Nisin

Nisin is a natural, toxicologically safe, antibacterial food preservative. It is regarded as natural because it is a polypeptide produced by certain strains of the food-grade lactic acid bacterium *Lactococcus lactis* subsp. *Lactis* during fermentation. Nisin exhibits antimicrobial activity towards awide range of **Gram positive bacteria,** and is particularly effective against spore-forming bacteria. It shows no activity against yeasts, and moulds.
In 1969, nisin was approved for use as an antimicrobial in food by the FAO/WHO .Nisin has been given the food additive number 234 and is permitted currently for use in over 50 countries.
There are two kinds of nisin has been used as food additives. They have a similar structure but differ in a single amino acid residue at position 27: Histamine in Nisin A and Asparagine in Niisn Z. You can choose to use them according to the local law.

Our advantage

1. Can be easily dissolved into water.
2. Almost white powder and satisfied smelling.
3. Selecting the Strain from the fermentation products of plant.
4. Produced by non-transgenic strains, it is safety for human consumption.
5. Suitable for vegetarian consumption.
6. Saving the cost for customer.

Stability and solubility

Nisin is an extremely stable product, showing no loss of activity over two years when stored under dry conditions in the dark, below 25°C. Nisin shows increased solubility in an acid environment andbecomes less soluble as the pH increases. However, owing to the low level of Nisin used in food preservation, solubility does not present a problem.

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Technical data sheet of nisin

	Nisin 1000IU/mg	NISIN 10000IU/mg	NISIN 20000IUmg	NISIN 38000IU/mg
Content of nisin : (% w/w)	≥2.5	≥25	≥50	≥95
Strain	*Lactococcus lactis* subsp. *lactis*			
EU NO./ INS NO /CAS NO.	E234/234/1414- 45-5			
Chemical Formula	Nisin Z($C_{141}H_{228}O_{38}N_{41}S_7$, Approximate Formula WT: 3331) Nisin A($C_{143}H_{230}O_{37}N_{42}S_7$, Approximate Formula WT: 3354)			
NaCl (%)	≥50%	> 70	> 50	---------
pH	3.1-3.6	> 3.6	> 3.6	> 3.6
Loss on drying/ (%)	≤3.0			
Total bacterial count (cfu/g)	＜10			
Coliform bacteria	≤30(MPN/100g)			
Salmonella	Not detected in 25g			

Application:

How to mark the nisin?

The activity of pure nisin is about $40x10^3$ IU/mg. The activity of commercial Nisin is 1000IU/ mg. 1ppm means per kg food should add 1mg commercial nisin.25ppm to 500ppm is enough to inhabit the most of **Gram positive bacteria** in varies food.

How to use nisin?

For liquid food, nisin can be solved in liquid food directly.

For solid food, nisin should be solved in aquae sterilisata firstly, and then add the solution to thesolid food and evenly mixed.

The usage of nisin（1000 IU/mg）:

Food	Level (mg/L or mg/kg)	Typical target organisms
Processed cheese	200-600	Clostridium spp. Bacillus spp.
Ricotta cheese	100–200	Listeria monocytogenes
Pasteurised milk	10–400	Clostridium spp Bacillus spp.
Yoghurt	20-50	preventing subsequent over-acidification of the yogurt
Egg products	100-200	B. cereus L. monocytogenes.
Pasteurised soups	100-200	Bacillus spp.
Flour based products	>150	B. cereus
low-acid canned vegetables(pH>4.5)	100-200	B. stearothermophilus C. thermosaccharolyticum
high acid tomato-based products(pH＜4.5)	150-300	C. pasteurianum B. macerans B. coagulans
Meat products(Sausage)	200-400	C. botulinum Lactic acid bacteria *Brochothrix thermosphacta* *Listeria monocytogenes*
Seafoods (vacuum-packed)	1000	C. botulinum L. monocytogenes
Juice	100-150	Alicyclobacillus acidoterrestris
Alcoholic beverages	50-100	Lactobacillus PediococcusLeuconostoc

Tested bacteria	Result (diameter of inhibition)	Result MIC (ug/ml)
Actobacillus bulgaricus	+	*500.0*
Bacillus	++	*400.0*
stearothermophilus	+++	*350.0*
Bacillus subtilis	++	*400.0*
Bacillus coagulans	++	*400.0*
Bacillus cereus	+	*500*
Bacillus thuringiensis	++	*400.0*
Bacillus lichiniformis	+++	*160.0*
Clostridium sporogenes	+++	*250.0*
Clostridium bifermentum	+++	*200.0*
Clostridium botulinum	+++	*350.0*
Clostridium perfringens	+++	*200.0*
Clostridium pasteurianum	++	*400.0*
Clostridium	+++	*200.0*
thermosaccharohyticum	+++	*200.0*
Clostridium tyobutyicum	++	*400.0*
Enterococcus spp.	+	*500.0*
Lactobacillus breuis	++	*400.0*
Lactobacillus bulgaricus	++	*400.0*
Lactobacillus casei	++	*400.0*
Lactobacillus plantarum	++	*400.0*
Leuconostoc	++	*400.0*
mesenteroides	+	*500.0*
Leuconostoc oenos	+	*400.0*
Listeria monocytogenes	++	*400.0*
Lactobacillus buchneri	+++	*200.0*
Micrococcus luteus	+++	*400.0*
Pedococcus acidlactici	+++	*160.0*
Pedococcus damnosus	+++	*350.0*
Pedococcus pentosaceus	+++	*200.0*
Streptococcus agalactia	++	*400.0*
Staphylococcus aureus	++	*400.0*
Streptococcus		
haemolyticus		
Streptococcus pyogenes		
Streptococcus		
thermophilus		

Indicates diameter of inhibition zone <0.8cm;
"+" indicates diameter of inhibition zone 0.8cm ~1.0cm; "+ +" Indicates diameter of inhibition zone 1.0 ~ 1.2cm;"+++" indicates diameter of inhibition zone > 1.2cm

Shelf-life:

24 months

Package:

Inner packing :100g/bottle, 500g/bottle, 1000g/bottle

Outer packing :10 kg/carton ,20kg/carton

Storage conditions:

In an airtight, dry, dark, cool place (0-10℃).

Executive Standard:

E234(Europe and overseas Market)
FCC V(USA Market)
USP(Cosmetic and Pharmaceutical Industry)