

Technical Data Sheet (TDS)

Pure Nisin (Food Grade, Powder)

1. Product Overview

- Product Name: Pure Nisin (Food Grade, Powder)
- English Name: Pure Nisin
- CAS Number: 1414-45-5
- Formula: $C_{143}H_{228}N_{42}O_{39}S_7$ (Nisin A, natural polypeptide)
- Molecular Weight: 3348.0 g/mol
- **Product Characteristics:** Food-grade Pure Nisin is a natural antimicrobial polypeptide produced by the fermentation of *Lactococcus lactis* (a harmless lactic acid bacterium). It is a white to off-white free-flowing powder with high antimicrobial activity (≥ 1000 IU/mg) against gram-positive bacteria (*Staphylococcus aureus*, *Listeria monocytogenes*, *Clostridium botulinum*, etc.). It is acid-stable, heat-sensitive, biodegradable, and has no residual toxicity in food. As a natural food preservative, it can inhibit food spoilage and pathogenic bacteria, extend food shelf life, and reduce the use of chemical preservatives. Compliant with GB 2760-2021, FDA, FAO/WHO and EU food safety standards, it is the most widely used natural antibiotic in the global food industry.

2. Technical Specifications (Complies with GB 1886.234-2016 / FCC / FAO/WHO)

Item	Specification (Food Grade, Powder)
Appearance	White to off-white free-flowing powder, no caking
Assay (Nisin Activity)	≥ 1000 IU/mg
Moisture Content	$\leq 5.0\%$
Ash Content	$\leq 8.0\%$
pH Value (25°C, 1% solution)	3.0-5.0
Heavy Metals (Pb)	≤ 0.5 ppm
Arsenic (As)	≤ 0.1 ppm
Total Bacterial Count	≤ 100 CFU/g
E. coli	Negative
Salmonella	Negative
Staphylococcus aureus	Negative
Particle Size	80-120 mesh (uniform fine powder)
Bulk Density	0.4-0.6 g/cm ³
Water Solubility	Soluble in acidic water (pH 3.0-5.0)
Temperature Stability	Stable at $\leq 85^\circ\text{C}$ (pasteurization), inactivated at $\geq 121^\circ\text{C}$
pH Stability	Stable at pH 2.0-6.0, inactivated at pH >8.0

3. Product Advantages

1. **Natural & Safe:** Fermented from natural lactic acid bacteria, no chemical synthesis; degradable into amino acids in human digestive tract, no residual, no accumulation, no toxic side effects.
2. **Highly Targeted Antimicrobial Activity:** Inhibits most food-borne gram-positive spoilage/pathogenic bacteria (*Listeria*, *Staphylococcus*, *Clostridium*), no effect on beneficial bacteria (lactic acid bacteria) and human intestinal flora.
3. **Synergistic Effect:** Has obvious synergistic antimicrobial effect with acidulants (lactic acid, citric acid), chelating agents (EDTA) and other preservatives (potassium sorbate, sodium benzoate), can reduce the dosage of single preservative.
4. **Wide Application Temperature Range:** Stable under low-temperature pasteurization ($\leq 85^\circ\text{C}$), suitable for most food processing technologies (excluding high-temperature sterilization $\geq 121^\circ\text{C}$ for long time).
5. **Environmentally Friendly:** Fully biodegradable in natural environment and sewage treatment systems; no bioaccumulation, no ecological pollution, meets global environmental protection requirements.

6. **Extend Food Shelf Life:** Effectively inhibits food spoilage bacteria, reduces food microbial contamination, extends the shelf life of dairy, meat, canned food and other foods by 2-5 times.
7. **Compliant with Global Standards:** Certified by FDA GRAS, FAO/WHO ADI, EU and China national food standards; suitable for domestic and export food processing.

4. Application Fields

Food-grade Pure Nisin is a natural antimicrobial preservative (specified application scope and dosage in GB 2760-2021), suitable for **various food processing** to control gram-positive bacterial contamination; not suitable for infant food (0-6 months):

- **Dairy Industry:** Cheese, yogurt, milk beverage, condensed milk, cream; inhibit spoilage bacteria, extend shelf life, no effect on dairy flavor and texture.
- **Meat & Poultry Industry:** Ham, sausage, bacon, cooked meat products, frozen meat; inhibit *Listeria monocytogenes* and *Staphylococcus aureus*, improve food safety.
- **Canned Food Industry:** Canned meat, canned vegetables, canned fruit, canned seafood; inhibit heat-resistant spore-forming bacteria (*Clostridium*), reduce sterilization intensity.
- **Beverage Industry:** Carbonated beverage, fruit juice, sports beverage, wine; inhibit spoilage bacteria, extend shelf life (suitable for acidic beverages pH 2.0-6.0).
- **Bakery & Snack Industry:** Bread, cake, pastry, instant noodles, potato chips; inhibit mold and gram-positive bacteria, prevent food spoilage.
- **Other Food Industry:** Soy sauce, vinegar, pickled food, protein powder, nut products; microbial contamination control and shelf life extension.

5. Usage Methods

Food Type	Recommended Dosage (IU/g / IU/mL)	Function
Cheese/Yogurt/Dairy Beverage	500-2000 IU/g/mL	Inhibit spoilage bacteria, extend shelf life
Cooked Meat/Sausage/Ham	1000-3000 IU/g	Inhibit <i>Listeria</i> / <i>Staphylococcus</i> , food safety control
Canned Food (meat/vegetable)	2000-4000 IU/g	Inhibit spore-forming bacteria, reduce sterilization intensity
Acidic Beverage (juice/carbonated)	500-1500 IU/mL	Inhibit spoilage bacteria, extend shelf life
Bread/Cake/Pastry	500-1000 IU/g	Inhibit mold and gram-positive bacteria
Soy Sauce/Vinegar/Pickled Food	1000-2000 IU/mL	Microbial contamination control

6. Packaging & Storage

- **Small Batch:** 100 g/500 g/1 kg food-grade aluminum foil vacuum bags (household/small-scale food processing)
- **Standard Batch:** 5 kg/10 kg sealed HDPE plastic drums (medium-scale food production)
- **Bulk Batch:** 25 kg/50 kg airtight HDPE plastic drums with aluminum foil inner lining (large-scale food production/export)
- **Custom Packaging:** Available upon request (according to customer's processing and dosage requirements)

7. Safety & Protection

- The product is low-toxic and mild irritant; wear nitrile rubber gloves and chemical protective goggles during handling to avoid dust entering eyes and direct skin contact with large amounts of powder.
- Wear FFP1/FFP2 respirator during bulk handling/powder mixing to prevent inhalation of dust and mild respiratory irritation.
- In case of eye contact: Rinse with plenty of running water for 5-10 minutes; consult a doctor only if irritation persists.
- In case of skin contact: Rinse with water and mild soap for 5 minutes; apply anti-irritant cream if redness/itching occurs.