



Dreamfields Pasta-- A Healthy Meal Addition for Sustainable Energy, Weight Management and Sports Nutrition

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No country in the world has as many people either striving to loose weight or gain a better looking, more healthy physique as the United States. It is estimated that 119 million, or 64.5%, of American adults are overweight or obese¹⁰. In addition, more than 30% of its children ages 6-12 years are at risk of being overweight¹¹. According to projections, 73 percent of American adults could be overweight (34 percent) or obese (39 percent) by 2008¹⁷. Likewise, as Americans continue to look for ways to loose weight and maintain a healthy-lifestyle, athletes continue to look for means to increase performance to gain a competitive edge.

Related to meeting the goals of these health areas is the type of fuel the body takes in (caloric diversity and value) and how the body uses its fuel (metabolism). A key element in regulating caloric intake and utilization by the body is the amount and type of dietary fiber consumed.

It is therefore not surprising that the possibility of exploiting the diet with healthy multi-fiber containing foods, like Dreamfields pasta, to meet these metabolic goals is gaining ever-increasing interest.

What the science says about fiber and its influence on energy and metabolism

- **Fiber, energy density and hunger suppression and the glycemic index (GI)**

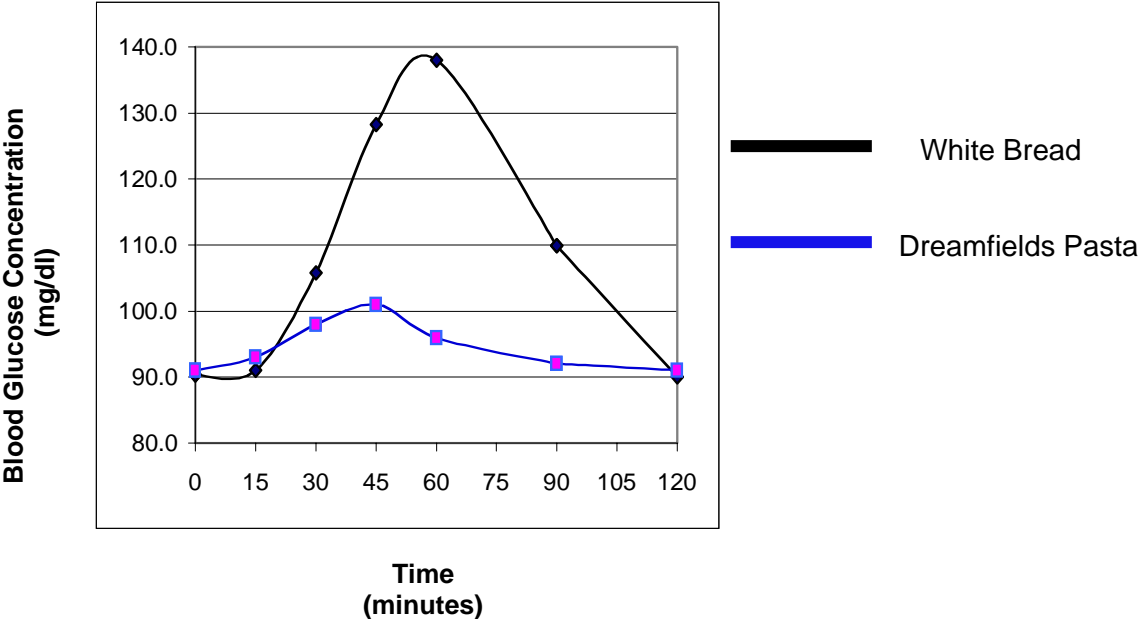
Dietary fiber plays a key role in caloric intake control and reduced risk for development of obesity^{1,9,15,18}. Fiber's role in caloric intake control is related to its unique physical and chemical properties that aid the body's early signals of feeling full and its prolonged signals of hunger suppression¹. Research indicates that the total overall caloric value of a food is only one aspect of healthy nutrition for weight management and energy. The body's response to foods—specifically, the rise in blood glucose—also plays a critical role. Recently the glycemic index (GI) has been developed as a means to measure how the body responds to foods, or more specifically to carbohydrates in foods. Foods with a high GI cause a rapid rise in blood sugar, while foods with a low GI maintain a relatively constant blood sugar level, also a longer period of time (more than 2 hours).

Since glucose is the main energy source for the body changes in blood glucose levels are directly related to changes in energy supply. High GI foods are a rapid energy source, but create a rapid feeling of hunger as glucose levels quickly drop. By comparison, low GI foods that are high in fiber, like Dreamfields pasta, with their more constant release of energy, not only prevent such hunger feelings, but also give a more constant energy supply. By comparison, white bread has a GI of 100, while Dreamfields pasta has a GI of 13. Associated with the rise in blood glucose, the insulin levels in the blood also rise. This hormonal response

elicited by the rise in glucose has major physiological consequences; very important is that insulin promotes storage processes and inhibits breakdown ones. Insulin signals the body to take up glucose and store it in muscle cells as glycogen and in fat cells as fat. This is important as glycogen is the storage form that is most easy for the muscles to use as energy for activity. Insulin is also connected with hunger suppression (satiety) feelings through its influence on other satiety-inducing hormones. As continuous peaks and valleys in insulin levels caused by high GI foods occurs, the insulin receptors become less sensitive to insulin. One becomes insulin resistant, and begins the cascade towards the metabolic syndrome proceeding towards Type II diabetes.

The response to different foods can be dramatic, Figure 1. The standard food causes an instant rise in blood sugar. Low GI foods cause slower energy release, a smooth increase and decrease in blood sugar and a lower glucose peak. This slower energy release not only helps those who are managing their weight, but it also aids in the prevention of Type II diabetes and helps promote the production of muscle glycogen, rather than fat storage, by controlling insulin release and related for more efficient energy utilization in athletic performance.

Figure 1. Blood glucose response of White Bread and Dreamfields Low GI/High Fiber pasta.



Fibers of certain types have varying effects on hunger. Early signals of feeling of fullness is mainly as a result of a particular fiber binding water and swelling to occupy more space, such as the insoluble, bran-type fibers and the soluble, thickening fruit and vegetable fibers, such as pectin and food gums. Both of these types are found in Dreamfields pasta. Signals of hunger suppression that act for prolonged periods are generally the outcome of certain soluble fibers, most notably the thickening-type dietary fibers, like the pectin and xanthan gum found in Dreamfields, to enhance hunger suppression through their gel-forming effect on the small

intestine contents^{1,15,18}. These fibers slow a particular meal's movement and delay absorption of sugar and fat from the diet, and are later fermented in the large intestine and provide effects on liver metabolism for longer term hunger suppression. Other dietary fibers, which do not exhibit gel-forming properties, notably the high fermentable, low viscosity fibers, like the inulin found in Dreamfields, also have satiety effects^{2,5}. Research indicates that inulin has influence on release of hunger-suppressing gut hormones, glucose-like peptide-1 and ghrelin, by its influence on insulin release^{2,3,4,5,12,13}. Research further suggests that inulin intake increases satiety following consumption of a meal and reduces hunger and prospective food consumption following a meal².

Moreover, certain soluble fiber-types--like those found in some fruits and vegetables and Dreamfields pasta--that gel can also reduce the absorption of fat, helping to prevent it from being transported to the body for storage in fat cells.

▪ **Fiber and nitrogen balance.**

Dietary fiber also has influence on nitrogen balance. Nitrogen balance is important in the body as it helps maintain lean body mass, muscle tissue, which establishes the body's calorie burning processes. The greater the lean body mass the greater the body's metabolism at rest to help maintain lean body mass. The fact that dietary fiber helps promote nitrogen balance is also important to performance athletes as they continue to find ways to increase muscle size and endurance. Further, many weight control diets also promote high protein and low carbohydrates. A benefit of higher fiber intake in high protein diets relates to fiber's ability to help manage the increased nitrogen from the digestion of a higher protein diet. Soluble fiber, particularly the highly fermentable type, helps promote proper protein digestion, and reduces the risk of potential harmful effects on kidneys that must clear excess nitrogen.

Fiber acts as food for increased microbial growth and biomass, which utilizes high fecal nitrogen and creates a marked enlargement of the cecum^{8,14}. Water soluble, fermentable fibers, like those found in Dreamfields, are utilized by resident microbes in the colon to grow and produce short chain fatty acids (SCFA). These acids increase the acidity of the colon and convert the potential liver toxin ammonia (NH₃), which can diffuse out of the colon to the blood stream, to a form that does not diffuse into the blood stream, ammonium ion (NH₄)¹⁹. The result of this process is higher nitrogen retention in the cecum, increased fecal nitrogen excretion, lower blood ammonia levels and decrease urinary excretion. Nitrogen balance, however, is not compromised due to an associated decrease in renal nitrogen excretion, likely due to a strong transfer of urea nitrogen to the intestine, to depress the blood uremia. This shift does not appear to alter protein bioavailability, and seems more evident when the dietary protein level is moderate¹⁴.

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