

Technical Data Sheet (TDS)

- Feed Grade Zinc Sulfate Heptahydrate Issue Date: 26 FEB 2026 | Version: V1.0

1. Product Overview

- **Product Name:** Zinc Sulfate Heptahydrate (Feed Grade)
- **CAS Number:** 14168-73-1 | **Molecular Formula:** $ZnSO_4 \cdot 7H_2O$ | **Molecular Weight:** 287.56 g/mol
- **Chemical Nature:** An inorganic trace mineral salt, also known as "White Vitriol". It is the most common and cost-effective water-soluble form of zinc for animal feed.
- **Core Characteristics:** High water solubility, high zinc content ($\geq 22.5\%$), excellent bioavailability, stable under feed processing conditions, and compliant with global feed safety standards.
- **Core Application:** Essential feed additive for all livestock, poultry and aquatic animals. Zinc is a key component of enzymes, hormones and proteins, playing a critical role in growth, immune function, reproduction and skin/feather health.

2. Technical Specifications (Feed Grade)

Item	Standard Requirement (GB/T 21696)	Test Method
Zinc (Zn) Content	$\geq 22.5\%$	Complexometric Titration
$ZnSO_4 \cdot 7H_2O$ Purity	$\geq 99.0\%$	Complexometric Titration
Appearance	Colorless crystals or white powder	Visual Inspection
pH Value (5% Aqueous)	4.0 - 6.0	Digital pH Meter
Loss on Drying	42.0% - 45.0%	105°C Constant Weight Method
Insoluble Matter in Water	$\leq 0.05\%$	Gravimetric Method
Heavy Metals (as Pb)	≤ 5 ppm	Atomic Absorption Spectrometry (AAS)
Arsenic (As)	≤ 2 ppm	Atomic Fluorescence Spectrometry (AFS)
Iron (Fe)	≤ 50 ppm	UV-Vis Spectrophotometry
Microbiological Limits	Meet GB 13078.1	Plate Count & Detection
Particle Size (Typical)	80-120 mesh (crystalline or powder)	Sieve Analysis

3. Product Advantages (Feed Grade Focus)

1. **Superior Bioavailability:** High water solubility ensures rapid absorption in the animal's small intestine, making it ideal for young animals and animals under stress.
2. **Essential for Growth & Immunity:** Zinc is required for DNA synthesis, cell division and immune cell function. Prevents stunted growth, reduced feed intake and increased susceptibility to disease.
3. **Reproductive Health:** Critical for spermatogenesis in males and ovulation/embryo development in females. Improves litter size and hatchability.
4. **Skin & Feather Condition:** Prevents parakeratosis (thickened skin) in pigs and poor feather quality in poultry. Promotes wound healing.
5. **Cost-Effective:** The most economical water-soluble zinc source, providing excellent value for money in feed formulations.

4. Application & Dosage Guide (Feed Formulation)

4.1 Target Species & Core Benefits

- **Pigs:** Prevents parakeratosis; improves growth rate and feed conversion; enhances boar fertility.
- **Poultry:** Improves egg production and hatchability; prevents skin lesions and poor feathering; boosts immunity against coccidiosis.
- **Aquaculture:** Critical for fish and shrimp growth; prevents cataracts and skin ulcers; improves survival rate.
- **Ruminants:** Enhances wool growth in sheep; improves hoof health and milk production in dairy cows.

4.2 Recommended Inclusion Levels (Zn content, ppm in feed)

Species	Growth/Production Stage	Recommended Zn Level	Corresponding ZSH Dosage
Pigs	Weaners (7-30 kg)	100 - 150	0.044% - 0.066%
Pigs	Growers/Finishers	50 - 80	0.022% - 0.035%
Poultry	Layers/Broilers	60 - 100	0.026% - 0.044%
Aquaculture	Fish/Shrimp	30 - 60	0.013% - 0.026%
<p><i>Note: Adjust dosage based on zinc content of other feed ingredients (e.g., corn, soybean meal) and environmental conditions. Higher levels may be needed during stress or disease outbreaks.</i></p>			

5. Handling & Formulation Guidelines

- Premixing is Essential:** Due to the low dosage required, premix zinc sulfate with a carrier (e.g., corn starch, wheat middlings) at a ratio of 1:50 to 1:200 to create a trace mineral premix before adding to the main feed batch.
- Excellent Compatibility:** Fully compatible with most feed ingredients including amino acids, vitamins (store away from vitamin A to prevent oxidation) and other minerals. **Avoid direct mixing with strong alkaline ingredients** (e.g., sodium bicarbonate) in high concentrations, as this may reduce solubility.
- Processing Stability:** Stable under the high temperatures of feed pelleting and extrusion. No loss of zinc content during standard feed processing.
- Water Solubility:** Ideal for use in liquid feed, drinking water supplementation and wet feed production due to its high solubility.

6. Packaging, Storage & Shelf Life

- Packaging Specifications:**
 - Standard Packaging:** 25 kg moisture-proof PP woven bags or HDPE drums with inner PE liners (sealed to prevent efflorescence).
 - Bulk Packaging:** 500 kg / 1000 kg jumbo bags with inner PE liners (for large feed mills).
 - Sample Packaging:** 100 g / 500 g HDPE plastic bottles (sealed, for quality testing).
- Storage Requirements:**
 - Store in a cool, dry, well-ventilated warehouse; temperature $\leq 25^{\circ}\text{C}$, relative humidity $\leq 60\%$.
 - Keep the package tightly sealed at all times to prevent **efflorescence (loss of water of crystallization)** and caking. Caked product can be crushed and reused without loss of nutritional value.
 - Shelf Life: **36 months (unopened, under specified conditions)**; 12 months after opening (if resealed tightly).
- Transportation Requirements:** Non-hazardous goods. Transport in covered, dry ordinary cargo vehicles. Protect from rain, snow and high humidity to prevent package dampening and product caking.

7. Quality Assurance & Control

- Production Standards:** Produced in a GMP-compliant facility with ISO 9001 (Quality Management) and ISO 22000 (Food Safety) certifications. Using high-purity zinc and sulfuric acid as raw materials.
- Batch Testing:** Every batch undergoes rigorous testing for zinc content, solubility, loss on drying, heavy metals and microbiology. A detailed English COA is provided with each shipment.
- Third-Party Validation:** Accepts testing by international authoritative laboratories (SGS, Intertek) to verify compliance with China, EU and US feed safety standards.
- Technical Support:** A professional nutrition team provides guidance on trace mineral premix formulation, zinc requirement calculation and quality control to help customers optimize feed formulations.