NISINA® NISINZ®
IN SOFT CHEESE INDUSTRY

Handary SHELF LIFE®

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 Choride (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

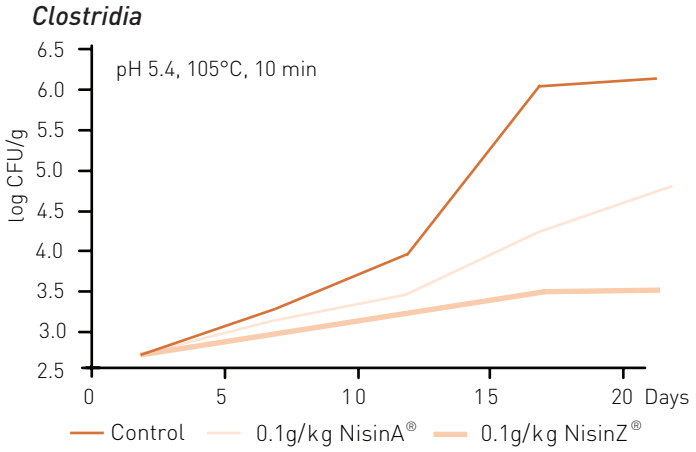
NISINZ
Vegetal Nisin Z

CASE STUDIES

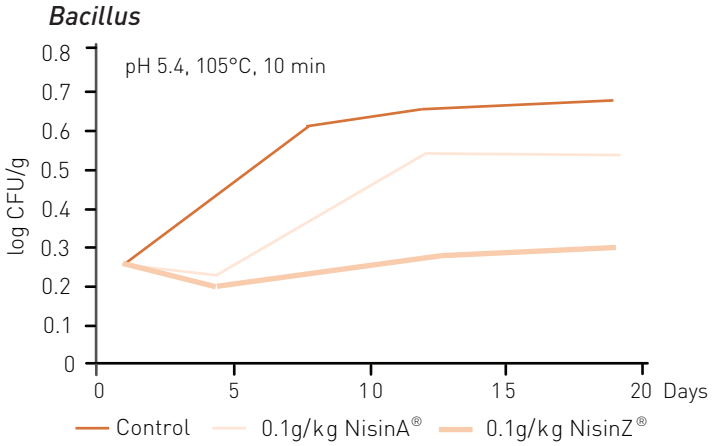
Nisin is known for its efficiency against many heat-resistant bacteria and has been widely accepted as a food preservative to maintain or even extend the shelf-life of heat-treated foods contributing to their safety and microbial stability.

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®.



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

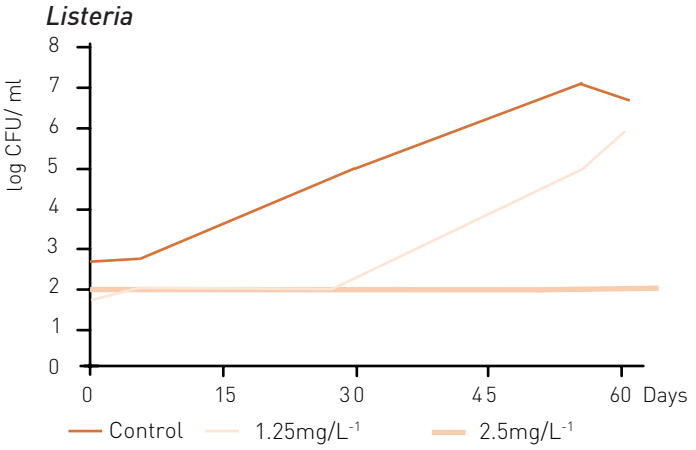


Effect of NisinZ® and NisinA® against heat-resistant spores especially *Bacillus* in processed cheese.

Soft Cheese

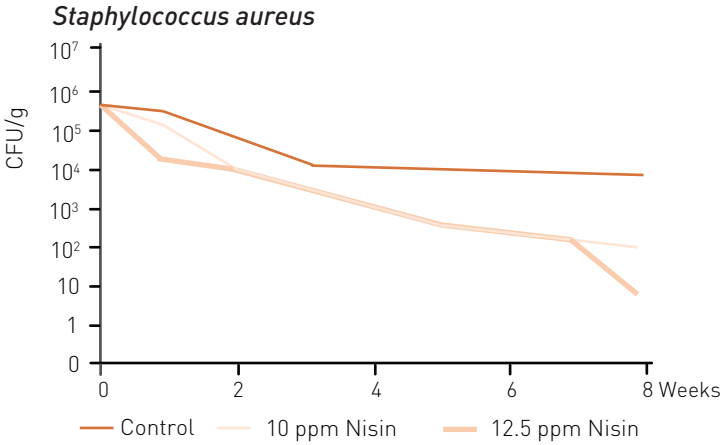
The physicochemical characteristics of soft cheese increase the potential risk of pathogenic bacteria, including *Listeria monocytogenes* and *Staphylococcus aureus*. The graph displayed below shows a specific dosage of 2.5 mg/L of Nisin helps with the complete control of *Listeria* in ricotta cheese 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 GUIDELINES

The following guideline steps will help you achieve the optimal solution using NisinZ to effectively extend the shelf life and preserve the food quality of soft cheese.
Nisin powder can be added directly to the soft cheese manufacturing process or dissolved in water before use.

1. Direct Addition to Cheese

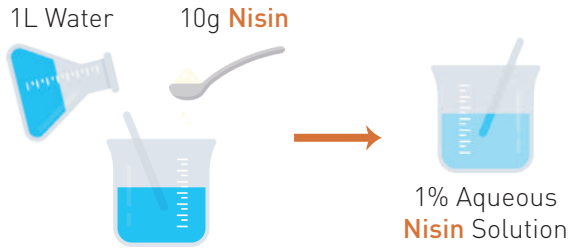
Follow the suggested dosage to apply NisinZ® or NisinA® directly during the cheese manufacturing process, before the curdling step.

NisinA® NisinZ®	Dairy Products	Pasteurized Double Cream	Control of Gram-positive bacteria	25-100 (mg/kg)
		Cultured Creams	Control of Bacillus cereus	400 (mg/kg)
		Ripened cheese	Growth control of Gram-positive bacteria	50-250 (mg/kg)
		Emmental & Cheddar Cheese	Growth Control of *Clostridium sporogenes, C. tyrobutyricum, C. botulinum*	100-250 (mg/kg)
		Pasteurized Processed Cheese	Growth control of *Clostridium botulinum*	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.