Scientific Studies and Study References

Today's consumer is bombarded with a tremendous amount of information about which ingredients and or products are considered healthy and which are not. Most of the information that reaches the consumer does so through the media and often this means the consumer receives biased conflicting and misleading information. All of this makes it extremely difficult for the consumer to decide what information is valid.

Below is my dedicated attempt to provide you with a series of scientific studies as well as reference articles which reflect the actual work of the dedicated scientific community who hope to bring you the real facts and data so that you can make wise and healthy choices.

Part One: Comprehensive Facts On Fiber

…along with scientific research in well received, and respected, mostly medical publications...

Proven benefits of an increase in fiber intake include weight loss and the prevention or need for treatment of diseases and conditions such as appendicitis, breast cancer, candida, high cholesterol, colon and colorectal cancer, constipation, coronary heart disease, diabetes, diverticular disease, gallstones, hemorrhoids, hiatus hernia, hypertension and stroke, infection, irritable bowel and/or gastrointestinal tolerance, prostate cancer, ulcers, varicose veins, and others including menstruation problems.

Weight-Loss

· The greater your fiber consumption, the higher your caloric waste. Fiber blocks the absorption of fat - and hence calories - in the intestines. The water-holding properties of fiber make your gut contents bulkier, and this distention of your stomach and small intestine induces satiety. Another possibility is that fiber changes the pattern of hormone release, thereby preventing low blood sugar, which contributes to hunger signals.

Studies on Fiber Intake and Weight Loss

· International Journal of Obesity, 1990. Dietary fiber has proved beyond all doubt to be of value in the management of overweight, in helping weight loss, and shrinking hunger feelings.

· Journal of Nutrition, 1990. Consumption of soluble fiber results in smaller final body weight. This effect is related to the insulin response of the dietary component.

· Appetite, 1986. Overweight people consume little more than half the fiber recommended, contributing to failure of weight loss programs.

· British Journal of Nutrition, 1984. Soluble fiber reduces hunger and influences carbohydrate and lipid (fat) metabolism in a beneficial way.

· Medical Aspects of Dietary Fiber, 1980. The greater your fiber consumption, the higher your waste of calories. Energy output is increased with the bulking action of dietary fiber.

Summary: "One thing is certain; the higher the percentage of fiber in your diet, the lower the tape measure reading around your waist."

Diseases

· **Appendicitis -** Appendectomy patients are at greater than average risk for certain cancers. It may be that the fiber-depleted diet resulting in appendicitis is the same diet that sets the scene for cancer.

· Gastroenterology, 1990. The increase in **appendicitis** is promoted primarily by an associated fall in dietary fiber intake.

· Cancer Research, 1990. A link between **appendicitis and large bowel cancer** has been noted, and both are hypothesized to be prevented by a high fiber diet.

Breast Cancer - The environmental factors, including diet, are now believed to be the most significant cause of breast cancer, including particularly high intake of certain polyunsaturated fatty acids and a poor intake of antioxidants.

Journal of the National Cancer Institute, April 1991. We found that by doubling the amount of fiber (in the typical Western diet), you can significantly reduce the amount of **mammary cancer** down to the level of a low-fat diet. It shows that the fiber itself contains substances which, when they get into the bloodstream, will inhibit the formation of a mammary tumor. What seems to be happening is that fiber, by some magical means that we don't understand, is creating changes in the hormone system which protect against breast cancer.

· *Medical Oncology and Tumor Pharmacotherapy*, 1990. The approach to **breast cancer** prevention should include an increase in fiber consumption to 25 or 30 grams a day.

· *Nutrition and Cancer*, 1990. Dietary fiber has the potential for affecting **breast cancer** risk. Fiber may have a protective role because of its influence on estrogen metabolism and excretion, or because of the effects of good-buy lignans - a family of compounds formed in the intestine from fiber-associated precursors.

· *Cancer Research*, 1989. Fiber from grains consumed during early teen-age years results in decreasing the chances of **breast cancer** in both premenopausal and post-menopausal women.

· *Journal of Steroid Biochemistry*, 1987. Fiber intake causes the production of substances that protect against **breast and prostate cancer**.

· **Prostate Cancer -** Prostate cancer is the most common cancer diagnosed in American men and is the second leading cause of cancer mortality. Diet is a primary cause of cancer.

· *International Journal of Epidemiology*, 1988. Population groups with diets high in fiber have a low incidence of **cancer**, including **cancer of the prostate**.

· *Journal of Steroid Biochemistry*, 1987. Fiber intake protects against **prostate cancer**.

· **Colon And Colorectal Cancer -** Low-fiber diets are associated bowel cancer. Colon cancer is our second most common type of cancer. The rates of colon cancer in various countries are inversely associated with the consumption of fiber; the more fiber, the less colon cancer. Fiber dilutes bacterial activity, thereby reducing the cancer potential. Fiber can act very rapidly to slow down colon cancer, even after initial signs have been diagnosed.

· *Southern Medical Journal*, 1990. Increasing the intake of dietary fiber greatly decreases mortality associated with **colorectal cancer**.

· *Proceedings of the Nutrition Society*, 1990. Fiber-containing foods are protective in **colorectal cancer**.

· *Reviews of Infectious Diseases*, 1990. The levels of **harmful colonic bacterial enzymes** are inhibited by dietary fibers.

· *Tidsskrift for den Norske Laegeforening*, 1990. A low-fiber, high-fat diet increases the risk of developing a **colonic neoplasm** (any new, abnormal, uncontrolled growth).

· *Cancer Research*, 1990. Fat has no affect on **cancer** development when the fiber content of the diet is high.

· *American Journal of Epidemiology*, 1989. Dietary fiber decreases **colon cancer** risk.

· *Journal of Gerontological Nursing*, 1990. "The supplement of dietary fiber reduces hunger and increases the **frequency of elimination**."

· **Coronary Heart Disease** - This condition, existing when arteries supplying blood to your heart are narrowed by plaques compounded from oxidized cholesterol, calcium, fats and proteins, is our number-one killer.

· *American Journal of Clinical Nutrition*, 1990. Dietary fiber lowers blood fat and **blood pressure**.

· *American Journal of Cardiology*, 1987. Soluble fiber decreases estimated risk for **coronary heart disease** by greater than 30%.

· **High Cholesterol** - High fiber diets result in bile acid excretion, reducing the amount returning to your liver. To compensate, your liver produces more primary bile acids using the cholesterol in your blood as part of the necessary new materials, thereby pruning your cholesterol pool. If no additional cholesterol is manufactured, your cholesterol levels decrease.

· *Journal of Gerontology*, 1991. Intake of fiber is inversely associated with total **cholesterol** levels in older people. The effect of dietary factors on cholesterol levels is not age-limited.

· *Journal of the American Medical Association*, 1988. A broad public health approach to lowered **cholesterol** levels by additional dietary modification, such as with soluble fiber, may be preferred to a medically oriented campaign that focuses on drug therapy.

· **Hypertension And Stroke** - Persistently high pressure of blood against arterial walls. Precursors are obesity, smoking, hyperactive personality, and stressful environments. Fiber helps to keep your circulatory system unobstructed.

· *British Medical Journal*, 1979. A group of 17 healthy volunteers was asked to increase fiber intake modestly by making high-fiber substitutions for low-fiber foods. **Blood pressure** dropped significantly over a four-week period.

· **Diabetes** - Fiber can reduce insulin requirements, improve glycemic control, lower cholesterol and triglyceride valued, and promote weight loss in diabetics. A high-fiber diet leads to discontinuance of insulin therapy in about 60% of non-insulin-dependent diabetics, and significantly reduces doses in the other 40%. Many types of dietary fiber modulate glucose absorption. Insulin resistance can be caused by a deficiency of biologically active G.T.F. - chromium (glucose-tolerance factor). Chromium is an essential trace mineral which is deficient in more than 95% of Americans.

· *British Journal of Nutrition*, 1990. Supplementation with soluble fiber improves **glucose tolerance**.

· *American Journal of Nutrition*, 1990. Dietary fiber improves **glucose metabolism**.

· **Diverticular Disease** - This is the development of small, blown-out, or inflamed pouches in the wall of the colon. Complications may occur with or without an acute attack. The role of high-fiber diets in reducing bowel-wall pressure is primary.

· *British Journal of Clinical Practice*, 1990. A high-fiber diet is effective in the treatment of **diverticular disease**.

· *Primary Care Clinics in Office Practice*, 1988. Diets low in fiber predispose a patient to the development of **diverticulosis**, and adding fiber to the diet is effective in prevention and treatment.

· **Gallstones -** Stone-like masses that form in the gallbladder. The more cholesterol in your bile, the greater the tendency for gallstones to develop. Fiber increases the production of a substance which helps keep bile cholesterol in solution.

· *Lipids*, 1990. The highest incidence of **gallstones** is found in animals receiving the lowest fiber diets. Gallstone incidence is reduced by dietary fiber.

· **Infection -** Invasion and multiplication of "unfriendly" microorganisms, most often in body tissues made susceptible to disease, and lacking adequate resistance to the invasion. Fiber supplementation helps to keep insulin levels stabilized, helping to prevent secondary problems during any infectious period. This facilitates the healing process.

Candida - Yeast-Like Fungus which causes various infections. Symptoms include headache, fatigue, depression, irritability, digestive disorders, respiratory disorders, joint pains, skin rashes, menstrual disorders, loss of sex drive, recurrent bladder and vaginal infections, sensitivity to chemical odors and additives.

· *Journal of Family Practice*, 1989. Even those women, whose environment was conductive to producing **candida**, were able to be candida-free with adequate fiber intake.

· **Varicose Veins -** Swollen veins susceptible to swelling and distortion. Inadequate fiber in our diet is an important cause of varicose veins.

Part Two:…Research From Scientific Literature

The research found in numerous scientific journals support that the use of fiber increases satiety, thus a weight control product, and that the use of fiber reduces levels of serum cholesterol. In addition, various scientific literature states that there remains a relationship between the use of dietary fiber and a decrease in coronary heart disease, the improvement of glucose homeostasis, a reduction in breast cancer, growth retardation caused by mineral oil ingestion, a prevention for strokes, and a lowering of blood pressure. In addition, further research encourages the use of fiber to the recommended level of twenty to thirty-five grams per day, and research supports the use of fiber in conformity to moderation and variety.

Research in scientific literature that claims that the use of fiber causes weight loss, appetite control, and reduced levels of serum cholesterol:

The role that fiber plays in the reduction of weight because it can be used as an appetite control. Scientific literature supports these claims. A primary research report directed by Burley et. al (1993) states that the use of a high-fiber food has a clear effect on the control of appetite and its relationship to body weight. Nine males and nine

females who had lean, healthy bodies participated in the study. Two different meals were prepared, everything remained similar within the two meals, except the fiber content. The low-fiber meal had three grams of dietary fiber, and the high-fiber meal had eleven grams of fiber.

The researchers did not tell the subjects about the hypothesis that fiber may be a beneficial aid for appetite control. Subjects were to eat the meals with the low-fiber content, and the high-fiber meal. After eating the two different meals, the subjects reported the pleasantness of the food and how full they felt. The subjects had to keep diaries throughout the day.

After four to four and a half hours after to lunch, the people who ate the high-fiber meal had a lower desire to eat than the group which ate the low-fiber meal. There remained an eighteen percent reduction of food intake because of the high-fiber meal. The researchers then concluded that the high-fiber meal (Quorn) can be an aid to increase the later stages of satiety. They also indicated that in previous studies (Burley& Blundell, 1992) that the intake of thirty grams of fiber supplements per day causes a decrease of appetite

(2). Jorgensen et. al (1996) conducted research with broiler chickens and found the same results. They concluded, through testing their appetite control, that the increase of fiber had a direct relationship with body fat reduction. They believe that the chickens who did not have a high-fiber diet, had an increase in fat retention (3).

In addition, **numerous primary research reports stated the important role of fiber in weight loss and its effect to decrease in serum cholesterol levels.** One primary research report, Kaul and Nidiry (1993), conducted experiments on nine obese patients (twenty percent or more above the recommended body weight). These patients were given a Meal Exchange for one to eight months. This Meal Exchange consisted of a high-fiber food (14.68 grams) which contained nuts, nonfat milk, whole grains, and lactase. The results confirmed the beneficial role fiber has concerning weight loss and blood cholesterol levels.

The patients, on average, lost seventeen pounds, and their blood cholesterol levels dropped dramatically. In addition, a previous study in 1987 showed that a regular 1200-calorie diet does not cause the same amount of weight loss as the high-fiber Meal Exchange. In that study the average weight loss on the regular diet was eight pounds, while the average weight loss for the high-fiber meal was twelve pounds. The report concluded that a high-fiber diet benefits the body through weight loss and lower levels of blood cholesterol (4).

Two other primary research reports depict the effects of fiber and its advantageous relationship to body weight and cholesterol. Seim and Holtmeier (1992) tested forty-one people who stayed on a low-fat, high-fiber diet for a period of six weeks. The subjects were given a list of certain foods to buy in grocery stores which were high in fiber, thus low in fat. The average weight loss was ten pounds and the average body mass index decreased five percent. Total cholesterol levels decreased sixteen percent. Thus, the

researchers concluded that a low-fat, high- fiber diet aids the body in weight and cholesterol reduction (5). Another primary research report executed by Borne et. al (1996) deduced the same conclusions. Six dogs were on a high-fat, low-fiber diet, and six different dogs were fed a low-fat, high-fiber diet.

The dogs on the low-fat, high-fiber diet had a decrease in body fat and reduced total serum cholesterol concentrations. Thus, the researchers believed that these findings become integral in understanding weight management, in regards to obesity research (6).

Furthermore, two primary research reports solely concern the relationship between dietary fiber and a reduction in cholesterol levels. Hypertensive and Wistar-Kyoto rats were used and they were fed dietary supplements. This diet also included a reduced intake of dietary fat. As an outcome of the experiment, serum total cholesterol and serum HDL-cholesterol concentrations were decreased in the rats. Another primary research report conducted by Donnelly et. al (1996) concluded that a low-fat and high-fiber meal reduces HDL cholesterol. Third and fifth graders were observed four two years in rural Nebraska. There was an intervention and a control group. The intervention group was fed a lower in fat and higher in fiber meal than the control group. After two years of tests, the researchers confirmed that the low-fat, high-fiber diet caused a dramatic reduction in HDL cholesterol levels (7).

Part Three: Research In Scientific Literature That Supports The Claim That Fiber Benefits The Body By Helping The Body To Maintain Good Health

A review research report on dietary fiber and health by Trusell (1993) made a comprehensive analysis of the numerous benefits of dietary fiber. They determined that there remain two types of fiber, soluble and insoluble fiber. These two various kinds of fiber perform different functions in the body, especially in blood glucose, plasma cholesterol, transit time, fermentability and levels of constipation (Wolever and Jenkins 1986). The review report determined that insoluble fiber can increase fecal bulk (Williams and Olmsted 1986) and relieve constipation (Muller-Lissner 1988).

Moreover, **soluble fiber can become an aid for diabetes helping the upper gastrointestinal tract** (Peterson and Mann 1985). Soluble fiber can also help lower plasma cholesterol (Truswell and Beynen 1992). **The review also reported that an incomplete intake of dietary fiber can be the result of gallstones** (Burkitt and Trowell 1975) and diverticular diseases (Painter and Almeida 1972). **The report further stated that the most beneficial aspect of fiber is its effect on the risk of large bowel cancer** (Neale 1988). A study conducted by Willett et al. on 88,000 nurses in the United States reported that an increase of fiber lowered the risk of colon cancer (1990). Therefore, there remain numerous advantages concerning of the use of dietary fiber and the maintenance of good health.

The most important information concerning the fact sheets and products advertised on the internet remains the effect fiber supplements have in weight reduction through its effect on satiety levels. Reports from the aforementioned review paper

deduced that fiber supplements can be a suitable source of fiber because the fiber supplements can separate the advantages from the disadvantages of the two different types of fiber. In addition, this review paper confirmed that in "double-blind" trials that fiber supplements result in a larger weight loss than the intake of regular dietary fiber (Ryttig and Leeds 1990). Fiber supplements also aid in weight loss because they are naturally low in saturated fat and they dispose fat. In addition, several research studies, including studies conducted by Haber and Heaton 1977, Brand and Holt 1990, and Burlery, Leeds and Blundell 1987, claimed that fiber reduces the appetite or extends satiety.

Ultimately, this review paper supports the claims made on the internet and the claims that the advertisements make. The review paper supported that fiber suppresses appetite, and thus leading to weight reduction. However, it does not state that fiber can be used solely as an aid in weight loss (8).

In primary research reports, fiber has been proven to have other beneficial aspects. Fiber reduces the risk of coronary heart disease, improves glucose homeostasis, reduces risk of breast cancer, causes growth retardation by mineral oil ingestion to become prevented, prevents strokes, and causes the blood pressure to become lowered. **Two primary research reports confirm that a diet high in fiber can reduce the risk of coronary heart disease.** Rimm and Ascherio (1996) studied 43, 757 male health professionals and gave them 131 questions in order to measure their dietary fiber intake.

After six years of follow-up, the researchers found that the professionals who had a ten gram increase of fiber intake had a decreased risk of coronary heart disease. Thus, they concluded that dietary fiber, independent of fat intake, will prevent coronary heart disease (9).

Another primary research report executed similar conclusions. Bagger and Andersen (1996) studied rats who were given an increase of dietary fiber. Cholesterol levels were reduced, and the researchers determined that an increase in fiber can decrease risk signs of coronary heart disease (10). Reimer and McBurney (1996) administered an experiment to test fiber and its role in glucose homeostasis. They tested Sprague-Dawley rats for fourteen days and gave them either a low-fiber or high-fiber diet. They found that the rats with high-fiber diets had modified insulin. In all, they concluded that fiber remains highly beneficial in helping glucose homeostasis (11).

Rohan, Howe, Friedenreich, Jain and Miller in 1993 studied 56,837 women for five years. The dietary intake of women who had breast cancer, and women who had not been diagnosed with breast cancer were compared and contrasted. **Women who had a high intake of fiber had a thirty percent reduction in the risk of breast cancer compared to the women who had a low intake of fiber (12).**

Through the experimentation on rats, Morita et. al (1993) made another conclusion about the helpful role of dietary fiber. Growth retardation can be caused by mineral oil.

However, through experiments they found that growth retardation was counteracted by the intake of dietary fiber (13).

Yamoir and Horie (1994) studied dietary fiber and its relationship in the prevention of strokes. They carried out an intervention study and studied sixty-three healthy senior citizens in a senior citizens' home. The researchers regulated their diet for four weeks and their mortality for strokes was observed for ten years and then compared to the average mortality rate in Japan for ten years. The researchers discovered that the senior citizens' blood pressure was lower, and there remained a decrease in hemorrhagic, ischemic and strokes compared to the average population in Japan (14).

Conclusion:

Fiber supplements prove to benefit the body through weight loss, discarding wastes in the body, for the prevention of diseases mentioned above, and for general good health. These primary research reports and review papers virtually support every claim made in the internet, excluding the psychological effects of dietary fiber. The internet research and scientific literature research both confirm the importance of fiber, thus the importance of fiber supplements in promoting good health. Few precautions exist, one review resolutely advocates the use of fiber, except the report suggests moderation and variety Kritchevsky (1993) (15).

In addition to the safety precautions mentioned in the internet research above, the primary research and review papers also believe that infants and long-distance athletes must be cautious with their fiber intake (Truswell 1992) (8). Excluding these groups, however, fiber supplements remain an integral aid in improving nutrition. In regard to weight control, fiber supplements help increase satiety and therefore procures weight loss. Fiber supplements can then become an aid to persons with obesity or binge eating disorder.

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