

FOOD INGREDIENT SOLUTIONS<sup>®</sup>

## Ways to make the glycemic index work

*Adding fiber and alternative sweeteners may improve the number associated with managing diabetes*

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## LATE NEWS

## Pepperidge to launch Goldfish Mac & Cheese

NORWALK, CONN. — Pepperidge Farm, Inc. is branching out the Goldfish brand with the launch of Goldfish Mac & Cheese, which will debut on store shelves exclusively at Wal-Mart Stores, Inc. Made with Goldfish-shaped pasta, Goldfish Mac & Cheese is available in four varieties: cheddar, nacho cheese, cheesy pizza, and butter Parmesan. "Just like Mac & Cheese, the Goldfish brand is adored by children and adults alike, so it made perfect sense for us to add the fun and wholesomeness of Goldfish to this favorite classic food," said Jared Konstanty, senior vice-president, general

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## For first time since 2000, U.S.D.A. buying sugar due to oversupply

WASHINGTON — The Commodity Credit Corp. of the U.S. Department of Agriculture on June 17 issued its first invitation in more than a decade to buy domestic sugar that would then be exchanged for export credits as part of a larger effort by the U.S.D.A.'s Farm Service Agency to reduce the current oversupply of sugar.

The F.S.A. said it intends to purchase sugar from domestic cane and beet processors and then conduct voluntary exchanges for credits under the Refined Sugar Re-export Program. The agency intends to exchange "not less than 2.5 tons of import credits ... per 1 ton of sugar," resulting in a "minimum net reduction of 1.5 tons of sugar in the U.S. market per ton of sugar exchanged," anticipating the action may remove around 300,000 tons of domestic sugar.

Under the U.S. sugar program, a floor is set on prices through non-recourse loans



to growers. Producers who take loans have the right to forfeit their sugar to the U.S. government, when market prices fall beneath the loan rate. For the current fiscal year, the loan rate for raw cane sugar is 18.75c per lb and 24.05c per lb for beet sugar. Other components of the program — domestic marketing allotments and tariff-rate

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## Plaza Belmont into specialty baking with Labriola acquisition

ALSIP, ILL. — Labriola Baking Co., a baker of fresh and frozen artisan bread, has been acquired by the private equity firm Plaza Belmont Fund III L.P., Shawnee Mission, Kas., and several other investors. Terms of the agreement were not announced, and the transaction does not include the Labriola Bakery Cafe located in Oak Brook, Ill.

Labriola Baking Co. supplies fresh artisan baked foods through its own distribution network of 25 routes to hotels,

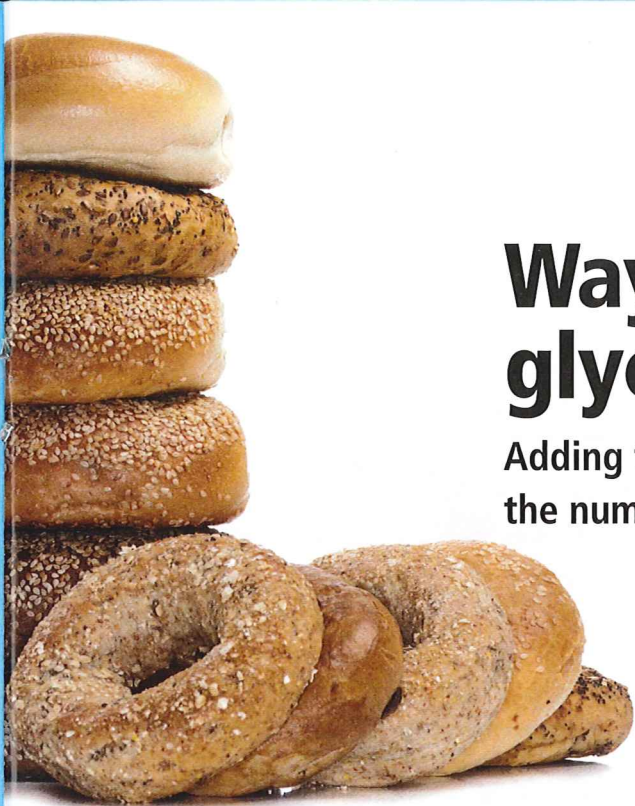
restaurants and retail stores in the Milwaukee, Chicago and Indianapolis regions.

"The rationale for the sale was to create a partnership that not only brings additional financial resources to Labriola, but extensive industry expertise as well," said Rich Labriola, who will maintain an ownership stake in the company and serve as vice chairman and chief innovation officer. "As I have been working with Plaza Belmont to put this transaction together, I am confident I have found the right partners to accomplish the growth I envision for the company. It also helps me free up resources to allow me to continue to grow and expand the Labriola Bakery Cafes beyond the current single store location."

Bob Parnow, president of Plaza Belmont, will become chairman and chief

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# Ways to make the glycemic index work

Adding fiber and alternative sweeteners may improve the number associated with managing diabetes

*Bagels may have a glycemic index score as high as 72, but adding fiber to the product may bring that number down.*

The glycemic index poses questions for the grain-based foods industry. Is it worth spending time and money to develop low-glycemic products? Will consumers understand the promotions of such products?

The food industry may consider that consumer understanding of the glycemic index is likely to increase since, unfortunately, more Americans are becoming diabetic. Also, formulating low-glycemic products may involve familiar tactics, such as fiber addition and sweetener manipulation. Using specific carbohydrates/sweeteners that are digested slowly is another option.

The American Diabetes Association, Alexandria, Va., defines the glycemic index as a way to measure how a carbohydrate-containing food raises blood glucose, an important factor in managing diabetes. Ingredients and foods are measured against glucose, which has a glycemic index of 100. The lower the number of a food or ingredient, the more likely it is to have a beneficial effect on blood sugar and people with diabetes.

According to a 2011 national diabetes fact sheet from the American Diabetes Association, 25.8 million Americans, or 8.3% of the U.S. population, have diabetes. Another 79 million have prediabetes, which means they have blood glucose levels that are

higher than normal but not yet high enough to be diagnosed as diabetes.

According to the Centers for Disease Control and Prevention, Atlanta, the prevalence of diagnosed diabetes increased in all U.S. states, the District of Columbia and Puerto Rico between 1995 and 2010. During that time, the prevalence of diagnosed diabetes increased by 50% or more in 42 states, including by 100% or more in 18 states.

Certain demographics are more likely to have diabetes. Among Americans age 65 or older, 10.9 million, or nearly 27%, have diabetes, according to the A.D.A. The percentage is 11.8% for Hispanics in the United States, which includes Cubans (7.6%), Mexican Americans (13.3%) and Puerto Ricans (13.8%).

According to the C.D.C. report "Health characteristics of the American Indian or Alaska native adult population, United States 2004-2008" released on March 9, 2010, 17.5% of the adults in that demographic had diabetes.

## Adding fiber, reducing G.I.

Sylvia Meléndez-Klinger, founder of Hispanic Food Communications, a food communications and culinary consulting company in Hinsdale, Ill., said she advises her clients who have diabetes to eat fiber-rich foods.

Bakers may increase fiber in their products by adding ground flaxseed or other high fiber seeds, said Ms. Meléndez-Klinger, a registered dietitian and a member of the scientific advisory board for the Grain Foods Foundation, Washington. Shredded vegetables like zucchini and carrots

may be added to yeast bread and quick bread, she said, while bananas, blueberries, apples, prunes, mangoes, raisins and other dried fruit may be used to create high fiber sweet bread. Nutrient-dense nuts such as walnuts are other options.

"Beans are bursting with fiber," Ms. Meléndez-Klinger said. "Pinto beans have 15.4 grams of fiber per cup while black beans have 15 grams per cup."

Likewise, beans may help in tackling the problem of diabetes in American Indians, said Dan Best, president and founder of Best Vantage, Inc., Northbrook, Ill. He recently has worked with the USA Dry Pea & Lentil Council, Moscow, Idaho.

Mr. Best mentioned the tepary bean, which has a high level of fiber and is grown by the Tohono O'odham Nation. According to the U.S. Department of Agriculture, the tepary bean (*Phaseolus acutifolius* A. Gray var. *acutifolius*) is grown in Arizona, New Mexico and Texas.

Beans, chickpeas, lentils and other legumes were part of a study that appeared on-line last October in the *Archives of Internal Medicine*. It involved 121 people with type 2 diabetes. They were asked either to increase legume intake by at least 1 cup per day or increase insoluble fiber intake by consuming whole wheat products. After three months, the legume diet reduced hemoglobin A1c values by 0.5% and the high wheat fiber diet reduced hemoglobin A1c values by 0.3%.

While pulses such as beans and peas have a low glycemic index, severe processing, such as putting them through



## Analyzing the credibility of the glycemic index

For those in the grain-based foods industry seeking to understand the credibility of the glycemic index, they are not alone. Governments and scientists are investigating the issue, too.

On June 10, an international committee of nutrition scientists from 10 countries released a scientific consensus statement while meeting in Italy. The committee recommended the inclusion of glycemic index and glycemic load in national dietary guidelines and food composition tables and the consideration of packaging labels and symbols on low-G.I. foods. The committee, led by glycemic index advocates, concluded there is convincing evidence from a large body of research that low-glycemic index/glycemic load diets reduce the risk of type 2 diabetes and coronary heart disease, help control blood glucose in people with diabetes, and may help with weight management.

Committee chairmen were David J.A. Jenkins, M.D., a professor in the Department of Nutritional Sciences, Faculty of Medicine, at the University of Toronto, and Walter C. Willett, M.D., a professor of epidemiology at the Harvard School of Public Health in Boston. Dr. Jenkins was involved in the origination of the glycemic index concept.

Health Canada will not include the glycemic index in its dietary guidelines, according to an article appearing on-line June 12 in *The American Journal of Clinical Nutrition*.

"Health Canada's current position is that the inclusion of the G.I. value on the label of eligible food products would be misleading and would not add value to nutrition labeling and dietary guidelines in assisting consumers to make healthier food choices," Health Canada said in the article.

Health Canada pointed to three areas of concern with G.I. labeling. For one, the G.I. measure has poor accuracy and precision for labeling purposes. For the second concern, as a ratio, the G.I. does not vary in response to how much food is consumed. Finally, Health Canada is concerned that an unintended focus on the G.I. for food selection may lead to food choices that are inconsistent with national dietary guidelines.

Julie Miller Jones, Ph.D., distinguished scholar and professor emerita with St. Catherine University in St. Paul, Minn., said many factors may affect the glycemic index of a food product. She mentioned milling as one factor and the amount of cooking and cooling, fat, fructose and fiber as others. The amount of chewing, whether a food is eaten hot or cold and the baseline glucose of the person consuming the food are other factors.

"There are millions of factors, which is another reason why values in the tables are not appropriate," Dr. Jones said. MBN

an extruder, may affect their glycemic index negatively, Mr. Best said. Processing may make the nutrients in the pulses more exposed to the human digestive system, which means the nutrients may digest quicker and increase the glycemic index.

Katherine Corbett, director of business development for the Glycemic Index Laboratories, Toronto, said, "The more finely milled or ground the food is, the more easily digested the food is (and therefore, generally, the higher the G.I.) That is why the seedy, whole grain breads are generally lower G.I. than the white breads, for example."

Processing a grain may remove fiber, said Don Verlhurst, M.D., chief science officer for InBalance Health Corp., a company based in Wayland, Minn., that provides doctor-formulated food bar and supplement solutions for people who have prediabetes or type 2 diabetes.

"If you remove fiber, you automatically

compared to the maltodextrin group.

Sensus America, Inc., Lawrenceville, N.J., offers Frutafit and Frutalose, which are non-digestible carbohydrates featuring inulin sourced from chicory root fiber.

"Consumers are becoming increasingly aware of the term glycemic index through various diet programs and the prevalence of diabetes," said Scott Turowski, technical sales, East coast for Sensus America. "However, it would be fair to say that most consumers do not truly understand it yet. The concept of sustained energy seems to be an easier way to communicate the benefit of low G.I. products to consumers."

Cargill, another inulin supplier, offers Oligo-Fiber. Beneo offers Synergy1, an inulin enriched with oligofructose.

Taiyo International, Inc., Minneapolis, offers Sunfiber, a partially hydrolyzed guar gum and source of soluble fiber. Fibers in general lower blood

### Glycemic index scores

A look at glycemic index scores for several foods and ingredients. The lower the glycemic index for a food or ingredient, the less it affects blood sugar and insulin levels:

Food/ingredient	Glycemic Index
Glucose	100
White rice, average	89
Boiled white potato, average	82
Pizza, plain baked dough, served with Parmesan cheese and tomato sauce	80
Graham crackers	74
Bagel, white, frozen	72
Whole wheat bread, average	71
White bread	71
Sweet potato, average	70
Raisins	64
Hamburger bun	61
Honey, average	61
Ice cream, regular	57
Oatmeal, average	55
Microwave popcorn, plain, average	55
Quinoa	53

Food/ingredient	Glycemic Index
Corn tortilla	52
Potato chips, average	51
Green peas, average	51
Orange juice, unsweetened	50
Macaroni, average	47
Spaghetti, white, boiled, average	46
Corn chips, plain, salted, average	42
Milk, full fat	41
Apple, average	39
Carrots, average	35
Milk, skim	32
Wheat tortilla	30
Black beans	30
Lentils, average	29
Soybeans, average	15
Chickpeas, average	10
Peanuts, average	7

Source: "International tables of glycemic index and glycemic load values: 2008" in the December 2008 issue of *Diabetes Care*

increase glycemic index," Dr. Verlhurst said.

Another fiber source, inulin, was the focus of a study appearing on-line April 16 of this year in *Diabetes & Metabolism Journal*. Researchers at the Tabriz University of Medical Sciences in Tabriz, Iran, divided 49 women with type 2 diabetes into two groups. One group received 10 grams of inulin a day and one group received maltodextrin. After two months, the inulin group saw significant decreases in such areas as fasting plasma glucose and glycosylated hemoglobin when

sugar levels, but the mechanism of action is different between soluble and insoluble fibers, according to Taiyo International. Insoluble fibers exhibit bulking effects and thereby act as an appetite suppressant to reduce the starch intake and glucose absorption. Soluble fibers dissolve and form a thin layer on the starch to slow down its digestion.

Ingredion, Inc., Westchester, Ill., offers Hi-Maize resistant starch, a form of dietary fiber. Twenty-one clinical studies found at the [www.resistantstarch.com](http://www.resistantstarch.com) web site show how it reduces the postprandial glycemic response of foods





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## Food Ingredient Solutions®



InBar has a sweetener blend of organic blue amber agave, brown rice syrup and monk fruit extract.

when it substitutes for high-glycemic flour or starch, said Rhonda Witwer, senior business development manager, Nutrition, for Ingredion.

"The post-prandial glycemic response of foods is a short-term measurement of glycemic health and may or may not reflect the longer-term impact on metabolism," she said. "Hi-Maize resistant starch significantly improves insulin sensitivity, with these benefits appearing just minutes after it is consumed."

Health Canada touched on this issue in a report published on-line June 12 in *The American Journal of Clinical Nutrition*. Health Canada's current opinion is that any form of G.I. labeling of food products would be misleading.

"However, Health Canada acknowledges that messages on the label related to the mitigation of the increase in postprandial glycemia could be useful for consumers and is currently preparing a guidance document that sets out the criteria for this type of health claims," Health Canada said.

## Sweeteners that digest slower

The choice of sweeteners also may affect the glycemic index of a food. InBalance Health Corp. last year launched InBar, which has 10 grams of protein and 4 grams of sugar, Dr. Verlhurst said. It is raw and not baked. InBar contains Morucel, a patented mulberry leaf extract that slows digestion by inhibiting alpha glucosidase, an enzyme, he said.

InBar has a sweetener blend of organic blue amber agave, brown rice syrup and monk fruit extract, which is a non-caloric, high-intensity sweetener.

Ms. Corbett of Glycemic Index Laboratories said, "We have found agave and maple syrup to be natural, lower G.I. sweeteners."

Some sweeteners digest more slowly than others, which may have a positive effect on the glycemic index.

Bioenergy Life Science, Inc., Minneapolis, offers Bioenergy Ribose.

"Ribose is a simple monosaccharide, 5-carbon (pentose) sugar and does not raise the blood sugar level (amount of glucose in the blood) for the food sys-

tem," said Donna O'Connor, a food scientist with Bioenergy Life Science. "Ribose actually lowers or modulates the glycemic response."

Tom VonderBrink, chief executive officer of Bioenergy Life Science, said Ribose does not contain caffeine, but it helps maintain healthy energy levels and increases the rate at which cells recover from exercise or exhaustion.

Cargill, Minneapolis, offers Xtend sucromalt, a slowly digested carbohydrate sweetener. Only half of sucromalt's constituent carbohydrates are claimed as sugars (mono- and disaccharides). It possesses functional properties similar to sucrose and high-fructose corn syrup with less impact on fluctuations in blood sugar, according to Cargill.

"You don't get the peaks and valleys with traditional sugar and sweeteners," said Carol Lowry, senior food scientist for Cargill. "The peak is not as high in the energy release, and the valley is not as low. It's more of a blunted release."

Beneo offers Palatinose (isomaltulose), a low-glycemic carbohydrate with prolonged energy supply in the form of glucose.

"Given that Palatinose is low-glycemic, it enters the body more slowly and balanced but nevertheless it still provides fully available energy," said Joseph O'Neill, president and general manager of Beneo, Inc. "Thus it is an important ingredient for nutritional bars targeted to athletes and consumers with active lifestyles. Palatinose is a natural ingredient derived from sugar beet that has a mild sweet and sugar-like taste."

Consumers may not know what low G.I. means or the effects of blood sugar management, he said.

"Many may even regard the topic as medically related," Mr. O'Neill said. "Therefore, transitions are often needed like e.g. balanced energy, does not strain your blood glucose levels, etc. These claims seem to be well accepted and understood by consumers. Moreover, manufacturers have the chance to communicate the effect and educate consumers at the same time." MBN

— Jeff Gelski