

GLUCONO DELTA LACTONE

Baking and Bakery Products

One of the primary food applications of GDL is in the baking industry. GDL is utilized as a leavening agent and as a preservative.

As a leavening agent, one gram of GDL will completely neutralize 0.472 grams of sodium bicarbonate, liberating 146 mLs of carbon dioxide. Consequently, in most bakery formulations, GDL is used at approximately twice the weight of sodium bicarbonate. The slow hydrolysis of GDL at room temperature and below, and its acceleration with an increase in temperature makes GDL an excellent acid source. Very little acid is formed during dough preparation with the resulting small loss of CO₂ at this stage.



Refrigeration and freezing temperatures adversely affect normal baker's yeast. For this reason, GDL is often the leavening agent of choice for refrigerated or frozen dough products. The leavening action can be further controlled during the baking process by the encapsulation of GDL in a fat matrix that has a selected melting point.

Another problem common to refrigerated dough is a discoloration and darkening of the dough when stored for a period of time. The use of an acidulant such as GDL can help in the prevention of this black spotting or gray discoloration in dough during refrigerated storage.

GDL is a helpful ingredient in preventing undesirable microbial growth in bakery fillings. Salmonellosis and staphylococcal food poisoning outbreaks can occur when filled bakery products are mishandled. Product safety can be assured by controlling temperature, water activity, and pH. In this role GDL can be used to lower the pH and thus retard the growth of microorganisms in bakery fillings and icings. When used in



combination with sugar and salt to control water activity, GDL is extremely useful in adding safe commercial shelf life to filled bakery products.

Refrigerated ready to cook batters can also be preserved by the addition of GDL to achieve a low pH.