



News Release

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New Clinical Study Shows Low Dose of Hi-maize[®] Natural Resistant Starch Significantly Improves Insulin Sensitivity in Men at Risk for Prediabetes

Improvement in Key Biomarker Suggests that Resistant Starch Can Help Maintain Healthy Blood Sugar Levels

Bridgewater, NJ – May 6, 2011 – Low doses of natural [Hi-maize[®] resistant starch](#) could improve insulin sensitivity in men at risk for prediabetes, according to a study underwritten by National Starch LLC, a business unit of Corn Products International. [The American Diabetes Association](#) defines [prediabetes](#) as a non-disease state where blood sugar (glucose) levels are higher than normal but not yet high enough to be diagnosed as diabetes.

In a [presentation given at Experimental Biology 2011](#) in Washington, DC on April 10, study leader Kevin C. Maki, Ph.D. of Biofortis-Provident Clinical Research (Glen Ellyn, Illinois) reported that overweight or obese but non-diabetic male participants taking part in a clinical study showed a 72.7% improvement in insulin sensitivity after receiving a 30 grams/day (g/d) dose of resistant starch from Hi-maize 260 and a 56.5% improvement in insulin sensitivity from a 15 g/d dose. While a positive insulin sensitivity effect has been reported in previous trials with Hi-maize resistant starch, this was the first study to examine the lower dose of 15 g/d.

The [Centers for Disease Control](#) has estimated that nearly 80 million American adults have [prediabetes](#). Studies such as the NIH's [Diabetes Prevention Program](#) have demonstrated that intensive lifestyle intervention including minimal weight loss and regular physical activity can effectively increase insulin

sensitivity and help to maintain blood sugar levels within the normal range. The study by Maki suggests that dietary consumption of modest levels of Hi-maize resistant starch on a regular basis can help individuals at risk for prediabetes maintain healthy blood sugar levels.

According to Dr. Christine Pelkman, Clinical Research Manager for National Starch and co-author on the study, “There is good evidence that minimal weight loss and increased physical activity can help to preserve healthy blood sugar levels. But in the United States, we seem to be moving in the opposite direction. The number of overweight and obese people in this country is increasing, and even when people are diagnosed with prediabetes, the percentage of people who commit to permanent lifestyle change is relatively low. With the costs in human suffering and medical treatment associated with high blood sugar levels, we should be doing everything we can to meet this burgeoning challenge.”

New study examines lower dose levels

The Maki study on Hi-maize resistant starch was a randomized, double-blind, controlled, crossover trial consisting of three 4-week treatment periods, separated by 3-week washouts. Participants were overweight and obese men and women, 18 to 69 years of age with elevated waist circumference: a marker for insulin resistance. They consumed either 15 or 30 g/d of resistant starch (measured as dietary fiber) from Hi-maize resistant starch with a control starch including no resistant starch. Insulin sensitivity index was assessed at the end of each period using an insulin-modified intravenous glucose tolerance test (minimal model). The men experienced a statistically significant average improvement in insulin sensitivity of 56.5% and 72.7% for the low- and high-dose treatments, respectively. In contrast, the same study did not find an improvement in insulin sensitivity in overweight women. The authors suggested that responses in women may have differed as they were less insulin resistant at baseline and changes over the menstrual cycle may have obscured the effects.

[Five previous studies](#) examining the effects of Hi-maize resistant starch have shown positive effects on insulin sensitivity. The lowest amount previously tested was 30 g/d of dietary fiber. This study lowered the threshold at which Hi-maize resistant starch contributes significant effects on insulin sensitivity – expanding the types of foods into which it can be added to promote positive health benefits.

Foods for increasing insulin sensitivity

The results shown in the Maki study and previous trials suggest that the addition of natural Hi-maize resistant starch can complement lifestyle changes (weight loss, healthier eating, and physical activity) to increase insulin sensitivity in the large and growing population of people with prediabetes. According to Rhonda Witwer, Senior Business Development Manager of Nutrition at National Starch, one of the keys to

long-term success in maintaining glycemic health is recognizing the lifestyle issues that contribute to the problem. “For better or worse, we as a society tend not to want to give up the things that we enjoy – even when they threaten our long-term health. Education is vital to helping us maintain health and wellness. But so too are developing alternative foods to help people easily integrate dietary components with proven health benefits,” she said. “There are commercial foods on the market that contain Hi-maize on store shelves right now – with more becoming available every month. Hi-maize resistant starch can also be added to foods at home because it easily replaces flour in recipes for muffins, pancakes, pizza crust, and other snacks that are easy to prepare. Simply blending it into smoothies, shakes, yogurt or oatmeal is another easy way to incorporate Hi-maize into foods. We can add these valuable health benefits while maintaining great taste, texture and eating experience – and increase the likelihood that people will make resistant starch a regular part of their diets,” she added.

For additional information, including a list of foods containing Hi-maize resistant starch, where to buy Hi-maize resistant starch for home cooking, visit www.hi-maize.com. For the latest research updates on the nutritional benefits of natural resistant starch from high-amylose corn, visit www.resistantstarch.com.

About Hi-maize resistant starch

Hi-maize resistant starch is a natural bioactive ingredient isolated from a special hybrid of corn that is naturally high in amylose content. Resistant starch resists digestion in the small intestine and reaches the large intestine. In the last 20 years, more than 200 published studies – including more than 70 human clinical trials – have demonstrated a range of potential health benefits including blood sugar and energy management, weight management and satiety. Hi-maize 260 resistant starch contains approximately 60% resistant starch (insoluble dietary fiber) and 40% digestible (glycemic) starch content. It can be added to foods such as breads, pizza and baked goods by partly replacing flour or to smoothies and shakes in a simple blending process. Hi-maize resistant starch improves the nutritional profile of everyday processed foods, but does not impact taste, appearance or texture of those foods.

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