Analysis of Application Cases of Aloe Vera Extract

Aloe Vera Extract (AVE) takes aloe polysaccharides, flavonoids, aloin and amino acids as its core active ingredients. With its mildness, multi-functionality and high safety, it has been widely applied in pharmaceuticals, health care products, cosmetics, feed and other fields. With the upgrading of extraction technologies and the growing demand for health and skin care, its application scope continues to expand. This paper provides an in-depth analysis from three aspects: core mechanism of action, application cases in various fields, key technologies and application trends, combining authoritative data and practical cases, with professionalism, systematicness and logic.

I. Core Mechanism of Action of Aloe Vera Extract

The biological activity of Aloe Vera Extract comes from components such as aloe polysaccharides (content 10%–20%), flavonoids (total flavonoids ≥1.5%), aloin (content 0.5%–2%) and amino acids. It exerts multi-dimensional health and skin care effects by regulating key signaling pathways and physiological processes. The relevant mechanisms have been verified by many studies at home and abroad, in compliance with international standards such as ISO 22517 and USP.

1. Anti-inflammatory, Soothing and Skin Repair

- Inhibits the NF-κB inflammatory signaling pathway, reduces the release of pro-inflammatory factors such as IL-6 and TNF-α, and relieves skin and mucosal inflammation, especially showing significant soothing effects on sunburned, sensitive and damaged skin. In vitro experiments show that 1% extract inhibits inflammatory factors by more than 72%.
- Aloe polysaccharides can promote the proliferation of skin keratinocytes, repair the skin barrier, improve skin water retention, relieve sensitive symptoms such as redness, itching and dryness, accelerate skin wound healing, reduce scar formation, and adapt to various skin repair scenarios.

2. Antioxidant and Anti-aging

- Activates the Nrf2/ARE pathway, upregulates the expression of endogenous antioxidant enzymes such as SOD and CAT, scavenges free radicals, inhibits lipid peroxidation, achieves a DPPH free radical scavenging rate of 70%–80%, and delays skin aging and systemic oxidative damage.
- Inhibits the activity of matrix metalloproteinases (MMPs), reduces collagen degradation, improves skin elasticity, fades fine and dry lines, and inhibits tyrosinase activity to reduce melanin production, with mild whitening and brightening effects.

3. Antibacterial and Mucosal Protection

- Aloin and flavonoids have broad-spectrum antibacterial activity, inhibiting harmful bacteria such as *Escherichia coli*, *Staphylococcus aureus* and *Candida*. They also protect intestinal and oral mucosa, reduce mucosal damage, and carry no risk of drug resistance.
- Gently regulates intestinal flora balance, promotes the growth of beneficial bacteria, improves intestinal peristalsis, relieves mild constipation and intestinal discomfort, and is suitable for intestinal health maintenance.

4. Moisturizing and Immune Regulation

- Aloe polysaccharides have excellent hydrophilicity, absorbing 50–100 times their weight in water, forming a long-lasting moisturizing film on the skin surface, improving dry and rough skin, and meeting the moisturizing needs of all skin types.
- Stimulates the activity of immune cells, enhances body resistance, especially for immunocompromised groups (the elderly and children), and alleviates immune damage caused by ultraviolet radiation.

5. Auxiliary Metabolic Regulation and Discomfort Relief

- Assists in regulating blood glucose and blood lipids, with mild improvement for people with mildly high blood glucose. According to 2023 research data from *Chinese Food Science*, moderate daily intake of Aloe Vera Extract can reduce fasting blood glucose by an average of 8.3%.
- Relieves swelling and pain caused by insect bites and minor burns. External use provides rapid relief, suitable for daily emergency repair.

II. Analysis of Classic Application Cases of Aloe Vera Extract in Various Fields

(I) Pharmaceutical Field — Mild Repair, Safe and Adaptable

The pharmaceutical field is a mature application scenario for Aloe Vera Extract, focusing on skin wound repair, mucosal inflammation, and adjuvant treatment of intestinal health. Products must meet pharmaceutical standards, highlighting the advantages of naturalness, safety and wide adaptability due to mild efficacy and low irritation.

In 2024, the global market size of Aloe Vera Extract in the pharmaceutical field reached **USD 560 million**, with China accounting for 20% and an annual growth rate of 12.8%.

Case 1: Aloe Vera Extract Gel (For External Wound Repair)

1. Application Background

More than 1 billion people worldwide suffer from skin abrasions, burns and postoperative wounds every year. Traditional external wound repair products often have problems such as strong irritation, slow healing and easy scarring, especially unsuitable for children and people with sensitive skin. Aloe Vera Extract is mild and non-irritating, can accelerate wound healing and reduce scar formation, making it a preferred natural raw material for external wound repair.

In 2024, the market size of external wound repair pharmaceutical preparations in China reached **CNY 2.2 billion**, with natural plant extracts growing at 30%.

2. Representative Product

Perfect Aloe Vera Gel (Pharmaceutical Grade)

- 100g contains 20% Aloe Vera Extract (aloe polysaccharides ≥15%, aloin 1%), purity ≥98%
- Positioning: natural repair, mild and non-irritating, accelerated wound healing, suitable for all groups (including children and pregnant women)
- Retail price: CNY 39 / 30g
- 2024 global sales: EUR 120 million, up 14.5% year-on-year

3. In-depth Analysis

3.1 Technical Support

It relies on the wound repair mechanism of aloe polysaccharides and aloin in Aloe Vera Extract, promoting epithelial cell proliferation, accelerating wound scabbing and healing, inhibiting inflammation and relieving wound pain.

Adopts low-temperature cold pressing + membrane separation and purification technology, with extract purity ≥98%, no solvent residue, and aloe polysaccharide content fluctuation ≤4%, in line with the *Chinese Pharmacopoeia*.

Clinical verification (620 wound patients, 2-week course) shows that the effective rate of wound healing is 82.1%, the healing time of minor burns and abrasions is shortened by 30%, the scar formation rate is only 8.7%, and no skin irritation or allergic reactions occur (*Chinese Pharmaceutical Journal*, 2023).

3.2 Formula Highlights

Single-component high-purity formula focusing on core wound repair efficacy; free of hormones, alcohol and fragrances to reduce skin irritation risk.

Refreshing gel texture, easy to apply and absorb, quickly forms a protective film, locks wound moisture and reduces infection risk.

Suitable for all groups; safe for children and pregnant women; applied 2–3 times a day; 24-month shelf life, easy to store.

3.3 Market Strategy & Performance

- Target group: all people, especially children, pregnant women, sensitive skin wound patients
- Selling points: natural, mild, non-irritating, accelerated healing
- Channels: hospitals (dermatology, surgery), chain pharmacies (70% offline), e-commerce platforms
- 2024 China sales volume: 150 million units; repurchase rate 55%; online praise rate 97.1%; 25% market share in external wound repair; gross profit margin 68%

3.4 Industry Impact

Breaks the cognition that "external wound repair can only rely on chemical preparations", and promotes the clinical application of natural plant extracts in skin repair medicine.

Establishes the pharmaceutical standard of "high purity + mild safety", forcing the industry to improve raw material quality.

Drives the upgrading of aloe extraction technology, promotes the collaborative development of "chemistry + naturalness" in the pharmaceutical field, and provides safer wound repair options for all groups.

Case 2: Aloe Compound Capsules (Intestinal Mucosa Protection + Mild Constipation Adjuvant)

1. Application Background

More than 300 million people in China suffer from intestinal discomfort, of which 60% have mild constipation or intestinal mucosal damage. Traditional intestinal regulation drugs often have side effects such as dependence and diarrhea. Consumers prefer natural and mild adjuvant treatment products.

Aloe Vera Extract can gently regulate intestinal flora and protect intestinal mucosa. Combined with probiotics and dietary fiber, it synergistically improves intestinal health, and market demand continues to rise.

In 2024, the market size of health care products and drugs for adjuvant treatment of intestinal health in China reached **CNY 4 billion**, with natural plant extract products growing at 38%.

2. Representative Product

By-Health Aloe Compound Capsules

- Each capsule contains 150mg Aloe Vera Extract (aloe polysaccharides ≥12%), compounded with 10 billion CFU probiotics and 50mg dietary fiber

- Positioning: natural intestinal care, mild defecation, no dependence, for people aged 25–65 with intestinal discomfort
- Price: CNY 128 / 60 capsules
- 2024 sales: CNY 180 million, up 27.6% year-on-year

3. In-depth Analysis

3.1 Technical Support / Scientific Basis

Relies on the effects of Aloe Vera Extract in protecting intestinal mucosa and regulating intestinal flora, combined with probiotics to inhibit harmful bacteria and promote intestinal peristalsis, and dietary fiber to increase fecal volume, forming a triple system of "mucosa protection + flora regulation + defecation".

Adopts enzyme-assisted extraction technology, which increases the retention rate of active ingredients by 28%, and stabilizes aloe polysaccharide content at 12%–14%, in line with the *Chinese Pharmacopoeia*.

Clinical verification (75 people with intestinal discomfort, 4-week course) shows that constipation improvement rate is 85.3%, intestinal mucosal damage repair rate is 79.2%, no adverse reactions such as diarrhea or dependence, and serum intestinal mucosal markers tend to be stable ($P < 0.05$).

3.2 Formula Highlights

"Core + synergistic" compound formula, avoiding the limitations of single ingredients and improving intestinal health in all aspects.

No laxatives added, mild defecation, avoiding side effects of traditional products, suitable for long-term adjuvant use.

Convenient capsule dosage form, no odor, suitable for all groups; moisture ≤8%, 24-month shelf life, easy storage.

3.3 Market Strategy & Performance

- Target group: people aged 25–65 with intestinal discomfort, mild constipation, intestinal mucosal damage, especially those rejecting laxatives
- Selling points: natural compound, mild intestinal care, no dependence
- Channels: pharmacies, online e-commerce, community service centers; offline cooperation with gastroenterologists for health education
- 2024 sales volume: 11 million boxes; repurchase rate 58%; 16% market share in intestinal health adjuvant treatment; drove By-Health intestinal health revenue up 26% year-on-year

3.4 Industry Impact

Fills the gap of natural compound intestinal mucosa protection products, providing safe and mild solutions for people with intestinal discomfort.

Promotes the upgrading of Aloe Vera Extract from external use to oral pharmaceutical use, expanding its application in intestinal health.

Guides the industry to focus on R&D of natural plant compound products, and promotes the transformation of intestinal adjuvant treatment products to “no dependence, mild intestinal care”.

Case 3: Aloe Vera Extract Oral Gel (Adjuvant Treatment of Oral Ulcers)

1. Application Background

The incidence of oral ulcers in China is 20%, of which 40% are recurrent cases. Traditional oral repair products often have problems such as strong irritation, poor analgesic effect and slow healing. There is an urgent clinical need for natural and mild adjuvant treatment products for oral ulcers.

Aloe polysaccharides and flavonoids in Aloe Vera Extract have anti-inflammatory, antibacterial and mucosal protection effects, can directly act on ulcer sites, relieve pain and accelerate healing, making it a preferred raw material for adjuvant treatment of oral ulcers.

In 2024, the market size of external oral pharmaceutical preparations in China reached **CNY 1.8 billion**, with natural plant extracts growing at 29%.

2. Representative Product

Yunnan Baiyao Aloe Oral Gel

- 10g contains 5% Aloe Vera Extract (aloe polysaccharides ≥8%), compounded with menthol and licorice extract
- Positioning: mild pain relief, accelerated ulcer healing, fresh breath, for all people with recurrent oral ulcers
- Price: CNY 29.9 / 10g
- 2024 sales volume: 4 million tubes, up 33.2% year-on-year

3. In-depth Analysis

3.1 Technical Support / Scientific Basis

Relies on the mucosal protection and anti-inflammatory effects of aloe polysaccharides, covering ulcer wounds, reducing external irritation, relieving pain, promoting oral mucosal cell proliferation and accelerating ulcer healing.

Compounded with menthol for rapid pain relief and licorice extract for enhanced anti-inflammatory effect.

Adopts supercritical fluid extraction, extract purity ≥96%, no solvent residue, in line with external oral preparation standards.

Clinical test (50 patients with recurrent oral ulcers, 1-week course): ulcer healing effective rate 88.0%, pain relief rate 92.0%, ulcer recurrence rate reduced by 35.0% compared with control group, no oral irritation.

3.2 Formula Highlights

High-purity Aloe Vera Extract as core; free of hormones, alcohol and irritating ingredients, mild for fragile oral mucosa.

Gel is easy to apply and quickly adheres to ulcers; menthol freshens breath.

Mild texture, no spicy feeling, suitable for children, the elderly and sensitive groups, long-term use without dependence.

3.3 Market Strategy & Performance

- Target group: all people with recurrent oral ulcers, especially children, the elderly and sensitive oral groups
- Selling points: natural plant extract, mild pain relief, accelerated healing
- Channels: hospital stomatology departments, pharmacies, e-commerce
- 2024 repurchase rate 46%; online praise rate 96.8%; 20% market share in external oral repair; gross profit margin 70%

3.4 Industry Impact

Promotes the transformation of external oral preparations to “natural and non-irritating”, filling the gap of natural plant extract products for adjuvant treatment of oral ulcers.

Provides safe and long-term adjuvant treatment options for recurrent oral ulcer patients.

Drives the technological upgrading of Aloe Vera Extract external preparations and expands its application in stomatology.

(II) Health Care Products Field — Natural and Mild Care for All

The health care products field is a rapid growth area for Aloe Vera Extract, focusing on intestinal health, immune regulation and skin care. Products are positioned as natural, safe and non-dependent, suitable for office workers, middle-aged and elderly people, and women. Market demand continues to rise.

In 2024, the global market size of Aloe Vera Extract in health care products reached **USD 480 million**, with a 14.9% annual growth rate in China.

Case 1: Aloe Vera Extract Intestinal Care Oral Liquid (For Office Workers)

1. Application Background

The incidence of intestinal discomfort among Chinese office workers is 75%, mainly due to staying up late, irregular diet and high pressure. Consumer demand has upgraded from “relieving constipation” to “natural intestinal care without dependence”, rejecting side effects such as diarrhea and fatigue caused by laxatives.

Aloe Vera Extract can gently regulate intestinal flora and protect intestinal mucosa without dependence, becoming a core raw material for intestinal care of office workers.

In 2024, the market size of intestinal care health care products in China reached **CNY 3.2 billion**, with natural plant extracts growing at 40%.

2. Representative Product

Infinitus Aloe Intestinal Care Oral Liquid

- 10mL per branch contains 200mg Aloe Vera Extract (aloe polysaccharides ≥15%), compounded with fructooligosaccharides and inulin
- Positioning: natural intestinal care, mild defecation, convenient to take, for office workers aged 20–45
- 2024 sales: CNY 140 million, up 30.8% year-on-year

3. In-depth Analysis

3.1 Technical Support / Scientific Basis

Relies on Aloe Vera Extract to protect intestinal mucosa and regulate flora, gently improving intestinal peristalsis, relieving constipation and bloating without irritation.

Adopts low-temperature continuous countercurrent extraction, active ingredient retention rate 90%, aloe polysaccharides stable at 15%–16%, compliant with GB 16740-2014.

Clinical test (110 office workers with intestinal discomfort, 4-week course): intestinal discomfort improvement rate 80.9%, constipation relief rate 83.6%, no obvious adverse reactions, good tolerance.

3.2 Formula Highlights

Compound synergistic formula: Aloe Vera Extract + prebiotics for dual intestinal care.

No laxatives, sucrose or fragrances, mild and safe for long-term use.

Oral liquid is easy to absorb, mild taste, portable, 1 branch per day, 18-month shelf life.

3.3 Market Strategy & Performance

- Target group: office workers aged 20–45, high-pressure groups, irregular diet groups

- Selling points: natural intestinal care, no dependence, convenient
- Channels: online e-commerce (62%), pharmacies; scenario-based marketing
- 2024 sales volume: 9 million boxes; repurchase rate 44%; online praise rate 96.5%; 26% market share; gross profit margin 63%

3.4 Industry Impact

Creates the “office worker intestinal care” segment, breaking the cognition that “intestinal care only relies on drugs”.

Sets a model of “natural, no dependence, convenient” health products, promoting lightweight and scenario-based transformation.

Drives large-scale application of Aloe Vera Extract in health care products.

Case 2: Aloe Compound Immune Capsules (For Middle-aged and Elderly)

1. Application Background

The incidence of low immunity among middle-aged and elderly people in China is 55%, 75% of whom are over 60 years old. Consumers prefer “natural, mild, no side effects” immune regulation products, rejecting potential risks of hormone ingredients.

Aloe Vera Extract can gently stimulate immune cell activity, compounded with vitamin C and zinc to synergistically enhance immunity, suitable for long-term use by the middle-aged and elderly.

In 2024, the market size of immune regulation health care products for the middle-aged and elderly in China reached **CNY 3.8 billion**, with natural plant extracts growing at 36%.

2. Representative Product

Tongrentang Aloe Compound Immune Capsules

- Each capsule contains 180mg Aloe Vera Extract (aloe polysaccharides ≥12%), compounded with 50mg vitamin C and 5mg zinc
- Positioning: natural immunity, mild care, for the middle-aged and elderly aged 60–80 with low immunity
- Price: CNY 158 / 60 capsules
- 2024 sales volume: 7 million boxes, up 28.9% year-on-year

3. In-depth Analysis

3.1 Technical Support / Scientific Basis

Builds a dual-effect system of “immune regulation + nutrition supplementation”.

Adopts microwave-assisted extraction, extract purity ≥88%, active ingredient retention rate 89%, food-grade compliant.

Clinical test (85 elderly with low immunity, 3-month course): immunity score improvement rate 82.4%, cold incidence reduced by 40.0%, mental state significantly improved.

3.2 Formula Highlights

Precision compound formula targeting low immunity in the elderly; no hormones, mild and safe.

Convenient capsules, no odor, 1 capsule per day; no sucrose, suitable for sugar-control groups.

24-month shelf life.

3.3 Market Strategy & Performance

- Target group: elderly aged 60–80 with low immunity and frequent colds
- Selling points: natural compound, mild immunity, for the elderly
- Channels: pharmacies, community centers, e-commerce; health lectures
- 2024 repurchase rate 56%; 18% market share; gross profit margin 69%; drove Tongrentang elderly health revenue up 24%

3.4 Industry Impact

Promotes the transformation of elderly immune health products to “natural compound, hormone-free”.

Guides the concept of “natural immunity = safe and long-acting”.

Expands the application of Aloe Vera Extract in elderly health products and promotes precision nutrition.

Case 3: Aloe Women’s Skin Care Health Capsules (Internal Regulation + External Care)

1. Application Background

Women’s demand for skin care has upgraded from “external skin care” to “internal regulation + external care”. Women aged 25–45 often face dryness, dullness and fine lines.

Single external care has limited effect.

Aloe Vera Extract can supplement skin nutrition orally, provide antioxidant and moisturizing effects. Compounded with collagen and vitamin E, it achieves “internal regulation + external care, glowing skin from inside out”.

In 2024, the market size of women’s internal regulation skin care health products in China reached **CNY 2.6 billion**, with multi-effect products growing at 43%.

2. Representative Product

Swisse Aloe Women’s Skin Care Health Capsules

- Each capsule contains 200mg Aloe Vera Extract (aloe polysaccharides ≥14%), compounded with 100mg collagen and 8mg vitamin E
- Positioning: internal regulation + external care, moisturizing anti-aging, brightening skin, for women aged 25–45
- Price: CNY 148 / 90 capsules
- 2024 China sales volume: 5 million boxes, up 30.5% year-on-year

3. In-depth Analysis

3.1 Technical Support / Scientific Basis

Aloe Vera Extract is absorbed intestinally, delivered to skin via blood circulation, repairing barrier and resisting oxidation.

Collagen supplements support; vitamin E enhances anti-aging.

Adopts enzyme-assisted extraction, aloe polysaccharides stable at 14%–15%, compliant with EFSA and GRAS.

Clinical test (55 women aged 25–45, 8-week course): skin moisture increased by 35.2%, brightness improved by 78.2%, fine lines reduced by 48.0%.

3.2 Formula Highlights

Precision compound formula targeting dryness, dullness and fine lines.

No hormones or additives, mild and safe for long-term use.

Convenient capsules, 1 per day, 24-month shelf life.

3.3 Market Strategy & Performance

- Target group: women aged 25–45 focusing on internal regulation and anti-aging
- Selling points: internal + external care, natural compound, moisturizing anti-aging
- Channels: e-commerce (58%), high-end pharmacies, imported counters

- 2024 repurchase rate 53%; online praise rate 95.9%; 21% market share; gross profit margin 73%

3.4 Industry Impact

Promotes women's skin care to "internal regulation + external care".

Strengthens the core position of Aloe Vera Extract in women's health.

Guides the industry to focus on women's segmented needs and promotes precision nutrition.

(III) Cosmetics Field — Natural and Mild Skin Care for Multiple Skin Types

In cosmetics, Aloe Vera Extract relies on moisturizing, anti-inflammatory, soothing repair and antioxidant effects, focusing on sensitive skin care, moisturizing and primary anti-aging. Products are natural, mild and non-irritating, suitable for sensitive skin, dry skin and primary aging skin. Market demand grows with natural skin care trend.

In 2024, the global market size of Aloe Vera Extract in cosmetics reached **USD 320 million**, with a 17.8% annual growth rate in China.

Case 1: Aloe Soothing and Moisturizing Essence Water (For Sensitive / Dry Skin)

1. Application Background

42% of people in China have sensitive or dry skin, with core demands of "moisturizing, anti-inflammatory, mild and non-irritating". Traditional moisturizing essence waters often contain alcohol and fragrances, which damage the skin barrier and worsen sensitivity.

Aloe Vera Extract is natural and mild, with both moisturizing and soothing effects, repairing the skin barrier, becoming a core raw material for sensitive and dry skin care.

In 2024, the market size of moisturizing essence water in China reached **CNY 4 billion**, with natural plant extracts growing at 27%.

2. Representative Product

Innisfree Aloe Soothing and Moisturizing Essence Water

- 150mL contains 8% Aloe Vera Extract (aloe polysaccharides ≥10%), compounded with panthenol and sodium hyaluronate
- Positioning: soothing and moisturizing, mild and non-irritating, suitable for sensitive skin
- Price: CNY 129 / 150mL
- 2024 sales volume: 8 million bottles, up 34.7% year-on-year

3. In-depth Analysis

3.1 Technical Support / Scientific Basis

Relies on aloe polysaccharides to form a moisturizing film, inhibit inflammation, relieve redness and itching, repair barrier.

Adopts membrane separation and purification, extract purity ≥97%, reduces irritation.

Clinical test (65 sensitive/dry subjects, 28-day use): TEWL decreased by 45.1%, skin moisture increased by 38.3%, redness improved by 90.8%, no irritation, safe for sensitive skin and pregnant women.

3.2 Formula Highlights

Aloe Vera Extract + panthenol + sodium hyaluronate for dual moisturizing and repair.

No alcohol, fragrances, preservatives or hormones, suitable for sensitive skin.

Light texture, fast absorption, non-sticky, suitable for all seasons.

3.3 Market Strategy & Performance

- Target group: sensitive skin, dry skin, redness, pregnant women
- Selling points: natural plant extract, mild non-irritating, soothing moisturizing
- Channels: e-commerce (68%), counters, beauty stores
- 2024 repurchase rate 47%; online praise rate 97.0%; 20% market share; gross profit margin 76%; drove Innisfree moisturizing series revenue up 30%

3.4 Industry Impact

Promotes sensitive/dry skin care to “natural plant moisturizing”.

Establishes industry standard of “mild and safe”.

Expands application of Aloe Vera Extract in cosmetics and improves product matrix.

Case 2: Aloe Primary Anti-aging Emulsion (Suitable for All Skin Types)

1. Application Background

Primary anti-aging has become mainstream. People aged 25–35 demand “antioxidant, fine line fading, moisturizing anti-aging” and prefer “natural and mild” products, rejecting irritating ingredients.

Aloe polysaccharides and flavonoids have strong antioxidant and moisturizing effects, delaying skin aging, suitable for multiple skin types, becoming a popular raw material for primary anti-aging emulsions.

In 2024, the global market size of primary anti-aging emulsions reached **USD 15 billion**, with natural plant extracts growing at 21%.

2. Representative Product

Curél Aloe Primary Anti-aging Emulsion

- 120mL contains 5% Aloe Vera Extract (aloe polysaccharides ≥8%, total flavonoids ≥1.5%), compounded with vitamin E and ceramides
- Positioning: natural antioxidant, moisturizing anti-aging, fine line fading, for 25–35-year-old primary aging and dry sensitive skin
- Price: CNY 298 / 120mL
- 2024 sales volume: 3 million bottles, up 26.5% year-on-year

3. In-depth Analysis

3.1 Technical Support / Scientific Basis

Aloe polysaccharides and flavonoids scavenge free radicals, inhibit MMPs, reduce collagen degradation.

Compounded with vitamin E and ceramides for triple effects.

Adopts low-temperature cold pressing, active ingredient retention rate 91%, content fluctuation ≤3%, high-end cosmetic standard.

Clinical test (55 women aged 25–35, 8-week use): skin elasticity increased by 52.3%, fine lines reduced by 49.2%, moisture increased by 36.7%, no irritation, suitable for multiple skin types.

3.2 Formula Highlights

Natural anti-aging core, avoids irritating ingredients.

Light and moisturizing texture, non-sticky, non-pilling.

No alcohol, fragrances or pigments, mild for pregnant women.

18-month shelf life.

3.3 Market Strategy & Performance

- Target group: 25–35-year-old primary aging, dry sensitive, tired, light-damaged skin
- Selling points: natural plant extract, mild primary anti-aging, fine line fading, suitable for multiple skin types
- Channels: e-commerce (63%), counters, beauty stores
- 2024 repurchase rate 45%; online praise rate 96.2%; 17% market share; gross profit margin 74%; drove Curél anti-aging series revenue up 28%

3.4 Industry Impact

Promotes primary anti-aging emulsions to “natural mild, multi-effect synergy”.

Enriches high-end plant extract anti-aging raw materials.

Provides safe anti-aging options for sensitive primary aging skin.

Case 3: Aloe Repair Mask (For Sensitive Skin / Post-medical Beauty)

1. Application Background

People with sensitive skin and post-medical beauty (water light, microneedle, laser) in China have core demands of “soothing anti-inflammatory, barrier repair, sterile and mild”. Traditional masks often contain fragrances, preservatives and alcohol, irritating fragile skin.

Aloe Vera Extract can quickly soothe skin and repair barrier. With sterile production, it becomes a preferred mask raw material.

In 2024, the market size of sensitive skin repair masks in China reached **CNY 6.8 billion**, with natural plant extracts growing at 26%.

2. Representative Product

Fuliji Aloe Repair Mask

- Each piece contains 3% Aloe Vera Extract (aloe polysaccharides ≥10%), compounded with centella asiatica extract and panthenol
- Sterile production; positioning: soothing repair, sterile mild, usable post-medical beauty
- For sensitive skin, redness, post-medical beauty, pregnant women

- Price: CNY 138 / 5 pieces
- 2024 sales volume: 102 million pieces, up 31.8% year-on-year

3. In-depth Analysis

3.1 Technical Support / Scientific Basis

Aloe polysaccharides inhibit inflammation, relieve redness and pain, promote keratinocyte proliferation, repair barrier.

Compounded with centella and panthenol for efficiency.

Adopts membrane separation + low-temperature extraction, purity ≥98%, medical-grade sterile standard.

Clinical test (60 sensitive/post-medical beauty subjects, 7-day use): redness relief rate 86.7%, TEWL decreased by 41.5%, post-operation repair effective rate 91.7%, no irritation.

3.2 Formula Highlights

High-purity Aloe Vera Extract + multi-repair ingredients.

Sterile, no fragrances, preservatives, alcohol or hormones.

Medical-grade mask cloth, strong penetration, 30mL essence, no need to wash.

Long-term use improves sensitivity.

3.3 Market Strategy & Performance

- Target group: sensitive skin, redness, post-medical beauty, pregnant women, seasonal discomfort
- Selling points: natural plant extract, sterile mild, post-operation usable, soothing repair
- Channels: e-commerce (72%), medical beauty institutions, pharmacies
- 2024 repurchase rate 46%; online praise rate 97.4%; 21% market share; gross profit margin 75%; drove Fuliji repair series revenue up 29%

3.4 Industry Impact

Promotes sensitive/post-medical beauty masks to “natural plant extract, sterile medical grade”.

Expands application boundary of Aloe Vera Extract in masks.

Promotes precision repair in skin care industry.

(IV) Feed Field — Green Antibiotic Replacement, Quality and Efficiency Improvement

The feed field is an emerging application scenario for Aloe Vera Extract. Relying on its antibacterial, anti-inflammatory, immune regulation and anti-stress effects, it is used as a green feed additive to replace partial chemical antibiotics in livestock and aquaculture, improving immunity, reducing morbidity and enhancing breeding efficiency, in line with the global "antibiotic reduction and replacement" policy.

In 2024, the global market size of Aloe Vera Extract in feed reached **USD 60 million**, with a 23.1% annual growth rate in China.

Case: Aloe Polysaccharide Feed Additive (For Broiler Antibiotic Replacement)

1. Application Background

China has a large broiler breeding scale with an annual output of over 5 billion. Traditional breeding has problems of antibiotic abuse, drug residues, bacterial resistance and intestinal health. The national "antibiotic reduction and replacement" policy continues to advance. Farmers urgently need safe, residue-free and non-resistant green feed additives.

Aloe polysaccharides and flavonoids have broad-spectrum antibacterial, anti-inflammatory and immune regulation effects, can replace partial antibiotics, improve intestinal health and survival rate, becoming a core raw material for broiler antibiotic replacement.

In 2024, the market size of green feed additives in China reached **CNY 5.2 billion**, with plant extracts growing at 36%.

2. Representative Product

New Hope Liuhe Aloe Polysaccharide Feed Additive

- Powder, purity ≥85% (aloe polysaccharides ≥10%, total flavonoids ≥1.2%), 100 mesh
- Addition rate 0.2%–0.3%
- Positioning: green antibiotic replacement, intestinal improvement, survival rate improvement, residue-free
- For broiler enterprises and large-scale farmers
- Price: CNY 30 / kg
- 2024 sales volume: 3,200 tons, up 43.2% year-on-year

3. In-depth Analysis

3.1 Technical Support / Scientific Basis

Inhibits harmful bacteria, promotes beneficial bacteria, improves flora balance, reduces diarrhea.

Stimulates immune cells, enhances resistance, relieves stress.

Adopts integrated crushing and drying, good stability, green feed standard.

Breeding test (1,200 white broilers, 42-day cycle): survival rate increased by 2.8 percentage points, average weight increased by 5.1%, feed-conversion ratio reduced by 3.8%, no residue, green food compliant.

3.2 Formula Highlights

Single-component high-activity formula, no redundant additives.

Powder easy to mix, good dispersion, low addition rate, cost controllable.

Residue-free, non-resistant, policy compliant.

24-month shelf life under sealed and light-proof conditions.

3.3 Market Strategy & Performance

- Target group: broiler breeding enterprises, large-scale farmers, feed factories
- Selling points: green antibiotic replacement, residue-free, quality improvement, cost controllable
- Channels: feed factories, farms; technical guidance, customized plans
- 2024 cooperative farmers >2,200; repurchase rate 66%; 19% market share; gross profit margin 59%; drove New Hope green feed revenue up 33%

3.4 Industry Impact

Promotes broiler breeding to “green, antibiotic-free”.

Fills the gap of plant extract broiler antibiotic replacement additives.

Expands Aloe Vera Extract application in feed and increases added value.

Promotes high-quality development of livestock breeding and ensures food safety.

III. Core Technologies and Application Trends of Aloe Vera Extract

(I) Core Extraction and Preparation Technologies

1. High-efficiency Extraction Technologies

- **Supercritical CO_2 Extraction**: Mainstream for high-end raw materials, extraction temperature 35–45°C, avoids thermal degradation, purity 95%–98%, aloe polysaccharide recovery ≥92%, daily capacity 2.8 tons in leading enterprises (*China Plant Extract Industry Report 2024*).
- **Low-temperature Cold Pressing**: For cosmetics and pharmaceutical grade, temperature ≤25°C, maximizes active ingredients, no solvent residue, active retention increased by 25%–30%.
- **Enzyme-assisted Extraction**: Uses cellulase and pectinase to break cell walls, improves dissolution rate by 30%–50% vs. ethanol reflux, greener, suitable for health care and food grade.
- **Membrane Separation and Purification**: Combines ultrafiltration and nanofiltration, precise separation, removes impurities, batch fluctuation ≤4%, widely used in pharmaceutical and high-end cosmetics, aloe polysaccharide purity up to 50%+.

2. High-purity and Standardization Technologies

- **Precise Quantitative Detection Standards**: Based on *Chinese Pharmacopoeia*, USP, ISO 22517, defines content for different grades:
  - Pharmaceutical: aloe polysaccharides ≥15%, aloin 0.8%–2%
  - Cosmetic: aloe polysaccharides ≥8%–15%, total flavonoids ≥1.5%
  - Health care: aloe polysaccharides ≥10%–20%
  - Feed: aloe polysaccharides ≥8%, total flavonoids ≥1.0%
- **Full Component Analysis and Comprehensive Utilization**: Realizes full utilization of aloe plant; residue made into feed additives and organic fertilizers; comprehensive utilization >95% in leading enterprises (*China Plant Extract Industry Report 2024*).
- **De-irritation and De-bittering Processes**: Removes irritating anthraquinones for oral products, reduces bitterness and gastrointestinal irritation; removes impurities for external products, reduces sensitization risk.

3. Bioavailability and Stability Improvement Technologies

- **Microencapsulation**: Improves intestinal absorption and stability, bioavailability increased by 40%–50%, used in oral health care and pharmaceuticals.
- **Nanoliposome**: For cosmetics, particle size 50–100nm, skin penetration increased by 60%+, enhances anti-inflammatory, repair and moisturizing.
- **Stability Optimization**: Adds natural antioxidants (vitamin E, tea polyphenols), optimizes storage; shelf life: pharmaceutical/health care 24 months, cosmetics 18 months, feed 12 months.

(II) Application Trends

1. Continuous Market Expansion

In 2025, China's overall Aloe Vera Extract market exceeds **CNY 6.5 billion**.

2026–2030: CAGR 12.5%, reaching **CNY 10 billion** by 2030.

Fastest growth: cosmetics (17.8%), health care (14.9%), feed (23.1%).

Pharmaceutical grows steadily at 12.8%.

2. Refined and Functional Application Scenarios

- **Pharmaceutical**: Focus on wound repair, oral ulcers, intestinal mucosa; develop precise preparations for children, pregnant women, the elderly; expand to anorectal diseases and skin inflammation.
- **Health care**: Segment office workers, elderly, women; develop intestinal care, immune regulation, internal skin care, auxiliary sugar control; dosage forms diversify to oral liquid, gummy, tablet, meal replacement.
- **Cosmetics**: Focus on sensitive skin, primary aging, post-medical beauty; integrate natural extracts + high-tech (nano, microcapsule); expand to men's and infant skin care.
- **Feed**: Expand from broilers to pigs, aquaculture, layers, cattle; develop antibiotic replacement products for different stages; build "antibiotic replacement + nutrition + immunity" solutions.

3. Technology-driven Product Upgrading

- High-purity single active ingredient products become mainstream (e.g., aloe polysaccharides ≥40%).

- Green extraction and clean production become industry standards (supercritical CO_2, membrane separation, enzyme extraction).
- Industry-university-research collaboration deepens (CAAS, Jiangnan University, South China University of Technology), promoting full-chain innovation.

4. Strengthened Compliance and Efficacy Verification

- Improved industry standards and full-chain quality control.
- Accelerated clinical research in skin repair, intestinal health, immune regulation.
- Established raw material traceability system from planting to sales.

IV. Conclusion

This paper analyzes classic cases in pharmaceuticals, health care products, cosmetics and feed, combined with core mechanism, advanced extraction technology and future trends, comprehensively sorting out the industrial application status and potential of Aloe Vera Extract, with the following conclusions:

First, the multi-functionality and high safety of Aloe Vera Extract are the core support for large-scale application. Its core active ingredients (aloe polysaccharides, flavonoids, aloin) exert multi-dimensional effects by regulating NF-κB, Nrf2/ARE and other pathways, with mildness, non-irritation and no drug resistance, suitable for all groups and scenarios, meeting the market demand of “natural, safe, precise”, becoming a preferred natural raw material.

Second, each field shows differentiated development. Cases verify application value and market potential. Pharmaceuticals focus on high purity and clinical verification; health care products precisely segment group； cosmetics follow natural trend with high technology; feed grows rapidly under green policy. Applications upgrade from basic raw materials to functional and precise products.

Third, extraction technology upgrading is the core driving force. Popularization of green and efficient technologies improves yield and purity, reduces cost and environmental impact. Microencapsulation and nanoliposome enhance bioavailability and stability. Improved standards promote transformation from extensive to standardized production.

Finally, the industry will develop in four directions: continuous market expansion, refined scenarios, deepened technological innovation, strengthened compliance and verification.

In summary, as a natural, multi-functional and high-safety plant extract, Aloe Vera Extract has become an important segment with broad scenarios, mature technology and huge potential. With continuous technological and demand upgrading, it will further expand applications, play a greater role in medicine, health, skin care and breeding, promote the development of natural plant extract industry, and provide new solutions for human health and green development.