



TECHNICAL APPLICATION
INFORMATION



**Cholesterol
and the Power of Pectin**

CHOLESTEROL *and the Power of Pectin*

Studies have shown that pectin can substantially reduce the level of cholesterol in the blood. Here Frank Mattes, food technologist and president of Herbstreith & Fox Inc., Elmsford / NY, USA, explains.

Arteriosclerosis is a disease caused by a combination of factors, in which the consumer's diet plays an important role. The constriction of the blood vessels caused by plaque forming comes from a high blood cholesterol level.

This has given cholesterol a bad image, but actually cholesterol is a substance without which we cannot live.

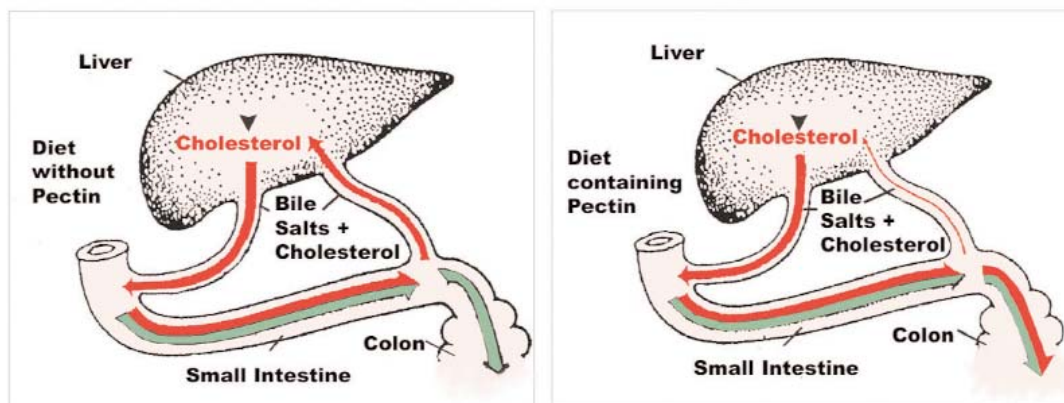
Medication is often prescribed to counter a high cholesterol level, and actively suppress the production of cholesterol in the liver. Another way is to change lifestyle, which, considering human nature is often very difficult.

But there is an easier way of lowering the cholesterol level, by consuming foods that contain a high level of soluble dietary fibres. Products can also be enriched with soluble dietary fibres to increase the effect. Pectin, mostly known as a thickener and gelling agent by its nature is one such soluble dietary fibre and studies carried out have shown the high potential of pectin to reduce the cholesterol level in the blood serum. With pectin it is possible to create products that both taste good and improve the health of the consumer.

Many studies have been carried out to investigate the cholesterol-lowering potential of pectin, if 6g – 15g / day is consumed. The positive effect of pectin is proportional to the blood cholesterol level and therefore more beneficial for consumers with an increased level.

Pectin has been compared with other soluble fibres for their ability to reduce the cholesterol level and the results show that in comparison to psyllium fibre, oat fibre and guar gum, it is most effective.

Pectin itself is resistant to digestion by the human body, but is almost completely degraded in the colon by *Aerobacillus*, *Lactobacillus*, *Micrococcus* and *Enterococcus* bacteria. The bacteria produce pectolytic enzymes that degrade pectin into short chain fatty acids (acetic acid, butyric acid, propionic acid) as well as carbon dioxide. The products are absorbed by the human body, so that pectin has low tendency to be laxative, and stimulates the bacterial growth in the colon.



The Herbstreith & Fox Corporate Group has established different products with unique properties (see table) to enhance products with dietary fibres, especially soluble fibres. The citrus fibre Herbacel CF 01 is a dietary fibre with the fibre profile of the albedo of the citrus fruit. With the natural high content of soluble fibre of 30% it is easily possible to fortify products with fibre providing more than traditional fibre products which have a very high content of insoluble fibre and a low percentage of soluble fibre.

Classic Pectins are the ideal products to lower cholesterol and can be obtained from different sources, with each providing different viscosity, in food quality but also with pharmaceutical quality. Pectin Classic GU 401 USP is a grapefruit pectin derived from grapefruit peels.

The apple pectin Classic AU 201 can be provided as a food grade pectin as well as meeting the USP criteria.

Pectin Classic AU 201 has a very high molecular weight of 80,000 Dalton and will provide high viscosity. The low-viscosity providing pectin Herbapekt SF 50-LV has a molecular weight of 25,000 Dalton to ensure its cholesterol reducing functionality.

Due to the low viscosity it can be used in very high dosage without having a major influence on the texture of the desired product. The agglomerated version of Herbapekt SF 50-LV are ideal for instant products, for example beverage powder.

The range of high viscous and low viscous pectin can also be derived from citrus peel. With high methylester pectin it is possible to manufacture tablets or create powder mixes for beverages. With the appropriate carrier, for example inulin beverage mixes can be manufactured that are easy to incorporate into water, milk or fruit juice. With a few servings per day it can be ensured that an appropriate amount of pectin will be consumed to achieve the desired effect on lowering the cholesterol level.

Beverages with low molecular weight pectin can be enriched up to 4% pectin. For beverages the chosen pectin type is mixed with other powdered ingredients, then added to the manufac-

turing process. In combination with vitamins and minerals a fresh tasting product will be obtained giving the consumer more than just a refreshing taste.

| | Product Characteristics | Further Properties |
|--------------------------------------|--|---|
| Herbacel Classic Citrus Fibre | Citrus peel fibre Contains naturally abt. 30% soluble fibre | Regulation of appetite Stimulation of bowel function Medium water binding |
| Herbapekt SF 50-LV | Apple pectin Soluble fibre Low viscosity | High concentration possible Agglomerated version available |
| Herbapekt SF 01 | Apple pectin Soluble fibre Medium to low viscosity | High concentration possible |
| Pektin Classic AU 201 USP | Apple pectin Soluble fibre High viscosity | Food grade Pharmaceutical grade available |
| Pektin Classic CU 201 | Citrus pectin Soluble fibre High viscosity | Food grade Pharmaceutical grade available |
| Pektin Classic GU 401 USP | Grapefruit pectin Soluble fibre High viscosity | Pharmaceutical grade |

Table: Cholesterol lowering products by Herbstreith & Fox and their properties

Other possibilities for the application of low molecular pectin include bread, biscuits and fruit preparations.

In acidic products, for example fruit preparations and beverage pectin will maintain its function for the period of the shelf life of the product, because of its excellent stability at low pH-value.

Whole product concepts combining taste and health claim can be developed that can show consumers clearly the benefit of buying the product, because the claims are backed by scientific studies.

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15/08/2005