



# GRAINS of TRUTH

## Whole Grain & Enriched Products

### Definitions: Whole Grains

Whole grain products are made with the whole kernel of grain. It consists of three components: bran, endosperm and germ. The bran (outer layer) contains the largest amount of fiber, the endosperm (middle layer) contains mostly protein and carbohydrates along with small amounts of B vitamins, and the germ (inner part) is a rich source of trace minerals, unsaturated fats, B vitamins, antioxidants and phytonutrients.

In 1999, the Food and Drug Administration (FDA) approved a health claim for whole grain products, for use on product labels of foods that contain 51 percent or more whole grains by weight. The claim was approved by FDA because over 50 scientific studies have shown the benefits of whole grains in the diet and their relationship with the reduction of risk of certain diseases. The claim reads as follows: "Diets rich in whole grain foods and other plant foods, and low in total fat, saturated fat, and cholesterol, may reduce the risk of heart disease and certain cancers."

Research continues to show the importance of including whole grain foods in a healthful diet. The 2010 Dietary Guidelines for Americans recommend that everyone eat at least three ounce equivalents of whole-grains (i.e. whole-wheat bread, whole grain cereal, whole wheat crackers, brown rice or whole wheat pasta) everyday. Continual research increases our knowledge about which nutrients, in what amounts, are needed to maintain and prevent disease for a healthy body.

- FACT: The number one cause of death or disability of both men and women in the United States is heart disease. A number of studies support the connection between consumption of whole grain foods and a reduced risk of CHD (coronary heart disease) and its risk factors.<sup>1</sup>

There are several feasible theories as to how whole grains may help reduce the risk of cardiovascular disease, however, the specific beneficial mechanism is still unclear. It is likely that whole grain components work together to achieve improved health. The sum is greater than its parts.

- FACT: Cancer claims an estimated 569,000 lives each year, second only to heart disease as an American killer. Dietary factors, such as fiber, vitamin B6 and phytoestrogen intake and positive lifestyle factors such as exercise, or negative factors such as smoking

and alcohol use, do not explain the apparent protective effect of whole grains against cancer. It is suggesting that once again it is all of the whole grain components that are effective.<sup>2,3,4</sup>

Whole grains are a rich source of a wide range of phytonutrients with anti-carcinogenic properties. Some of these phytonutrients may block DNA damage and suppress cancer-cell growth. Many of the phytonutrients concentrated in grains have shown promising results against cancer in lab and animal studies.<sup>5</sup>

Other components of whole grains may bind carcinogens and thereby limit their absorption or limit their exposure time in the stomach. Components such as selenium, dietary fiber and vitamin E are also believed to be cancer inhibitors by preventing the formation of carcinogens.

- FACT: Whole grains may help protect against diabetes, which is the nation's fifth leading cause of death by disease in the United States. Several studies have shown that cereal fiber (wheat, oats, barley, corn, millet, sorghum, rye and rice) intake is associated with a reduced risk of type 2 diabetes. The intake of fiber from whole grain cereals has also been found to be inversely related to type 2 diabetes. In a long-term study of almost 90,000 women and in a similar study of 45,000 men, researchers found that those with higher intakes of cereal fiber had about a 21% to 36% lower risk of developing type 2 diabetes, compared to those with the lowest intakes. 6, 7

### Definitions: Enriched Grains

Enriched white flour is the finely ground endosperm of the kernel. The assumption that everything good has been "stripped" away is a fallacy. Many of the nutrients that have been milled out are replaced through enrichment or fortification. Slice for slice, enriched white bread, as well as other enriched grain products, are a good source of iron and four B vitamins; thiamin, niacin, riboflavin and folic acid, as well as complex carbohydrates.

- FACT: Refined grains have been enriched since 1941 with iron and three B vitamins; riboflavin, niacin and thiamin. In fact, riboflavin and thiamin are added back at twice the original amounts. With this enrichment, pellegra and beriberi have been eradicated from the United States.





# GRAINS of TRUTH

- FACT: In 1998, a 4th B vitamin, folic acid, was added to the enrichment formula. Since that time, neural tube birth defects have decreased by 1/3. A study showed that neural tube defects (NTD) have decreased by 26 percent following the folic acid fortification in enriched grains in the U.S.<sup>8</sup> In Nova Scotia, NTD has decreased by 54 percent.<sup>9</sup> FACT: Enriched grain products have over twice the amount of folic acid as whole grains. A slice of enriched white bread has 37 mcg versus whole-wheat at 17.5 mcg.
- FACT: Recent studies demonstrated folic acid's value to help prevent some cancers and birth defects, and may help to prevent strokes and Alzheimer's.<sup>10</sup>
- FACT: Folic acid also helps lower blood levels of an amino acid called homocysteine, which has been linked with an increased risk for heart disease.<sup>11</sup>
- FACT: Studies from Tufts and Boston Universities have linked high homocysteine levels with increased risk for Alzheimer's disease.<sup>12</sup>
- FACT: A 1999 study found that 77 percent of low-income women could consume adequate amounts of folic acid through enriched grain products. The cost of supplements can be expensive, and therefore often not taken by low-income women.<sup>13</sup> Even those who can afford a folic acid supplement often forget to take them.

## References

1. American Heart Association: 1999 Heart and Stroke Statistical Update. Dallas, Texas: American Heart Association, 1998
2. Jacobs DR, Slavin J and Marquart L. (1995) Whole-grain intake and cancer: a review of the literature. *Nutrition and cancer* 24:221-229
3. Jacobs DR, Marquart L, Slavin J and Kushi LH. (1998) Whole-grain intake and cancer: An expanded review and meta-analysis. *Nutrition and Cancer* 30(2):85-96
4. Chatenoud L, Tavani A, La Vecchia C, Jacobs DR, Negri E, Levi F and Franceschi S. (1998) Whole-grain food intake and cancer risk. *International Journal of Cancer* 77:24-28
5. General Mills, 1999. Eat Whole Grain for a Healthier You.
6. Salmeron J, Ascherio A, Rimm EB, Colditz GA, Spiegelman D, Jenkins DJ, Stampfer JM, Wing AL and Willet WC (1997) Dietary fiber, glycemic load and risk of NIDDM in men. *Diabetes Care* 20:545-550
7. Salmeron J, Manson JE, Stampfer MJ, Colditz GA, Wing AL and Willett WC (1997) Dietary fiber, glycemic load and rise of non-insulin-dependent diabetes mellitus in women. *Journal of the American Medical Association* 277:472-477
8. Honein MA, Paulozzi LJ, Mathews TJ, Erickson JD and Wong LYC (2001) Impact of folic acid fortification of the US food supply on the occurrence of neural tube defects. *Journal of the American Medical Association* 285:2981-2986
9. Persad VL, Van der Hof MC, Dube JM and Zimmer P (2002) Incidence of open neural tube defects in Nova Scotia after folic acid fortification. *Canadian Medical Association Journal* 167(3):241-245
10. Seshadri S, Beiser A, Selhub J, Jacques PF, Rosenberg IH, D'Agostino RB, Wilson PWF and Wolf PA (2002) Plasma homocysteine as a risk factor for dementia and alzheimer's disease. *New England Journal of Medicine* 346(7):476-483
11. Jacques PF, Selhub J, Bostom AG, Wilson PWF and Rosenberg IH (1999) The effect of folic acid fortification on plasma folate and total homocysteine concentrations. *New England Journal of Medicine* 340(19):1449-1454
12. Seshadri S, Beiser A, Selhub J, Jacques PF, Rosenberg IH, D'Agostino RB, Wilson PWF, Wolf PA (2002) Plasma homocysteine as a risk factor for dementia and alzheimer's disease. *New England Journal of Medicine* 346(7):476-483
13. Kloebler AS (1999) Folate knowledge, intake from fortified grain products, and periconceptional supplementation patterns of a sample of low-income pregnant women according to the health belief model. *Journal of the American Dietetic Association* 99(1):33-38

