Operation Guidelines for Addition Methods of Quinoa Flakes in Multiple Application Fields

Preface

Quinoa Flakes are internationally recognized deep-processed super grain raw materials. They contain complete high-quality plant protein, nine essential amino acids for human body, dietary fiber, quinoa saponins, polyphenols, as well as trace minerals including calcium, iron and zinc. Featuring **gluten-free**, low GI, strong satiety, easy absorption and antioxidant properties, they meet dietary demands of people with sensitive constitutions.

This guideline covers six core application sectors: food processing, bakery products, dairy products, meal replacement functional food, feed nutrition and daily chemical accessories. Standardized operation systems are established from six dimensions: raw material selection, addition ratio, technological parameters, operational key points, quality control and common problem solutions. It applies to large-scale production of food enterprises, bakery workshop making, nutritional formula research and development and refined commercial processing. Balancing practicality and professionalism, it provides authoritative technical guidance for scientific, compliant and efficient addition of quinoa flakes in multiple fields.

Chapter 1 Basic Raw Material Knowledge and Selection Standards

1. Core Classification and Properties of Quinoa Flakes

Based on processing technology, curing degree and end-use scenarios, mainstream quinoa flakes are divided into four categories: instant quinoa flakes, quick-cook quinoa flakes, original thick quinoa flakes, quinoa crumbs and quinoa powder. Obvious differences exist in processing techniques, nutrient retention, taste and applicable scenarios. Specific specifications are as follows:

- **Instant Quinoa Flakes**

Manufactured via high-temperature steaming and boiling, roller pressing, low-temperature drying and full curing. The flakes are thin, loose and fine without raw grain odor. No secondary heating is required. Edible after brewing in boiling water, hot milk or warm water for 3 to 4 minutes. It tastes soft and smooth with high nutrient dissolution rate. Mainly used for instant consumption scenarios such as brewed meal replacement, yogurt matching, instant drinks, overnight quinoa and ready-to-eat light meals.

- **Quick-cook Quinoa Flakes**

Processed by mild pre-curing, medium-thick roller pressing and constant-temperature drying in semi-cured state. The dietary fiber structure remains intact. It turns tender and tasty after boiling in clean water for 2 to 4 minutes, featuring dense texture and slight chewiness with minimal nutrient loss. Suitable for thermal processing scenes including mixed grain porridge, steamed staple food, instant soup and pre-made dishes.

- **Original Thick Quinoa Flakes**

Directly pressed from whole raw quinoa grains under low temperature without excessive pre-curing procedures. Native nutrients are fully preserved with the highest content of quinoa saponins and active polyphenols. Complete curing takes 6 to 12 minutes of boiling. It delivers full chewiness and rich grain aroma, applicable to high-temperature baked goods such as bread, coarse grain pastries, energy bars and baked meal replacements.

- **Quinoa Crumbs & Quinoa Powder**

Crushed from cured and original quinoa flakes with conventional fineness ranging from 40 to 100 mesh. The powder is even and delicate with excellent dispersibility, solubility and compounding performance, showing prominent natural thickening and bonding effects. Primarily adopted in scenarios demanding high raw material fineness and mixing uniformity, such as bakery flour substitution, sauce thickening, dairy blending and facial mask accessories.

2. Raw Material Quality Standards

- **Sensory Standards**

Uniform off-white, pale yellow or pale cyan white color without black spots, burnt marks or mildew; no rancid, stale or moldy peculiar odor, with faint natural grain fragrance; free of sediment, weeds, insect eggs and other impurities. Intact flakes keep regular shapes, while quinoa powder has no lumps, burnt dry particles or foreign matters.

- **Physical and Chemical Standards**

Moisture content ≤9% to effectively prevent damp agglomeration and oxidative deterioration during long-term storage; crude protein content ≥13%, total dietary fiber content ≥7%; ash content ≤1.8%; gluten not detected, complying with gluten-free food standards and applicable to products for celiac and gluten-sensitive crowds.

- **Safety Standards**

Strictly conform to requirements of **GB 19640 Cereal Products for Brewing**, **GB 2762 National Food Safety Standard - Contaminant Limits in Food** and **GB 2763 National Food Safety Standard - Maximum Pesticide Residue Limits in Food**. No excessive pesticide residues or heavy metals. Microbial indicators including total bacterial count, mold and yeast meet specifications, free of pathogenic microorganisms such as Salmonella and Staphylococcus aureus.

3. General Specifications for Raw Material Pretreatment

- **Screening and Impurity Removal**

Multi-layer vibrating screens are used to remove dust, debris, broken pieces and impurities. Store instant, quick-cook and original thick quinoa flakes separately. Sift quinoa powder through 60-mesh standard sieve to eliminate lumps, and screen ultra-fine powder above 80 mesh separately for standby use as required.

- **Deodorization and Aroma Enhancement (Optional)**

For raw materials with slight astringency and grassy taste, adopt low-temperature baking passivation at 75-95℃ for 4-8 minutes. It effectively eliminates raw flavor, weakens astringency, stimulates grain aroma, inactivates active oxidase and extends shelf life.

- **Crushing and Refining (On-demand)**

For production scenes requiring high fineness such as beverages, sauces, fine bakery and daily chemical accessories, crush original thick and quick-cook quinoa flakes into powder of 40-100 mesh under low temperature, then seal and store away from light.

Chapter 2 Addition Methods in Food Processing (Porridge, Staple Food, Soup)

1. Quinoa Porridge (Instant / Quick-cook / Original Thick Quinoa Flakes)

1.1 Ratio Standard (Calculated based on 1000g finished product)

- Pure Quinoa Porridge: 75g quick-cook quinoa flakes matched with 925g clean water; alternatively replace with milk base formula of 500g pure milk plus 425g water. Seasonings like sugar, salt and wolfberry can be adjusted according to product positioning.
- Compound Mixed Grain Quinoa Porridge: 55g quick-cook quinoa flakes, 35g rice, 15g black rice, 10g millet and 885g clean water. Mixed grains optimize nutritional composition and increase dietary fiber and mineral content, suitable for daily staple food and pre-made instant porridge.

1.2 Technological Procedures

- Pretreatment: Instant and quick-cook quinoa flakes can be directly added without soaking in advance. Original thick quinoa flakes with compact fiber need cold water soaking for 25 minutes to soften dietary fiber, shorten boiling time and reduce coarse taste.
- Boiling Operation: Put instant quinoa flakes into boiling water, simmer on medium-low heat for 1-2 minutes, stir evenly then turn off heat for standing. After adding quick-cook quinoa flakes into boiling water, keep simmering for 2-4 minutes with uniform stirring until flakes turn soft and porridge becomes homogeneous. Simmer

original thick quinoa flakes on low heat for 6-12 minutes till thick, translucent and fully cooked without hard cores.

- Seasoning: Add an appropriate amount of salt, rock sugar, red dates and longans before serving, or mix with fresh fruit dices and nut crumbs to enrich flavor layers.

1.3 Key Points

Stir evenly every 20 to 30 seconds during boiling to avoid bottom burning and agglomeration. Strictly control solid-liquid ratio with ideal consistency of thick and cohesive texture. Add boiling water if too thin, or extend simmering time to thicken over dilute porridge. Prohibit prolonged high-temperature boiling to prevent damage to active nutrients and yellowing turbidity.

2. Quinoa Staple Food (Rice, Mixed Grain Rice)

2.1 Ratio Standard

The optimal commercial and household ratio of quinoa flakes to rice is 1:3 with balanced soft taste and high public acceptance. The maximum proportion shall not exceed 1:1, otherwise the staple food will taste coarse and loose. Quick-cook and original thick quinoa flakes are preferred raw materials.

2.2 Technological Procedures

Wash quinoa flakes and rice thoroughly, soak in cold water for 20 minutes to soften crude fiber. Add water following regular rice cooking proportion, steam in electric rice cooker for 30 minutes, stand for 8-10 minutes after steaming, stir well to blend grain flavors before serving.

2.3 Key Points

This formula effectively replaces refined carbohydrates, lowers overall GI value and increases plant protein and dietary fiber content. It fits fat loss, blood sugar control, fitness and daily healthy diets, and suits gluten-sensitive groups due to gluten-free property.

3. Soup Thickening (Quinoa Crumbs / Quinoa Powder)

3.1 Ratio Standard

Add 2.5%-4% quinoa powder by total weight for light vegetable and mushroom soups. The dosage is controlled at 4%-7% for rich soups such as pumpkin soup, corn soup, western cream soup and low-fat meal replacement soup.

3.2 Technological Procedures

Mix quinoa powder with room-temperature water in small batches while stirring continuously into smooth paste without dry powder or particles. Direct feeding of dry powder is forbidden to avoid caking and precipitation. Slowly pour quinoa paste into fully boiled soup, stir and simmer on medium-low heat for 3-4 minutes until homogeneous thick and smooth texture formed.

3.3 Key Points

Relying on natural thickening property of dietary fiber, quinoa powder can substitute traditional thickeners like starch, cream and butter. It features low fat and calorie without greasy aftertaste and retains original food flavor, ideal for commercial light meals, pre-made soups and low-fat catering with superior nutrition compared with common starch thickeners.

Chapter 3 Addition Methods in Bakery Products (Bread, Biscuits, Energy Bars)

1. Quinoa Bread (Original / Quick-cook Quinoa Flakes)

1.1 Ratio Standard (Calculated based on 500g flour)

Basic formula: 420g high-gluten flour, 80g quinoa flakes accounting for 16% of total weight, maximum safe baking proportion no more than 25%; matched with 5g yeast, 25g white granulated sugar, 3g edible salt, 28g butter and 255g clean water.

1.2 Technological Procedures

- Pretreatment: Soak quinoa flakes in warm water for 8 minutes to soften crude fiber and drain excess water, improving rough texture, crumbing and dry hardness of bread.
- Dough Kneading and Fermentation: Sift and mix flour, yeast, sugar and salt evenly, add water and knead until dough reaches expansion stage. Incorporate softened butter and soaked quinoa flakes, knead to full expansion. Ferment at 25℃ room temperature until doubled in volume, exhaust gas, divide and shape, then conduct secondary fermentation to 1.5 times original size.
- Baking and Shaping: Preheat oven to 175℃, bake raw bread embryos for 22-28 minutes until golden surface and fully cooked interior. Cool naturally and seal for preservation after taking out.

1.3 Key Points

Maximum baking temperature shall not exceed 175℃, as excessive heat causes bitter taste and destroys amino acids and active nutritional structures. Higher quinoa proportion brings stronger chewiness and coarser taste. Raisins, cranberries and nut crumbs can be added to enrich flavor, optimize texture and enhance palatability.

2. Quinoa Biscuits (Quinoa Flakes / Quinoa Powder)

2.1 Ratio Standard (Calculated based on 500g finished product)

Basic formula: 260g low-gluten flour, 140g quinoa flakes; replace with 90g quinoa powder for delicate soft texture. Complemented with 145g butter, 75g white granulated sugar, 1 egg, 1.8g baking soda and a pinch of salt.

2.2 Technological Procedures

- Pretreatment: Select whole quinoa flakes for crisp chewy biscuits, or crush into 60-mesh coarse powder for soft delicate products for standby.
- Material Mixing: Soften butter at room temperature, beat with sugar until fluffy milky white. Add egg liquid in two portions and stir thoroughly without granules. Sift blended low-gluten flour, baking soda and quinoa materials, pour into butter egg mixture and knead into smooth even dough. Refrigerate and stand for 25 minutes for shaping and relaxation.
- Baking Production: Slice and mold shaped dough, bake at preheated 165℃ for 14-18 minutes until crisp golden edges and thorough drying. Cool and seal storage after demoulding.

2.3 Key Points

Quinoa proportion directly affects crispness and nutritional value. Higher content creates crispier biscuits with richer dietary fiber. Lower dough moisture and oil dosage lead to harder texture. Adjust proportion parameters based on commercial product positioning.

3. Quinoa Energy Bars (Instant / Quick-cook Quinoa Flakes)

3.1 Ratio Standard (Calculated based on 500g finished product)

Basic formula: 280g instant quinoa flakes, 75g honey, 45g butter, 55g roasted nut crumbs, 45g freeze-dried fruits. Add 25g protein powder optionally to enhance high-protein property for fitness meal replacement.

3.2 Technological Procedures

- Pretreatment: Bake quinoa flakes at 90℃ for 4 minutes to activate grain aroma and remove raw taste, cool for standby. Roast nut crumbs synchronously to eliminate raw astringency.
- Syrup Preparation: Heat honey and butter over low water bath until fully melted, stir evenly and stop heating immediately to avoid scorching and bitterness from overcooking.
- Mixing and Shaping: Blend quinoa flakes, roasted nuts, dried fruits and protein powder uniformly, pour in warm honey butter liquid and stir thoroughly for complete adhesion. Press evenly into food-grade molds, refrigerate for 1.5-2 hours for shaping, cut into pieces and pack individually in sealed bags.

3.3 Key Points

Store sealed finished products in cool, dry and dark environment with shelf life of 20 to 35 days at normal temperature. Avoid high temperature and humid storage to prevent damp softening, flavor deterioration and microbial growth.

Chapter 4 Addition Methods in Dairy Products (Yogurt, Milk Drinks, Cheese)

1. Quinoa Yogurt Cups (Instant Quinoa Flakes)

1.1 Ratio Standard

Industrial optimal ratio of instant quinoa flakes to yogurt is 1:2.2. Standard commercial single serving contains 18g quinoa flakes and 40g yogurt, decorated with fresh fruits, nuts and grain crisps for enriched taste and layered texture.

1.2 Technological Procedures

- Pretreatment: Soak instant quinoa flakes in boiling water for 2-3 minutes to soften flakes and eliminate raw astringency, drain excess water to guarantee soft smooth taste.
- Layered Production: Lay quinoa flakes and yogurt alternately in food-grade containers, add fruit dices and nut crumbs layer by layer, decorate top surface to improve appearance.
- Cold Ripening: Seal and refrigerate at 0-4℃ for over 3 hours, overnight preparation achieves best effect. Quinoa fully absorbs moisture and milk flavor to form dense pudding-like texture.

1.3 Key Points

Sell and consume finished products within 24 hours under refrigeration to prevent excessive fermentation, acidity rise and sour taste. People with sensitive intestines can warm up before eating to reduce cold stimulation.

2. Quinoa Milk Drinks (Instant Quinoa Flakes / Quinoa Powder)

2.1 Ratio Standard

Add 4% quinoa powder by milk weight for refreshing smooth low-fat light drinks; increase dosage to 8% for rich grain milk flavor and strong satiety, the optimal industrial range without sticky heavy texture.

2.2 Technological Procedures

- Pretreatment: Mix quinoa powder with a small amount of 40℃ warm milk gradually into particle-free smooth paste to prevent caking and precipitation.
- Mixing and Heating: Heat pure milk to 55-60℃, slowly add quinoa paste and stir evenly, simmer on low constant temperature for 3-4 minutes until homogeneous smooth texture and released grain aroma.
- Seasoning and Filling: Adjust taste with white sugar, honey and vanilla essence as needed. Filter impurities through 80-mesh sieve for finer mouthfeel, conduct aseptic filling after cooling and store under refrigeration.

2.3 Key Points

Legally add 0.1%-0.25% xanthan gum or CMC stabilizer in industrial mass production to solve particle precipitation, layering and uneven taste problems, greatly enhancing system stability and extending shelf life.

Chapter 5 Addition Methods in Meal Replacement & Functional Food (Meal Replacement Powder, Nutrition Bars, Brewable Powder)

1. Quinoa Meal Replacement Powder (Instant Quinoa Flakes & Compound Ingredients)

1.1 Ratio Standard (Basic Formula, 100g per serving)

Nutritional proportion: 58g instant quinoa powder (58%), 22g whey protein powder (22%), 4g chia seeds (4%), 4g konjac powder (4%), 6g nut crumbs (6%), 6g freeze-dried fruits (6%). Balanced formula with high protein, strong satiety and low glycemic index.

1.2 Technological Procedures

- Pretreatment: Dry quinoa flakes and nut crumbs at 75℃ for 4 minutes to remove residual moisture, crush into 60-mesh fine powder after cooling for particle-free brewing.
- Mixing: Put all ingredients into sterile three-dimensional mixing equipment according to standard proportion, stir at low speed for 8-10 minutes to ensure uniform blending and accurate ratio.
- Aseptic Packaging: Conduct quantitative filling in sterile dust-free workshop with vacuum sealed package, implement moisture-proof, anti-oxidation and light-shielding treatment.

1.3 Key Points

Fortify nutrients with B vitamins, calcium, iron, zinc and other minerals legally in accordance with **GB 14880 Food Nutrient Fortification Standard**. Add maltodextrin no more than 4% to improve brewability and prevent damp agglomeration without changing low-fat high-nutrition attributes.

2. Quinoa Protein Bars (Instant Quinoa Flakes & Protein Substrate)

2.1 Ratio Standard (100g per serving)

Basic formula: 38g instant quinoa powder, 32g whey protein powder, 9g coconut oil, 9g fructooligosaccharides, 7g nut crumbs, 5g cocoa powder. Low sugar, low fat, high protein and high dietary fiber, satisfying functional meal replacement demands.

2.2 Technological Procedures

- Pretreatment: Crush instant quinoa flakes into 60-mesh coarse powder, melt coconut oil via low-temperature water bath for standby.
- Material Mixing: Sift and blend quinoa coarse powder, protein powder, nut crumbs and cocoa powder thoroughly, add melted coconut oil and fructooligosaccharides, knead gently until fully cohesive without loose dry powder.
- Forming and Baking: Mold materials, bake at 115℃ low temperature for 8-10 minutes for thorough drying and nutrition locking, pack independently under sterile condition after natural cooling.

2.3 Key Points

Fructooligosaccharides replace traditional sucrose with no added white granulated sugar, reducing calorie and glycemic index to meet demands of fat loss, blood sugar control, fitness and weight management crowds accurately.

Chapter 6 Addition Methods in Feed Nutrition (Livestock & Poultry Feed, Pet Food)

1. Basic Livestock & Poultry Feed (Quinoa Flakes / Quinoa Crumbs)

1.1 Ratio Standard

Add 4%-9% quinoa flakes in fattening pig feed to partially substitute corn and bran, improving plant protein and dietary fiber content and intestinal digestion function. The dosage ranges 3%-6% in laying hen feed to optimize egg protein quality, enhance shell hardness and stabilize laying rate. 7%-14% addition suits high-nutrition high-metabolism demands of lactating cattle and sheep and improves milk quality.

1.2 Technological Procedures

- Pretreatment: Crush quinoa flakes into 20-40-mesh coarse granules, separate store with corn flour, soybean meal, wheat bran and premix feed materials.
- Pelletizing Processing: Add 1%-1.5% molasses as natural adhesive, mix all materials evenly and press into standard pellet feed via pellet mill.
- Drying and Storage: Air dry to control feed moisture ≤12%, seal and store in ventilated warehouse after natural cooling.

1.3 Key Points

Match high-protein livestock feed with high-quality animal and plant protein materials such as soybean meal and fish meal to reach qualified crude protein content, satisfying core nutritional needs of growth, lactation and egg production and avoiding unbalanced nutrition from single raw material.

2. Pet Food (Dog & Cat Staple Food, Snacks)

2.1 Ratio Standard

4%-7% quinoa flakes added in dog expanded staple food adjust intestinal flora, relieve loose stool and improve hair condition with mild digestible texture. 2.5%-4.5% quinoa powder applied in functional cat snacks achieves thickening, shaping and nutritional balancing effects, fitting sensitive feline intestines due to gluten-free property.

2.2 Technological Procedures

- Pretreatment: Crush quinoa flakes into 40-mesh fine powder, blend evenly with fresh meat powder, vegetable powder and special pet nutritional premix.
- Curing and Sterilization: Conduct high-pressure steaming at 121℃ for 15 minutes for thorough curing and full sterilization to enhance palatability and edible safety.
- Forming and Packaging: Adopt low-temperature extrusion molding for staple food and slice baking shaping for snacks, vacuum seal package after complete cooling to prevent secondary pollution.

Chapter 7 Addition Methods in Daily Chemical Accessories (Scrub Cream, Facial Mask, Skin Care Additives)

1. Mild Quinoa Scrub Cream (Ultra-fine Quinoa Powder)

1.1 Ratio Standard

Adopt 80-100-mesh ultra-fine quinoa powder accounting for 12%-22% of finished product weight, compound with mild skin care ingredients including shea butter, honey, vitamin E and glycerin.

1.2 Technological Procedures

- Pretreatment: Crush common quinoa flakes into 100-mesh ultra-fine powder under low temperature, sift repeatedly to remove hard coarse particles and impurities and avoid skin scratch during use.
- Homogeneous Mixing: Melt shea butter via low-temperature water bath, add honey and vitamin E sequentially and stir until fully dissolved. Incorporate ultra-fine quinoa powder in batches at low stirring speed for 4-6 minutes to obtain stable homogeneous cream without lumps.
- Aseptic Filling: Finish filling and sealing in constant-temperature sterile workshop with shelf life of 6 months under normal temperature and dark storage.

1.3 Key Points

100-mesh ultra-fine quinoa powder contains natural amino acids and soothing ingredients, mildly exfoliating dead keratin and alleviating skin redness for sensitive facial care. Coarse particles below 60 mesh are only applicable to body scrubs and prohibited for facial use.

2. Soothing Repair Quinoa Facial Mask (Quinoa Powder / Quinoa Extract)

2.1 Ratio Standard

6%-11% ultra-fine quinoa powder matched with moisturizing and soothing repair materials such as hyaluronic acid, glycerin, sodium hyaluronate and panthenol.

2.2 Technological Procedures

- Active Ingredient Extraction: Soak ultra-fine quinoa powder in purified water at room temperature for 30 minutes to release quinoa alkaloid, beta-glucan, polyphenols and other soothing repair components, filter residues to retain high-purity extract liquid.
- Blending and Homogenization: Dissolve hyaluronic acid, glycerin and sodium hyaluronate into quinoa extract successively, add appropriate ultra-fine quinoa powder and stir slowly into even delicate paste.
- Filling and Storage: Conduct quantitative filling under sterile environment, store at 0-4℃ with shelf life of 3 months.

Chapter 8 Quality Control and Common Problem Solutions

1. Quality Control Standards

- **Sensory Quality Control**

Uniform color without blackening, scorching and mildew; no rancid or peculiar odor. Even quinoa distribution free of local agglomeration, residual dry powder and impurities with neat overall appearance.

- **Physical and Chemical Quality Control**

Indicators including moisture, protein, dietary fiber and ash comply with national food safety standards of corresponding categories. Gluten-free products can provide authoritative third-party certification with all qualified physical and chemical indexes.

- **Microbial Quality Control**

Strictly follow core standards **GB 7099** and **GB 19640**. Quantities of total bacteria, mold and yeast are controllable and qualified, free of pathogenic microorganisms such as Salmonella, Escherichia coli and Staphylococcus aureus to guarantee safe consumption and usage.

2. Common Problems and Solutions

2.1 Agglomeration

Core causes: Excessive raw material moisture, uneven powder fineness, over-fast mixing speed and local adhesion from direct high-temperature feeding.

Solutions: Control initial raw material moisture ≤9%, sieve and grade powder in advance; stir uniformly at low speed, avoid direct high-temperature dry powder feeding and mix cold and hot materials gradually to eliminate agglomeration thoroughly.

2.2 Coarse and Hard Taste

Core causes: Excessive quinoa proportion, insufficient crude fiber softening, oversized particle size and incomplete pretreatment.

Solutions: Properly reduce quinoa ratio according to product types; soften raw materials via soaking, pre-boiling and low-temperature baking before processing; crush large particles as required and neutralize coarse taste with grease, dairy and powder materials.

2.3 Bitter Taste and Peculiar Odor

Core causes: Excessively high heating temperature and prolonged heating time, or raw material deterioration from damp storage, oxidation and microbial breeding.

Solutions: Strictly control processing temperature with baking temperature no higher than 175℃ and constant low-temperature boiling; inspect raw material quality before production and abandon deteriorated damp discolored materials with odd smell.

2.4 Beverage Precipitation and Layering

Core causes: Oversized quinoa particles, poor powder dispersibility, unstable beverage system and uneven cold-hot blending.

Solutions: Crush beverage-dedicated raw materials above 60 mesh and pre-make paste; legally add 0.1%-0.25% food-grade stabilizer in industrial production to optimize system and prevent layering and precipitation.

2.5 Short Shelf Life and Damp Deterioration

Core causes: Insufficient packaging tightness, excessive finished product moisture, high storage temperature and humidity and strong raw material oxidation activity.

Solutions: Adopt vacuum moisture-proof sealed package, control finished product moisture ≤9%; adjust storage temperature and humidity, place food-grade desiccant and store in dark ventilated place to delay oxidation, damp damage and insect infestation.

Chapter 9 Storage and Transportation Specifications

1. Storage Conditions

- **Environmental Requirements:**

  Keep storage place cool, dry, ventilated, odorless and pollution-free with constant temperature ≤25℃ and relative air humidity ≤60%. Forbid damp, high-temperature, sun-exposed and stuffy storage environment.

- **Packaging Requirements:**

  Seal all quinoa raw materials and finished products during storage. Use up opened raw materials within 25 days to avoid damp absorption, oxidation, insect infestation and deterioration from long-term open placement.

- **Classified Storage:**

  Store instant, quick-cook, original thick quinoa flakes and quinoa powder in separate zones with clear labels to prevent mixed placement, misuse and cross contamination.

2. Transportation Requirements

- **Moisture Protection:**

  Equip outer packages with moisture-proof film and waterproof cushioning materials, avoid rain soaking and water seepage to guarantee qualified dryness of materials and finished goods.

- **Pressure Resistance Protection:**

  Handle goods gently during loading and unloading, forbid violent throwing, extrusion and over-height stacking to prevent flake breakage, product deformation and package damage.

- **Temperature Control:**

  Conduct constant normal-temperature transportation, avoid extreme environments such as intense sunlight, freezing and excessive day-night temperature difference to stabilize product quality and flavor.

Chapter 10 Safety and Compliance Statement

1. All addition ratios, technological parameters and quality control standards in this guideline are formulated in accordance with valid 2026 national food safety standards, mainly complying with **GB 19640 Cereal Products for Brewing**, **GB 7099 Hygienic Standard for Pastry and Bread**, **GB 14880 Standard for Use of Food Nutrient Fortifiers**, **GB 2760 National Food Safety Standard - Standard for Use of Food Additives** and general food production specifications with authoritative compliant parameters.

2. Quinoa is natural grain food. Extremely few people suffer grain allergy and shall not consume any quinoa products. Gluten-sensitive and celiac crowds shall choose products processed with certified gluten-free quinoa raw materials.

3. Industrial food processing and daily chemical production must strictly abide by **GB 14881 General Hygiene Specification for Food Production** and daily chemical hygiene standards. Implement full sterile operation, regional work and utensil disinfection to eliminate cross contamination and ensure edible and usage safety.

4. This is a professional standardized operation manual applicable to industrial mass production, commercial processing, formula research and quality inspection. Household homemade products can appropriately adjust ratios and technological parameters based on equipment conditions, taste preference and consumption demands.