

## Technical Data Sheet (TDS)

### - Food Grade L-Isoleucine (73-32-5)

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#### 1. Product Overview

- **Product Name:** L-Isoleucine (Food Grade)
- **CAS Number:** 73-32-5
- **Molecular Formula:** C<sub>6</sub> H<sub>13</sub>NO<sub>2</sub> | **Molecular Weight:** 131.17 g/mol
- **Chemical Classification:** Essential branched-chain amino acid (BCAA), food grade nutrient fortifier
- **Core Characteristics:** High purity (≥98.5%), white crystalline powder, slightly hygroscopic, water-soluble, stable under normal food processing conditions. As an **essential human amino acid** (the body cannot synthesize it), it is a safe food additive compliant with GB, EU, FDA and CAC food safety standards. It participates in human protein synthesis, muscle metabolism and energy supply; non-toxic at recommended application levels, suitable for various food processing industries.

#### 2. Technical Specifications (Food Grade, Compliant with GB 1886.209-2016 & CAC)

Item	Standard Requirement	Test Method
Appearance	White crystalline powder, free-flowing, odorless	Visual & Olfactory Inspection
Assay (L-Isoleucine)	≥98.5%	High Performance Liquid Chromatography (HPLC)
Specific Rotation [α] <sub>20</sub> <sup>D</sup>	+38.0° ~ +41.0° (6 mol/L HCl)	Polarimetry
Moisture Content	≤0.5%	Karl Fischer Titration
pH Value (1% aqueous, 25°C)	5.5~7.0	Digital pH Meter
Residue on Ignition	≤0.1%	Gravimetric Method (600±50°C)
Chloride (as Cl <sup>-</sup> )	≤0.02%	Volumetric Method (AgNO <sub>3</sub> )
Sulfate (as SO <sub>4</sub> <sup>2-</sup> )	≤0.02%	Turbidimetric Method
Heavy Metals (as Pb)	≤5 ppm	Atomic Absorption Spectrometry (AAS)
Arsenic (As)	≤1 ppm	Atomic Fluorescence Spectrometry (AFS)
Cadmium (Cd)	≤0.1 ppm	AAS
Mercury (Hg)	≤0.01 ppm	Cold Vapor Atomic Absorption
Total Bacterial Count	≤100 CFU/g	Plate Count Method
E. coli	Negative	Food Microbial Detection Method
Salmonella	Negative in 25g	Food Microbial Detection Method
Bulk Density	0.75-0.90 g/cm <sup>3</sup>	Volumetric Method
Water Solubility	≥4.0 g/100 mL (25°C)	Visual/Volumetric Method

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

1. **Essential Amino Acid:** A core branched-chain amino acid (BCAA) that the human body cannot synthesize independently; must be supplemented through food, with irreplaceable nutritional value.
2. **High Purity & Food Safety:** ≥98.5% high purity, no harmful impurities, complies with international food safety standards; no toxic side effects at recommended dosages, suitable for all food categories including infant food.
3. **Dual Nutritional Function:** Participates in human protein synthesis and muscle metabolism, and can be directly used as an energy source for skeletal muscle; ideal for sports nutrition food and nutritional fortification food.

#### 4. Application & Dosage Guide (Food Formulation, Compliant with GB 2760)

##### 4.1 Target Food & Core Benefits

- **Nutritional/Health Food:** Balanced amino acid fortification, supplements BCAA, improves product nutritional value; suitable for protein powder, amino acid oral liquid, meal replacement powder.
- **Infant & Child Food:** Essential amino acid supplement, meets the growth and development needs of infants/children; used in milk powder, rice flour, baby cereal.
- **Sports Nutrition Food:** Promotes muscle synthesis and energy supply, relieves muscle fatigue; suitable for sports drinks, protein bars, fitness supplements.
- **Dairy Products:** Fortifies milk, yogurt, cheese with amino acids, improves protein quality and nutritional value; no impact on dairy flavor and texture.

#### 4.2 Recommended Addition Levels (w/w, based on food raw materials)

Food Category	Recommended Dosage	Core Effect
Nutritional/Health Food	1.0~5.0%	Amino acid fortification/BCAA supplement
Infant & Child Food	0.1~0.5%	Essential amino acid supplement for growth
Sports Nutrition Food	2.0~6.0%	Muscle synthesis/energy supply
Dairy Products	0.05~0.2%	Protein quality improvement
Bakery & Cereal	0.02~0.1%	Nutrient fortification
Meat & Aquatic Products	0.03~0.15%	Protein quality improvement
Beverages	0.01~0.05%	Amino acid supplement
<p><i>Note: Adjust dosage based on food type, processing technology and product nutritional requirements; comply with national and international food additive use limits. Higher dosage can be used in special nutritional food according to formula needs.</i></p>		

#### 5. Handling & Formulation Guidelines

1. **Premixing is Recommended:** Premix with food-grade inert carrier (sucrose, maltodextrin, corn starch) at a ratio of 1:10 to 1:20 to create a premix; ensures uniform distribution in food raw materials and prevents hygroscopic caking.
2. **Dry Handling First:** The product is slightly hygroscopic; use dry food-grade equipment/tools for weighing/mixing. Avoid contact with water and air for a long time during processing to prevent caking.

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

- **Small Packaging:** 1 kg/5 kg food-grade moisture-proof aluminum foil bags (for small food factories, laboratory use)
- **Standard Packaging:** 25 kg food-grade moisture-proof HDPE drums with inner PE liners (industrial use, anti-hygroscopic)
- **Bulk Packaging:** 500 kg/1000 kg food-grade jumbo bags with inner PE liners (for large food factories, closed loading/unloading)

#### 7. Quality Assurance & Control

1. **Production Standards:** Produced in a GMP-compliant food-grade production workshop; comply with ISO 9001 (Quality Management) and ISO 22000 (Food Safety Management) system standards. Adopt closed fermentation/crystallization/drying process to ensure high purity, hygiene and no contamination.
2. **Batch Testing:** Every batch of product undergoes rigorous testing for purity, specific rotation, moisture, heavy metals, microbiology and physical-chemical properties; a detailed English COA is provided with each shipment, including solubility and purity test data.