

Creating Gluten Free Winners

The availability of gluten-free foods is critical to an effective avoidance diet because gluten-containing grains and ingredients are so ubiquitous in processed food products.

by Steve L. Taylor

The development of gluten-free foods has become an important trend in recent years. Historically, gluten-free foods were a specialty foods category and were often available in limited variety from traditional food marketing channels. Gluten-free foods were originally developed for the benefit of consumers with celiac disease, an intestinal inflammatory disease that leads to nutrient malabsorption if untreated. The inflammation is triggered in affected individuals by consumption of gluten proteins from certain grains. Treatment involves the avoidance of dietary gluten which led to the development of the gluten-free product category. Improved diagnostic testing has

resulted in the recognition of an increased number of individuals with celiac disease in recent years. As many as 1 in every 133 individuals in the US may have some susceptibility to the development of celiac disease, although probably fewer than 1 in 1,000 individuals are symptomatic on exposure to gluten. Individuals with allergies to wheat and barley may also follow gluten-free diets.

Wider Appeal

However, the popularity of gluten-free foods currently seems to exceed the number of individuals with celiac disease and wheat/barley allergy combined. Originally, gluten-free foods were primarily manufactured by specialty food com-

panies. While many of those companies remain active, the recent popularity of gluten-free foods has induced many other companies to develop or consider developing gluten-free products. Although gluten-free foods may indeed be purchased by consumers who have no need to completely avoid gluten, product developers must always remember that celiac sufferers are dependent on these products. Thus, gluten-free foods must be made with celiac sufferers in mind. Celiac sufferers must adhere to a gluten-free diet throughout their lifetime.

The availability of gluten-free foods is critical to an effective avoidance diet because gluten-containing grains and ingredients are so ubiquitous in

processed food products.

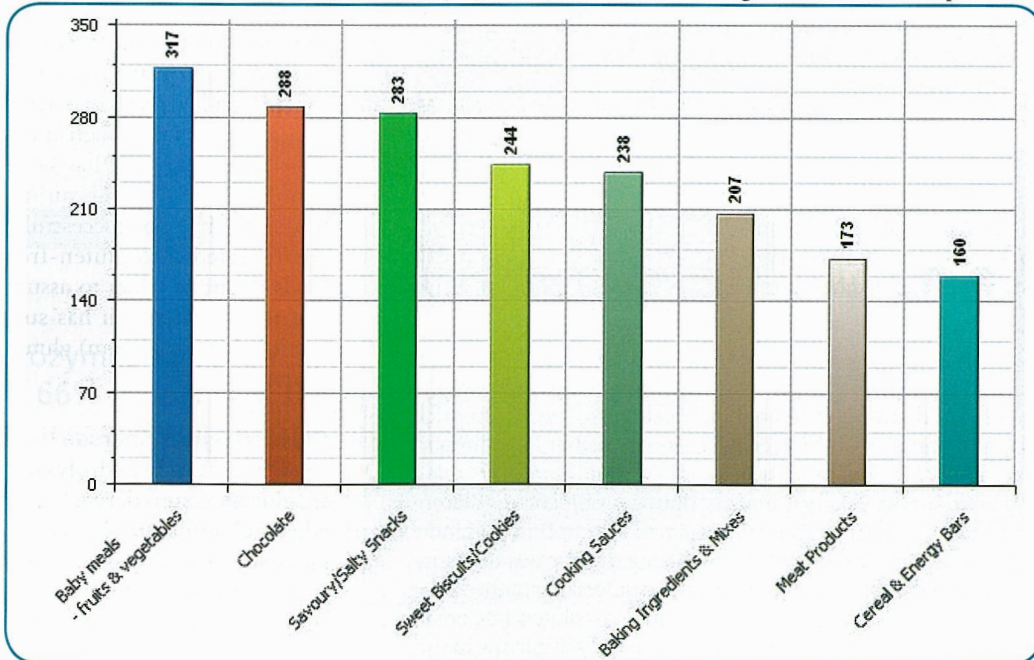
Defining Gluten-Free

The definition of "gluten-free" is rather critical to any discussion of gluten-free foods or gluten-free ingredients. No official regulatory definition of gluten-free exists in the US. However, on a worldwide basis, gluten-free is commonly defined as <20 ppm (mg/kg) of gluten. Some countries also recognize <100 ppm as low gluten. From a clinical viewpoint, the ingestion of gluten-free foods containing <20 ppm gluten appears to be safe for celiac sufferers. Since gluten-free is typically expressed as an allowable residual amount of gluten, the allowable levels are defined by the analytical methods used.

Currently, quantitative enzyme-linked immunosorbent assays (ELISAs) are the favored methods for the detection of residual gluten in foods or food ingredients. Several different companies sell ELISA kits for analysis of gluten residues. The ELISA kits are based upon several distinct types of antisera including the so-called Skerritt antibodies and the R5 antibodies. Analytical results may vary to some extent, depending upon the type of ELISA that is used for the analysis. Thus, the definition of gluten-free also depends upon the method used to analyze for gluten residues.

Grain Sources

In the development of gluten-free foods, grain sources



Top market categories featuring "gluten free" claims (Global, Jan-Aug 10), Source: Innova Market Insights

of gluten and ingredients derived from those grains must be avoided. Celiac disease is triggered by exposure to the prolamin proteins of wheat (gliadin), barley (hordein), rye (secalin), and related grains including durum, spelt, kamut, emmer, einkorn, farro, and triticale.

All other foods could be considered naturally gluten-free. However, other grains in particular can become contaminated with gluten-bearing grains because of shared agricultural fields and shared harvesting, transporting, and storage systems. The likelihood of contamination of oats with wheat is particularly high because these

two grains are grown in similar regions. Clinical research has documented that the ingestion of uncontaminated oats is safe for individuals with celiac disease (Janatuinen et al., 1995; Srinivasan et al., 1996), although some debate remains that a small percentage of celiac sufferers might be adversely affected by ingestion of oats.

Despite the data indicating that oats are safe, most gluten-free diets still espouse avoidance of oats because of the likelihood of contamination with wheat or other gluten-containing grains (Storsrud et al., 2003; Thompson, 2004). In recent years, gluten-free oats have entered the marketplace. These oats

must be grown very carefully from highly pure foundation-type seed in isolated plots and then be harvested, transported, and stored in a manner that does not allow contamination. Other grains can occasionally be contaminated with gluten including corn (maize), rice, sorghum, buckwheat, millets, teff, amaranth, and quinoa. These other grains, along with gluten-free oats, are often the mainstays of a gluten-free diet. The risk of cross-contamination with gluten-containing grains is lower for rice, amaranth, and quinoa because these grains are typically grown in areas where gluten-containing grains are not grown (Ratner, 2010).

However, in the formulation of gluten-free foods, great care must be taken to assure that gluten-free supplies of these grains are obtained. The analysis of individual shipments of these grains for residual gluten may be wise to assure that these grains are truly free of gluten.

Gluten Sources

Many food ingredients are derived from gluten-containing grains especially wheat and barley. Table 1 provides a list of ingredients that may be derived from wheat and barley although in some cases these ingredients may also be obtained from other sources. A few of these ingredients are clearly hazardous for celiac sufferers including gluten, wheat protein isolate, and probably wheat bran.

Other wheat- and barley-derived ingredients may have been rendered gluten-free by the process used to manufacture the ingredients. Assessing the gluten content of ingredients derived from gluten sources is obviously critical in the development of gluten-free foods. However, the appropriateness of the analytical method is a key concern in the analysis of some wheat- and barley-derived ingredients.

Wheat starch is actually a common component of gluten-free foods. Wheat starch can contain residual levels of detectable gluten even though most of the wheat protein has been removed during manufacturing. Wheat starch can be successfully incorporated into gluten-free foods if care is taken to assure that the wheat starch has sufficiently low (<20 ppm) gluten content.

Glucose Syrup Sources

Wheat starch hydrolysates are glucose syrups derived from wheat. Commercial sources of glucose syrup are wheat and corn. Corn-based glucose syrup should be gluten-free and is the most widely used source of glucose syrup in the US.

Great Gluten-Free Way to Bake



Ever since gluten intolerance was first diagnosed, consumers with the condition have either had to eliminate bread entirely from their diets or live with gluten-free alternatives that have stood out for their unappealing dry, crumbly texture. Today a sugar beet fiber from Nordic Sugar and the expertise of Artisan Bakery Concepts are painting an altogether much tastier, healthier future for consumers of gluten-free bread. Nordic Sugar is the world's only producer of natural sugar beet fiber for use in food at a custom-made facility in southern Sweden. Sold as Fibrex, this gluten-free fiber has a unique ability to retain moisture in bakery products, contributing to longer-lasting softness and a pleasing mouthfeel. That the fiber has

both insoluble and soluble parts is a definite health bonus.

At Artisan Bakery Concepts, based in Edinburgh, Scotland, Colin Sneddon (pictured) uses Fibrex in almost all the bakery products he develops for the gluten-free market. Among them is a new bread range launched by a leading retailer in the UK, where it has become an almost overnight success. Drawing on 20 years of bakery experience, Sneddon's revolutionary approach to gluten-free baking with Fibrex produces breads with a soft, luxurious feel. His recipes are not only a favorite of consumers with celiac disease, the medical term for gluten intolerance. Other health-conscious consumers choose them, too – underlining the tremendous step away from the unappealing, gluten-free breads of old.



"Fibrex acts like a sponge, locking moisture in and keeping bread soft," says Sneddon. "No other vegetable fibre absorbs so much water." When developing differentiated bread recipes, the range of Fibrex granulations is an inspiration. Sneddon uses the finer granulations to create fiber-rich products with the look and feel of white bread. Coarse Fibrex flakes, on the other hand, impart a nutty flavor, chewy mouthfeel and a healthy wholegrain appearance. Comprising pure, dried sugar beet fiber, Fibrex fits perfectly with Artisan Bakery Concepts' business objectives. "Gluten-free products have typically contained a lot of artificial additives. We aim to use cupboard-friendly ingredients for breads with a natural, clean label," Sneddon states. To gauge the popular response to his recipes, he regularly follows the gluten-free blogs, where coeliac consumers comment on the latest product launches. Here, he has found many recommendations for the new gluten-free bread range now available across the UK. Come the beginning of 2011, more products will join the range.