Competitive Advantages and Future Market Development Outlook of Blueberry Extract Products

Blueberry extract is a functional raw material made from blueberries through extraction, purification and drying processes. It is rich in active ingredients such as anthocyanins and widely used in health products, cosmetics, food and beverages, and pharmaceutical fields. Supported by multiple dimensions including raw materials, technology, efficacy and industrial chain, it has formed distinct market competitive advantages; driven by the upgrading of healthy consumption, technological iteration and policy guidance, the industry will develop towards high quality and diversification. Combining industry data and market status, this paper analyzes its competitive advantages and looks forward to its development trends, providing reference for industry practitioners and investors.

I. Core Competitive Advantages of Blueberry Extract Products

The competitive advantages of blueberry extract run through all links of the industrial chain, forming a multi-level and differentiated competitive barrier. The core focuses on four dimensions: raw materials, technology, efficacy and industrial chain. All dimensions work together to build core competitiveness.

(I) Raw Material Advantage: Controllable Quality, Stable Supply and Prominent Cost Advantage

Raw material quality directly determines the content of active ingredients and the quality of extracts. China, the United States, Canada and Chile are core raw material producing areas, among which China has become an important global supply base by virtue of its planting scale and cost advantage. By the end of 2025, the total blueberry planting area in China had exceeded 138,000 hectares, an increase of nearly 45% compared with five years ago. The three major producing areas of Yunnan, Shandong and Liaoning contributed more than 72% of the output, and 38% of the protected cultivation area realized annual raw material supply, effectively solving the problem of seasonal supply shortage.

In terms of quality, core producing areas in China have cultivated special processing varieties such as "Emerald" and "Legacy", which have high anthocyanin content, good storage and transportation resistance, and the rate of high-quality fruits has increased by 15 percentage points compared with three years ago. In terms of cost, large-scale and standardized planting has increased the per mu yield from 0.8 tons to more than 1.2 tons, improved cold chain has reduced the post-harvest loss rate to 12%, and the raw material cost is 30%-40% lower than that in Europe and the United States. With more than 60% coverage of order agriculture, costs are locked through long-term agreement pricing. In addition, characteristic raw materials such as wild lowbush blueberries in Canada form a high-end differentiated advantage due to higher active ingredient content, supporting product premium.

(II) Technological Advantage: Process Iteration and Dual Improvement of Purity and Safety

Production technology is the core competitiveness. The industry is transforming from extensive processing to refined and green processing. Solvent extraction, supercritical CO_2 extraction and other methods are the main processes, among which green and efficient technologies such as supercritical CO_2 extraction and membrane separation are accelerating the replacement of traditional processes and becoming the mainstream.

Technological upgrading has significantly improved product quality: supercritical CO_2 extraction can avoid solvent residue, and the purity of extracts is 20%-30% higher than that of traditional processes, with the purity of high-purity anthocyanin products reaching more than 40%; membrane separation realizes directional purification of active ingredients; enzyme-assisted extraction increases the anthocyanin extraction rate to more than 85% and the active ingredient retention rate to more than 90%. Intelligent equipment realizes full-process standardized production, controlling the purity deviation between batches within ±2%, and greatly improving stability. Improved detection technology can accurately detect core ingredients and harmful substances, ensuring that products meet international standards such as the European Pharmacopoeia and the US FDA, laying a foundation for export.

(III) Efficacy Advantage: Clear Activity and Diversified Application Scenarios

The core competitiveness of blueberry extract comes from its clear functional value. Its active ingredients such as anthocyanins and polyphenols have been clinically verified to have multiple health effects and high safety, which is in line with the modern consumers' demand for "natural, healthy and precise". In terms of antioxidant capacity, its EC_{50} in DPPH test is 9.24±0.22 μg/ml, and EC_{50} in ABTS test is 12.70±0.11 μg/ml, which is better than most plant extracts.

Among the segmented efficacies, vision protection is the core advantage. Anthocyanins can promote the regeneration of retinal cells, and related products have passed relevant certifications in China and Japan. In terms of neuroprotection, it can improve mood and cognitive function, and clinical trials have shown that it can significantly reduce tension and depression scores ($p<0.05$). In terms of metabolic regulation, it can regulate intestinal flora, inhibit α-glucosidase activity, help reduce postprandial blood glucose and alleviate non-alcoholic fatty liver symptoms. In addition, anti-inflammatory, cardiovascular protection and other efficacies further expand application scenarios, forming the advantage of "one product with multiple uses" and improving risk resistance and added value.

(IV) Industrial Chain Advantage: Upstream and Downstream Coordination and Strong Risk Resistance

A complete global industrial chain of "upstream planting - midstream extraction - downstream application" has been formed for blueberry extract, and the coordination between upstream and downstream is continuously enhanced. In the upstream, the "company + base + farmer" model ensures stable raw material supply and controllable quality, and leading domestic enterprises have locked in high-quality planting bases. In the midstream, enterprises have realized large-scale production through technological upgrading

and capacity expansion. The global annual production capacity is expected to increase from 8,500 tons to more than 12,000 tons by 2030, and China's production capacity ratio will rise from 28% to 35%, with the comprehensive utilization rate of by-products increasing from less than 20% to 85%. In the downstream, the rapid development of terminal industries, leading extraction enterprises have established long-term cooperation with brands such as By-Health and Amorepacific, reducing the risk of market fluctuations. At the same time, the European Pharmacopoeia and domestic industry standards are gradually improved, regulating market competition and highlighting the advantages of enterprises with complete industrial chains.

II. Future Market Development Outlook of Blueberry Extract

Combined with the global healthy consumption trend, technological iteration and policy guidance, the blueberry extract market will show a trend of "scale expansion, structure optimization, technology-driven and concentrated competition" in the next 5-10 years, with both opportunities and challenges.

(I) Market Scale: Steady Global Growth, Asia-Pacific as the Core Growth Pole

Benefiting from the rising demand for natural antioxidants, the development of functional foods and the deepening application of plant active ingredients, the global blueberry extract market continues to expand. From 2021 to 2025, the market scale increased from 480 million US dollars to 670 million US dollars, with a compound annual growth rate of 8.6%; it is expected to grow at a compound annual rate of 9.2% from 2026 to 2030, exceeding 1.05 billion US dollars by 2030 and reaching 17.905 billion yuan by 2032.

Regionally, North America and Europe are still the main consumer markets, accounting for 38.2% and 29.5% of the market share in 2023 respectively, but the growth rate is slowing down. The Asia-Pacific region is growing rapidly, accounting for 22.1% of the market share in 2023, with a compound annual growth rate of more than 9.4% from 2026 to 2030, driven by China, Japan and South Korea. The Chinese market has performed prominently, with a scale exceeding 1.2 billion yuan (another statistical caliber of 4.244 billion yuan) in 2025, a compound annual growth rate of more than 12%, and is expected to maintain a growth rate of more than 10% in the next 5 years, becoming the core engine of global growth. The markets of Latin America, the Middle East and Africa account for less than 10% of the total, but have great potential and will become new growth points.

(II) Product Structure: Prominent Trends of High-End, Refined and Diversified

With the upgrading of consumer demand and technological iteration, the product structure is continuously optimized, showing a trend of "high-end leading, refined segmentation and diversified extension". In terms of high-end, the demand for high-purity products with anthocyanin content ≥36% is surging, with a price of 200-300 US

dollars per kilogram. It is expected that the market share will increase from 25% to more than 40% within 5 years, replacing ordinary products with anthocyanin ≤25% (80-120 US dollars per kilogram) as the mainstream.

In terms of refinement, customized products have become a hot spot, covering special extracts for health products, cosmetics, pharmaceuticals and other fields, gradually replacing general-purpose products. In terms of diversification, in addition to powder and liquid forms, microencapsulated and nano-scale extracts are gradually commercialized, expanding to new fields such as maternal and infant food and special medical food. At the same time, organically certified products have become the core competitiveness of the high-end market. The scale of organic planting at home and abroad is expanding, and organic extracts obtain higher premiums by virtue of high quality.

(III) Technological Development: Guided by Greenization, Intelligence and High Efficiency

Technological innovation drives the high-quality development of the industry, and future iteration will focus on three directions: greenization, intelligence and high efficiency. In terms of greenization, green processes such as supercritical CO_2 extraction will gradually replace traditional solvent methods, and technologies such as closed-loop extraction and carbon footprint tracking will become popular, with the carbon emission per unit product decreasing by 55% compared with the baseline year by 2030. In terms of intelligence, automated production lines and digital management will be widely applied, with the popularization rate of flexible intelligent manufacturing reaching 45% by 2028, improving efficiency and stability. In terms of high efficiency, microwave and ultrasonic assisted extraction technologies will be promoted, and the high-value utilization of by-products will be continuously improved, promoting the industry's transformation to a circular economy. In addition, the in-depth clinical research on emerging efficacies will endorse products and enhance market recognition.

(IV) Application Scenarios: Downstream Expansion and Accelerated Cross-Border Integration

Application scenarios are expanding from traditional health products, food and beverages to cosmetics, pharmaceuticals, special medical food and other fields, forming an all-scenario pattern. Health products are still the core scenario, accounting for more than 50% in the next 5 years, transforming towards "precise efficacy and diversified formulas", and leading brands have launched a number of compound products. In the cosmetics field, the concept of natural skin care has promoted the wide application of extracts in anti-aging, whitening and other products, with a demand growth rate of more than 15% in the next 5 years, becoming the second largest scenario. In the pharmaceutical field, extracts are gradually applied to the research and development of drugs for vision protection, metabolic syndrome intervention, etc., and will become a growth highlight in the next 5-10 years, with the market share rising to about 20%. In addition, extracts are gradually expanding to emerging fields such as prepared dishes and pet food, forming new growth drivers.

(V) Competitive Pattern: Increasing Concentration, Differentiated Competition as the Key

In the future, market competition will become increasingly fierce, and the concentration will continue to increase, gradually transitioning to oligopoly. Global core enterprises include Nutragreen Biotechnology, Futureceuticals, etc. The CR5 of the Chinese market increased from 21.5% in 2020 to 38.7% in 2025, and it is expected that the CR10 will exceed 65% by 2030, with the elimination rate of small and micro enterprises exceeding 40%.

The focus of competition has shifted from price competition to technology, quality, brand and differentiated competition. Leading enterprises will expand their market share by virtue of core technologies, stable raw materials and complete industrial chains; small and medium-sized enterprises will transform to segmented scenarios and segmented efficacies to avoid homogeneous competition. Multinational enterprises will accelerate their layout in emerging markets, and leading Chinese enterprises will gradually internationalize. It is expected that the global share of Chinese enterprises will rise to more than 25% by 2030, breaking the dominant pattern of Europe and the United States.

(VI) Industry Challenges and Countermeasures

The industry faces five major challenges: first, the raw material supply is greatly affected by natural factors, and the homogenization of varieties leads to price fluctuations; second, the homogenization of the mid-to-low-end market is serious, and price competition squeezes profits; third, small and medium-sized enterprises have insufficient R&D investment, making it difficult to adapt to high-end and emerging needs; fourth, the industry standards are not unified, increasing the cost of export compliance; fifth, insufficient consumer awareness restricts the release of demand.

Countermeasures: promote standardized planting in the upstream, cultivate high-quality varieties, and improve the cold chain and price early warning mechanism; increase R&D investment in the midstream, upgrade green and intelligent technologies, layout the utilization of by-products, and build differentiated brands; strengthen popular science and scenario marketing in the downstream, and expand emerging applications; accelerate the construction of industry standards and promote the integration of Chinese and foreign standards; increase policy support, strengthen market supervision, and crack down on counterfeiting and shoddy products.

III. Conclusion

With four major advantages of raw materials, technology, efficacy and industrial chain, blueberry extract has strong demand and great potential under the background of healthy consumption upgrading. In the future, the industry will enter a high-quality development stage. The main trends will be market scale expansion, structure optimization, technological innovation and concentrated competition. At the same time, it faces multiple challenges that need to be solved by the whole industry. Practitioners should focus on technological R&D and differentiated layout, and investors can focus on leading enterprises and high-end, emerging fields. On the whole, the industry has both opportunities and challenges, and will realize the transformation from "scale growth" to "quality improvement", becoming one of the most dynamic segmented fields in the plant extract industry.