



***RichLacto™***

*A lactase enzyme for producing easily digestible, sweeter,  
non-crystallizing milk and dairy products,  
& for application as a food supplement*



OUR STRENGTH EVOLVES FROM OUR EXPERIENCE

**Richcore Lifesciences Pvt. Ltd**

Plot No. 204 and 237, Bommasandra - Jigani Link Road, K.I.A.D.B Industrial Area, Bangalore Urban District,  
Karnataka - 562106, INDIA; Phone: +91- 8110 - 419777; Tele-Fax: +91 - 8110 - 416834; Email: [info@richcoreindia.com](mailto:info@richcoreindia.com)

## **RichLacto™**

### **Product Introduction**

RichLacto™, a non-GMO *lactase* enzyme, enables easy digestion of milk and dairy products in people with lactose intolerance. It is estimated that 70% of the world population and 30-50% of Indians are lactose intolerant. Lactose intolerance could result from natural causes in mammals as the ability to digest lactose is genetically programmed to decrease after weaning and also in certain disease conditions. Due to lactose intolerance, people are forced to opt for alternatives to milk in their diet such as Soy milk which is about 5 times more expensive than normal milk or are forced to avoid milk altogether which deprives them of the rich nutrients and calcium present in milk that may cause calcium deficiency resulting in diseases such as hypocalcemia and osteoporosis. RichLacto can be consumed as tablets or liquid drops to aid lactose digestion and to treat milk at home, or applied at an industrial scale to produce lactose-free milk and dairy products. RichCore's RichLacto™ enables you to enjoy the benefits of milk to the core!

### **Symptoms of Lactose Intolerance**

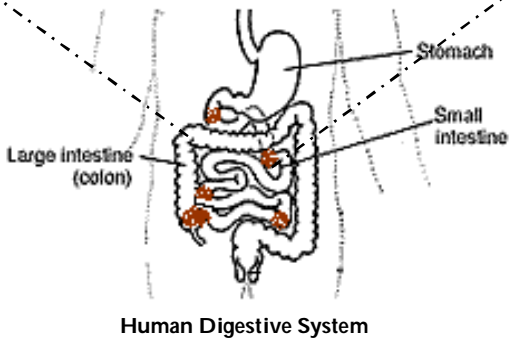
The common symptoms of lactose intolerance are gastrointestinal, primarily, abdominal pain, diarrhea, flatulence (passing gas), and, less commonly, abdominal bloating, abdominal distention, and nausea. The severity of the symptoms varies greatly from person to person. Variability of the symptoms depends on the amount of lactose in a person's diet; the more lactose in the diet, the more likely and severe the symptoms. Variability of the symptoms also depends on the differing severities of lactase deficiency from person to person, that is, a person may have mildly, moderately, or severely reduced amounts of lactase in their intestines. Thus, small amounts of lactose will cause major symptoms in severely lactase deficient people but only mild or no symptoms in mildly lactase deficient people.

### **Quick facts**

- Milk and milk-containing products are the best sources of calcium and vitamin D.
- The ability to digest lactose in mammals is genetically programmed to decrease during the process of weaning as the food intake is diversified.
- 70% of the world population and 30 - 50% of Indian population are lactose intolerant.
- Avoiding milk causes calcium deficiency, which leads to osteoporosis, which is common among the lactose intolerant people. Deficiency of vitamin D is also common among lactose intolerant people and leads to diseases of bones and fractures.
- Lactose crystallization is responsible for the sandiness that develops in ice-creams.

### Lactose Intolerance and the Human Digestion Process

3. The enteric bacteria in the large intestine detect the presence of lactose and switch to *lactose metabolism* that results in the emission of gases (such as methane and nitrogenous gases) causing flatulence, indigestion, stomach cramps and bloating.

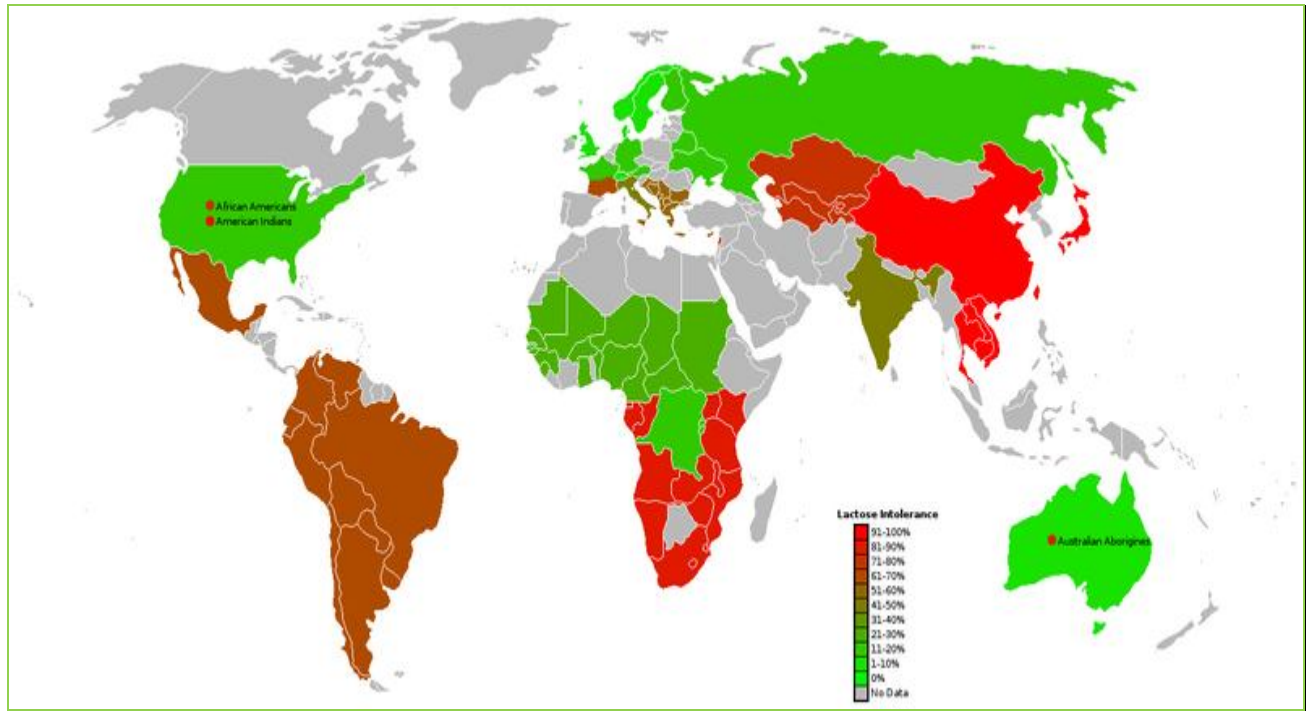


1. Lactose in the food passes into the small intestine through the stomach.  
 2. Depending on the lactose intolerance levels of the person, the lactose is not completely digested and some amount enters the large intestine.

### Diagnosis

Lactose intolerance can be detected with the help of various tests such as Elimination diet, Milk challenge, Breath test, Blood glucose test, Stool acidity test and Intestinal biopsy.

### Global Incidence of Lactose Intolerance



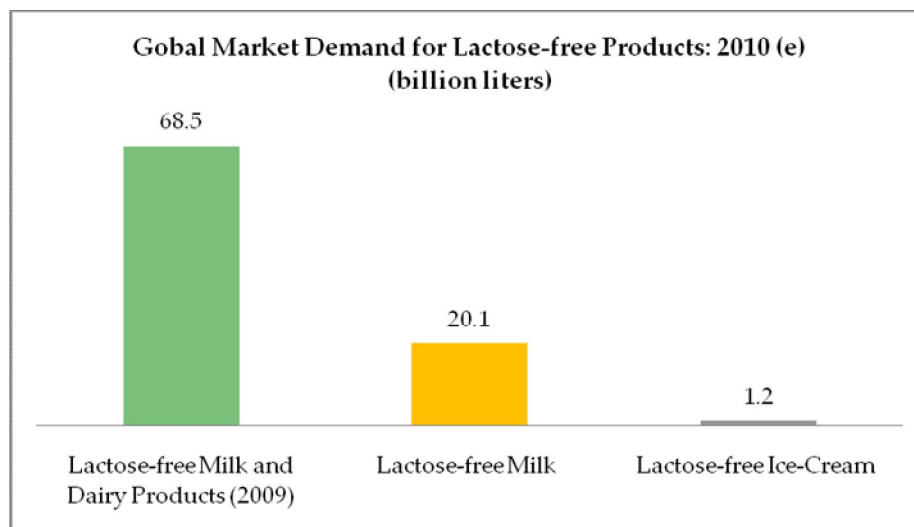
Source: <http://en.wikipedia.org/wiki/File:LacIntol-World2.png>

## **RichLacto™ Advantages**

- ✓ **Lactose free milk and dairy products:** RichLacto™ produces milk and other dairy products that are 'lactose free' bringing a larger population under the umbrella of consumers of dairy products.
- ✓ **Food Supplement:** RichLacto™ enables the easy digestion of lactose when consumed orally and eliminates the ill-effects of lactose indigestion.
- ✓ **Lactose-free milk at home:** RichLacto™ can be added to milk at home itself to produce lactose-free milk.
- ✓ **No more sandiness of ice-creams:** RichLacto™ treated milk, when used for making dairy products like ice-creams, eliminates the possibility of sandiness upon storage.
- ✓ **Increased Sweetness:** RichLacto™ produces glucose and galactose as end products that are 60% sweeter than lactose which makes the milk naturally sweeter. Thus, lesser amounts of sweetener are required to be added.

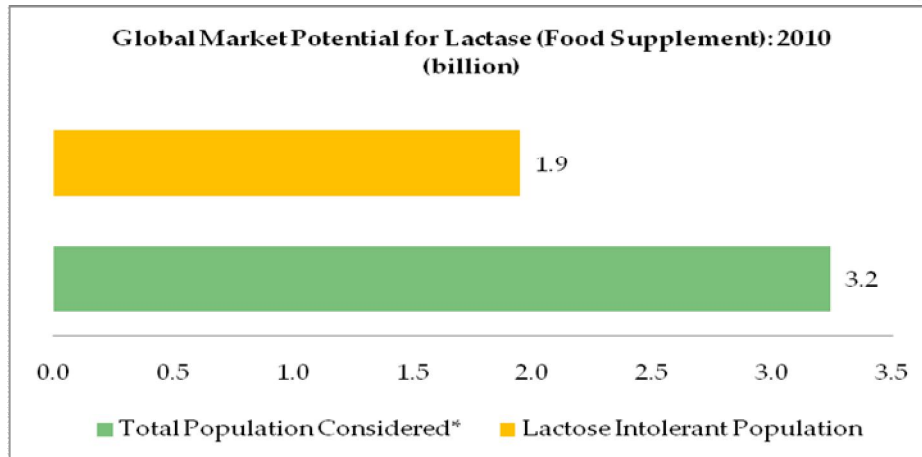
## **Market Snapshot**

### **Market Trends**



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\*Only countries with more than 1 billion lactose intolerant population have been considered

Based on the percentage of lactose intolerant population across the world, the Global market demand for lactose-free milk and liquid dairy products is estimated to be 68.5 billion liters in 2009 and is expected to grow at a CAGR of 2.2% over the next three years. The Global market demand for lactose-free milk alone (excluding Canada, Middle-East, Africa and Russia) is expected to be 20.1 billion liters in 2010. The cumulative market demand for lactose-free ice-cream in countries with market potential more than 8 million liters is expected to be 1.6 billion liters in 2010.

The global market demand for lactase enzyme as a food supplement is estimated to be 1.9 billion (population). Since lactose intolerance is also a genetically programmed condition, there will be a perennial need for lactase as a food supplement.

### **Growth Drivers**

#### **Increasing Awareness**

The demand for lactose free milk and milk products, and consequently the demand for lactase enzyme are being primarily driven by the increasing awareness of people towards the ill-effects of excessive lactose in diet, greater sensitivity to the condition of lactose intolerance and increasing awareness of the benefits of consuming milk and milk products.

#### **Purchasing Power**

In countries like India, where the purchasing power of the middle class is increasing by the day driven by a booming economy, a large segment of people are increasingly becoming health conscious and are focusing on dairy based healthy foods and drinks as well as nutraceuticals.

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### Changing Perceptions

Ice-cream is being increasingly perceived as an 'anytime' product (contrary to the conventional belief that it is seasonal) that is driving the demand for through-out the year production of ice-cream.

### Neutraceuticals

The increasing demand for neutraceuticals as an integral part of health and well-being is driving the demand for newer and specific products like beta-gal.

## Product Safety

RichLacto™ is completely safe since it is produced by culturing naturally occurring yeast and NOT through any Genetic Modification (GM). However, people with *Galactosemia* (a very rare genetic metabolic disorder due to which *galactose* is not metabolized by the person) and *diabetes* should consult their physician before consuming lactose free milk and milk products since the *galactose* and *glucose* content of such products will be higher than normal milk.

## References:

1. The American Journal of Clinical Nutrition, <http://www.ajcn.org/cgi/content/abstract/91/1/140>
2. The American Journal of Clinical Nutrition, <http://www.ajcn.org/cgi/reprint/25/1/114.pdf>
3. The American Journal of Clinical Nutrition, <http://www.ajcn.org/cgi/content/abstract/34/5/943>
4. British Medical Journal, <http://www.bmj.com/cgi/content/abstract/4/5631/611>
5. MedicineNet.com, [http://www.medicinenet.com/lactose\\_intolerance/article.htm#toch](http://www.medicinenet.com/lactose_intolerance/article.htm#toch)
6. Pediatrics (Committee on Nutrition), <http://aappolicy.aappublications.org/cgi/reprint/pediatrics;86/4/643.pdf>

## Sources for graphs:

- <http://www.foodsci.uoquelp.ca/dairyedu/intro.html>
- <http://www.foodsci.uoquelp.ca/dairyedu/icdata.html>
- <http://upload.wikimedia.org/wikipedia/commons/9/9a/LacIntol-World2.png>
- [http://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_population](http://en.wikipedia.org/wiki/List_of_countries_by_population)

## Note:

Since not all lactose intolerant people completely renounce milk and dairy products, while calculating the market potential, it was assumed that the equivalent percentage of lactose intolerant population not consuming any milk or dairy products is equal to 30% of total lactose intolerant population

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