



DREAMFIELDS PASTA

THE DELICIOUS & HEALTHY WAY TO HELP MANAGE BLOOD GLUCOSE, CONTROL WEIGHT & SUSTAIN ENERGY

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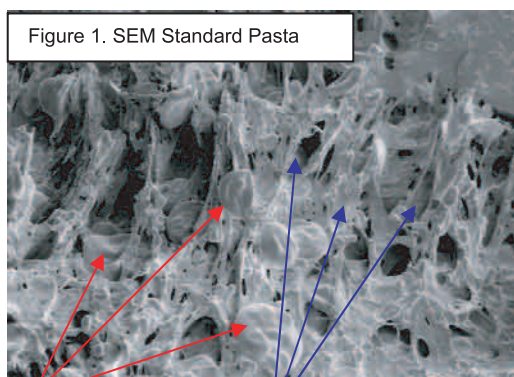
Growing world health concerns towards rising obesity and diabetes levels have created renewed interest in dietary caloric contributions of macronutrients (fat, protein, and carbohydrate) to maintain overall good health. Historically, reducing fat was the trend towards maintaining health. Recently, portion control and reducing digestible carbohydrates in the diet have provided means to manage weight and help normalize blood glucose levels. Particular interest has focused on the use of dietary fibers--especially soluble fibers such as guar gum, pectin, locust bean gum, xanthan, psyllium and inulin and insoluble fibers such as resistant starch and resistant dextrins--to help manage weight and control blood glucose levels. The soluble fibers have been shown to modify food microstructure, texture, viscosity and can modify starch granule permeability, while the insoluble fiber generally reduces the amount of digestible carbohydrates in a food. Both influence the blood glucose rise. Research has shown that changes in food microstructure and influence on starch granule wall permeability ultimately have direct influence on the amount starch degraded during digestion and the amount of resulting glucose that is absorbed. These changes influence a food's glycemic index, which is a measure of the speed at which the carbohydrates in the food are digested and absorbed as glucose. Research has also shown a relationship between the rate of carbohydrate degradation during digestion, and the effects on postprandial blood glucose and hormonal levels, especially those affecting satiety and energy.

Related to meeting the goals of maintaining proper weight, blood glucose control and sustainable energy, 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.

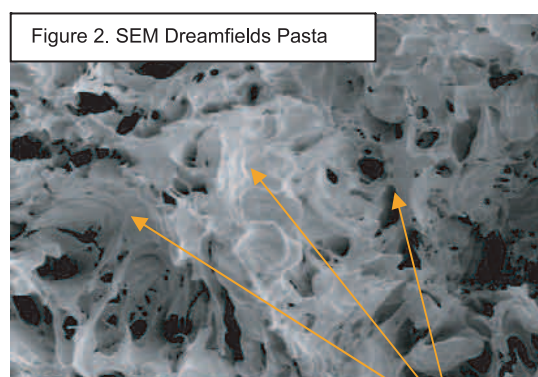
It is therefore not surprising that the possibility of exploiting the diet with healthy multi-fiber containing foods, like **Dreamfields** pasta, to meet these metabolic goals is gaining ever-increasing interest.

Discussion

Dreamfields pasta products contain a technology utilizing a specific blend of dietary fibers and proteins that are balanced to provide functional properties to modify the product's microstructure and influence starch granule permeability. These changes, shown by scanning electron microscopy, can help provide effective metabolic modification to influence satiety, weight, blood glucose levels and energy, Figures 1 and 2. As compared to regular pasta, changes to the pasta's microstructure and starch granule permeability reduce starch digestibility and reduce by 65% the rise in blood sugar, as measured by the glycemic index (GI). Various fibers also have significant influence on hormonal responses and energy management in the body.



- Visible embedded starch granules (swollen discs & small pellets)
- Filamentous protein matrix



- No visible starch granules
- Complexed protein-hydrocolloid filamentous mass

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 glucose, while foods with a low GI maintain a relatively constant blood glucose 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.

By influencing blood glucose rise, fiber has been shown to play a key role in caloric intake control and reduced risk for development of obesity^{1,7,10,11}. 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. The type of fiber is as important as the amount in the diet. 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. Table 1 illustrates the comparison between fiber type, fiber amount and GI in pasta. Signals of hunger suppression that act for prolonged periods are generally the outcome of certain soluble fibers, most notably the thickening-type fibers, like the pectin and xanthan gum found in **Dreamfields**, to enhance hunger suppression through their gel-forming effect on the small intestine contents^{1,10,11}. 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 fibers, which do not exhibit gelforming properties, notably the soluble, low viscosity fibers, like the inulin found in **Dreamfields**, also have satiety effects^{2,5}. Research indicates that inulin has influence on release of incretins or hunger-suppressing gut hormones, glucose-like peptide-1(7-36)amide (GLP-1), glucose-dependent insulinotropic polypeptide (GIP) and ghrelin, by its influence on insulin release^{2,3,4,6,8,9}. Research further suggests that inulin intake increases satiety following consumption of a meal and reduces hunger and prospective food consumption following a meal². Moreover, the gel-forming soluble fiber-types also reduce absorption of fat, helping to prevent it from being transported to the body for storage in fat cells.

Table 1. Pasta Comparative Facts: 56 gram serving size

| Pasta Serving Facts | Dreamfields Pasta | Standard Pasta | Whole wheat pasta |
|----------------------------|--------------------------|-----------------------|--------------------------|
| Glycemic Index (GI) | 13 | 41 | 37 |
| Fiber (Total) | 5.0 grams | 2.0 grams | 4.7 grams |
| Insoluble Fiber | 0.9 grams | 0.9 grams | 4.0 grams |
| Soluble Fiber | 4.1 grams | 1.1 grams | 0.7 grams |

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