Specification Sheet for White Kidney Bean Extract

1.1 Product Definition

This product is a fine powdered extract prepared from the mature seeds of *Phaseolus vulgaris L.* (a plant belonging to the Leguminosae family) through processes including washing, crushing, water extraction, concentration, drying, pulverization and sieving. It mainly retains active ingredients such as α-amylase inhibitor without adding any preservatives, pigments or flavors. It can be widely used in food, health care products, dietary supplements and other fields, complying with international food raw material access standards and safety specifications, featuring safety, controllability and high stability.

1.2 Basic Product Information

- Product Name: White Kidney Bean Extract
- English Name: White Kidney Bean Extract
- Latin Name: *Phaseolus vulgaris L.*
- INCI Name: Phaseolus Vulgaris (White Kidney Bean) Extract
- CAS No.: 85085-22-9
- EN No.: 289-882-2
- UN No.: None (Non-dangerous goods, no corresponding UN number)
- Part Used: Mature seeds
- Extraction Solvent: Food-grade pure water (water-based extraction can be adjusted as required to meet food-grade safety requirements)
- Specifications:
    - α-amylase inhibitor: ≥10000 U/g (conventional type), ≥30000 U/g (high-activity type) (determined by HPLC)
    - Phaseolin: 1%, 2% (customizable as required)

The above indicators can be customized according to customers' application scenarios.

- Extraction Ratio: 10:1, 20:1; customization range of 5:1~30:1 is supported

1.3 Organoleptic Properties

- Appearance: Off-white to pale yellow fine powder, free of caking and visible foreign impurities
- Odor: Characteristic mild odor of white kidney beans, free of pungent odor, moldy odor or rancid odor
- Taste: Slightly sweet with mild astringency, consistent with the inherent characteristics of white kidney beans, free of off-flavors
- Solubility: Soluble in warm water; solubility of water-soluble product ≥95.0% (25℃), with excellent dispersibility, suitable for direct dissolution in food processing

1.4 Active Ingredients

- α-amylase inhibitor: ≥10000 U/g, Test Method: HPLC
- Phaseolin: 1%~2% (customizable), Test Method: HPLC
- Total Polysaccharides: ≥5.0% (dry basis), Test Method: Phenol-sulfuric acid method
- Protein (dry basis): ≥12.0%, Test Method: Kjeldahl method (GB 5009.5)
- Flavanones: ≥0.5%, Test Method: HPLC

1.5 Physicochemical Indicators

- Particle Size: 95% passes 100 mesh; 80~120 mesh can be customized, Test Method: Sieving method (GB/T 5507)
- Loss on Drying: ≤7.0%, Test Method: 105℃ for 2h (GB 5009.3)
- Residue on Ignition (Ash): ≤5.0%, Test Method: Gravimetric method (GB 5009.4)
- Total Heavy Metals: ≤20 mg/kg, Test Method: AAS/ICP-MS
- Lead (Pb): ≤0.5 mg/kg, Test Method: AAS/ICP-MS (GB 5009.12)
- Arsenic (As): ≤0.5 mg/kg, Test Method: AAS/ICP-MS (GB 5009.11)
- Cadmium (Cd): ≤0.2 mg/kg, Test Method: AAS/ICP-MS (GB 5009.15)
- Mercury (Hg): ≤0.1 mg/kg, Test Method: AAS/ICP-MS (GB 5009.17)

- Residual Solvents: Ethanol residue ≤0.5% (for targeted extraction scenarios), no methanol residue, complying with food-grade standards, Test Method: GC
- Pesticide Residues: BHC and DDT ≤0.05 mg/kg respectively, complying with GB 2763 Pesticide Residue Limits for Food Raw Materials

1.6 Microbiological Indicators

Complying with food-grade standards of US FDA, EU EFSA and China's national food safety standards

- Total Plate Count: ≤10000 CFU/g, Test Method: GB 4789.2
- Molds and Yeasts: ≤50 CFU/g, Test Method: GB 4789.15
- Coliforms: ≤100 CFU/g, Test Method: GB 4789.3
- Salmonella: Negative / 25g, Test Method: GB 4789.4
- *Staphylococcus aureus*: ≤100 CFU/g, Test Method: GB 4789.10

1.7 Nutritional Composition (Per 100g, dry basis)

Item	**Content**	**NRV% (Reference)**
Energy	1520 kJ	18%
Protein	65.0 g	108%
Fat	2.5 g	4%
Carbohydrates	25.0 g	8%
Dietary Fiber	18.0 g	72%
Sodium	20 mg	1%
Note: NRV% is calculated in accordance with China GB 28050-2011, EU Directive 90/496/EEC and relevant US FDA standards, for reference only.		

1.8 Application Fields

1.8.1 Food Field

It can be added as a functional raw material into solid beverages, compressed tablets, meal replacement powder, baked foods, milk beverages and other foods, mainly exerting the functions of inhibiting starch decomposition and assisting weight management. It adapts to the R&D trend of natural and healthy foods and meets consumers' demand for sugar-controlled and light food products.

1.8.2 Health Care Products / Dietary Supplements Field

It is used to prepare dietary supplements for starch blocking, weight management and blood sugar regulation, and can serve as the core raw material for capsules, granules and oral liquids. With stable active ingredient content, it complies with USP, EP pharmacopoeia standards and relevant requirements for Chinese health care product raw materials, suitable for the development of high-end functional products.

1.8.3 Pet Food Field

It can be added into pet weight-control food and special food for senior dogs and cats to assist in regulating pets' carbohydrate metabolism, meeting the upgrading demand of pet health nutrition and enhancing product differentiated competitiveness.

1.8.4 Other Fields

It can be used as a functional ingredient in the R&D of special dietary foods to meet compliance requirements in multiple scenarios. Exclusive activity indicators and process parameters can be customized according to different industry scenarios.

1.9 Compliance Statement

1.9.1 Standard Basis

- International: ISO 20483, ISO 6496
- Europe and America: USP (United States Pharmacopoeia), EP (European Pharmacopoeia), FDA 21 CFR, EU Food Supplements Directive 2002/46/EC
- China: Pharmacopoeia of the People's Republic of China (as required), GB 14881, GB 28050-2011, GB 2760

1.9.2 Certifications

ISO 9001, HACCP, Kosher, Halal, Organic (optional; corresponding certification documents such as ECOCERT, USDA Organic can be provided according to

customer requirements)

1.9.3 Additional Statements

- Non-GMO
- Allergen-free (complying with EU allergen directives, free of common allergenic ingredients)
- Non-irradiated
- Free of preservatives, pigments, flavors and harmful solvent residues
- Free of animal-derived ingredients, suitable for vegetarian, halal and other special demand scenarios

1.10 Packaging and Storage

- Packaging: 1kg/5kg aluminum foil bags; 25kg fiber drums (lined with double-layer PE bags). Small packaging specifications can be customized according to customer requirements, with deoxidizer inside and good sealing performance to prevent moisture absorption and oxidation of the product.
- Storage: Sealed, stored in a cool, dry and ventilated place, away from strong light and high temperature (>30°C), peculiar smell and toxic and harmful substances to prevent moisture absorption, oxidation and microbial contamination.
- Shelf Life: 24 months (under unopened original packaging); the product shall be used up within 30 days after opening with proper sealing.

1.11 Key Points of International Market Standards

- Active Ingredients: α-amylase inhibitor activity and phaseolin content are core international quality control indicators, mandatory testing items for customers in Europe, America, Japan and South Korea. Testing methods and limits can be adjusted according to customer requirements.
- Heavy Metals / Microorganisms: Strictly complying with the limits of EU 1881/2006 and FDA cGMP, which are key indicators for product export to major global markets. Third-party test reports with CMA/CNAS qualifications can be provided as evidence.
- Supporting Documents: COA (Certificate of Analysis), MSDS, plant origin certificate and third-party test reports are required for export. Document content can be customized according to the requirements of target markets (Europe, America, Southeast Asia, Japan, South Korea, etc.) to ensure smooth customs clearance.

Appendix: Specifications (Classified by Application Scenarios)

1. **Food Grade (GB-F01)**
   - Application Scenarios: Solid beverages, compressed tablets, condiments, baked foods, milk beverages and other food fields;
   - Exclusive Specification: Prepared by pure water extraction process, free of solvent residues, α-amylase inhibitor ≥10000 U/g, mild odor, particle size 100~120 mesh, excellent instant solubility, directly applicable, complying with food-grade safety access.

2. **Health Care Product Grade (GB-H02)**
   - Application Scenarios: Dietary supplements, weight management capsules, sugar-control oral liquids, granules and other health care product fields;
   - Exclusive Specification: Prepared by water extraction + membrane separation and purification process, α-amylase inhibitor ≥30000 U/g, phaseolin ≥2%, high purity and activity, free of harmful impurity residues, complying with stringent health care product-grade safety standards.

3. **Pet Food Grade (GB-P03)**
   - Application Scenarios: Pet weight-control food, special food for senior pets and other pet food fields;
   - Exclusive Specification: Prepared by low-temperature extraction process to retain the stability of active ingredients, α-amylase inhibitor ≥8000 U/g, pesticide residue-free, complying with pet food safety standards and easily digestible and absorbable by pets.

4. **High-End Custom Grade (GB-C04)**
   - Application Scenarios: High-end dietary supplements, special dietary foods, core raw materials for functional foods and other high-end scenarios;
   - Exclusive Specification: Prepared by multi-stage purification process, fully complying with international high-end market standards, α-amylase inhibitor 30000~50000 U/g, phaseolin 2%~5%, solvent residue-free and ultra-high purity. Parameters such as particle size and solubility can be customized as required.

Analysis of White Kidney Bean Extract Manufacturing Process

As a classic medicinal and edible homologous material, white kidney bean extract is rich in core functional ingredients such as α-amylase inhibitor, phaseolin and active polysaccharides. With its excellent properties of naturally blocking starch decomposition, assisting sugar and weight control, and regulating metabolism, it is widely used in functional foods, health care products, dietary supplements, special diets and other fields. This document provides an in-depth analysis of the whole production process of white kidney bean extract, systematically presenting the process principles, core technologies, quality control standards and product advantages from raw material source to finished product delivery. It not only demonstrates production professionalism and technical barriers, but also clearly conveys the core product value, providing customers with comprehensive and credible process references to help them accurately select high-quality natural white kidney bean raw materials.

This white kidney bean extract adopts a full-process modernized process: source-selected white kidney beans + low-temperature pretreatment + targeted extraction + multi-stage membrane separation and purification + deep removal of harmful impurities + low-temperature drying. Under mild conditions, it maximally retains core active ingredients such as α-amylase inhibitor, while strictly removing ineffective and toxic impurities including starch, crude fiber, phytohemagglutinin and trypsin inhibitor. The production process strictly follows food-grade/health care product-grade standards, with full-process quality control at key links, ensuring high purity, high activity, no harmful residues and high stability of the product. It can be widely used in functional foods, health care products, meal replacement foods, solid beverages and other fields, providing customers with safe, stable and high-quality natural plant raw materials.

I. Raw Material Source Control: Selecting High-Quality White Kidney Beans to Secure Activity Foundation

Raw material quality is the core premise for the activity and safety of white kidney bean extract. We adhere to the principle of "source selection and strict access", establish a full-chain raw material control system, and ensure each batch of raw materials meets high-end production standards from four dimensions: variety, production area, harvesting and testing, laying a solid foundation for subsequent processes.

1.1 Variety and Harvest Selection: Targeted Screening of High-Activity Raw Materials

Mature dry seeds of authentic source plant *Phaseolus vulgaris L.* are selected, excluding damaged, germinated, moldy, shriveled and small beans. Only high-quality, plump beans of the current year's new crop are used, at which the accumulation of active ingredients such as α-amylase inhibitor and phaseolin is sufficient, with activity more than 30% higher than old or inferior beans. All raw materials are naturally cultivated, non-GMO and free of excessive artificial intervention, ensuring the efficacy advantages and quality stability of the extract at the variety and harvesting level.

1.2 Direct Procurement from Core Ecological Production Areas: Ensuring Raw Material Purity and Safety

We select core ecological coarse grain production areas in China with fertile soil, sufficient sunlight, far away from industrial pollution and traffic arteries, and irrigation water meeting drinking water standards, eliminating the risk of excessive pesticide residues and heavy metals from the source. Adopting the "direct production area procurement + instant drying" mode, white kidney beans are quickly dehydrated at low temperature after harvesting to avoid mold, fermentation and loss of active ingredients, ensuring natural purity, qualified moisture content and resistance to deterioration of raw materials.

1.3 Raw Material Incoming Inspection: Strict Access, Batch-by-Batch Testing

A strict raw material incoming inspection standard is established. Each batch of raw materials must pass multi-dimensional testing before entering the production process, covering:

- Organoleptic Testing: Free of mold, insect damage, sediment, discolored beans, off-odor and branch impurities, plump and dry;
- Physicochemical Testing: Moisture ≤13%, ash ≤8%, ensuring raw material storage stability;
- Safety Testing: Pesticide residues complying with national and EU standards, strict limits on heavy metals (Pb, As, Cd, Hg, etc.) complying with EU EFSA, US FDA and Chinese GB standards;
- Activity Testing: Qualified basic activity of α-amylase inhibitor, ensuring sufficient activity foundation of raw materials.

Unqualified raw materials are rejected unconditionally, eliminating quality risks from the source and reassuring customers.

II. Pretreatment Process: Clean Wall-Breaking and Mild Activity Retention

Pretreatment is the key link for "high dissolution, low impurities and high activity" of white kidney bean extract, corely solving pain points in traditional processes such as "low extraction rate, many impurities, lectin residue and poor taste". Through refined operations, it removes impurities while protecting thermosensitive active proteins, paving the way for efficient subsequent extraction.

2.1 Washing and Impurity Removal: Clean and Residue-Free, Mild and Non-Damaging

A triple washing and impurity removal mode of "high-pressure countercurrent spraying + mechanical screening + manual sorting" is adopted. Spraying water temperature is strictly controlled below 25℃ to avoid denaturation and inactivation of active ingredients caused by high temperature; mechanical screening removes sand, shriveled and discolored beans, and manual sorting removes moldy beans and foreign impurities. Rapid draining after washing prevents loss of effective ingredients due to long-term soaking, ensuring clean and impurity-free raw materials.

2.2 Low-Temperature Crushing and Wall-Breaking: Mild Wall-Breaking to Improve Dissolution Efficiency

Drained white kidney beans enter the low-temperature crushing process using a low-temperature ultrafine grinder, with crushing temperature ≤40℃ and particle size controlled at 40~80 mesh. Mild crushing increases the specific surface area of raw materials, destroys cell wall structure, greatly improves subsequent extraction efficiency, and avoids denaturation and degradation of active proteins such as α-amylase inhibitor caused by high-temperature crushing. Sealed temporary storage after crushing reduces contact with air to prevent oxidative deterioration.

III. Core Extraction Process: Multi-Mode Targeted Extraction Balancing Efficiency and Activity

Extraction is the core link for the enrichment of white kidney bean active ingredients. Abandoning traditional high-temperature extensive processes, we adopt a modern extraction system of "multi-process adaptation and targeted enrichment", flexibly selected according to product application scenarios and customer requirements, ensuring extraction efficiency while maximally retaining thermosensitive active ingredients, demonstrating technical professionalism and flexibility.

3.1 Pure Water Low-Temperature Extraction (Mainstream for Food Grade): Green and Safe, Solvent Residue-Free

For scenarios with extremely high requirements for "solvent residue-free" such as food, solid beverages, meal replacements and compressed tablets, pure water low-temperature extraction is adopted. Using purified water meeting drinking water standards as the medium, raw materials are mixed at a solid-liquid ratio of 1:8~1:20, extraction temperature controlled at 20~50℃, extracted 2~3 times for 1~2 hours each time, with low-speed stirring throughout to ensure full dissolution of water-soluble active ingredients.

Process Advantages: Green and environmentally friendly, no organic solvent residues, high safety, mild odor and taste, suitable for various food fields, meeting public health consumption demand.

3.2 Water-Ethanol Targeted Extraction (Mainstream for Health Care Product Grade): Efficient Enrichment with Higher Activity

For health care products and high-end dietary supplements, food-grade dilute ethanol-water mixed solvent extraction is adopted. Using 10%~30% ethanol as the extraction medium, raw materials are mixed at a solid-liquid ratio of 1:10~1:15, extraction temperature controlled at 30~50℃, extracted 2~3 times for 1~1.5 hours each time, with sealed stirring throughout to accurately enrich core ingredients such as α-amylase inhibitor and phaseolin, improving extraction purity.

Process Advantages: Comprehensive dissolution of active ingredients, recyclable ethanol, controllable solvent residues, suitable for high-activity health care products, capsules, oral liquids and other products.

3.3 Modern Assisted Extraction: High-End Empowerment to Strengthen Technical Barriers

For high-end health care products and special diets, a combined process of ultrasonic-assisted extraction + low-temperature negative pressure extraction is adopted:

- Ultrasonic-Assisted Extraction: Mildly breaks cell walls via cavitation effect, shortening extraction time by 50% and increasing extraction rate by over 25%, avoiding high-temperature degradation;
- Low-Temperature Negative Pressure Extraction: Temperature controlled below 40℃, vacuum degree -0.08~-0.09MPa, reducing oxidation and inactivation, with active ingredient retention rate ≥90%.

High-end customized products can adopt enzymatic-assisted extraction technology for mild wall-breaking and targeted release of active ingredients, free of

chemical residues and ultra-high purity, suitable as core raw materials for high-end functional foods.

IV. Separation and Purification Process: Multi-Stage Refining for High-Purity Residue-Free Products

The extract contains impurities such as crude fiber, starch, polysaccharides, phytohemagglutinin and trypsin inhibitor, easily leading to poor color, solubility and safety. We adopt multi-stage separation and purification + deep detoxification process for accurate impurity removal, targeted enrichment and strict control of harmful residues, creating high-purity, highly soluble, odorless, safe and harmless high-quality products.

4.1 Multi-Stage Filtration and Centrifugation: Basic Impurity Removal for Clarity

The extract is first filtered by plate-and-frame filtration to remove white kidney bean dregs and coarse suspended solids; then high-speed centrifuged (4000~6000r/min) to remove fine impurities, starch granules and colloids, making the extract clear and transparent, laying a foundation for subsequent purification.

4.2 Membrane Separation and Purification (Core Process): Targeted Enrichment of Effective Ingredients

A combined purification technology of multi-stage ultrafiltration membrane + nanofiltration membrane is adopted for precise screening by molecular weight, realizing separation of active ingredients from impurities:

1. Primary Ultrafiltration: Retains impurities such as macromolecular polysaccharides, crude fiber and denatured proteins, allowing small-molecule active ingredients to pass through;
2. Secondary Ultrafiltration: Precisely retains core active substances such as α-amylase inhibitor and phaseolin, allowing small-molecule impurities such as inorganic salts and monosaccharides to pass through.

Process Advantages: Full-process normal-temperature physical separation, free of chemical flocculants and secondary pollution, high enrichment multiple of effective ingredients, thorough impurity removal, and greatly improved product purity.

4.3 Deep Detoxification Technology: Core Safety Control Point

Phytohemagglutinin and trypsin inhibitor are allergenic harmful impurities, the core safety control point of white kidney bean extract. This process adopts a multi-stage combined detoxification technology:

- Temperature-Controlled Denaturation Detoxification: Precisely regulates temperature and pH to denature and precipitate harmful proteins, removed by centrifugation;
- Membrane Separation Retention Detoxification: Retains residual harmful macromolecular substances through special membrane modules;
- Fine Purification Detoxification: Deeply removes trace residues to ensure no harmful impurities detected in finished products.

Full-process strict control ensures no lectin or trypsin inhibitor residues in finished products, complying with international food allergen control standards for safer consumption.

4.4 Decolorization and Deodorization Refining: Optimizing Organoleptic Properties for Better Adaptability

For high-end food and health care product scenarios, low-temperature food-grade activated carbon adsorption technology is adopted to adsorb excess pigments and beany flavor below 50℃. After filtration and carbon removal, the product is off-white to pale yellow with uniform color and mild odor, not affecting the appearance and taste of end products, suitable for more high-end formula requirements.

V. Low-Temperature Concentration Process: Mild Temperature Control to Lock Activity

The core of concentration is "removing water and increasing concentration" while avoiding high-temperature damage to thermosensitive active proteins such as α-amylase inhibitor. We adopt low-temperature negative pressure double-effect concentration with full-process mild temperature control to ensure no degradation, denaturation or oxidation of active ingredients.

- Precise Temperature Control: Temperature ≤60℃, preventing active protein denaturation and eliminating Maillard reaction and ingredient degradation;
- Negative Pressure Sealing: Vacuum degree -0.08~-0.09MPa, reducing volatilization and pollution, retaining raw material natural flavor;
- Stable Specific Gravity: Controlling solid content at 15%~25% to ensure batch consistency;

- Green and Energy-Saving: Condensed water recycling, environmentally friendly and low-consumption, reducing production costs.

VI. Drying Process: Graded Adaptation to Create High-Quality Powder

Drying directly determines the fluidity, solubility, color and shelf life of white kidney bean extract. We adopt graded drying processes according to product positioning, balancing efficiency and quality to meet different scenario requirements.

6.1 Spray Drying (Mainstream for Food/Health Care Product Grade)

For large-scale production of food and general health care products, inlet air temperature 160~180℃, outlet air 60~80℃, instant drying into fine powder with particle size 80~120 mesh, good fluidity and strong instant solubility, moisture ≤7.0%, shelf life 24 months.

6.2 Vacuum Drying (Small and Medium Batch Customization)

For high-viscosity extracts and customized products, temperature 50~60℃, vacuum dried to moisture ≤6.0%, uniform particle size after crushing and sieving, complete activity retention and stable quality.

6.3 Freeze Drying (High-End High-Activity Grade)

For high-end health care products and special dietary raw materials, -40℃ pre-freezing + vacuum sublimation drying is adopted, with active ingredient retention rate ≥95%, loose and porous product, excellent solubility, pure white color, no thermal damage, optimal quality, shelf life up to 30 months.

6.4 Post-Drying Treatment

After drying, low-temperature crushing, vibration sieving (80~120 mesh) and three-dimensional total mixing for 20~30min are carried out to ensure uniform ingredients and particle size, strong batch stability, no caking or delamination.

VII. Quality Control System: Full-Chain Control for Safety and Compliance

A full-chain quality control system "from raw materials to finished products" is established, with Key Control Points (KCP) set for real-time monitoring and full-process recording, ensuring products comply with international and domestic standards and smoothly pass export and domestic quality inspection.

7.1 Full-Process Monitoring of Key Control Points

- Raw Material Access: Batch-by-batch testing, rejection of unqualified products;
- Pretreatment: Monitoring of crushing particle size and washing temperature;
- Extraction: Recording of temperature, time, solid-liquid ratio and solvent concentration;
- Purification: Strict control of membrane parameters and detoxification process;
- Concentration and Drying: Real-time monitoring of temperature, vacuum degree and moisture;
- Finished Product: Packaging and delivery only after full-item testing qualification.

7.2 Full-Item Testing of Finished Products

Each batch of finished products undergoes full-item testing in accordance with standards, with methods complying with ISO, USP, EP and Chinese national standards. CMA/CNAS third-party reports can be provided:

- Active Ingredients: α-amylase inhibitor ≥10000U/g (conventional type), ≥30000U/g (high-activity type), qualified phaseolin;
- Physicochemical Indicators: Moisture, ash, particle size, solubility;
- Safety Indicators: No detection of heavy metals, pesticide residues, solvent residues and harmful impurities;
- Microorganisms: Total plate count, molds and yeasts, coliforms, salmonella and *Staphylococcus aureus* all qualified.

7.3 Testing Equipment and Team

Equipped with professional equipment such as HPLC, UV, AAS and microbial clean laboratory and a full-time testing team, with standardized operation and accurate and reliable data, fully guaranteeing product quality.

VIII. Summary of Process Advantages: Technical Empowerment to Build Core Competitiveness

8.1 Activity Advantage

Full-process low-temperature mild process, retention rate of core active ingredients such as α-amylase inhibitor ≥90%, ≥95% for high-end products, stable activity and outstanding efficacy.

8.2 Quality Advantage

Multi-stage purification + deep detoxification + decolorization and deodorization, resulting in light color, fast dissolution, no odor or impurities, mild taste, strong compatibility suitable for multi-field formulas.

8.3 Safety Advantage

Deep removal of harmful impurities such as lectin, green process with no solvent residues, heavy metals, microorganisms and pesticide residues complying with European, American and Chinese standards, no allergenic risk, suitable for all populations (special populations follow medical advice).

8.4 Stability Advantage

Full-process standardized quality control, strong batch consistency, stable long-term supply, resistance to moisture absorption and caking, long shelf life.

8.5 Flexibility Advantage

Customizable extraction ratio, active content, particle size, solubility and taste, supporting three-level customization of food grade, health care product grade and high-end custom grade to meet various customer needs.

8.6 Environmental Advantage

Recycling of water resources and solvents, resource utilization of by-products, green and sustainable, complying with environmental protection production requirements.

IX. Conclusion

The quality of white kidney bean extract stems from precise control of every process link. Adhering to the philosophy of "professionalism, rigor, naturality and safety", we focus on the modernized production of white kidney bean extract, making continuous improvements and strictly abiding by standards from high-quality white kidney bean selection to low-temperature dried finished products. We not only demonstrate the technical strength of plant extraction, but also uphold the core commitment of "high activity, no residues, purity and safety".

We will continue to optimize processes and upgrade quality to provide global customers with more stable, high-quality and valuable white kidney bean extract, supporting product innovation and market breakthroughs in functional foods, health care products, meal replacement foods and other fields.

Appendix: Simplified Flowchart of White Kidney Bean Extract Manufacturing Process

