

## Technical Data Sheet (TDS)

- Feed Grade Carotenoids Issue Date: 22 FEB 2026 | Version: V1.0

### 1. Product Overview

- **Product Name:** Carotenoids (Feed Grade)
- **Main CAS No.:** β-Carotene 7235-40-7, Lutein 127-40-2, Zeaxanthin 144-68-3
- **Formula:** Natural composite mixture of carotenoids extracted from marigold, palm oil and microalgae, with food-grade maltodextrin as carrier
- **Total Carotenoids Content:** ≥10.0% (w/w)
- **Core Characteristics:** Natural plant-derived, non-toxic, high pigmentation efficiency, strong antioxidant capacity, good stability (under sealed/lightproof conditions), compliant with global feed safety standards. Dual functions as **natural feed colorant** and **nutritional supplement**.
- **Core Application:** Essential feed additive for poultry (layers, broilers), aquaculture (fish, shrimp, crab), swine and ruminants. Improves egg yolk/meat/shrimp flesh pigmentation, enhances animal antioxidant capacity and immune function, promotes growth and reproductive performance, and improves product commercial value.

### 2. Technical Specifications (Feed Grade)

Item	Standard Requirement	Test Method
Appearance	Red to orange red fine powder, odorless	Visual/Olfactory Inspection
Total Carotenoids Content	≥10.0%	High Performance Liquid Chromatography (HPLC)
β-Carotene Content	≥3.0%	HPLC
Lutein Content	≥2.5%	HPLC
Moisture Content	≤5.0%	Karl Fischer Titration
Ash Content	≤3.0%	Gravimetric Method (550±50°C)
Bulk Density	0.30-0.60 g/cm <sup>3</sup>	Volumetric Method
Heavy Metals (as Pb)	≤5 ppm	Atomic Absorption Spectrometry (AAS)
Arsenic (As)	≤2 ppm	Atomic Fluorescence Spectrometry (AFS)
Cadmium (Cd)	≤1 ppm	AAS
Total Bacterial Count	≤100 CFU/g	Plate Count Method
E. coli	Negative	Microbiological Detection
Salmonella	Negative in 25g	GB 13078.1 Method
Light Stability	Retain ≥80% activity after 30 days of dark storage	HPLC
Heat Stability	Retain ≥75% activity at 80°C for 30 minutes	HPLC

### 3. Product Advantages (Feed Grade Focus)

1. **Natural & Safe:** 100% plant/microalgae-derived, no synthetic pigments or chemical additives, compliant with organic feed standards. Non-toxic, no residues in animal products (meat, eggs, milk).
2. **Dual Function:** Both natural colorant and nutritional supplement. Improves product pigmentation (egg yolk, shrimp flesh, chicken skin) and provides antioxidant nutrients (converts to vitamin A in animals).
3. **High Pigmentation Efficiency:** Strong coloring power, low addition amount, obvious effect. Pigmentation effect is more natural and stable than synthetic colorants, meeting consumer demand for natural animal products.

### 4. Application & Dosage Guide (Feed Formulation)

#### 4.1 Target Species & Core Benefits

- **Layers/Broilers:** Improves egg yolk color (Roche yolk color fan 10-14) and chicken skin/leg pigmentation; enhances immunity, reduces laying rate decline during high temperature stress.
- **Aquaculture (Fish/Shrimp/Crab):** Improves shrimp/crab flesh and fish skin color (e.g., tilapia, salmon); enhances antioxidant capacity, improves survival rate of fry/fingerlings.
- **Swine:** Improves pork color and meat quality (reduces PSE meat); enhances sow reproductive performance and litter vitality.

#### 4.2 Recommended Inclusion Levels (w/w, based on total compound feed)

Species	Growth/Production Stage	Recommended Dosage	Core Effect
Poultry	Layers (Egg production stage)	0.02% - 0.05%	Improve egg yolk pigmentation
Poultry	Broilers (Finisher stage)	0.01% - 0.03%	Improve skin/leg pigmentation
Aquaculture	Shrimp/Crab (Grow-out stage)	0.05% - 0.10%	Improve flesh color and antioxidant capacity
Aquaculture	Freshwater fish (All stages)	0.03% - 0.08%	Improve skin color and survival rate
Swine	Sows (Gestation/Lactation)	0.03% - 0.06%	Enhance reproductive performance
Swine	Finishers (Fattening stage)	0.02% - 0.04%	Improve pork color and meat quality
<i>Note: Adjust dosage according to animal species, production stage, desired pigmentation effect and feed raw material composition. Higher dosage is recommended for high-stress environments.</i>			

#### 5. Handling & Formulation Guidelines

1. **Premixing is Recommended:** Premix carotenoids with a small amount of carrier (e.g., corn starch, wheat middlings) at a ratio of 1:20 to 1:50 to create a premix, then add to the main feed batch for uniform mixing.
2. **Avoid Light and Heat:** Carotenoids are sensitive to light and high temperature. **Add the premix at the cooling stage of feed pelleting ( $\leq 60^{\circ}\text{C}$ )** to minimize activity loss. Avoid direct sunlight during feed production and storage.

#### 6. Packaging, Storage & Shelf Life

- **Standard Packaging:** 1 kg/5 kg aluminum foil composite bags (lightproof, moisture-proof, vacuum sealed); 25 kg HDPE drums with inner aluminum foil bags (for industrial use).
- **Bulk Packaging:** 500 kg/1000 kg jumbo bags with inner lightproof liners (for large feed mills, closed loading/unloading).
- **Sample Packaging:** 50 g/100 g aluminum foil bags (sealed, for quality testing).
- **Custom Packaging:** Available upon request (small bags for premix manufacturers, customized weight).

#### 7. Quality Assurance & Control

1. **Production Standards:** Produced in a GMP-compliant facility with ISO 9001 (Quality Management) and ISO 14001 (Environmental Management) certifications. Using natural plant/microalgae raw materials that comply with feed grade standards; closed extraction and production process to retain active ingredients.
2. **Batch Testing:** Every batch undergoes rigorous testing for total carotenoids content, individual component content, moisture, heavy metals and microbiology. A detailed English COA is provided with each shipment, including activity and stability test data.