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# Effect of lactose on intestinal calcium absorption in man

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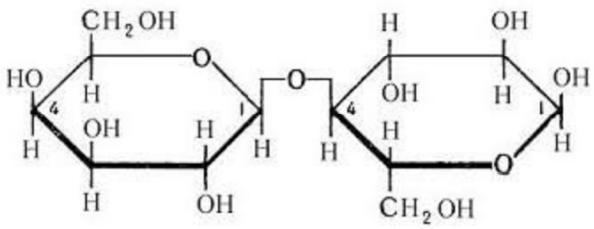
***ABSTRACT:*** Lactose is the type of principal suger naturally found in milk and dairy products. It may composed of two simpler sugers i.e. glucose and galactose, which are used as an energy rich contant for human body. Enzyme lactase plays vital role to break down lactose into glucose and galactose in our body. Although glucose could be found in several types of foods but lactose is the only source of galactose, which has various biological functions and plays major role in neural and immunological processes and also act as a source of absorption of calcium in human body.

***keywards:*** Lactose, carbohydrate, lactase enzyme, calcium absorption, lactose intolerance.

## Introduction

Lactose is basically milk suger. It is the type of disaccharide carbohydrate but can not be broken down in our gut. It needs an enzyme lactase to get the job. Enzyme lactase secreted in the villi of gut break down lactose into two simpler sugers like glucose and galactose. Lactose plays major role in milk synthesis. It is the major osmole in milk and the process of synthesis of lactose is resposible for drawing water into the milk as it is being formed in the mammary epithelial cells of human body. It is also present in processed food like baked food, pan cake mix processed meats and coffee creamers because all these foods are manufactured by the addition of milk. Human milk contain 7.2% of lactose as compared to cow's milk it is 4.7%, which provides about 50% of an infant's energy needs. Lactose is less sweeter than table suger. It occurs naturally in milk and other dairy products. Lactose is a disaccharides or suger molecule consisting of two sugers glucose and galactose.

Lactose is the type of carbohydrate and acts as macronutrients. It is the primary source of energy for our body and act like a fuel to activate our metabolic activities. When our body digest the lactose the suger enter into our cells, where they are metabolized for energy. Lactose and other milk sugers plays important role in the growth of bifidobacteria in the gut and play a lifelong role



in countering the aging associated dacline of some immune functions in human body. In the recent studies, lactose is the source of absorption of calcium, copper and zinc specially at infancy. It is found that if it is not digest in small intestine, it may be used by intestinal microbiota ( the micro organism population that lives in the digestive tract) as a bifidobacteria in the gut and play a life long role in countering the aging associated decline of some immune function in human body.

**Experimental Method**: In animals studies, the increased concentration of glucose and galactose in the small intestine cause of hydrolysis of lactose, which also increase the water concentration in the small intestine, that effect on calcium absorption in intestine. Lactose is responsible for calcium absorption in mammals as compared to other animals but still controversial. In the recent studies, when glucose or galactose was choosen as a control suger, calcium absorption was insignificant ($P > 0.05$) due to lactose as compared to non adsorbable suger it has ($P < 0.05$) in human. The unhydrolysed lactose as a prebiotic support the growth of health

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promoting gut flora and enhance the calcium absorption.

The effect of lactose on intestinal calcium absorption was studied in 12 normal-lactase subjects and 7 lactose-deficient subjects. Calcium absorption was compared by using the double isotope technique with or without the presence of an oral load of 50 g of lactose in each subject. The kinetic parameters were measured by the deconvolution method. In the normal lactase group, the lactose prolonged the duration of absorption at a maximum rate and therefore increased the total fractional calcium absorption from $0.224 \pm 0.039$ to $0.356 \pm 0.076$ ($p < 0.001$). In the lactase-deficient subjects, the lactose decreased the total absorption from $0.255 \pm 0.039$ to $0.209 \pm 0.032$ ($p < 0.005$); this effect resulted in a decrease of the maximum absorption rate. There was no significant difference between the two groups when calcium was ingested alone.

## RESULT

These results indicate that the effect of lactose on calcium absorption is dependent on intestinal lactase activity.The low lactase level cause incomplete digestion of milk and other foods contain lactose. Undigested lactose in the bowel then in subjected to fermentation which causes bloating, gas, constipation, diarrhea and cramping associated with lactose intolerence. In the recent studies the symptoms of lactase enzyme deficiency begin 30 minutes to 2 hours after inject milk or similar dairy products. Symptoms can include feeling of empty stomach with abdominal bloating causes low calcium absorption due to low secretion of lactase enzyme in the small intestine.

## DISCUSSION

The study behind hydrolysed and unhydrolysed lactose give positive approach for enhancement of calcium absorption in mammals. Lactose shown an essential nutrient and good for calcium absorption in the human body. The bacteria in intestinal tract will use the lactose and enhance the growth of microflora in the intestinal tract for a healthy digestive system. Since dairy products are major source of calcium we might assume that people with lactose intolerance could be a risk of calcium deficiency. People who have at least some intestinal lactase can increase their tolerance to lactose for better calcium aborption by gradually introducing dairy products into their diet in stead to avoid.

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