China's Position and Core Market Advantages in the Global Ginseng Extract Supply Chain

China serves as the world's core raw material supply center and largest manufacturer of ginseng extracts, possessing irreplaceable advantages in terms of raw material scale, complete industrial chain support, cost control, and dominance in the mid-to-low-end market. Simultaneously, it is accelerating its upgrade towards high-purity, high-value-added technology and branding, gradually reshaping the global value chain division of labor.

I. Core Position in the Global Supply Chain

(1) Raw Material Supply: Global Dominance, Establishing the Industry Foundation

1. **Leading in Output and Cultivation Scale:** Northeast China (Jilin, Liaoning, Heilongjiang) is the world's primary ginseng-producing region, with an average annual fresh ginseng output of approximately 45,000 tons, accounting for over 70% of global production. Jilin Province alone contributes over 85% of China's output, with the Changbai Mountain region being the world's largest ginseng cultivation base, covering 62.3% of the nation's cultivation area. Ginseng from Northeast China comprises 60%-70% of international ginseng trade, and 60% of Korea's high-quality ginseng (*Korean ginseng*) raw materials rely on imports from Northeast China, making it the "ballast stone" of the global ginseng raw material market.
2. **Superior Quality and Bioactive Components:** Changbai Mountain ginseng boasts a total ginsenoside content of 4%-8%, significantly higher than Canadian and American ginseng (*Panax quinquefolius*, 2%-5%). Its content of key active ingredients like ginsenosides Rg1, Rg3, and Rh2 is among the highest globally, providing a premium raw material base for high-purity extracts.
3. **Complete Variety and Supply System:** China's ginseng portfolio encompasses garden ginseng, forest-cultivated ginseng, and wild ginseng. It has established a complete raw material form system covering "fresh ginseng → dried ginseng → slices → initial extracts," capable of meeting the bulk and stable delivery needs of global clients across different tiers.

(2) Manufacturing: World's Largest Extracts Producer, with Global Capacity Coverage

1. **Leading Market Size and Capacity Share:** In 2023, China's ginseng extract industry reached a scale of 8.53 billion yuan, holding about 42% of the global market share. From 2021 to 2025, it maintained a compound annual growth rate (CAGR) of 13.1%, continuing to lead globally. Jilin Province accounts for over 70% of the nation's raw material supply and production capacity, with Tonghua, Yanbian, and Baishan forming

three major industrial clusters, processing over 52,000 tons of fresh ginseng annually.

2. **Global Export Coverage, Clear Trade Structure:** Chinese exports cover 100+ countries and regions, including Europe, America, Japan, South Korea, and Southeast Asia, with 2023 exports valued at 780 million USD. South Korea, Germany, and the United States are the top three export markets, accounting for 38%, 22%, and 15% shares respectively. China supplies the majority of mid-to-low-end extracts globally, while the proportion of high-end, high-purity product exports has increased from 12% to 18%, gradually entering the high-end market.
3. **Position in the Industrial Chain Division of Labor:** China occupies the core segments of "raw material supply → scale extraction → mid-to-low-end finished products" in the global supply chain, serving as a key raw material and basic extract supplier for companies in South Korea, Japan, Europe, and America. Concurrently, driven by technological upgrades, it is climbing the value chain towards high-value-added segments like "high-purity single ginsenosides → functional formulations → branded end-products."

(3) Infrastructure and Support: Comprehensive Chain Support Ensuring Supply Chain Efficiency

1. **Mature Industrial Clusters and Trading Platforms:** The Jilin Tonghua Ginseng Trading Market handles over 80,000 tons annually, making it the world's largest professional ginseng trading market. It is supported by -25°C constant-temperature warehouses with a capacity of 120,000 cubic meters, controlling ginsenoside degradation below 3%, ensuring raw material quality stability.
2. **Authoritative Testing and Standardization System:** The National Ginseng and Antler Product Quality Inspection and Testing Center establishes the world's most stringent ginseng testing standards, covering 32 indicators including ginsenosides, pesticide residues, and heavy metals. It acts as the core quality inspection body for China-South Korea ginseng trade, providing quality endorsement for the global supply chain.
3. **Comprehensive Policies and Industry Services:** Policies like the "Traditional Chinese Medicine Protection and Development Plan" and the "Jilin Province Ginseng Industry High-Quality Development Regulations" promote GAP-standardized cultivation and standardized extract production, forming a full-chain service system covering "cultivation → processing → inspection → logistics → sales."

II. Core Market Advantages

(1) Resource Endowment Advantage: Irreplicable Raw Material Barrier

1. **Unique Geographical and Climatic Conditions:** The Changbai Mountain region, with an average annual temperature of 3-7°C, a frost-free period of 120-150 days, and soil rich in organic matter with a pH of 5.5-6.5, provides the most optimal growing environment for ginseng, yielding ginseng with far superior active ingredient content and quality stability compared to other regions.
2. **Scale and Cost Advantage:** Being the world leader in cultivation area and output creates economies of scale, resulting in raw material costs 30%-50% lower than South Korea. Furthermore, GAP-standardized cultivation increases yield per mu, and cold-region cultivation techniques in Heilongjiang have raised yield per mu by 28% to 450 kilograms, further reducing unit costs.
3. **Rich Germplasm Resources:** With a century-old history of ginseng cultivation, China has bred high-quality varieties like "Changbai Mountain Ginseng," with ginsenoside content increased by 120% compared to traditional varieties. Unique resources like forest-cultivated ginseng and wild ginseng provide rare raw materials for high-end product development.

(2) Full Industry Chain Advantage: Closed-Loop Capability from Source to End-Product

1. **Standardized Upstream Cultivation:** 32 national-level GAP demonstration bases have been established, covering over 12,000 mu, achieving full traceability from "variety breeding → cultivation → harvesting → initial processing," with raw material quality consistency meeting international standards.
2. **Midstream Extraction Technology Upgrade:** Extraction processes have evolved from traditional water/alcohol methods to green and efficient technologies like supercritical CO_2 extraction, macroporous resin separation, membrane separation, and enzymatic/fermentation extraction. The adoption rate of supercritical extraction technology rose from 12% in 2018 to 41% in 2023, improving extraction efficiency by 3.2 times, while the number of enterprises producing high-purity products (purity ⩾98%) grew by 400%.
3. **Diversified Downstream Applications:** Products cover four major areas: functional foods, health supplements, cosmetics, and pharmaceutical preparations, forming a product matrix of "basic extracts → high-purity ginsenosides → functional formulations." Applications in specific segments like anti-fatigue, immune regulation, neuroprotection, and anti-aging continuously drive product value-added.

(3) Technological Innovation Advantage: Breaking High-End Bottlenecks, Enhancing Global Competitiveness

1. **Leadership in Rare Ginsenoside Preparation:** Chinese research teams have developed

water-soluble ginsenoside Rg3, which has passed Phase IV clinical trials, obtained patents in 15 countries, and boasts bioavailability 9-45 times that of ordinary products. A solid-state fermentation process using *Jinhua*fungus increased ginsenoside varieties from 23 to 41, enabling industrial-scale production of rare ginsenosides (e.g., Rk1, Rh3).

2. **Breakthroughs in Bioconversion and Formulation Technology:** Enzymatic and microbial fermentation techniques enable directional conversion of ginsenosides, increasing rare ginsenoside content. Nanoliposome and microencapsulation technologies improve product stability and bioavailability, narrowing the gap with high-end products from Japan and South Korea.
3. **Standards and Testing Technologies Aligning with International Norms:** Established ginsenoside fingerprinting and single ginsenoside quantitative detection systems comply with international standards from the EU, US FDA, and Japan's Ministry of Health, Labour and Welfare, providing technical support for high-end market access.

(4) Cost and Scale Advantage: The "Best Value King" of the Global Supply Chain

1. **Lowest Comprehensive Cost:** Combined costs for raw materials, labor, equipment, and energy consumption are 40%-60% lower than South Korea and 50%-70% lower than Europe and America. Large-scale production minimizes unit extraction cost globally, providing strong price competitiveness.
2. **Strong Flexible Production Capacity:** With over 200 extract processing enterprises, China can meet customized production from kilogram-scale small batches to ton-scale large batches, with delivery cycles 30% shorter than Japan and South Korea, adapting to diverse global client needs.

(5) Policy and Market Advantage: Dual Internal and External Drivers Ensuring Long-Term Development

1. **Strong Domestic Policy Support:** Integrated into national strategies like "Healthy China 2030" and "Modernization of Traditional Chinese Medicine," the industry benefits from tax incentives (e.g., 15% corporate income tax rate in Northeast China), 100% additional deductions for R&D expenses, and special credit facilities (43.7 billion yuan), lowering operational costs for enterprises.
2. **Vast International Market Space:** Global trends like healthy aging and increased demand for sports nutrition drive ginseng product consumption, reaching 34% among the population aged 45+. Tariff reductions under RCEP and China-South Korea quality mutual recognition lower export barriers, facilitating the entry of Chinese extracts into high-end markets in Southeast Asia, Japan, and South Korea.
3. **Large Domestic Demand Market:** China's functional food market has surpassed 480

billion yuan, with an aging population reaching 297 million, providing stable domestic demand support and forming a "domestic demand + export" dual-circulation pattern.

III. Core Challenges and Upgrade Directions

(1) Major Challenges

1. **Low Value Chain Positioning:** Mid-to-low-end products constitute over 80% of output. High-end, high-purity, and branded products are dominated by South Korea and Japan, with price gaps of 10-20 times.
2. **Branding and Recognition Shortcomings:** Lack of top-tier international brands. Insufficient global consumer recognition of the high-end quality of Chinese ginseng extracts.
3. **International Regulatory Barriers:** The EU's Novel Food approval process takes 18-24 months. The US FDA's heavy metal limits are stricter than Chinese national standards, creating high entry barriers to premium markets.

(2) Upgrade Directions

1. **Technological Advancement to High-End:** Focus on the industrial-scale production of rare ginsenosides like Rg3, Rh2, and Compound K, increasing the share of high-purity products to over 30%.
2. **Product Functionalization:** Develop high-value-added products like targeted formulations, special medical purpose foods, and cosmeceutical ingredients, shifting from "selling raw materials" to "selling functionality."
3. **Brand Internationalization:** Build the "Changbai Mountain Ginseng" as an international brand, leveraging clinical data and quality standards to enhance global recognition.

IV. Summary

Leveraging its four core advantages—resource endowment, complete industrial chain, cost and scale, and technological innovation—China firmly holds a central position in the global ginseng extract supply chain, serving as the absolute dominant player in global raw material supply and large-scale manufacturing. Looking forward, as technological upgrades, brand building, and international compliance efforts advance, China is poised to gradually break through high-end market barriers, transitioning from the "world's raw material workshop" to a "global innovation center for ginseng extracts," thereby reshaping the value chain structure of the global ginseng industry.