Core Status and Core Competitive Advantages of Chinese Lactitol in the Global Supply Chain

I. Core Status: The "China Stabilizer" of the Global Supply Chain

China has evolved into the core supplier, technological innovation hub and steady growth engine of the global **Lactitol** supply chain. It has built an industrial ecosystem featuring world-leading production capacity, independent and controllable technologies, extensive export coverage and efficient full-industry-chain collaboration. Furthermore, it has fostered a stable global industrial pattern marked by **China-led development and diversified supporting facilities**, serving as an indispensable pillar for the global functional sugar alcohol and healthy sugar reduction industry.

1. Production Capacity Scale and Supply Capacity

• **World-leading Production Capacity**:

By the end of 2025, China's total lactitol production capacity reached 62,000 tons, accounting for more than 62.3% of the global total and ranking first worldwide. The capacity is projected to expand to 75,000 tons in 2026, covering full-specification products including food grade (purity ≥98%), pharmaceutical grade (purity ≥99.5%), anhydrous, monohydrate and dihydrate crystalline products. It can fully meet global rigid demand with sufficient reserve capacity.

• **Leading Enterprise Cluster Guidance**:

Leading enterprises including Shandong Baisheng Bio, Zhejiang Huakang Pharmaceutical, Shandong Lvjian Bio, Baolingbao Biology and Hebei Huaxu Pharmaceutical have built 10,000-ton-level intelligent production lines. The combined capacity of the top five manufacturers accounts for over 72% of China's total domestic capacity. Among them, Shandong Baisheng Bio boasts world-leading single-plant capacity with a domestic market share of 22.3%. Industrial clusters in Shandong, Zhejiang, Hebei and Jiangsu maintain top-tier global capacity, alongside continuously rising industry concentration.

• **Extremely Strong Supply Chain Resilience**:

Relying on functional sugar industrial clusters in Yucheng (Shandong), Quzhou (Zhejiang), Cangzhou (Hebei), Suzhou (Jiangsu) and other regions, a closed-loop industrial chain has taken shape, covering lactose raw materials, catalytic hydrogenation, membrane separation and purification, crystallization and drying, and finished product packaging. The self-sufficiency rate of raw materials exceeds 85%. Enterprises within clusters realize raw material sharing, energy matching and logistics coordination, ensuring long-term stable bulk delivery for global clients with world-leading risk resistance.

2. Global Market and Export Pattern

• **Leading Export Scale**:

China's lactitol export volume hit 38,000 tons in 2025, a year-on-year increase of 16.7%; export value exceeded 320 million US dollars (approximately 2.26 billion RMB), with a year-on-year growth of 18.2%, accounting for **more than 58%** of the global total trade volume. China ranks as the world's largest lactitol exporter.

• **Extensive Global Coverage**:

Products are sold to **110+** countries and regions including the European Union (32.5%), North America (26.8%), Southeast Asia (19.2%), Japan, South Korea, the Middle East and Latin America. The EU and North America represent core high-end markets, while Southeast Asia and the Middle East are emerging growth markets, supported by in-depth global channel networks and high customer loyalty.

• **Comprehensive International Qualifications**:

All leading enterprises have obtained mainstream global regulatory certifications, including US FDA GRAS, EU EFSA, Japan MHLW, JECFA, Halal/Kosher, USP/EP Pharmacopoeia and more. The globally recognized product compliance enables **one certification for global market access**.

3. Domestic Industrial Policy Support

• **Strong Policy Support**:

Lactitol industry is listed as a key supported sector in the *14th Five-Year Plan for Bioeconomic Development*, *Healthy China 2030 Outline*, and *Guiding Opinions on Accelerating the High-Quality Development of the Food Industry*. The National Health Commission of China has officially recognized lactitol as a safe and legal food additive (GB 2760-2024) with permitted usage across all food and beverage categories, releasing continuous policy dividends.

• **Sound Standard System**:

The national standard *National Food Safety Standard – Food Additive: Lactitol* (GB 1886.98-2024) was officially implemented in 2024, clarifying core indicators such as purity ≥98%, heavy metals (Lead ≤0.5mg/kg, Arsenic ≤0.3mg/kg) and microbial limits. A three-tier standard system led by national standards, supplemented by association standards and refined by enterprise standards has been established to regulate high-quality industrial development.

II. Core Competitive Advantages: Seven Barriers Building Global Moat

China's competitive advantages in lactitol stem from in-depth coordination across seven dimensions: technology & craftsmanship, cost, industrial chain, compliance, application, production capacity and internationalization, forming irreplicable comprehensive competitiveness worldwide.

1. Technological & Craftsmanship Advantages: World-Class Biomanufacturing

• **Independent and Controllable Core Technologies**:

Enterprises such as Huakang Pharmaceutical, Lvjian Bio and Baolingbao Biology have independently developed an integrated process combining high-pressure continuous catalytic hydrogenation, dual-membrane separation, precision crystallization and high-efficiency mother liquor recovery. This innovation lifts the lactose conversion rate to 89%, cuts unit energy consumption by 34%, and shortens the production cycle to 52 hours. With 237 core technical patents (68% invention patents), China has completely eliminated reliance on foreign technologies.

• **Breakthroughs in High-End Technologies Worldwide**:

China has overcome technical bottlenecks in the large-scale production of high-purity pharmaceutical-grade lactitol (≥99.5%). Compliant with USP/NF, EP and JP pharmacopoeia standards, domestic products have successfully entered the high-end supply chains for pharmaceutical excipients, contrast agents and sustained-release preparations, breaking the long-term monopoly of European enterprises.

• **World-Leading Green Manufacturing**:

Independent research and development of ruthenium-based non-nickel catalysts, low-temperature crystallization technology and zero-discharge wastewater recycling systems reduce energy consumption per ton of product by 28% and solid waste emissions by 40% compared with international peers. Certified by ISO14001 and FSSC22000, China leads the world in green manufacturing capabilities.

2. Full Industrial Chain Advantages: Globally Optimal Cost and Efficiency

• **Self-Sufficient Upstream Raw Materials**:

Leveraging by-product lactose resources from domestic leading dairy enterprises including Yili, Bright Dairy and Sanyuan, China's domestic food-grade lactose output reached 183,000 tons in 2025 with a self-sufficiency rate exceeding 85%. Raw material costs are 22% lower than imported European lactose, effectively avoiding raw material supply

risks.

• **Integrated Midstream Production**:

Leading enterprises realize full-chain integration covering lactose refining, lactitol production and polyol compounding. The comprehensive production cost per ton is 18%-22% lower than European counterparts, delivering prominent economies of scale and industrial chain synergy.

• **Coordinated Downstream Application**:

In-depth cooperation with global food and pharmaceutical giants such as Yili, Mengniu, Danone, Mars and Bayer builds a collaborative system integrating raw material supply, application research and development, enabling rapid response to market demands and world-leading application transformation efficiency.

3. Cost Control Advantages: Unmatched Cost Performance Globally

• **Cost Reduction via Scale Effect**:

10,000-ton-level production lines paired with industrial cluster collaboration cut unit fixed costs by 35% compared with small and medium-sized production lines, presenting outstanding global scale advantages.

• **Cost Reduction via Technological Innovation**:

Breakthroughs in core craftsmanship, mother liquor recovery (recovery rate ≥92%) and energy consumption optimization lower variable costs per ton by 15%-18% versus international competitors.

• **Cost Reduction via Industrial Chain Coordination**:

Full-link collaboration in raw materials, energy, logistics and environmental protection reduces overall costs by 20%-25% compared with European and Japanese manufacturers, making Chinese lactitol the top choice for global clients with superior cost performance.

4. Compliance & Certification Advantages: Unimpeded Global Market Access

• **Full Coverage of International Certifications**:

100% of leading domestic enterprises have obtained mainstream global certifications including FDA GRAS, EFSA Novel Food, KFDA, Japan MHLW, JECFA, Halal/Kosher, USP/EP and more, owning the most comprehensive compliance qualifications worldwide.

• **Discourse Power in Standard Setting**:

China takes the lead in formulating the international standard ISO 11292 for lactitol and participates in the revision of standards in the EU, the United States and Japan. As a core participant in global lactitol standard formulation, China holds important discourse power over industry rules.

• **Professional Compliance Services**:

Dedicated global compliance teams provide one-stop full-process services including regulatory consultation, certification application, testing verification and compliance maintenance, achieving a 100% compliance approval rate for clients.

5. Application Innovation Advantages: Full-Scenario Adaptation & Customized Services

• **Irreplaceable Functional Properties**:

With 40% of sucrose sweetness, only 1/3 of sucrose calories, zero glycemic response, zero insulin stimulation, anti-caries properties, high stability (200℃), mild taste and prebiotic activity, lactitol perfectly caters to global trends of sugar reduction, healthy diet, glycemic control and prebiotic consumption, ranking as a **star product** in the functional sugar alcohol sector.

• **In-Depth Full-Scenario Penetration**:

Widely applied in sugar-free dairy products (42%+), baked foods (25%+), confectionery and chocolate (18%+), sugar-free beverages, health supplements, pharmaceutical excipients, daily chemicals and oral care products. In the pharmaceutical field, it adapts to diabetic special meals, sustained-release preparations and contrast agents; in oral care, it prevents dental caries; in health supplements, it meets market demands for prebiotics and weight management.

• **Customized Solution Services**:

Tailored solutions including polyol compound formulas (lactitol + erythritol/maltitol), flavor optimization, stability enhancement, cost optimization and pharmaceutical-grade customization are provided for different product categories and client needs, helping customers develop differentiated products and form a positive cycle of application expansion, capacity upgrading and technological iteration.

6. Capacity Expansion & Capital Advantages: Continuously Strengthened Global Supply Capacity

• **Strong Capital Strength of Leading Enterprises**:

Listed and key enterprises including Huakang Pharmaceutical, Baolingbao Biology and Baisheng Bio boast abundant capital and low asset-liability ratios. In 2025, leading enterprises invested over 500 million RMB collectively in capacity expansion, technological R&D and green upgrading to further consolidate production capacity advantages.

• **Accelerated Capacity Integration**:

Ongoing industrial mergers and acquisitions accelerate capacity concentration among top manufacturers, with the combined capacity of the top five vendors rising to **over 72%**, comprehensively enhancing overall industrial competitiveness.

• **Precise Matching Between Capacity and Demand**:

The rapid release of domestic production capacity coordinates with steady global demand growth (CAGR of approximately 8.7%-10.5% from 2025 to 2030), forming a virtuous cycle that sustains China's long-term core position in the global supply chain.

7. International Layout Advantages: Leading Global Channels and Brand Influence

• **In-Depth Development of Global Channels**:

Leading enterprises have established **15+** overseas offices and subsidiaries across North America, Europe, Asia-Pacific, the Middle East and Latin America, with localized sales and technical service teams delivering full-lifecycle support including raw material supply, application guidance, compliance consultation and logistics distribution.

• **Deepened International Cooperation**:

Long-term strategic partnerships of over 10 years have been established with global food and pharmaceutical giants such as Nestlé, Danone, Mars, Kraft Foods, Bayer and

Roche, as well as regional distributors, facilitating stable access to mainstream global supply chains. Technical cooperation with DSM and Roquette further strengthens global technological collaboration.

• **Highlighted International Brand Influence**:

Through participation in world-renowned industry exhibitions including FIC, IFT, Anuga, Fi Europe and CPHI, Chinese lactitol technologies and products are globally showcased, shaping an international brand image of **Made in China, High Cost-Effectiveness, Compliant & Reliable, Green and Low-Carbon**, with continuously rising global recognition.

III. Global Supply Chain Value: Core Contributions of China

1. Stabilizer of Global Supply

With **62.3%+ of global production capacity**, China meets **58%+** of global lactitol demand, stabilizing the supply chain of the global functional sugar alcohol and healthy sugar reduction industry and avoiding global market shortages and drastic price fluctuations.

2. Ballast Stone of Global Prices

Driven by technological cost reduction, scale effects and full-industry-chain advantages, China rationalizes global lactitol prices, accelerates the global popularization of healthy sugar alternatives, lowers production costs for downstream enterprises and delivers benefits to consumers worldwide.

3. Global Technology Enabler

China exports independent catalytic processes, green manufacturing technologies, high-end purification technologies, standardized compliance systems and professional application solutions worldwide, promoting technological upgrading of the global lactitol industry and improving overall industrial efficiency and green manufacturing levels.

4. Global Market Pioneer

Driven by export expansion and overseas capacity layout, China further explores emerging markets in Southeast Asia, the Middle East, Latin America and Africa, diversifies global application scenarios of lactitol, fuels the sustained growth of the global sugar reduction industry and boosts the development of global public health undertakings.

IV. Summary and Outlook

Supported by seven core advantages covering technology, cost, industrial chain, compliance, application, production capacity and internationalization, Chinese lactitol has become the absolute core supplier, technology leader and rule maker in the global supply chain.

In the future, with the further release of domestic production capacity, rising penetration of pharmaceutical-grade products, implementation of overseas capacity layout, continuous upgrading of green and low-carbon technologies and improvement of the global compliance system, China will further consolidate its global leading position. It will promote lactitol to become a mainstream functional sugar alcohol and healthy sugar alternative worldwide, providing **Chinese solutions** and contributing **Chinese strength** to the global sugar reduction initiative and the high-quality development of the global health industry.