VERSÈNECTM CA Food-Grade EDTA
Pickled Products

Improving the Quality of Pickled Products with VERSÈNE™ CA Food-Grade EDTA

Metal ions can dramatically affect the quality of pickled products such as pickled cucumbers and pickled cabbage (kraut). Left uncontrolled, these ions can promote discoloration, off-flavors and off-odors, reducing overall quality and customer appeal.

Why Metals are a Problem
Significant amounts of trace metal ions such as iron and copper are found naturally in produce. These metal ions are strong catalysts for lipid oxidation and degradation reactions which cause off-flavors, off-odors, and discoloration in the product.

Based on samples tested by the METAL SIGNATURE† analytical service, a typical metal ion concentration of pickles is:

- Iron 2.5 ppm
- Copper 0.5 ppm
- Zinc 0.4 ppm
- Manganese 0.6 ppm
- Calcium 400 ppm
- Manganese 50 ppm

How VERSÈNE CA Food-Grade EDTA Can Help
VERSÈNE CA food-grade EDTA (ethylenediaminetetraacetate) preferentially binds with free iron, copper, and other trace metal ions—as well as metals in a number of naturally occurring enzymes—to form stable ring structures. The chelated metals cannot react and cause product degradation, so quality is maintained and shelf life is extended.

Addition to Fermentation Brines
VERSÈNE CA food-grade EDTA may be added during the fermentation process or to the packaging brines. Since off-flavors and aromas may be developed anywhere in the processing of pickles, the earlier the VERSÈNE CA is added, the greater the protection from degradation. Thus, the best time to add chelant is prior to fermentation.

Studies1 indicate that adding VERSÈNE CA food-grade EDTA during fermentation offers the advantages of reduced flavor oxidation and reduced bleaching of pickle pigmentation. Studies have also shown that VERSÈNE CA, added at 110 ppm prior to fermentation, has little to no effect on the rate or degree of pickle fermentation.

Addition to Packaging Brine
Studies1 of processed whole dills, whole sweets, and hamburger dill slices showed that lipid oxidation was significantly reduced with the addition of VERSÈNE CA food-grade EDTA. Much less change to flavor, aroma, and color were noted in pickles treated with VERSÈNE CA, especially when exposed to light. Even in the most sensitive products, differences in flavor and odor were delayed.

Addition to Fresh Pack Refrigerator Pickles
Studies of fresh, refrigerated products have shown that 110-150 ppm of VERSÈNE CA food-grade EDTA may extend the shelf life from 90 to 120 days based on taste and aroma. Hindrance of curing in these types of products has shown inconsistent results.

VERSÈNE Food-Grade EDTA Products
VERSÈNE CA food-grade EDTA offers excellent processing flexibility. It’s a white crystalline powder which dissolves readily in water. VERSÈNE CA is essentially odorless, colorless, and tasteless at recommended use levels. And it’s Kosher-certified. Table 1 (on page 2) shows the typical properties for this product.

FDA Status
VERSÈNE CA food-grade EDTA is cleared by the FDA for use in pickled cucumbers and pickled cabbage at levels up to 220 ppm in the finished product under FDA Food Additive Regulation 21 CFR 172.120.

New applications require that a petition be filed with the FDA. If you are interested in developing an application for EDTA in food, our Technical Service and Development team for VERSÈNE products will assist you in your development work and can help you petition the FDA.

†Service mark of The Dow Chemical Company
1Studies conducted by Dr. R. Buescher at the University of Arkansas
Dow Service to the Pickle Industry

Often, a portion of the fermentation brines is recycled. This portion of VERSENE CA food-grade EDTA, which is recycled in brine, retains its activity season after season. Dow can analyze for this remaining VERSENE CA in the brine as a service to customers and make a recommendation on the proper amount of chelant make-up each year.

For Formulation and Other Assistance, Contact Dow

Dow food application specialists can help you troubleshoot food problems and provide formulation suggestions. The PIMIC® computer modeling service helps us identify the best metals control measures you can take. We use specific data about your system to predict and optimize the behavior of different chelating agents in your food system.

To learn more about VERSENE CA food-grade EDTA and how you can take advantage of our valuable support services, contact Dow at the numbers below. We’ll be happy to answer your questions, provide additional literature, and send a sample of VERSENE CA for your evaluation.

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Table 1: Typical Properties of VERSENE CA

<table>
<thead>
<tr>
<th>Product</th>
<th>VERSENE CA CaNa₂EDTA•2H₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition</td>
<td>Calcium chelate of disodium ethylenediamine-tetraacetate, dihydrate</td>
</tr>
<tr>
<td>Minimum Active Ingredients</td>
<td>Food Chemicals Codex (FCC)</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>410</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>40 lb./ft.³</td>
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<tr>
<td>pH, 1% Solution</td>
<td>6.5-7.5</td>
</tr>
</tbody>
</table>

The data provided for these properties are typical values, intended only as guides, and should not be construed as sales specifications.

Meets all requirements for the Food Chemicals Codex (FCC) and the Joint FAO/WHO Expert Committee on Food Additives (JECFA).

www.versene.com

For more information, contact us at your convenience:

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