

NATAMAX Salt

A NATURAL ANTIMYCOTIC PRODUCED BY FERMENTATION

NataMAX is produced by fermentation using a non-genetically modified strain of *Streptomyces natalensis*. It is supplied as a powder containing 50% active natamycin.

Benefits

- NataMAX is effective against a broad list of mold, fungi, and yeast strains, improving both aesthetic appearance and shelf life of food products.
- NataMAX reduces the risk of fungal mycotoxin production.
- NataMAX will not effect the appearance, flavor, aroma, or color of food products.
- NataMAX has no effect on desirable culture activity in fermented products or on bacteria.
- NataMAX use does not result in targeted organisms developing resistance.
- NataMAX is more effective than chemical preservatives in much lower doses.

Characteristics

Assay: 56.1% (dry solids basis)

Form: Cream colored powder

Solubility: Low solubility in water and most organic solvents

Diluent: Salt

Stability: Susceptible to natural hydrolysis, oxidation, and ultraviolet light.

Applications

NataMAX works in many different food and beverage systems to prevent mold and yeast growth. Dose rates are typically in the 10 ppm range and are much lower than sorbate and other alternative treatments. Actual dose rates will vary based on the type of food to be protected and the anticipated microbial load.

Major applications include:

- Cheese

Surfaces of cuts and slices of cheese, where the standards for such cheese provides for such ingredients, can be treated with NataMAX to inhibit spoilage due to mold. Treatment typically can be applied as a dry mix, a liquid dip or spray, or in emulsion coatings.

Dry mix treatment should be dosed to result in no more than 20 parts per million of NataMAX in the finished product. Dips and sprays are typically formulated to contain 200 to 300 parts per million NataMAX. Dipping solutions must be mixed continuously as the low water solubility of natamycin results in a tendency for the active ingredient to precipitate out.

- **Sausage and Meat Products**

Sausage and meats can also be treated with dip and spray solutions. Solution concentrations of 4,000 ppm of NataMAX can be used to target surface concentrations of 8 µg per square centimeter.

- **Beverages**

NataMAX offers an attractive alternative to sulfur dioxide and sorbate for use in fruit juice and wine. In acidic conditions of pH 4.5 and below, natamycin will decompose over a period of 1 to 2 weeks, depending on temperature. Exposure of product to fresh contamination can result in spoilage. Dose rates are typically 10 ppm.

Effects on Temperature

NataMAX solutions are stable at ambient temperatures for periods of up to 24 hours. Natamycin is susceptible to hydrolysis of the ring structure so stability is affected with solution storage times over 24 hours and temperatures over 50°C.

Effect of pH

The optimal activity of NataMAX is between pH 5 and 7. Effectiveness is slightly diminished between pH 3 and 5.

Effect of Light

Powder and liquid solutions of NataMAX are susceptible to deterioration due to exposure to ultraviolet light and should be protected from direct sunlight.

Regulatory Status

Food processors have used natamycin in Europe for decades. A recent European Union directive authorizes EU member states to create local laws allowing the use of natamycin in cheese. As the regulatory status of natamycin varies from country to country the user is encouraged to seek information from local authorities regarding local regulations. Danisco Inc. makes no recommendation for and assumes no liability for unauthorized use. The FDA has approved Natamycin for use on cuts and slices of specified cheese according to 21 CFR 172.155

Spray Applications for Cheese Shreds

A NataMAX suspension should be prepared by mixing NataMAX with water at a ratio of 10 grams of NataMAX to 4 liters of water (0.25%). The NataMAX solution should be pumped under pressure to spray nozzles.

Shred the cheese and convey to a revolving tumbler. Apply the anti-caking agent to the shreds before the tumbler or in the front half of the tumbler. The spray nozzles should be extended into the back half of the tumbler. The spray nozzles must be designed to deliver a fine mist of NataMAX solution to uniformly cover all cheese surfaces. NataMAX is insoluble in water and must be agitated or continually recirculated to avoid settling. The application rate should be approximately 6 per ton of cheese to achieve 3-10 ppm NataMAX on the shreds. It is desirable to have a solenoid valve regulating the NataMAX spray in production to prevent waste and over wetting of product and equipment during down times.

Spray Application for Barrel Cheese

NataMAX can be applied to barrel cheese by spraying a fine mist of suspension onto the exposed cheese surface. A suspension of 0.25% NataMAX in water is recommended. The solution is sprayed to effectively coat all the exposed cheese surfaces resulting in a targeted 4-10 ppm level NataMAX. It is important to uniformly apply the spray under agitation to prevent settling of the insoluble NataMAX. Samples of the top one-inch of treated product can be submitted periodically to ensure optimum performance.

Brine Treatment

Treat the existing brine to destroy any current yeast and mold growth. Suspend NataMAX at 25 ppm in the brine (0.05 g/liter, 0.19 g/gallon). NataMAX level must be maintained by effectively dosing 12 g NataMAX per metric ton of cheese treated. The suspended NataMAX should be continuously circulated to prevent settling. Samples of brine and treated cheese can be submitted regularly for NataMAX level testing to determine optimum level maintenance. The brine should be fully pasteurized a minimum of once a year. Sanitizers like chlorine or hydrogen peroxide can degrade NataMAX activity.

Dipping

NataMAX suspensions should be prepared by mixing NataMAX with water at 10 grams of NataMAX to 4 liters of water (0.25%). This level should be doubled for blue cheese wheel dips due to the high concentration of mold. The NataMAX is applied by dipping the cheese slurry for several seconds. The suspended NataMAX should be continuously agitated to prevent settling.

The NataMAX concentration must be maintained in the dipping solution as more is absorbed onto cheese surfaces. A typical range of addition is 10-20 grams of NataMAX per 1000 lb. Of cheese treated. This rate will vary depending on cheese type, surface area, treatment time and other factors. Monitoring of the NataMAX level is recommended to ensure optimum performance.