

2009 NutrAward Nomination



**Dietary Supplement, Functional Food and Beverage
Ingredient**

November 2008

Market Opportunity

With 2007 U.S. obesity rates exceeding 20 percent in 49 states and continually rising since 1985, consumer demand for weight loss products and meal supplements has also increased. Overall, supplement sales for 2007 rank weight-loss meal supplements third, exceeded only by multivitamins and sports nutrition products.

Aside from a diminished quality of life, The American Obesity Association estimates that obesity-related health conditions result in \$93 billion in medical bills annually, representing 9.1 percent of national medical costs and significant productivity loss due to related complications. As health care costs continue to spiral, companies, small-business owners and independent contractors realize that maintaining a healthy weight is a crucial component to preventive health and well-being.

With an estimated \$33 billion spent on weight-loss products and services annually, consumer interest to reach and maintain a healthy weight is evident. Yet, when it comes to consumer confidence in weight loss supplements, skepticism is rampant. *Nutrition Business Journal* reports indicate that 46 percent of polled consumers believe that more than 70 percent of weight loss supplement products contain illegitimate claims. And with Ephedra and Fen-phen pulled from U.S. markets due to their harmful and even fatal effects, it's understandable that consumer confidence in the weight loss category, as evidenced by a dramatic 2004 sales dip, has led to cautious consideration of new weight loss offerings.

As consumers search out and consider weight loss supplements, the need for scientifically supported, safety-backed and "transparent" ingredients and products is of paramount importance. Harmful side effects can no longer be tolerated by a new wave of consumers viewing a healthy weight as a means to a healthy life. And with reports indicating that as many as 65 percent of Americans attempt some form of weight loss or weight control annually, LuraLean's thorough roster of clinical studies and safety trials will help to ensure its success for a wary, more educated, and health-centered audience.

Product Description

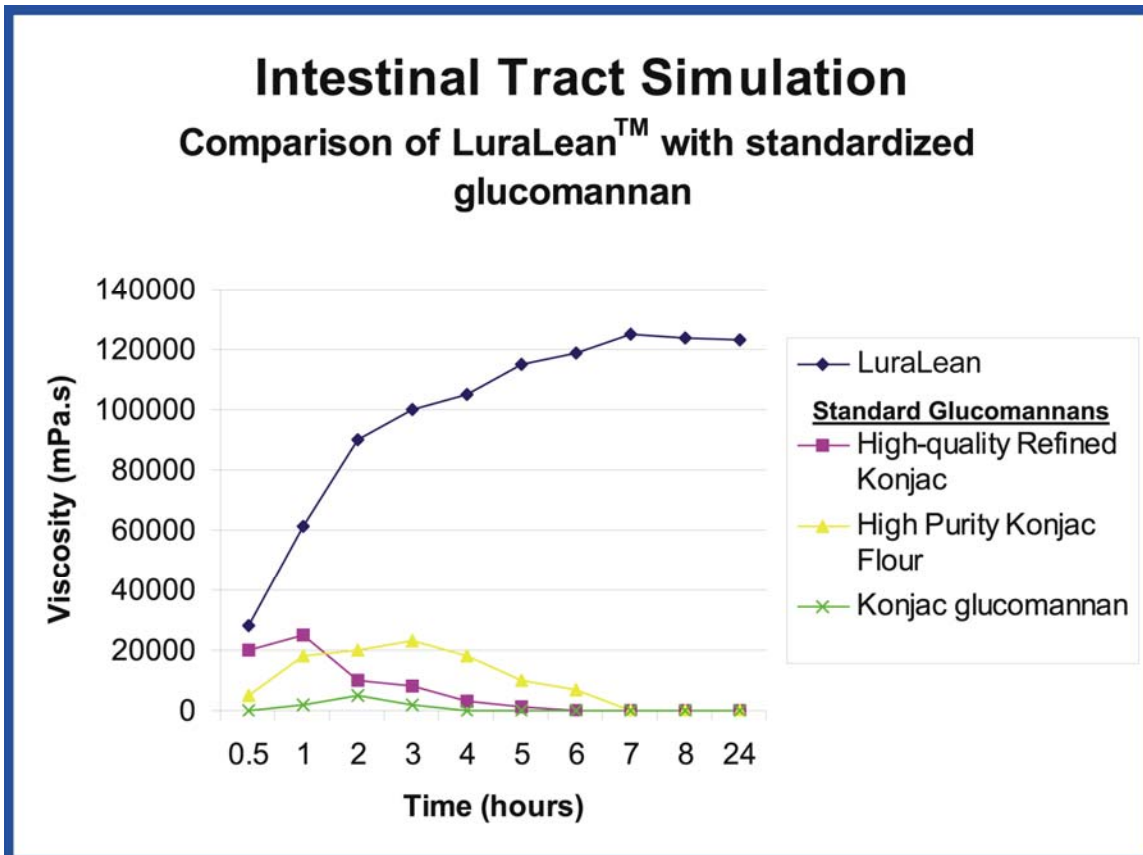
LuraLean is a unique refined glucomannan ingredient from AHD International that promotes healthy weight loss in overweight individuals. When used as a dietary supplement, LuraLean interacts with liquid in the stomach to swell to nearly 200 times its original size. Once expanded in the system, LuraLean promotes a feeling of satiety while traveling through the gastrointestinal tract, causing individuals to eat less. Additionally, LuraLean acts as a magnet, attracting and binding excess oils and calories and carrying them out of the system through normal digestion.

Additionally, LuraLean can help regulate cholesterol levels already in normal range, and along with a restricted diet, has been shown to improve glycemic control, serum lipids and promote healthy blood pressure in people with blood glucose, cholesterol and blood pressure issues. LuraLean can also help promote regularity.

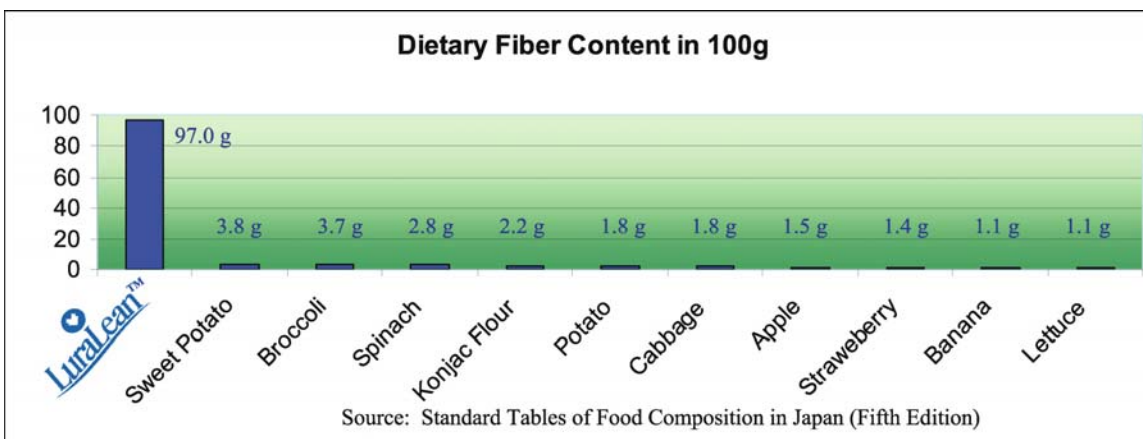
The grade of LuraLean specifically for use in beverage applications, LuraLean Phoenix, is completely soluble and flavorless, and only achieves full viscosity upon reaching the stomach and interacting with digestive enzymes. It then expands to nearly 10 times its original size to promote a feeling of satiety while traveling through the gastrointestinal tract. Due to the fact that full viscosity is achieved only after reaching the stomach, beverage manufacturers can use LuraLean Phoenix in both high and low viscosity applications including waters, juices and smoothies.

LuraLean is manufactured via a proprietary process that delivers a condensed, soluble fiber end material with a higher molecular weight and viscosity than other fibers. During this proprietary manufacturing process, all impurities including enzymes such as mannanase are removed. Mannanase remains in other glucomannan ingredients during conventional processing and when the material is exposed to high moisture and temperature, which can occur even during storage, it begins to break down. The breakdown process continues when the ingredient reaches the stomach, further limiting its efficacy.

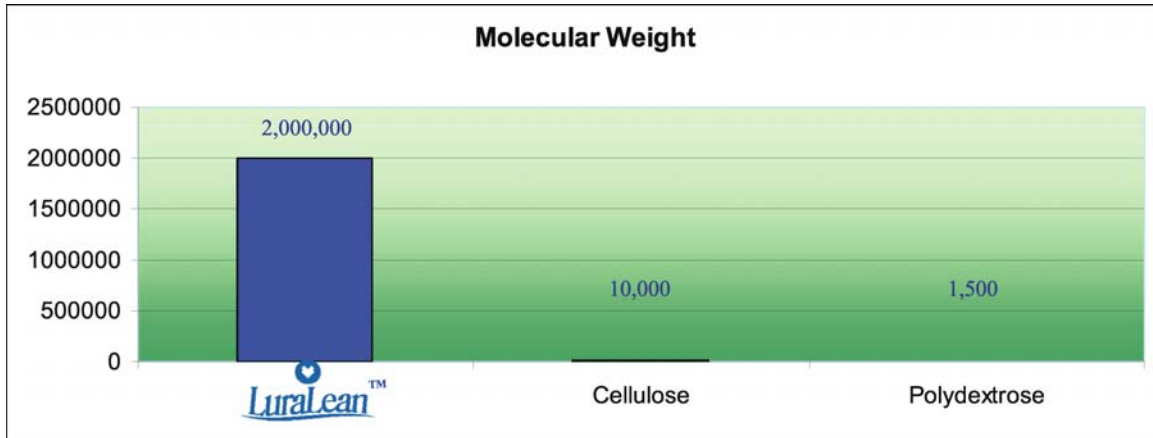
Because all impurities are removed from LuraLean, it has the unique ability to keep its viscosity while passing through the stomach and intestines, where other fibers fall apart. During testing which simulated conditions in the stomach and intestinal tract, LuraLean retained its viscosity for more than 24 hours. As illustrated in the following graph, other glucomannan ingredients showed significant breakdown after three hours.



LuraLean also has an extremely high fiber content compared to foods and other fiber ingredient offerings currently on the market. Every 100 grams of LuraLean contains 97 grams of pure fiber. Since fiber cannot be digested or absorbed by the body, LuraLean is passed through the system almost completely, carrying out excess calories and fats. The following chart compares the amount of fiber in 100 grams of LuraLean to 100 grams of other foods known for their high-fiber content:



LuraLean's larger molecular size suggests that higher levels of fiber are condensed into a single particle, making it more efficacious than other forms of fiber.



In all research conducted on LuraLean, results show that it is completely safe for human consumption. The 14 safety studies conducted included dose-response, toxicity, acute toxicity and F1 in-utero exposure.

LuraLean is derived from the *Amorphophallus Propol konjac* root, a plant native to only to Japan. AHD International’s LuraLean is produced in Japan. Although glucomannan ingredients are available from other ingredient suppliers, they are generally sourced from China, and not supported by any clinical research proving safety and efficacy. This 100 percent natural, plant-based ingredient is patented in 33 countries and has been approved for use in the European Union.

Application

LuraLean is available in several different formulations of varying mesh size, fiber content and viscosity in a 1 percent solution for use in supplements, functional beverages and functional foods.

Mesh Size	Viscosity (1% solution)	Pure Dietary Fiber per 100 g	Application
35 – 120 mesh	100,000 mPa’s minimum small granule	97g minimum	These grades of LuraLean represent the highest-grade refined glucomannan specialized for nutraceutical applications. Viscosity development speed is suppressed for the first 10 – 20 minutes after hydration, which makes them ideal for instant powder beverage applications. Also suitable for meal-replacement bars and bakery applications
35 – 120 mesh	60,000 mPa’s minimum small granule	95g minimum	
35 – 120 mesh	30,000 mPa’s minimum small granule	93g minimum	
35 – 300 mesh	15,000 mPa’s minimum fine	93g minimum	

80 mesh	100 mPa's minimum very fine	93g minimum	Low-molecular refined glucomannan. Excellent source of fiber, without changing the viscosity for finished products
80 mesh		10g minimum	Viscosity-suppressed formula for ready-to-drink smoothies and beverage applications. The original high viscosity is engineered to recover after it gets into the body. Suitable for bottled beverages, meal-replacement drinks and smoothies. Acts as a satiety-suppressant when used prior to meals
100 – 300 mesh	35,000 +/- 3,000 mPa's minimum very fine	95g minimum	Fine mesh powders with smooth mouth feel. In addition to supplement and nutraceutical products, these grades are widely applied for baked goods, meat/poultry, frozen foods and confectionaries. Instantaneously hydrates to form a gel with heat/freeze, pH, salt, sugar stability.
80 mesh	15,000 mPa's minimum very fine	95g minimum	

When used as a supplement for weight loss, AHD recommends manufacturers create an application that allows individuals to take 1.0 gram, three times per day. LuraLean should be consumed approximately one hour before meals along with 200 – 250 ml of liquid for best results.

LuraLean Phoenix, engineered specifically for use in beverage applications, is completely soluble and flavorless, and only achieves full viscosity upon reaching the stomach and interacting with human enzymes. Therefore, beverage manufacturers can use LuraLean in both high and low viscosity applications including waters, juices and smoothies.

LuraLean also has the ability to withstand extreme heat and freezing temperatures, allowing for it to be used in a host of food applications including breads, cookies, soups, meal-replacement bars and ice creams.

The ingredient has GRAS (Generally Recognized As Safe) designation from the FDA and USDA.

Mechanism of Action

LuraLean has the ability to absorb 200 times its weight in water, resulting in a gel formation that has bulk-forming properties. This added bulk in the stomach just before a meal promotes a feeling of satiety while traveling through the gastrointestinal tract, causing individuals to eat less. LuraLean will absorb approximately 100 ml of water (in vitro), greatly increasing the moisture content of the food bolus during digestion. Studies show that the gel forms around the food

particles, causing digestive enzymes to release sugars and fats at a slow rate. Additionally, LuraLean acts as a magnet, attracting and binding excess oils and calories and carrying them out of the system through normal digestion. LuraLean does not bind minerals and vitamins that are necessary for the body to maintain its health. However, some oil-soluble portions of vitamins and minerals may be blocked. It also works to increase stool volume.

LuraLean is free of calories due to the fact that the body cannot assimilate the carbohydrates it contains because the enzymes in the small intestine are unable to transform them into glucose and mannose.

The grade of LuraLean specifically for use in beverage applications only achieves full viscosity upon reaching the stomach and interacting with digestive enzymes. It then expands to nearly 10 times its original size to promote a feeling of satiety while traveling through the gastrointestinal tract.

Proof of Efficacy

More than 60 clinical trials have been conducted using LuraLean specifically that support its ability to:

- Promote weight loss in overweight adults, children and adolescents
- Regulate cholesterol levels already within normal range, as well as improve the cholesterol lipid status in overweight children, adolescents, adults and the elderly
- Suppress rises in glucose concentrations after a meal; LuraLean may also support blood sugar levels already in normal range
- Sate people and promote positive metabolic effects
- Promote regularity and healthy colon function

Below is a review of select clinical studies which includes: name of study; type and number of participating subjects; dose of LuraLean administered; duration of study; journal in which the findings were published or conference where results were presented; and short description of the results that were reported by the organization conducting the research.

“Metabolic Nutritional Effects of Long-term use of Glucomannan in the treatment of Obese Diabetics”

Progress in Obesity Research – 1990

Subjects: 195 obese and non-obese diabetic subjects

Dose: 2.6g LuraLean – 3 times per day for 16 weeks

- Low-viscosity glucomannan merely delays the rise of postprandial glucose concentration. In contrast, high-viscosity (LuraLean) is far more effective in bringing about suppression
- Glucomannan does delay the absorption of glucose

- Glucomannan enhanced the accelerated GI time significantly, did not significantly affect the intestinal flora, and increased the amount of bile acid in the feces
- Mean cholesterol levels reduced in both obese and non-obese. Mean triglyceride levels reduced in obese. Significant reductions in blood glucose and body weight of obese

“Effect of Glucomannan on Obese Patients: A Clinical Study”

International Journal of Obesity – 1984

Subjects: 20 obese women

Dose: 1g LuraLean - 3 times per day for 8 weeks

- Body weight reduction was observed with a mean weight loss of 5.5lbs
- Serum cholesterol reduction and LDL-cholesterol reduction were observed
- Patients felt the full-feeling, and constipation improvement was observed

“Effect of short-term ingestion of konjac glucomannan on serum cholesterol in healthy men”

American Journal of Clinical Nutrition – 1995

Subjects: 63 healthy men (normocholesterolemic or hypercholesterolemic)

Dose: 1.3g LuraLean - 3 times per day for 4 weeks

- The results of this study show that konjac glucomannan is an effective cholesterol-lowering dietary adjunct

“Glucomannan in the Treatment of Overweight Patients with Osteoarthritis”

Current Therapeutic Research – 1989

Subjects: 20 overweight men and women

Dose: 1.5g LuraLean – 2 times per day for 2 months

- Glucomannan produced a statistically significant mean reduction in body weight of 3.7kg and was well tolerated
- Glucomannan appears to be a useful agent for the treatment of overweight patients

“Double-Blind Evaluation of Glucomannan versus Placebo in Postinfarcted Patients after Cardiac Rehabilitation”

Current Therapeutic Research – 1990

Subjects: 28 post-myocardial infarction outpatients

Dose: 1.5g LuraLean – 2 times per day for 2 months

- Glucomannan may be useful for improving daily compliance with general medical and dietetic recommendations in postinfarcted patients
- In our opinion, glucomannan may therefore be useful in the prevention and treatment of arteriosclerotic risk factors

“Efficacy of a normocaloric diet in obesity treatment”

International Journal of Obesity – 1996

Subjects: 30 obese individuals

Dose: 1g LuraLean – 2 times per day

- The caloric restriction is not the only alternative in obesity dietary treatment. Some soluble dietary fibers, in this case glucomannan, are a useful element, not only in the maintenance phase, but also in the reduction

“Effect of Konjac Fibre (Glucomannan) on Glucose and Lipids”

European Journal of Clinical Nutrition – 1995

Subjects: 195 non-insulin-dependent-diabetes-mellitus (NIDDM) patients

Dose: 2.6g LuraLean – 3 times per day for 16 weeks

- High-viscosity glucomannan is effective at suppressing a significant rise of the mean postprandial blood glucose levels
- Glucomannan has no radical-binding metal ions
- Glucomannan supplementation did not affect absorption of iron, magnesium, calcium or zinc, but it may affect the absorption of fat-soluble vitamins when large amounts are taken

“Konjac-Mannan (Glucomannan) Improves Glycemia and Other Associated Risk Factors for Coronary and Heart Disease on Type 2 Diabetes - A randomized controlled metabolic trial”

Diabetes Care – 1999

Subjects: 11 hyperlipidemic and hypertensive type 2 diabetic patients

Dose: 0.7g LuraLean-enriched biscuits 3 times per day with NCEP; Step 2 metabolically controlled diet for 5 weeks; 2-week washout, then placebo (or vice-versa)

- Konjac-mannan fiber added to conventional treatment may ameliorate glycemic control, blood lipid profiles, and sBP in high-risk diabetic individuals, possibly improving the effectiveness of conventional treatment in type 2 diabetes
- The application of konjac-mannan supplementation in the high-risk diabetic study group demonstrated simultaneous improvement in all three diet-modifiable risk factors, indicating a reduction in overall Coronary Heart Disease risk

“Usefulness of Highly Purified Glucomannan Fibers in Childhood Obesity” – 1992

Subjects: 23 obese kids ages 5 – 15 years

Dose: Under 10: 1g LuraLean – 2 times per day for 4 months; Over 10: 1g LuraLean – 3 times per day for 4 months

- The best treatment of childhood obesity was obtained in the subjects that, besides dietary treatment and physical exercise, took the glucomannan based product, which, if accepted and tolerated can function to alter excess weight and dislipidemia

Dosage Form/Delivery Mechanism

For weight loss, 1.0 gram of LuraLean is recommended three times per day. Individuals should take LuraLean approximately one hour before meals along with 200 – 250 ml of liquid for best results. For supplement applications, LuraLean could be used in both tablet and capsules.

A viscosity-suppressed formula is available for ready-to-drink and instant powder beverage applications. The original high-viscosity of LuraLean is engineered to recover only after it gets into the body and interact with human digestive enzymes.

Summary

AHD International believes strongly in the viability of LuraLean across various market segments including supplements, functional foods and functional beverages. The majority of weight management ingredients today have no clinical support to substantiate efficacy. LuraLean provides manufacturers with an ingredient option that is supported by more than 60 clinical trials showing its ability to promote weight loss, support regularity, regulate cholesterol levels already in normal range, improve glycemic control and serum lipids and promote healthy blood pressure in people with blood glucose, cholesterol and blood pressure issues. LuraLean has also been shown to be safe and well tolerated. Because LuraLean is available in several grades, it can be easily used in virtually any type of application, which enables manufacturers to capitalize on consumers' movement toward weight loss foods and beverages.

AHD International

AHD International is a major supplier of the highest quality new-to-market nutraceutical ingredients and functional food products to manufacturers, wholesalers and food companies worldwide. AHD's triple-check system ensures that products are evaluated for natural purity, consistency and exceptional quality.