Growyoung Chitosan Fat Blocker*

What is Chitosan

Growyoung Chitosan Fat Blocker contains Chitosan.

Chitosan is a natural dietary fiber and is made from the shell of shrimps that were harvested from northern Atlantic Ocean, where has the least level of pollution. The unique property of Chitosan makes it the effective fat blocker. Chitosan can bind dietary fat and cholesterol. Each gram of Chitosan can bind equal amount of fat. By binding with cholesterol, Chitosan can reduce the re-absorption of cholesterol of the bile acid. The Chitosan bound dietary fats and cholesterol is excreted from body. Chitosan also reduces the micelle formation of fat in the intestine and interferes the enzymatic interaction of pancreatic lipase with the fat.

The following are the functionality of Chitosan and its biological effects in the digestive system: Taken as a nutritional supplement, chitosan dissolves in the stomach and mixes with the dietary fat. Being a dietary fiber, chitosan increases the viscosity, giving a filling effect (1, 2). From the stomach, the dietary fats are passed on to the small intestine, in the small intestine; bile acids are released and later reabsorbed. Bile acids solubilize the fat and decrease the fat droplet size to what is called micelles. Chitosan binds to the micelles and disturbs the structure of the fat-bile acid complex (3, 4).

Pancreatic lipase is an enzyme also released in the small intestine, which breaks down micelle fat into free fatty acids and monoglycerids.

Chitosan partly inhibits this enzyme, and thereby reduces the fat digestion (5).

Bile acids mainly consist of cholesterol, and are normally reabsorbed in the small intestine. In addition to binding fatty acids and monoglycerids, chitosan also binds bile acids (3,6). Chitosan thereby directly reduces the uptake of cholesterol, reducing the total blood cholesterol level (7). This process is called bile acid sequestration.

Chitosan with a high degree of deacetylation increases the capacity to bind dietary fat and bile acids. Chitosan-bound fat and bile acids are excreted in the stool (2).

As a result, Chitosan reduces the digestion and absorption of the fats in the intestine. Long-term use of this product will help to reduce both cholesterol and triglycerine in the blood and reduces the body overweight. These results have been demonstrated in several clinical studies (8- 12).

References:

- 1. M. Sugano, S Watanabe, A, Kishi, M. Izume, and A, Ohtakara, Hypocholesterolemic action of chitosans with different viscosity in rat, Lipids 23: 187 (1988). 2. M. Sugano, T. Fujikawa, Y. HIratsuji, K. Nakashima, N. Fukuda, and Y. Hosegawa, A novel use of chitosan as a hypocholesterolemic agent in rats, Am. J. Clin. Nutr. 33:787 (1980).
- 3. G. V. Vahoruny, S. Satchilhanandam, M. M. Cassidy, F. B. LIghtfoot, and I, Furda, Comparative effects of chitosan and choleslyamine on lymphatic absorption of lipids in the rat, Am. J. Clin. Nutr. 38:278 (1983).

 4. O. Kanauchi, K. Imasato, M. Shizukuishi, and E. Kobayashi, Mechanism for the inhibition of the inhibition of fat digestion by chitosan and for the
- synergistic effect of ascorbate, Biosci. Biotechnol. Biochem. 59:786 (1995).

 5. R. A. Muzzarelli, Human enzymatic activities related to the therapeutic activities related to the therapeutic administration of chitin derivatives.
- Cell Mol. Life Sc. 53: 131 (1997).
- 6. Nauss, Thompson and Nagyvary, The Binding of Micellar Lipids to Chitosan, Lipids 18:10 (1983).
 7. I. Ikeda, Y. Tomari, and M. Sugano, Interrelated effects of dietary fiber and fat on lymphatic cholesterol and triglyceride absorption in rats, J. Nutr. 119: 1383 (1989).
 8. D. J. Ormrod, C. C. Holmes. And T. E. Miller, Dietary chitosan inhibits hypercholesterolaemia and atherogenesis in the apolipoprotein E-deficient mouse
- model of atherosclerosis, Atherosclerosis 138:329 (1998).
- 9. S. B. Jing, L. Li, D. Ji. Y. Takiguchi, and T. Yamaguchi, Effect of chitosan on renal function in patients with chronic renal failure, J. Phorm. Pharmacol. 49:721 (1997).
- E. Wuolijoki, T. Hirveol, and P. Ylitaol. Decrease in serum LDL cholesterol with microcrystalline chitosan Methods Find. Exp. Clin. Pharmacol. 21: 375 (1999).
- 11. G. Sciutto and P. Colombo. Lipid-lowering effect of chitosan dietary integrator and hypocaloric diet in obese subjects. Acta Toxicol. Ther.1 6 [4], 215-230, (1995). 12. G. Macchi. A new approach to the treatment of obesity: Chitosan's effect on body weight reduction and plasma cholesterol levels. Acta Toxicol. Ther. 17[4], 303-320. (1996). 13. Anderson RA, Polansky MM et al. Supplemental chromium effects on glucose, insuline, glucagons, and urinary chromium losses in subjects conscontrolled low-chromium diets, Am. J. Clin. Nutr. 54:909-16, (1991)
- 14. BW. Morris, S. MacNeil, K. Stanely, et al. the inter-relationship between insulin and chromium in hyperinsulinemic euglycemic clamps in helthy volunteers,
- 15. AOAC (1990) Total Dietary Fiber in Food. Official Methods of Analysis, 15th edn. Vol 2. pp 1105-1106. Association of Official Analytical Chemists. Virginia. 16. Scott K J (1995). Encyclopedia of Food Science Food Technology and Nutrition, in Macrae R., Robinson R. K & Sadler M. J. (ed.), pp 844-847 Academy Press. London

Fast Facts

- Each 2 capsules contain 1,175 mg of dietary fibers from Chitosan and Apple Pectin.
- · Contains patented chromium picolinate to help normalizing energy metabolism and weight control. chromium picolinate also helps to control high chleosterol.
- Can be used in conjunction with CHSIR's entire line of nutritional products



CHS INTERNATIONAL RESEARCH LTD www.chsir.com



SUPPLEMENT FACT

Serving size: two (2) capsules Servings per container: 15

One capsule provides: Activated Fiber Blend, a combination of dietary fibers high in soluble components, patented chromine picolinate and important minerals (Znic, magnesium)

Amount Per Serving %Daily Value**

Total Carbohydrate	<1.2g	
Dietay Fiber Chitosan	1175 mg□	
Apple Pectin	800 mg 375 mg	†
Characters (as Characters		Ť
Chromium (as Chromium Picolinate^ or Protein bound)	60 mcg□	50 %
Zinc (as Zinc oxide)	10 mg 🗆	66 %
Magnesium (as magnesium Oxide or chelated)	75 mg□	19 %

- † Daily Value not established
- ** Percent Daily Value are based on a 2,000 calorie diet.
- ^: Chromium Picolinate is licensed under US patent # 33,988

Suggested serving: Take two capsules up to 3 times a day

For maximum results: Take Chitosan Fat Blocker with a full glass of liquid. Use this product in conjunction with other ${\sf CHS'}$ products.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

Ordering Details: