

PROSPECTS OF ALOE VERA IN FMCG PRODUCTS

Abstract

This report explores the prospects of incorporating Aloe vera in FMCG products.

Aloe vera, a plant renowned for its therapeutic and cosmetic advantages, has experienced a surge in popularity within the FMCG sector. With increasing awareness, customers are seeking natural and herbal options for their skincare and personal care products. The antimicrobial qualities and skin-soothing and nourishing abilities of aloe vera present a significant prospect for FMCG companies.

The antibacterial characteristics of aloe vera make it a significant component in skincare and personal care products. It possesses the ability to counteract harmful bacteria like *Staphylococcus aureus* and *Escherichia coli*, which corresponds to the increasing need for skincare products that are both natural and efficient. Moreover, its calming and hydrating characteristics render it a perfect ingredient in items such as moisturizers, ointments, and face masks.

The multifaceted application of aloe vera in the manufacturing of pre-packaged beverages, health beverages, and carbonated beverages presents FMCG firms with prospects to expand and vary their beverage offerings. The possibility for creating unique beverages using aloe vera is extensive, ranging from aloe vera lemon juice to aloe sports drinks enriched with electrolytes.

Given the increasing use of aloe vera products as substitutes for antibiotics in the poultry industry, there exists a potential to create nutritional supplements for human use. Aloe vera capsules, gel, and juice can be developed to meet different health and wellness needs, addressing the increasing need for natural supplements.

FMCG firms must guarantee the integrity and genuineness of aloe vera products. To ensure

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trustworthy and effective products, it is crucial to do comprehensive testing and quality assurance procedures due to the existence of adulterants, contaminants, and uneven quality in the market.

Ultimately, the inclusion of aloe vera in fast-moving consumer goods (FMCG) offers numerous prospects in the realms of skincare, beverages, and dietary supplements. Nevertheless, to fully use the potential of aloe vera in the FMCG sector, companies must prioritize the resolution of quality control and consumer safety issues.

Keywords: Aloe Vera, FMCG Products.

I. INTRODUCTION

Aloe vera is a well-known plant that has long been used as a successful and effective ingredient in skincare products. For all FMCG (fast-moving consumer goods), including cosmetics, ayurveda, nutraceuticals, and herbal medications, its natural attributes make it a popular option. Aloe vera also contains a significant amount of vitamins and antioxidants, which feed the skin and give it a beautiful, healthy appearance. The herb has a long history of usage in traditional medicine due to its incredible advantages for the skin and hair. Historical personalities like Cleopatra and Alexander the Great are associated with its use. In many well-known healthcare and cosmetic products, aloe vera is a common cosmetic component. Aloe vera has several benefits for the skin, some of which include reducing redness and irritation and promoting healing. Additionally, it is known to have moisturising properties that may improve the overall texture of the skin and help alleviate dryness. Due to its naturally gel-like consistency, aloe vera is also a popular ingredient in several face masks, moisturisers, and serums. It is adaptable and unlikely to cause allergies, sensitivities, or adverse skin responses. It is widely found in body, face, and hair cosmetics as well as after-sun care products. Aloe vera also has a lot of antioxidants, which may protect the skin from damage from the environment and premature ageing. Thanks to its antimicrobial characteristics, it effectively treats acne and prevents outbreaks. Additionally, aloe vera helps ease sunburns and minimise the prominence of scars and blemishes. The qualities and composition of aloe vera have been the subject of several investigations, making it a well-liked plant in academic circles. According to some research, aloe vera may have anti-inflammatory characteristics that might make it beneficial for illnesses including psoriasis and eczema. Additionally, aloe vera gel is commonly used as a natural moisturiser because of its moisturising properties, which make it suitable for all skin types. One of the most well-known and often used aloe species among the more than 400 varieties is Aloe vera Burm, which is recognised for its thick, succulent leaves that are filled with a gel-like substance. Due to its rich vitamin, mineral, and antioxidant content, which increases its healing capabilities, this gel is a common component in skincare products. Aloe vera gel may help decrease skin irritability and redness since it has both regenerative and anti-inflammatory effects. This makes it particularly beneficial for those with sensitive skin or acne problems. The creation of collagen may improve the skin's general suppleness and firmness and give it a more youthful look. Aloe vera gel has also been found to support this process. In traditional medicine, aloe vera balm has been used for millennia to cure burns and wounds. Both names refer to the same plant, which is also known as Aloe barbadensis Miller. The anti-inflammatory qualities of aloe vera gel are very widely recognised, and they may help reduce the redness and swelling caused by skin disorders like eczema or psoriasis. The natural moisturising qualities of the plant may also moisturise and nourish the skin, leaving it feeling supple and smooth. The many aloe vera ingredients accessible to those who create natural skincare products are covered in this article, along with their applications and methods of incorporation. By comprehending the varied forms and functions of aloe vera ingredients, natural skincare formulators may create solutions that properly treat specific skin conditions. Incorporating components into high-performance formulas will provide the most advantages, including calming inflamed skin and increasing general skin health.

II. ALOE VERA IN SKIN FORMULATIONS

Aloe vera contains a wide variety of bioactive compounds, including lipophilic and hydrosoluble vitamins, minerals, enzymes, simple and complex polysaccharides, phenolic compounds, and organic acids. Aloe vera is a common component in skincare formulations because of its moisturising and anti-inflammatory qualities, which are attributed to these chemicals. Additionally, the suppleness and firmness of the skin may be enhanced by aloe vera's capacity to promote collagen formation. The inside of an aloe vera frond is a clear gel, whereas the outside is a green peel. Be cautious not to mix the translucent inner gel with the bitter-yellow exudate from the outer peel. Vitamins A, C, and E, which are recognised for their antioxidant effects, are among the vitamins found in the clear gel within the aloe vera leaves (Gupta et al., 2021). These antioxidants may aid in defending the skin against oxidative stress and make it look younger. Additionally, the natural enzymes included in aloe vera help exfoliate dead skin cells and unclog pores, giving skin a cleaner appearance. Understanding the differences between the two aloe vera plant portions will help you choose the right part of the plant depending on the qualities you want to include in your cosmetic. Each part of the plant has various components and activities. Because of its soothing and moisturising qualities, the gel from the inside of the aloe vera leaf is often used to treat dry skin and sunburns (Krishnamoorthy, 2012). On the other hand, the latex, which is made from the leaf's outer layer and is recognised for its laxative properties, is often used in products for digestive health. Knowing the individual advantages of each component will enable you to choose aloe vera wisely for your cosmetic requirements.

III. GEL ALOE VERA

Aloe vera gel has a remarkable ability to moisturise. Its high concentration of polysaccharides, which give it a gel-like appearance, is the cause of this. Due to their high hygroscopicity, the polysaccharides bond to moisture. This helps to maintain skin moisture and lock in hydration. A popular ingredient in skincare products, aloe vera gel also contains vitamins, minerals, and antioxidants that may hydrate and calm the skin. This arrangement, however, provides the epidermis with a protective barrier, which enhances its healing capacity (Chang et al., 2011). The skin may recover more rapidly thanks to the protective barrier that aloe vera gel creates against environmental allergens and contaminants. The anti-inflammatory properties of the gel may help reduce redness and irritation, hastening the healing process. Additionally, it enhances the skin's capacity for self-defence and healing. Studies suggest that the gel may have analgesic and anti-inflammatory properties, which would be especially helpful for treating burns and skin lesions as well as promoting radiation damage recovery. Because it contains vitamins, amino acids, minerals, and enzymes, aloe vera gel calms the skin. These components also assist the gel in moisturising and hydrating the skin, which enables it to alleviate dryness and enhance the overall health of the skin. Additionally, it has been shown that aloe vera gel contains antibacterial characteristics, which may help prevent infections and speed up the healing of a number of skin diseases (Hamman et al., 2014).

IV. ALOE VERA FOLIAGE EXUDE

Aloe vera's green peel exudate has been studied for both its hazardous and medicinal potential. Scientists are interested in the exudate's ability to provide useful chemicals for

application in medications and cosmetics (Al-Nima, 2022). Studies have shown that the exudate from the aloe vera plant may have anti-inflammatory capabilities, making it a possible treatment option for skin problems including eczema and acne. The antioxidant content in the exudate has been shown to shield the skin from free radical damage, possibly expanding its therapeutic use. The composition of the exudate differs across species. However, it typically includes a variety of components that irritate the skin and induce erythema (redness); these include phenolic chemicals, including chromone, anthraquinone, and anthrone derivatives. As a result, we suggest sticking to aloe vera gel and not using leaf exudate in your recipes. The ability of aloin to lighten skin has been effectively isolated from aloe vera leaf exudate. Aloe vera is an intricate component, as the aforementioned cosmetic science has shown (Renuga, 2019).

V. ALOE VERA JUICE

Juice from aloe vera is touted as being good for the digestive system. It is thought to have anti-inflammatory properties and might help with digestion. It should be noted that some of the phenolic substances we previously discussed, which could be bad for the digestive system, might also be in aloe vera juice (Langmead *et al.*, 2004). As a result, it is advised that you see a doctor before adding aloe vera juice to your diet. Ayurveda supports a number of therapeutic treatments in this area, although there is no scientific proof for them. Aloe vera does, however, contain antioxidant and anti-inflammatory properties that may be helpful for the skin. Aloe vera is a popular component in skincare products because of these qualities. It's important to remember that although aloe vera may offer potential benefits for the skin, additional study is required to fully comprehend these benefits and choose the optimum use. It may be used to treat sunburns and other abrasive skin diseases and has moisturising properties. Aloe vera has also been shown to speed up wound recovery and reduce scar prominence. It is therefore a useful component in cosmetics designed to improve the texture and appearance of the skin. People with sensitive skin should use aloe vera carefully since it sometimes causes allergic reactions. It is a key ingredient in many digestive cures and is known as Ghrit Kumari in old texts.

Aloe vera has long been used in traditional medicine to aid digestion, in addition to its advantages for the skin. Its calming properties might minimise indigestion symptoms and improve intestinal health. Before using aloe vera for digestive difficulties, you should see a doctor, particularly if you have any pre-existing conditions or are on medication. It is currently thought that excessively utilising plant extract may be harmful and that the toxicity of its effects varies with dosage. Aloe vera may also have anti-inflammatory properties, which might help maintain a healthy gut in addition to its benefits for digestion. Aloe vera products may vary in quality and concentration; therefore, it is best to stick with recommended dosages and choose reputable brands. Women who are expecting or nursing should also take care and consult a doctor before using aloe vera in their diet. In addition to being a potent dietary supplement for diabetic wound healing, processed aloe food items include compounds that have been shown to prevent cancer. Aloe vera has also been shown to have potential advantages for skin health, including lowering inflammation and hastening the healing of wounds. While aloe vera may have health benefits, it shouldn't be used as a substitute for expert medical advice or treatment for certain diseases. As a result, it is always preferable to seek medical advice before including aloe vera products in your diet or skincare regimen (Dilla Sastri Mara, 2022).

VI. ALOE-BASED PASTE

The anti-inflammatory qualities of aloe vera paste have been shown to be useful in calming painful gums and reducing gum inflammation. The use of aloe vera paste shouldn't replace routine dental checkups or expert dental treatment, but it is crucial to keep in mind. Aloe vera gel, a typical component in commercial toothpastes, displays antibacterial efficacy against microbial infection of the buccal cavity (Sultan, 2019). Aloe vera gel has been shown to be beneficial in combating oral bacterial infections, which may serve as a barrier against gum disease and tooth decay. Due to its antibacterial properties, this organic ingredient is often used in the production of commercial toothpaste. Aloe vera gel may be a beneficial addition to oral hygiene regimens, but it shouldn't take the place of periodic dental examinations and treatments performed by dental professionals. It's important to keep this in mind.

Aloe vera, chitosan, and collagen are used to create a scaffold for tissue engineering applications. Aloe vera has polysaccharides with antiparasitic properties in its juice, gel, and flower. These polysaccharides are helpful for dental applications because they may be able to prevent the development of numerous germs. A possible therapy for regenerative medicine involves the addition of aloe vera, collagen, and chitosan to composite scaffolds. to get rid of E. Aloe vera is used in passive ultrasonic irrigation for *Faecalis* biofilm in place of 1% sodium hypochlorite. Its organic ingredients have been shown to be effective against sheep intestinal worms (Hassan et al., 2023).

Aloe vera's mucopolysaccharides aid in maintaining skin moisture. The skin becomes more elastic and less prone to wrinkles as a result of aloe's stimulation of the fibroblasts to make more collagen and elastin. Additionally, it softens the skin by inducing the superficially flaky epidermal cells to adhere to one another via cohesive actions. Some bacteria that the aloe vera paste has been shown to be effective against are *Streptococcus mutans*, *Lactobacillus acidophilus*, *Enterococcus faecalis*, *Prevotella intermedia*, and *Peptostreptococcus anaerobius*. The most often mentioned medical disorders handled were wounds, infections, intestinal parasites, gastrointestinal issues, and gastrointestinal troubles (Dewiyani & Alamsyah, 2023). Additionally, studies have shown that aloe vera's anti-inflammatory properties can help reduce the swelling and redness brought on by a variety of skin conditions. It may also be a natural means of treating infections and has the power to hasten the healing of wounds due to its antibacterial properties.

VII. ALOE VERA POWDER

Aloe gel may be used to enhance other products since it is virtually totally liquid after being dried and ground into powder. Aloe vera powder is most often used in foods, nutritional supplements, skincare and cosmetics, and haircare products. Aloe vera's suitable bioactive chemical makeup offers a number of beneficial health impacts (Çoban, 2021). Aloe vera powder is one of the most widely used substances in the health, wellness, and nutraceutical industries.

Aloe vera powder is highly valued in the food and beverage business as well. Aloe vera powder is often used in foods like yoghurt, lassi, aloe vera juice, sports drinks prepared from the plant without any laxative effects, etc.

Aloe vera powder is used in everything from cosmetics to hand sanitizer because of its incredible health advantages. Due to its pH-friendly properties for the skin and bioactive compounds, aloe vera is quite different from other plants in terms of health (Handayani et al., 2022).

Aloe vera powder reduces the quantity of gluten while increasing the amount of minerals when used in lieu of wheat flour in cakes. Because ALP offers a number of potentially beneficial active components, the present research attempted to partly replace wheat flour with it. Catechin, lignin, saponin, sinapic acid, and quercetin concentrations in aloe vera leaves are very high. In addition to the anticancer properties of the anthroquinone molecule, the antioxidant, analgesic, and anti-inflammatory properties of aloe vera leaves have also been shown. Bakery products like cakes have greater functional and nutritional qualities when aloe vera leaf powder (ALP) is substituted for wheat flour. After the aloe gel is ground up, aloe vera leaf powder (ALP) is produced. Aloe vera gel may also serve as a traditional food preserver when applied in a thin layer (Gorsi, 2019).

The nutritional profile of aloe vera powder is good and meets all requirements for a healthy body. Aloe vera powder has 231 calories, 2.2 g of fat, 8% protein, 8% fibre, 8% calcium, 2% iron, and 2% salt per 100 g serving (Bista *et al.*, 2020).

Because it contains all essential vitamins, minerals, and macronutrients, it is an ideal ingredient for the culinary, nutraceutical, dietary, and wellness industries.

VIII. COSMETICS CONTAINING ALOE VERA

Aloe vera is a crucial ingredient in cosmetics. It is a miracle plant for beauty, including around 20 amino acids, enough calcium, magnesium, and sodium, as well as enzymes, vitamins, polysaccharides, nitrogen, and other substances. The following is a quick explanation of the most significant applications of aloe vera for cosmetic reasons.

- 1. Pigmentation:** Melanin, one of the pigments that make up skin, gives human skin its distinctive colour. Hyperpigmentation is a disorder that develops when a lot of melanin is generated. This is often brought on by excessive sun exposure to the skin. Melanin production in the skin begins in response to UV light from sunbeams by melanocytes, which are skin cells. The skin begins to show dark patches as a consequence of this increased melanin production. Aloe vera may be used to lessen pigmentation and dark patches on the face.
- 2. Skin Eruption:** Aloe vera creams are effective for treating skin outbreaks. The best treatment for burns and wounds has been shown to be aloe vera gel. Aloe vera is really helpful for skin eruptions because of its ability to regenerate cells and because of its anti-bacterial and anti-fungal properties.
- 3. Scalp:** Use of aloe vera may greatly aid in the treatment of scalds and other skin conditions. The scalp, stings, sprains, sunburns, eczema, aching muscles, arthritis, scrapes, cold sores, scalds, abrasions, and other conditions may also be treated with it.

- 4. Blisters and Itching:** Aloe vera also relieves itching and aids in the treatment of blisters. Vitamins B1, B2, B6, B12, and C from aloe soothe and pleasantly feel the skin.

Aloe vera stimulates the synthesis of collagen and elastin, which slows the ageing process of the skin. These proteins are necessary for the skin to maintain its youth.

- 5. Acne:** Aloe vera helps acne scars shrink by boosting the immune system and reducing inflammation. Aloe vera-based cosmetics might potentially lessen the severity of acne. It also contains chemical components that may prevent acne from forming on the skin.
- 6. Freshness:** Aloe vera seems to have just been picked. It aids in boosting blood flow, which promotes better cell nourishment and oxygen exchange.

Aloe Vera has the fantastic ability to significantly lessen the discomfort of sunburns. It is directly administered to the skin for this. Sunburns may be treated using aloe vera after-sun remedies or the plant's fresh juice.

The natural moisturiser aloe vera can be applied to the skin to soften and moisturise it (Simanjuntak, 2022). For exceptionally soft skin after a shower, there are several lotions with aloe vera on the market. Aloe vera gel, cream, or lotion applied to the face forms a great barrier that protects the skin from dust and other potentially damaging environmental impacts.

IX. HOUSEHOLD CLEANING PRODUCTS

Aloe vera's main advantages as a disinfectant include being a natural material with little to no side effects, being readily available and affordable, and not creating any environmental problems. Aloe vera is an excellent addition to home cleaning products because of its antibacterial capabilities, which may effectively eliminate bacteria and germs. Not only does it calm, but it also protects surfaces from fading or damage. All things considered, using aloe vera as part of your cleaning regimen may be a secure and reliable approach to maintaining a tidy and healthy house.

Aloe vera functions well in hand sanitizers as a natural moisturiser because of its gel-like nature. Because it contains polyphenols that prevent bacterial development, aloe vera naturally protects against viral and bacterial infections. Aloe vera is a perfect ingredient for hand sanitizers due to its antibacterial properties, which may also decrease the likelihood of cross-contamination. The moisturising effects of aloe vera may help stop the usual side effects of regular hand washing, such as dryness and irritation (Taufik et al., 2021). It contains organic Aloe Barbadensis (Aloe Vera) Leaf Juice, which kills germs without interfering with your hormonal balance, and 70% ethyl alcohol. Because aloe vera cools and soothes the skin, it improves the comfort of using hand sanitizers. Aloe vera has also been shown to possess anti-inflammatory properties, which may aid in minimising any irritation or redness brought on by the harsh chemicals in conventional sanitizers.

X. ALOE VERA IN AYURVEDA

The Sanskrit name for aloe vera is Ghrita-Kumari, which means "young girl" in English. According to the Vedas, this plant bestows youth and has a rejuvenating effect on women, which is why it was given this name. According to the ancient holistic medicinal practise, aloe vera contains four of the six Ayurvedic flavours, including bitter, stiff, spicy, and sweet. Aloe vera is highly valued in Ayurveda because of its cooling effects and capacity to balance the Pitta dosha, which is linked to heat and inflammation (Jyothsna Chowdary Kantam *et al.*, 2016). Its bitter taste supports a healthy digestive tract and aids in the body's detoxification process. Aloe vera has also been linked to the promotion of good skin and hair when applied topically and consumed. The flavour (vipaka) is sweet after digestion, and the outcome is cooling. Aloe is one of the rare plants that only has a bitter taste. Aloin, a naturally occurring component of aloe vera that contains antioxidant and anti-inflammatory properties, is considered to be the cause of the plant's bitter flavour. Due to these qualities, aloe vera is a common component of skincare products and all-natural treatments for a range of skin ailments, including acne and sunburn. Irritable bowel syndrome and other digestive disorders like acid reflux may both be calmed down with aloe vera (Mahboubi, 2021). Aloe has a variety of flavours, as was mentioned before, but the bitter flavour combined with the stiff flavour is the most advantageous in terms of its healing properties. Compared to other aloe flavours, this one is stronger. Aloe juice has the ability to balance all three doshas, although the Pita dosha is the most susceptible. People who consume satvic foods and want to develop their spirituality may include this medicinal plant in their diets since it is classified as a satvic food in Ayurvedic medicine. Aloe juice balances the doshas in addition to promoting healthy digestion and cleaning. It's a great addition to any cleansing or weight reduction routine because of its bitter flavour, which stimulates the liver and encourages regular bowel movements.

Aloe vera promotes ovulation and assists in the onset of periods when combined with other related Ayurvedic remedies like kaseesa and Tankana (purified borax) and hot-potency herbs like asafotida. This justification is in favour of Raja Pravartini vati tablets' usage as a period-inducing medication in Ayurvedic medicine. Aloe vera is widely recognised for having anti-inflammatory properties that may ease pain such as menstrual cramps. Aloe vera and other Ayurvedic medicines may be used to address hormonal imbalances that could impact the menstrual cycle (Dey *et al.*, 2017).

The aloe vera flower may heal infected wounds, remove worm infestations, and balance the Vata and Pitta doshas (heavy). Aloe vera blooms are also well-known in Ayurveda for treating worm infestations and promoting faster wound healing. The Vata and Pitta Doshas, which are linked to bodily heaviness and imbalance, are also claimed to be able to be balanced by their characteristics (Ranjbar & Yousefi, 2018).

XI. CONCLUSION

Because of its varied properties, aloe vera is an important element in a variety of businesses, ranging from the cosmetics and skincare industries to Ayurvedic medicine. Its ability to calm and nourish the skin, as well as its anti-inflammatory and general health-enhancing properties, have made it a popular choice as a natural cure. In addition, the high water content and moisturising characteristics of aloe vera make it an efficient moisturiser for

dry and injured skin. Its antioxidant qualities also help protect the skin from damage caused by free radicals and from the premature ageing that comes from doing so. Because of its many uses and advantages, aloe vera is a product that is often recommended to those who are searching for natural and holistic remedies to address their concerns with their health and appearance. Aloe vera continues to demonstrate its efficacy in enhancing both physical and mental well-being, whether it is applied to the hands in the form of hand sanitizers or ingested as part of a balanced diet.

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