

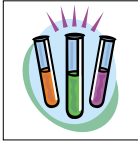


The Dairy Herald

Vol 1 Issue 1

Reporting on Research News You Can Use

Whey Phospholipids are the future of beverages



WHEY PL STUDY

The North Carolina State University study involved alcohol fractionation.

- An alcohol soluble and insoluble fraction with high amounts of PS and PE were created.
- The PC and PE ratio did not change in either fraction.



COST SAVINGS

Bottom-line benefits include:

- PLs in modified whey act as potentiating agents that allow formulators to use fewer flavor ingredients and reduce expenses.
- Concentrated PLs naturally found in modified whey can intensify the flavor of a standard formula by using cost-efficient PLs found in modified whey.



Whey Phospholipids—The Next Big Thing in Beverages

They're terrific emulsifiers. They provide critical nutrients to nerve and cerebral tissue. And they also make beverages taste better ... inexpensively.

They're whey phospholipids (PLs)—ingredients that weren't on most food development radar screens until now. New research suggests that PLs can deliver unprecedented functional, nutritive and taste benefits to prepared foods—especially beverages.

Readily available commercial ingredients such as whey protein concentrate (WPC80) naturally contain low amounts of PLs. Newer whey ingredients, containing higher levels of PLs, have also recently been introduced to the market. These new ingredients have

been created as a by-product when the fat is removed from whey to produce whey protein isolate (WPI). PL levels will vary, but one manufacturer reported that its product contained approximately 20% PLs, creating a highly effective emulsifying ingredient. While manufacturers aren't currently producing a purified PL, researchers did isolate PLs to study functional properties.

LAB NOTES

Researchers from the Department of Food Science in North Carolina State University recently used a laboratory model microfiltration unit to concentrate PLs as part

of a study sponsored by Dairy Management Inc.[™] (DMI) with funding from America's dairy farmers. Both commercial and experimental whey were tested.

Each type of whey contained phosphatidylcholine (PC), also known as lecithin, and phosphatidylethanolamine (PE) as its principle PLs. Phosphatidylserine (PS), sphingomyelin (SPH) and cerebroside were also found in the whey.

Studies showed that the separated phospholipids were very effective emulsifiers for water-in-oil systems. Similar to detergents, PL molecules

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Whey Phospholipids provide product power



SHAKE IT

Other uses for whey PLs include:

- Replacing the fat content in a low-fat shake.
- Improving both whipping and foaming functions.



MORE NUTRITION

Studies show:

- Sphingolipids (fats found in dairy foods) contain the PL, sphingomyelin, and other compounds.
- Sphingomyelin provides nutrients to nerve and cerebral tissue.
- Long-term feeding of sphingolipids (1%) to laboratory rats decreased their total blood cholesterol levels by approximately 30%.
- Studies in laboratory mice indicate a protective effect of dietary sphingomyelin on colon cancer.



contain both hydrophilic and lipophilic regions. The phosphate component of the PL molecule is water soluble, while the fatty-acid portion is fat soluble.

Although additional research is needed, recent findings show that increased PL levels in formulas can contribute to functionality and antioxidant properties in beverages. These findings are especially good news for companies that produce health and sports drinks. Both product segments have experienced an explosion in consumer spending in grocery stores. This is attributed to the perception that health food boutiques are no longer the sole supplier of health-conscious products.

FUNCTIONALITY FIRST

Whey proteins are very efficient emulsifiers of fat and oil. They easily form stable emulsions and can be used to totally or partially replace chemical emulsifiers in beverages and health shakes. Additionally, the “bound” fat in whey products is relatively high in phospholipids (e.g., lecithin), adding to the emulsification capacity of whey ingredients. Concentrated whey PLs can provide the highest emulsification levels.

Whey products such as sweet whey have a sweet dairy flavor, while whey protein concentrate and isolates have virtually no flavor profile of their own. Accordingly, whey PLs may be much milder in flavor than many other common emulsifiers. When organic acids (e.g., citric, malic, lactic) and fruit flavors are used in beverage applications, many whey flavors are eliminated. Formulators can balance levels of whey products and organic acids to optimize beverage flavor.

NUTRITION NEWS

The article, “Stabilizing Cultured Beverages,” in the August issue of *Dairy Foods* magazine, highlights a new whey fraction unveiled at an Institute of Food Technologists’ (IFT) meeting. The fraction



was originally developed as a cost-effective source of immunoglobins and lactoferrin to promote a healthy immune system. Since it contains PLs, it also acts as a stabilizer in cultured dairy beverages.

FLAVOR BITES

What about consumer demand and appeal? Whey proteins enhanced taste when added to milk formulas, according to a study presented at the 1998 IFT Annual Meeting. Flavor potentiation properties were traced back to whey PLs. Sensory panelists specifically noted an increase in flavor intensity in whey-enhanced sweet milk.

While whey proteins and PLs are usually added to products to enhance functional and nutritional properties, it is vital to continue taste studies. By using sensory evaluation techniques such as descriptive

analysis and preference tests, companies are finding that consumers show a positive reaction to whey-enhanced products.

NEXT STEPS

Does going to market with a moderately priced, great-tasting, nutritious ingredient with natural emulsification properties sound good to you? Although whey phospholipid testing is in its early stages, the research community is already buzzing about potential formulation benefits from concentrated PLs—and the food industry is eager to see results.

If you want to be one of the first formulators to take advantage of this new dairy ingredient opportunity, call our Technical Support Hotline at 1-800-248-8829. Get expert advice from a food technologist and discover new levels of success when you *Do it with dairy*®.

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