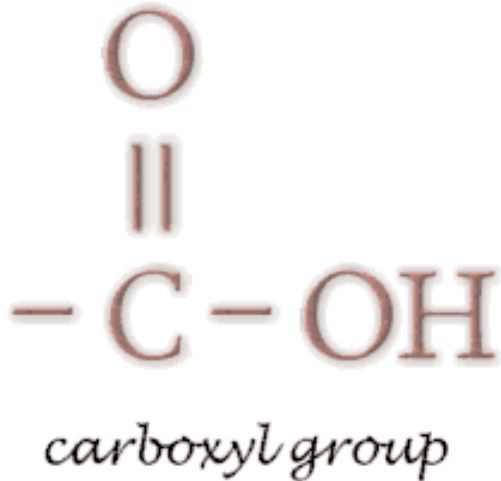


## Take Advantage of the Newest Discoveries Surrounding Carboxyl Group Fatty Acid Preservatives



Although preservatives themselves are as old as recorded history (i.e. starting with ordinary salt), the carboxyl group fatty acids which currently comprise among the most abundantly used food-grade preservatives, particularly in intermediate moisture foods, are of relatively recent development -- (these include benzoic, propionic, and sorbic acids, and their salts).

The use of even the oldest, approved (U.S. FDA) food-grade preservative (benzoic acid -- C6 H5COOH) is of relatively recent development (approved in 1906 for food use). The most popular member of this group in terms of modern day usage, the straight chain, monocarboxylic, trans-trans unsaturated fatty acid, sorbic acid (2,4 hexadienoic --- CH3-CH=CH-CH=CH-COOH) and its salts, was first discovered in 1859, but its preservative properties were not realized until the early 1940's. The

first patent for sorbic acid for use as a fungistatic agent was not awarded until 1945 -- C.M. Gooding and Best foods, Inc. Even the U.S. Environmental Protection Agency [EPA] did not recognize the first registered propionic acid-containing products until the early 1970's. Today propionic acid (CH3CH2COOH) and its salts are ubiquitous within the world of processed foods - particularly baked goods.)

Despite their ubiquitous usage, particularly in food and beverage applications, it was not until the 1990's that new patents began appearing that employed carboxyl group preservatives in various solutions that overcame inherent instability issues (i.e. sorbates, in particular, are quite unstable in aqueous solutions and degrade by first order reaction kinetics), extended their properties well beyond anti-microbial uses, and set the stage for more widespread applications.

Our goal at **Natura Scio** is to find applications that fit your preservation challenges and make that solution cost effective.

### GLO 1000

**GLO 1000** is an anti-microbial and organoleptic stabilizer, designed to work with a wide variety of foods and beverages. It is particularly effective in the IM (intermediate moisture) mode of 15 to 50% moisture where unwanted bacteria, mold, and yeast work to degrade shelf-life and product quality. Made from all-natural ingredients (i.e. can be freely found in nature), all GRAS-approved by U.S.



FDA standards, **GLO 1000** works by providing a "surfactantized" structure in the end product's watery substrate -- the only place that organisms can use to live and breed. This re-structured water allows the carboxyl-based preservatives to work much better, so that less product is used to accomplish the same end result.

### GLO 1000: FAQ

#### How do you apply GLO 1000?

In the case of baked goods, GLO 1000 is added directly into the slurry during the mixing process. (By the way, GLO 1000 works amazingly well on all "sweet goods." For breads, a post-baking spray on the surface is required, otherwise GLO 1000 will interfere with the yeast needed for leavening). In applications where there is no homogenous slurry or batter prior to processing (i.e. baking, frying, extruding, etc.), a surface-coating will work just fine. One customer uses GLO 1000 in a flavor "syrup base" that is poured into a revolving enrobbing pan containing the solid substrate. The syrup, which contains the flavors that gives the product its flavor, doesn't penetrate the entire substrate, just the surface. But this technique helps protect the product from mold better than any other known product or method used to date.

#### How much do you use?

As little as 1% or as much as 3%. There are a variety of factors which determine the optimal usage level: the A(w) level of the target product (i.e. the higher the free to bound water ratio, the more product needed), the level of solutes (i.e. higher percentages of solutes, including sugar and salt, should depress the percentage needed), pH (i.e. relatively speaking, more acidity will decrease usage percentage).

#### How do you store GLO 1000 and does IT have a shelf-life?

The best way to store GLO 1000 is in a cool, dry place. For best results, GLO 1000 itself should be used within three months after your receipt from Natura Scio or our distributor.