lecithins in our soy portfolio, if they need a specialty function." Some of these specialty soy-based lecithins are hydrolyzed to offer better emulsification for a product.

The only other limitation for plant-based lecithins is that the structure cannot be changed in processing, Guo added. "What we have is what we have, so we may not always achieve the same function as synthetic lecithin." To get around this, formulators can use an emulsification system to make it work better. For example, she explained, in almond milk, canola lecithin can provide the emulsification required to mix water in almond paste.

Choosing the best plant-based lecithin may come down to consumer perceptions of the plant source, according to Bauer. "I don't know that consumers have specific perceptions about lecithin itself, so it depends on the botanical source that precedes it. If someone is trying to avoid soy, then that becomes an issue. If you are using sunflower lecithin, that is a plant with a good image in consumers' minds, so it really does depend on the botanical source."

Sources

[1] The National Academies of Sciences, Engineering, Medicine; Dietary Reference Intakes Tables and Application. http://nationalacademies.org/hmd/~/media/Files/Activity%20Files/Nutrition/DRI-Tables/7_%20Nutrients%20Summary.pdf?la=en

[2] There is no single definition of "Non-GM" in the U.S.A. Contact Cargill for source and processing information.

[3] What is soy lecithin? Dr. Axe.com. https://draxe.com/what-is-soy-lecithin/

[4] Is soy lecithin natural? New Hope Network. http://www.newhope.com/ingredients-general/is-soy-lecithin-natural

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