

# LIPOPHYTOL®-P

## WATER DISPERSIBLE PLANT STEROLS FOR CHOLESTEROL REDUCTION



**EFFICIENT CHOLESTEROL REDUCTION**

**HIGH PHYTOSTEROLS CONCENTRATION**

**READILY DISPERSIBLE**

**FAT FREE INGREDIENT**

### DESCRIPTION

Due to their insolubility in water and lipids, phytosterols incorporation into foods and beverages has been very challenging.

**LIPOPHYTOL®-P** is a dispersible form of pine sterols that has been microencapsulated to facilitate their incorporation in food matrices.

This unique delivery system increases pine phytosterols dispersibility in foods and beverages, thus providing a convenient way of introducing phytosterols into the human diet.

### COMPOSITION

Pine phytosterols, maltodextrin, sucrose ester.

### A NUTRITIONAL VIEW

High blood cholesterol level is the first risk factor for coronary heart disease. Studies have shown that a 10% decrease in blood cholesterol level can reduce the risk of cardiovascular disease by 19% to 54% depending on a person's age<sup>(1)</sup>.

The cholesterol lowering effect of plant sterols is well documented in the literature.

Consumption of 1.5 to 3 grams of plant sterols per day can lower LDL-Cholesterol by 8% to 15%<sup>(1)</sup>.

The European Food Safety Authority (EFSA), has approved claims for plant sterols namely: i) "plant sterols have been shown to lower/ reduce blood cholesterol<sup>(2)</sup>" and ii) "plant sterols/stanols contribute to the maintenance of normal blood cholesterol levels<sup>(3)</sup>".

The U.S. Food and Drug Administration (FDA) approved the following claim for phytosterols: "foods containing at least 0.4 grams per serving of plant sterols, eaten twice a day with meals for a daily total intake of at least 0.8 grams, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease".

### APPLICATIONS

EU has approved the use of **phytosterols** in yellow fat spreads, milk type products, yoghurt type products, soya drinks and cheese type products. FDA has authorized the use of **phytosterols** in conventional foods and nutraceuticals.

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## PHYTOSTEROL MODE OF ACTION - CHOLESTEROL REDUCTION

Structural similarities between phytosterols and cholesterol have led to the conclusion that phytosterols' ability to reduce cholesterol is based on their ability to block intestinal absorption of cholesterol, from dietary and biliary sources, thus reducing cholesterol concentration in serum.

### IN VIVO EFFICACY

The effect of **LIPOPHYTOL®-P** (LP-P) on cholesterol reduction was studied in vivo using knock out Apo E mice (Blanco's study group)<sup>(4)</sup>. Three groups of mice were fed either i) a high fat diet (control), ii) a high fat diet with LP-P or iii) a high fat diet with phytosterol esters. Results from this study showed that both **LIPOPHYTOL®-P** and phytosterol esters have significantly reduced the concentration of VLDL+LDL cholesterol in serum compared to the control, though no differences between **LIPOPHYTOL®-P** and the phytosterol esters groups (Figure 1). Atherosclerosis damage test indicated that **LIPOPHYTOL®-P** was the most effective in protecting the mice arteries from the harmful effects of the high fat diet (Figure 2).

Figure 1. VLDL + LDL Cholesterol

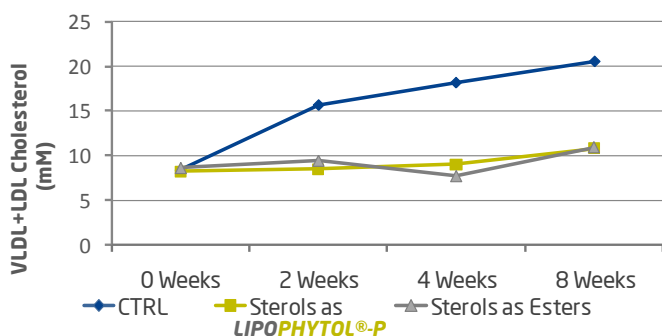
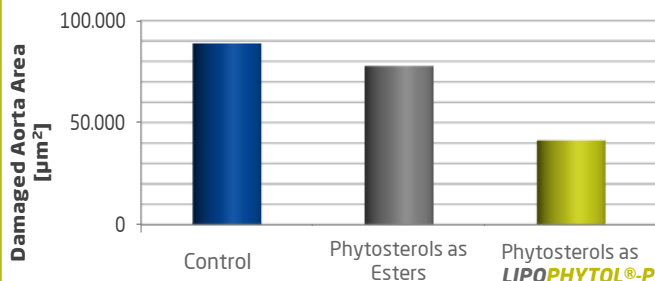


Figure 2. Atherosclerosis Damage After 8 Weeks



## REFERENCES

- (1) *Clinical Nutrition* (2003) 22(4): 343-351
- (2) Art.14(1)(a) Commission Regulation (EC) 983/2009 of 21/10/2009, Amended by Commission Regulation (EC) 376/2010 of 03/05/2010
- (3) Art.13(1) Commission Regulation (EC) 983/2009 of 21/10/2009, Amended by Commission Regulation (EC) 376/2010 of 03/05/2010
- (4) *Atherosclerosis* 181 (2005) 75-85