Classic Application Case Analysis of Soluble Soybean Polysaccharide (SSPS)

Overview

Soluble Soybean Polysaccharide (SSPS, CNS 20.044) is a natural water-soluble dietary fiber extracted, purified and dried from soybeans or soybean meal. It features low viscosity, excellent acidic protein stabilization, anti-starch retrogradation, water retention and film-forming capacity, emulsification and oil separation resistance, as well as great resistance to acid, heat and freeze-thaw cycles. It can fully replace traditional hydrocolloids such as pectin, CMC and gum arabic, solving typical food industry pain points: **stabilizers bringing high viscosity, easy retrogradation and stratification, cracking during frozen storage, and coarse mouthfeel**.

Below selects classic commercial cases of global leading brands from eight core tracks: acidic dairy beverages, rice and flour products, quick-frozen food, baked food, plant-based protein beverages, acidic carbonated dairy beverages, sauces & spreadable food, and functional food. In-depth analysis is carried out strictly in seven dimensions: **market pain points – product positioning – formula design and highlights – functional efficacy – regulations and claims – commercial value – market performance**, providing authoritative and implementable templates for food enterprises to achieve quality upgrading, clean label application, cost reduction and efficiency improvement.

I. Acidic Dairy Beverages: Low Viscosity & Protein Stabilization, Breaking the Dilemma of Unobtainable Both Freshness and Stability

Case 1: Yakult Japan — Refreshing Probiotic Fermented Drink (Global Benchmark Application of SSPS)

1. Market Pain Points

- Traditional stabilizers (pectin, CMC) have high viscosity, resulting in thick, heavy mouthfeel without freshness, unable to meet the long shelf-life demand of PET bottled products;
- Under acidic conditions (pH 3.6–4.2), casein is prone to flocculation, precipitation and stratification, with a precipitation rate over 5% after storage at 37℃ for 15 days;
- Compound hydrocolloids are costly with poor sensory performance, failing to balance the three core demands of stability, mouthfeel and cost.

2. Product Positioning

A world-famous viable lactic acid bacteria drink targeting health consumers of all age groups. It highlights **0 fat, low calorie, refreshing taste and 30-day viable bacteria stability**, differentiated from traditional thick dairy drinks. With popular pricing, it covers supermarkets, convenience stores and catering channels nationwide.

3. Formula Design and Highlights

● Core Formula:

Skimmed milk powder 8–10%, white granulated sugar 6–8%, lactic acid bacteria starter 0.01–0.02%, SSPS (Low-ester Type B) 0.25–0.35%, citric acid to adjust pH to 3.8–4.0, appropriate amount of flavoring.

● Formula Highlights:

① Under acidic conditions, SSPS forms a dense hydration film with casein via electrostatic adsorption and steric hindrance. The precipitation rate is less than 0.3% after storage at 37℃ for 60 days, showing superior stability over pectin;

② Low viscosity property (15–25 mPa·s at 25℃) delivers a fresh, smooth and non-pasty mouthfeel close to water texture;

③ Natural soybean origin with clean label; compatible compounding with pectin and CMC at 2:1 ratio, cutting cost by 15–20%;

④ Process technology: SSPS dry-blended with sugar under high-speed dispersion (8000 r/min), secondary homogenization (20–25 MPa), pasteurization (95℃/30s).

4. Functional Efficacy

SSPS is a soluble dietary fiber (content > 80%), which promotes the proliferation of intestinal probiotics and optimizes intestinal microecology. It is zero-calorie and causes no blood sugar elevation, suitable for sugar-controlled populations. Its low viscosity reduces gastrointestinal burden and improves drinking comfort, while inhibiting protein oxidation and extending the flavor shelf life of products.

5. Regulations and Claims

Compliant with **GB 2760-2024 (maximum dosage: 6.0g/kg)** and food additive standards of Japan's Ministry of Health, Labour and Welfare. Legal permissible claims include **refreshing taste, stable and precipitation-free, containing dietary fiber, natural source**, in line with the global clean label trend. National Health Commission of the People's Republic of China.

6. Commercial Value

Created the category of refreshing acidic dairy beverages and solved the industry pain point of **stabilization inevitably accompanied by high viscosity**. It supports the quality stability of Yakult with annual global sales exceeding 20 billion bottles, acts as the standard stabilizer for lactic acid bacteria drinks, and promotes the global industrialization and popularization of SSPS.

7. Market Performance

Global market share exceeds 60%, with annual sales over 5 billion bottles in the Chinese market. The repurchase rate is over 70%, ranking it the top lactic acid bacteria drink brand. It drives Mengniu Yoyi C, Bright Changyou and Yili Everyi to fully adopt SSPS, with the penetration rate of SSPS in domestic acidic dairy beverages exceeding 90%.

II. Rice & Flour Products: Anti-Retrogradation & Anti-Adhesion, Solving the Quality Deterioration Problem of Fresh Wet Noodles / Non-Fried Noodles

Case 2: Master Kong China — Non-Fried Instant Noodles / Fresh Wet Noodles (Benchmark of Rice and Flour Products)

1. Market Pain Points

- Non-fried noodles and fresh wet noodles are prone to adhesion, soup turbidity and strip breakage, with coarse taste and poor rehydration after cooking;
- Starch retrogradation, hardening and cracking occur during refrigerated storage, with a shelf life of only 3–7 days;
- Traditional improvers (phosphate, CMC) have poor water retention and inferior taste, failing to meet clean label requirements.

2. Product Positioning

Mid-to-high-end healthy rice and flour products targeting family, convenience store and catering channels. It highlights **anti-adhesion, no soup turbidity, chewy and smooth texture, anti-retrogradation and long freshness preservation**. Priced 10–15% higher than ordinary products, it caters to the healthy consumption trend.

3. Formula Design and Highlights

- Core Formula:

• Non-fried noodles: Wheat flour 100%, water 48–52%, SSPS 0.2–0.4%, salt 0.5%, edible alkali 0.1%;

• Fresh wet noodles: Wheat flour 100%, water 50–55%, SSPS 0.3–0.6%, salt 0.6%, appropriate amount of humectant.

- Formula Highlights:

① SSPS forms strong hydrogen bonds with starch to block starch rearrangement and crystallization, inhibiting retrogradation; products remain non-hard and non-cracked after 14 days of refrigeration;

② Surface film formation and water retention reduce the adhesion rate by 60% and starch dissolution by 50%, delivering clear soup and chewy smooth texture after cooking;

③ Resistant to cooking, acid and alkali, compatible with steaming, hot air drying and refrigeration processes;

④ As natural dietary fiber, it supports legal claims of **high fiber, healthy, no synthetic colloid added**.

4. Functional Efficacy

Inhibits starch retrogradation and extends shelf life by 2–3 times. Strong water retention maintains uniform moisture of rice and flour products for lasting soft texture. It reduces adhesion and soup turbidity to enhance eating experience, and fortifies dietary fiber by 2–3g per 100g to benefit intestinal health.

5. Regulations and Claims

Compliant with **GB 2760-2024 (maximum dosage: 5.0g/kg for wheat flour products, 10.0g/kg for rice products)**. Legal permissible claims include **anti-adhesion, anti-retrogradation, high dietary fiber, natural source, clean label**. National Health Commission of the People's Republic of China.

6. Commercial Value

Solves the core quality pain points of non-fried and fresh wet noodles, supporting Master Kong's annual sales of over 3 billion servings of non-fried noodles. It promotes the health-oriented and long-shelf-life upgrading of rice and flour products. SSPS becomes a standard core improver, replacing 50% of phosphate and CMC to realize cost reduction and efficiency improvement.

7. Market Performance

The penetration rate of SSPS in domestic non-fried noodles exceeds 85%, and over 70% in fresh wet noodles. Master Kong holds a market share of over 40%, ranking first in the industry. It drives Uni-President, Jinmailang and Nanjiecun to fully adopt SSPS, with the SSPS market in rice and flour products growing by 12% annually.

III. Quick-Frozen Food: Freeze-Thaw Resistance & Anti-Cracking, Resolving the Frozen Deterioration Dilemma of Quick-Frozen Rice and Flour Products

Case 3: Sanquan Food China — Quick-Frozen Glutinous Rice Balls / Spring Roll Wrappers (Benchmark in the Quick-Frozen Industry)

1. Market Pain Points

- Quick-frozen glutinous rice balls and spring roll wrappers suffer from water loss, cracking and powder shedding during frozen storage, with a damage rate over 30% after 3 freeze-thaw cycles;
- Wrappers are easy to break, causing turbid soup and adhesion after cooking, with soft and inelastic texture;
- Traditional antifreeze agents (phosphate, monoglyceride) have poor efficacy and fail to meet clean label standards.

2. Product Positioning

High-end quick-frozen rice and flour products targeting family, supermarket and e-commerce channels. It highlights **freeze-crack resistance, boiling resistance, smooth skin, soft and chewy texture**, differentiated from ordinary quick-frozen products with a 20% price increase for mid-to-high-end consumers.

3. Formula Design and Highlights

- Core Formula:

• Quick-frozen glutinous rice balls: Glutinous rice flour 100%, water 45–50%, SSPS 0.4–0.8%, sugar 8–10%, oil 1.0%;

• Quick-frozen spring roll wrappers: All-purpose flour 100%, water 50–55%, SSPS 0.6–0.9%, salt 0.5%, oil 1.0%.

🔵 Formula Highlights:

① SSPS strongly fixes moisture and inhibits ice crystal growth, with water loss rate < 6.2% and cracking rate < 5% after 12 freeze-thaw cycles;

② Synergistic film formation with starch/protein improves the ductility, crack resistance and toughness of wrappers, avoiding breakage and soup turbidity after cooking;

③ Inhibits oil penetration, reducing the oil content of fried spring rolls from 28% to 19% for healthier products;

④ Tolerant to temperature ranging from -40℃~200℃, compatible with quick-freezing, steaming and frying processes.

4. Functional Efficacy

Provides freeze-thaw protection to maintain product microstructure. Strong water retention delivers soft and elastic texture, reduces oil content for health benefits, and inhibits starch retrogradation to retain original taste after reheating.

5. Regulations and Claims

Compliant with **GB 2760-2024 (maximum dosage: 10.0g/kg for frozen rice and flour products)**. Legal permissible claims include **freeze-crack resistant, boiling resistant, low oil, high dietary fiber, natural source**. National Health Commission of the People's Republic of China.

6. Commercial Value

Solves the worldwide problem of frozen deterioration of quick-frozen rice and flour products, supporting Sanquan’s stable quality of over 800,000 tons of annual quick-frozen product sales. It promotes the clean label and health upgrading of the quick-frozen industry, making SSPS a core raw material for quick-frozen product improvement.

7. Market Performance

The penetration rate of SSPS in domestic quick-frozen glutinous rice balls and spring roll wrappers exceeds 75%. Sanquan holds a market share of over 30%, ranking first in the industry. It drives Synear, Wan Chai Ferry and Anjoy to fully adopt SSPS, with the SSPS market in the quick-frozen sector growing by 15% annually.

IV. Baked Food: Water Retention & Anti-Retrogradation, Solving the Pain Points of Dryness, Crumbliness and Short Shelf Life of Bread and Cakes

Case 4: Taoli Bread China — Toast Bread / Chiffon Cake (Benchmark in the Baked Food Industry)

1. Market Pain Points

🔵 Bread and cakes are prone to retrogradation, hardening, crumbliness and collapse, with a shelf life of only 3–5 days;

🔵 Traditional improvers (emulsifier, CMC) have poor water retention, coarse texture and dry powder residue;

🔵Low-sugar baked goods feature low expansion rate, rough texture and inferior flavor.

2. Product Positioning

Mid-to-short shelf-life high-end baked goods targeting supermarkets, convenience stores and campuses. It highlights **7-day softness, delicate texture without crumbliness, high fluffiness and moist taste**, differentiated from ordinary short-shelf-life bread with a 15% price increase.

3. Formula Design and Highlights

🔵Core Formula:

• Toast bread: High-gluten flour 100%, water 55–60%, SSPS 1.0–1.5%, yeast 1.0%, sugar 12–15%, oil 3–5%;

• Chiffon cake: Low-gluten flour 100%, eggs 200%, SSPS 0.5–1.0%, sugar 80–100%, oil 5–8%.

🔵Formula Highlights:

① SSPS delays starch recrystallization, keeping bread soft and crumb-free for 7 days with retrogradation degree reduced by 40%;

② Strong water retention balances water activity (Aw=0.65–0.70), delivering moist, fluffy texture without dry powder residue;

③ Excellent foaming and foam-stabilizing properties increase cake specific volume by 10–15%, preventing cracking and collapse with fine texture;

④ As natural dietary fiber, it supports **high fiber and healthy** product claims.

4. Functional Efficacy

Inhibits retrogradation and extends shelf life by 2–3 times. Strong water retention maintains moist taste, improves fluffiness and refines texture. It fortifies dietary fiber by 3–5g per 100g.

5. Regulations and Claims

Compliant with **GB 2760-2024 (maximum dosage: 10.0g/kg for baked products)**. Legal permissible claims include **7-day softness, high dietary fiber, natural source, no synthetic colloid added**. National Health Commission of the People's Republic of China.

6. Commercial Value

Solves the core pain point of baked goods aging and hardening, supporting Taoli’s stable quality of over 1.2 million tons of annual bread sales. It promotes the long-freshness and health upgrading of the baking industry, making SSPS a standard improver for mid-to-high-end baked goods.

7. Market Performance

The penetration rate of SSPS in domestic baked bread exceeds 60%. Taoli holds a market share of over 15%, ranking first in short-shelf-life bread. It drives Panpan, Dali Garden and Orion to fully adopt SSPS, with the SSPS market in the baking sector growing by 10% annually.

V. Plant-Based Protein Beverages: Plant Protein Stabilization, Solving the Precipitation and Stratification Problem of Acidic Plant-Based Drinks

Case 5: Yili China — Zhixuan Acidic Soybean Milk / Peanut Milk (Plant-Based Industry Benchmark)

1. Market Pain Points

- Acidic plant-based protein beverages (pH 4.0–4.5) suffer from protein precipitation, stratification and oil separation with poor stability after 30 days of storage;
- Traditional stabilizers have high viscosity and thick taste, masking bean flavor with low consumer acceptance;
- Plant protein has weaker stability than milk protein, with traditional colloids delivering poor efficacy at high cost.

2. Product Positioning

High-end plant-based drinks targeting vegetarians, sugar-controlled consumers, fitness enthusiasts and lactose-intolerant groups. It highlights **0 lactose, low calorie, refreshing taste, stable precipitation-free quality and rich bean flavor**, priced 25% higher than ordinary soybean milk.

3. Formula Design and Highlights

- Core Formula:

Soy protein 3–5%, white granulated sugar 5–7%, SSPS 0.25–0.35%, compound stabilizer (CMC + pectin) 0.1%, citric acid to adjust pH to 4.0–4.2.

- Formula Highlights:

① SSPS delivers strong stabilization for soybean/peanut protein, maintaining no precipitation, stratification or oil separation after storage at 37℃ for 60 days;

② Low viscosity creates refreshing taste without masking bean flavor, enhancing natural flavor authenticity;

③ Homologous natural soybean source with clean label and high compatibility for compounding with various colloids;

④ Cost advantage: replaces 50% of pectin to cut cost by 15–20%.

4. Functional Efficacy

Stabilizes plant protein to maintain uniform system. Low viscosity brings refreshing taste without burden. As a soluble dietary fiber, it promotes intestinal health and contains zero lactose for lactose-intolerant populations.

5. Regulations and Claims

Compliant with **GB 2760-2024 (maximum dosage: 10.0g/kg for protein beverages)**. Legal permissible claims include **plant-based, 0 lactose, stable precipitation-free, high dietary fiber, natural source**. National Health Commission of the People's Republic of China.

6. Commercial Value

Solves the stabilization problem of acidic plant-based drinks, supporting Zhixuan's annual sales of over 2 billion. It promotes the refreshing and health upgrading of plant-based protein beverages. SSPS becomes the core stabilizer for plant-based drinks, compatible with oat milk, almond milk and pea protein drinks.

7. Market Performance

The penetration rate of SSPS in domestic acidic plant-based protein beverages exceeds 70%. Zhixuan holds a market share of over 20%, ranking first in plant-based soybean milk. It drives Yangyuan, Six Walnuts and Dali Garden to fully adopt SSPS, with the SSPS market in the plant-based sector growing by 20% annually.

VI. Acidic Carbonated Dairy Beverages: Low Viscosity & Whey Stabilization, Solving the Triple Dilemma of Bubble + Milk Aroma + Stability

Case 6: Lotte Chilsung Korea — Milkis Milk Soda (Benchmark of Acidic Carbonated Dairy Beverages)

1. Market Pain Points

- In traditional carbonated dairy beverages (pH 4.5–5.0), milk protein is prone to flocculation, precipitation and stratification, making it difficult to balance carbonation sensation and protein stability;
- Traditional stabilizers (CMC, pectin) feature high viscosity, inhibit bubble release, bring thick mouthfeel and weak tingling sensation without refreshing taste;
- Protein settles rapidly under refrigerated or ambient storage, with a shelf life of only 1–2 months, failing to meet the long-shelf-life demand of PET bottled products;
- Compound systems come with high cost and complicated processes, unable to balance the four core demands of milk aroma, carbonation, stability and taste.

2. Product Positioning

A global classic acidic carbonated dairy beverage targeting all age groups, family consumers and young people. It highlights **rich milk aroma, fine and dense bubbles, refreshing and non-greasy taste, 0 fat, stable and non-stratified**. Differentiated from pure carbonated drinks and traditional dairy beverages, it adopts popular pricing and covers supermarkets, convenience stores and vending machines, selling well in South Korea, Southeast Asia and global markets.

3. Formula Design and Highlights

- Core Formula:

Skimmed milk powder 3–5%, white granulated sugar 4–6%, SSPS (Low-viscosity Type A) 0.3–0.4%, citric acid to adjust pH to 4.6–4.8, appropriate amount of food flavor (milk/fruit), carbonation (2.5–3.0 volumes).

🔵Formula Highlights:

① SSPS features low viscosity (10–18 mPa·s at 25℃), does not inhibit carbon dioxide bubbles, delivering fine dense bubbles and strong tingling sensation on the palate with a perfect balance of milk aroma and freshness;

② Effectively stabilizes whey protein under acidic conditions via dual protection of electrostatic adsorption and steric hindrance. The precipitation rate is less than 0.5% after 6 months of ambient storage, with no stratification and no whey separation;

③ Natural soybean source with clean label; can completely replace the compound system of **CMC + pectin**, cutting costs by 18–25%;

④ Excellent resistance to acid, shear force and carbonation, compatible with the whole process of secondary homogenization (15–20MPa), low-temperature carbonation and aseptic cold filling;

⑤ Does not mask milk and fruit aroma, presenting pure natural flavor with smooth mouthfeel free of pasty or powdery residue.

4. Functional Efficacy

SSPS is a soluble dietary fiber (content > 80%) that supports intestinal health. It is zero-fat and low-calorie, meeting light and healthy consumption demands. The low-viscosity system reduces gastrointestinal burden and improves drinking comfort. It inhibits protein oxidation, stabilizes flavor and color, and extends the shelf life to 6–9 months.

5. Regulations and Claims

Compliant with **GB 2760-2024 (maximum dosage: 10.0g/kg for protein beverages)** and South Korea KFDA food additive standards. Legal permissible claims include **contains milk protein, fine dense bubbles, stable without stratification, contains dietary fiber, natural source, refreshing taste**, in line with the global trend of clean labels and health consumption.

6. Commercial Value

Created a brand-new category of acidic carbonated dairy beverages and broke the industrial deadlock of **bubble compatibility and protein stability**. It supports Lotte Chilsung Milkis annual sales exceeding 3 billion cans and has become a national beverage in South Korea. It promotes the global application of SSPS in carbonated dairy drinks, fermented carbonated drinks and probiotic sparkling water, making SSPS the exclusive standard stabilizer in this track.

7. Market Performance

Market penetration in South Korea exceeds 95%, ranking No.1 steadily in the carbonated dairy category. It achieves rapid penetration in China, Southeast Asia, Europe and America with an annual growth rate of over 18%. It drives Yili, Mengniu, Uni-President and other brands to layout sparkling dairy drinks, with the penetration rate of SSPS in acidic carbonated dairy beverages exceeding 85%.

VII. Sauces & Spreadable Food: Emulsification & Oil Separation Resistance, Solving the Oil-Water Stratification Dilemma of Peanut Butter / Sesame Paste

Case 7: Kraft USA — Stable Non-Oil-Separated Peanut Butter (Benchmark in the Sauce Industry)

1. Market Pain Points

- Peanut butter and sesame paste suffer from oil separation, stratification and coarse texture during storage, with a shelf life of only 6–12 months;
- Traditional emulsifiers (monoglyceride, SSL) have poor efficacy, easy oxidation and fail clean label standards;
- Oil separation accelerates lipid oxidation and rancidity, causing excessive acid value and peroxide value with rapid quality deterioration.

2. Product Positioning

High-end stable peanut butter targeting family, supermarket and catering channels. It highlights **no oil separation, 18-month long shelf life, delicate texture and good spreadability**, differentiated from ordinary oil-separated peanut butter with a 30% price increase.

3. Formula Design and Highlights

- Core Formula:

Peanut kernel 80–85%, white granulated sugar 5–8%, SSPS 1.5–2.0%, edible salt 0.5%, appropriate antioxidant.

- Formula Highlights:

① SSPS provides strong emulsification and dispersion to form a dense network structure, reducing oil separation rate from 12% to less than 3%;

② Improves texture with enhanced hardness and cohesion, delivering good spreadability, no water seepage and delicate taste;

③ Inhibits lipid oxidation, reducing acid value and peroxide value by 40% and extending shelf life to 18 months;

④ Natural source with clean label, replacing synthetic emulsifiers.

4. Functional Efficacy

Achieves emulsification and oil separation resistance to maintain system stability. Inhibits oxidation to extend shelf life, improves texture and spreadability, and fortifies dietary fiber by 5–8g per 100g.

5. Regulations and Claims

Compliant with U.S. FDA standards and **GB 2760-2024 (maximum dosage: 10.0g/kg for sauces)**. Legal permissible claims include **no oil separation, long shelf life, high dietary fiber, natural source, no synthetic emulsifier added**. National Health Commission of the People's Republic of China.

6. Commercial Value

Solves the worldwide oil separation problem of sauces, supporting Kraft's annual global sales of over 500,000 tons of peanut butter. It promotes the stabilization, long-shelf-life and clean label upgrading of the sauce industry, making SSPS a core emulsifying stabilizer for sauces.

7. Market Performance

The global penetration rate of SSPS in stable peanut butter exceeds 65%. Kraft holds a global market share of over 30%, ranking first worldwide. It drives Skippy, Yinlu and Humaying to fully adopt SSPS, with the SSPS market in the sauce sector growing by 13% annually.

VIII. Functional Food: Dietary Fiber Fortification & Carrier, Balancing the Efficacy and Stability of Medical Special Food & Health Food

Case 8: Fuji Oil Japan — High-Fiber Sugar-Control Meal Replacement Powder / Probiotic Microcapsules (Benchmark in Functional Food)

1. Market Pain Points

- Sugar-control meal replacement powder is prone to precipitation, coarse texture and low dietary fiber content, leading to conflict between efficacy and taste;
- Probiotics and active substances have poor stability, easy oxidation and low embedding rate with short shelf life;
- Traditional carriers feature poor solubility, inferior taste and no additional functional benefits.

2. Product Positioning

High-end functional food targeting sugar-controlled consumers, fat loss groups, intestinal health demanders and elderly populations. It highlights **high fiber, low GI, stable and easy dissolution, probiotic protection and long-lasting efficacy**, positioned in the high-end market covering pharmacies, health food stores and e-commerce channels.

3. Formula Design and Highlights

- Core Formula:

• High-fiber meal replacement powder: Maltodextrin 30–40%, SSPS 20–30%, isolated protein 20–25%, appropriate minerals and vitamins;

• Probiotic microcapsules: Probiotics 10–15%, SSPS 40–50%, wall material accessories 35–45%.

- Formula Highlights:

① SSPS with high soluble dietary fiber (> 80%) enables meal replacement powder to reach dietary fiber ≥25g/100g with low GI (GI≈15);

② Excellent dispersibility allows instant dissolution in cold water without precipitation, delivering smooth taste without residue;

③ Serves as a nano-embedding carrier with probiotic embedding rate > 90%, resisting gastric acid and storage, increasing viable bacteria count by 100 times;

④ Antioxidation and film formation protection extend the shelf life of active substances by 2–3 times.

4. Functional Efficacy

High dietary fiber promotes intestinal peristalsis, regulates blood sugar and lipid, and enhances satiety. Protects probiotics to improve colonization rate and activity. Low GI suits diabetic populations with natural safety and no side effects.

5. Regulations and Claims

Compliant with standards of Japan's Ministry of Health, Labour and Welfare and **GB 2760-2024 (dosage as required for production for special dietary food)**. Legal permissible claims include **high dietary fiber, low GI, intestinal regulation, probiotic protection, natural source**. National Health Commission of the People's Republic of China.

6. Commercial Value

Created a new track for SSPS application in functional food, supporting Fuji Oil’s annual sales of over 1 billion USD in functional raw materials. It promotes the high-fiber and efficacy-oriented upgrading of medical special food and health food, making SSPS a core dietary fiber carrier.

7. Market Performance

The global penetration rate of SSPS in functional food exceeds 50%. Fuji Oil holds a global market share of over 60%, ranking first worldwide. It drives DuPont, Cargill and Yihai Kerry to fully deploy the market, with the SSPS market in the functional food sector growing by 25% annually.

IX. Core Summary of Classic SSPS Application

1. Core Application Logic

The core competitiveness of SSPS lies in **low viscosity + strong acidic protein stabilization + anti-starch retrogradation + water retention & film formation + emulsification & oil separation resistance + natural dietary fiber + full process compatibility**. It can fully replace traditional additives such as pectin, CMC, gum arabic and phosphate, solving five core pain points including stability, taste, shelf life, cost and clean label, covering eight golden tracks: acidic dairy beverages, rice and flour products, quick-frozen food, baked food, plant-based drinks, acidic carbonated dairy beverages, sauces and functional food.

2. Golden Rules for Formula Compounding

● Acidic dairy beverages / Plant-based drinks: **0.25–0.35%** SSPS for single stabilization, or 0.2% SSPS + 0.1% pectin (2:1 compounding) for low viscosity, high stability and refreshing taste;

🔵Rice & flour products / Quick-frozen food: 0.2–0.9% SSPS (0.2–0.6% for rice & flour products, 0.4–0.9% for quick-frozen food) for anti-retrogradation, anti-adhesion, freeze-crack resistance and water retention;

🔵Baked food / Sauces: 0.5–2.0% SSPS (1.0–1.5% for baked food, 1.5–2.0% for sauces) for anti-retrogradation, water retention, emulsification and oil separation resistance;

🔵Functional food: 20–50% SSPS for high fiber fortification, probiotic embedding and active substance protection.

3. Regulations and Market Trends

🔵Regulations: **GB 2760-2024 (CNS 20.044)**, U.S. FDA, Japan, EU and South Korea all approve SSPS application, with maximum dosage as production required or 5.0–10.0g/kg, releasing full global regulatory dividends;

🔵Market Trends: The global SSPS market size will exceed 230 million USD in 2026 with a compound annual growth rate of 8.02%, and the Asia-Pacific region acts as the core growth engine. The Chinese market grows by over 15% annually, exceeding 1.5 billion RMB by 2030. With full penetration in eight core tracks, SSPS replaces traditional colloids and becomes an all-purpose functional ingredient in the food industry.

4. Core Commercial Value

SSPS is not only a quality improver, but also a core strategic tool for food enterprises to realize product upgrading, differentiated competition, cost reduction and efficiency improvement, clean label application and health claims:

• **Quality Upgrading**: Solve industry pain points, achieving triple improvement in taste, stability and shelf life;

• **Cost Reduction & Efficiency Improvement**: Replace 30–50% of traditional colloids, cutting costs by 15–25%;

• **Health Premium**: Natural dietary fiber plus clean label brings 10–30% product premium;

• **Full Scenario Adaptation**: Resistant to acid, heat and freeze-thaw, compatible with the full temperature range of **-40℃~200℃**.

X. Conclusion

With six core advantages including low-viscosity protein stabilization, anti-retrogradation & anti-adhesion, freeze-thaw resistance & water retention, emulsification & oil separation resistance, natural high fiber and full process compatibility, **Soluble Soybean Polysaccharide (SSPS)** has become the optimal functional ingredient in eight fields: acidic dairy beverages, rice and flour products, quick-frozen food, baked food, plant-based protein beverages, acidic carbonated dairy beverages, sauces and functional food. The above classic cases of global leading brands have fully verified SSPS's commercial maturity, market acceptance, technical feasibility and regulatory compliance, providing replicable, implementable and profitable standardized solutions for food enterprises.

In the future, with the accelerated development of four major trends — health orientation, plant-based development, clean label and long shelf life, SSPS will fully replace traditional colloids and become the core pillar of the health transformation in the food industry, driving the global food industry into a new development stage featuring naturalness, stability, refreshing taste, health and high cost performance.