

# NISINA® NISINZ®

## IN SOFT CHEESE INDUSTRY



### KEY BENEFITS

- Growth Control of Gram + Bacteria
- Shelf-Life Extension
- No Organoleptic Impact
- Renewable and Non-GMO Source
- Worldwide Approval in Cheese
- Natural, Consumer Label-Friendly

|                       | NisinA®              | NisinZ®              |
|-----------------------|----------------------|----------------------|
| Code                  | 0301                 | 0302                 |
| Registration Number   | E234 / CAS:1414-45-5 | E234/CAS:137061-46-2 |
| Organoleptic impact   | No Impact            | No Impact            |
| Source                | Non-GMO, renewable   | Non-GMO, renewable   |
| Thermal Stability     | Up to 121°C          | Up to 121°C          |
| Applicable pH         | 2.5 - 6.5            | 2.5 - 6.5            |
| Recommended dosage    | 25-500 (mg/kg)       | 25-500 (mg/kg)       |
| Packing Size          | 0.5KG, 5KG, 20KG     | 0.5KG, 5KG, 20KG     |
| Appearance            | Grey White Powder    | Grey White Powder    |
| Concentration (w/w)   | ≥ 2.5% NisinA        | ≥ 2.5% NisinZ        |
| Sodium Chloride (w/w) | ≥ 75%                | ≥ 75%                |

### VEGETAL GRAM+ BACTERIA INHIBITOR

Cheese is a highly perishable product and has a short shelf-life even at refrigerated temperatures. Soft, white, and fresh cheeses present a high moisture content, the pH fall between 5.4 - 6.0, and they often go through the least processing procedures before packaging. Their intrinsic factors usually favor the growth of *Clostridium* and *Bacillus* species, which leads to cheese blowing, off-odor, and liquefaction. Alongside, *L. monocytogenes* and pathogens also pose a threat to such products with their ability to survive and grow at chilled temperatures.

Handary SA Nisin has been accepted as a food antimicrobial of natural origin and it is acknowledged as label-friendly. Both, NisinA and NisinZ, are used as a high-effective Gram-positive inhibitor in a variety of acidic food and beverages.

Nisin inhibits undesired microorganisms, including lactic acid bacteria, helping to extend shelf-life and preserve food quality. It has also been used as a primary intervention to inhibit the growth of pathogenic food microorganisms such as *Listeria*, *Staphylococcus* and *Mycobacterium*, and the spore-forming bacteria, *Bacillus*, and *Clostridium*, increasing the food safety.

### OUR BRANDS

**NISINA**  
Vegetal Nisin A



**NISINZ**  
Vegetal Nisin Z



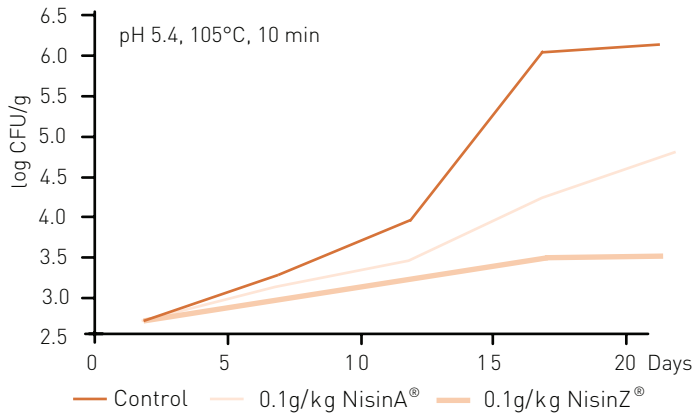
# CASE STUDIES

Nisin is known for its efficiency against many heat-resistant bacteria and has been widely accepted as a food preservative to maintain or even extend the shelf-life of heat-treated foods contributing to their safety and microbial stability.

## Processed Cheese

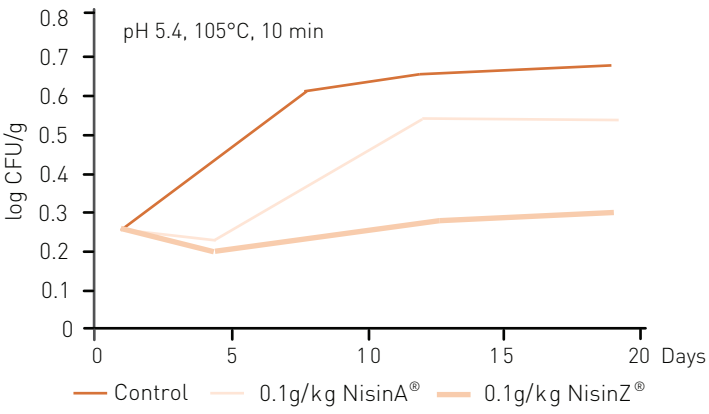
Processed cheeses are susceptible to *Bacillus* spp. and “late blowing” caused by *Clostridia* spp. The following graphs show that both NisinA® and NisinZ® are active against all heat-resistance spores when added into processed cheese. At the same dosage, NisinZ® is more efficient than NisinA®.

### Clostridia



Effect of NisinZ® and NisinA® to control the growth of *Clostridia* in processed cheese.

### Bacillus

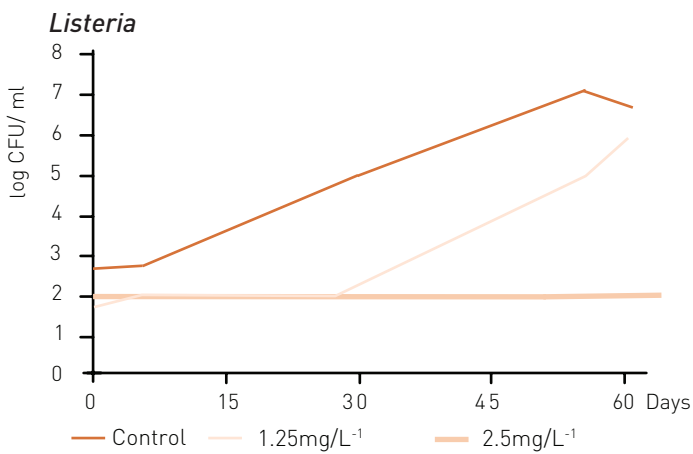


Effect of NisinZ® and NisinA® against heat-resistant spores especially *Bacillus* in processed cheese.

## Soft Cheese

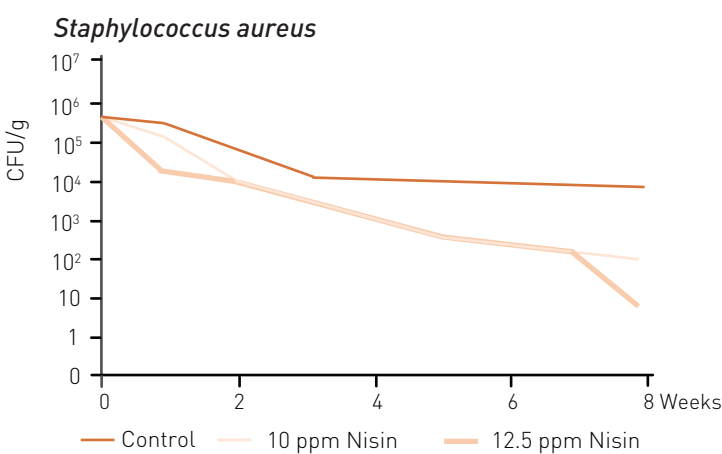
The physicochemical characteristics of soft cheese increase the potential risk of pathogenic bacteria, including *Listeria monocytogenes* and *Staphylococcus aureus*. The graph displayed below shows a specific dosage of 2.5 mg/L of Nisin helps with the complete control of *Listeria* in ricotta cheese for over two months. Moreover, Nisin can effectively control *S. aureus* growth in Damietta cheese for more than eight weeks.

### Ricotta Cheese



Effect of nisin in ricotta type cheese to control the foodborne pathogen *Listeria monocytogenes* at 6-8°C.

### Damietta Cheese



Effect of Nisin to laboratory manufactured Damietta cheese to reduce coliform and *Staphylococcus aureus* counts during storage period (8 weeks).



APPLICATION GUIDELINE

The following guideline steps will assist you to get the optimum solution by using Handary Nisin products to effectively extend the shelf-life and preserve the food quality of soft cheese.

Nisin powder can either be directly added to the soft cheese process or dissolved into the water before use.

1. Direct Addition to Cheese

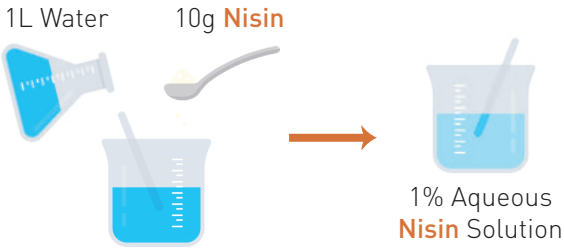
Follow the suggested dosage to apply NisinZ® or NisinA® directly into the cheese process, before the curdling process step.

|                        |       |                              |   |                 |
|------------------------|-------|------------------------------|---|-----------------|
| NisinA®<br><br>NisinZ® | Dairy | Pasteurized Double Cream     | Growth control of Gram + spoilage organisms   | 25-100 (mg/kg)  |
|                        |       | Clotted Cream                | Growth control of <i>Bacillus cereus</i>  | 400 (mg/kg)     |
|                        |       | Rippened Cheese              | Growth control of Gram + bacteria   | 50-250 (mg/kg)  |
|                        |       | Emmental & Cheddar Cheese    | Growth Control of <i>Clostridium sporogenes</i> , <i>C. tyrobutyricum</i> , <i>C. botulinum</i> | 100-250 (mg/kg) |
|                        |       | Pasteurized Processed Cheese | Growth control of <i>Clostridium botulinum</i>  | 100-250 (mg/kg) |
|                        |       | Processed cheese             | Growth control of TPC   | 100-250 (mg/kg) |

2. Nisin Aqueous Solution

To prepare a Nisin aqueous solution of 1% concentration, 10 grams of Nisin needs to be dissolved in 1L water. The dosage guide in the following table displays the exact amount (g) of 1% Nisin aqueous solution to be added to the milk before the curdling process step, to obtain the suggested final Nisin dosage in cheese (mg/kg).

| Final Dosage in cheese (mg/kg) | Nisin Aqueous Solution 1% (g) |
|--------------------------------|-------------------------------|
| 25                             | 2.5                           |
| 100                            | 10                            |
| 500                            | 50                            |



3. Cheese Manufacturing Process

Follow the representative production process flow chart of cheese and the recommended stage of application to get the best efficiency of NisinZ® or NisinA® application.

