

Research Article

Avernas Wash: Facial Wash Belimbing Wuluh Combination of Bromelain Boost Enzyme Brightens Face and is Environmentally Friendly

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Abstract . The natural cosmetics market in Indonesia has experienced significant growth from 2019 to 2024, with around 60-70% of facial care product users still relying on chemical products. Microplastic waste from chemical products contributes to the clean water crisis and ecosystem damage. Avernas wash is here as an innovative solution by utilizing natural ingredients, such as starfruit and pineapple enzymes, which are safe for the skin and environmentally friendly. This product helps the appearance of the face to be brighter and maintains skin elasticity. Starfruit contains antioxidants such as vitamins C and E which protect the skin from free radicals and dark spots, the water content in starfruit provides hydration and moisturizes the skin. In addition, starfruit contains Alpha-Hydroxy Acid (AHA) which removes dead skin cells and increases skin cell turnover to provide a brighter skin appearance. Meanwhile, the bromelain enzyme from pineapple functions as a natural exfoliator that stimulates the regeneration of new skin cells and relieves skin inflammation. This product was developed through a series of manufacturing methods including natural ingredient extraction, product formulation, evaluation testing, and packaging. Avernas wash is marketed at an affordable price and is effective for all skin types, including sensitive skin. This product has a wide market opportunity, covering teenagers to professionals in the beauty industry. This product is expected to be a safe and sustainable alternative in facial skin care. By choosing Avernas wash products that are made from natural ingredients and produced in a responsible manner, consumers can help reduce the environmental impact of facial skin care routines.

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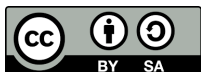
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Keywords : Environmentally friendly, Facial wash, Natural cosmetics, Pineapple enzyme, Starfruit.

1. Introduction

Indonesia is rich in natural resource diversity, one of which is abundant plant resources in the form of fruits (Kusmiyati et al., 2022). Pineapples and starfruit are two types of fruit that are widely found in Indonesia. In addition to being delicious, these two fruits also have properties that can be used in making beauty products. This is important because many beauty products on the market contain dangerous chemicals that can damage the skin (Herlina, 2019), including liquid facial soap. Therefore, beauty products that are made from natural and safe ingredients are needed, especially for sensitive facial skin.

According to data from Euromonitor International 2024, the natural cosmetics market in Indonesia experienced significant growth from 2019 to 2024, with a projected market size reaching around 16 billion USD in 2024. This trend reflects increasing consumer awareness



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of natural cosmetic products and indicates great opportunities in this sector (Euromonitor, 2024). Based on the same report, the use of beauty products in Indonesia shows a positive growth trend. In 2023, the beauty and personal care market in Indonesia recorded significant growth. Around 60-70% of users in this market mostly use facial wash products with chemical or synthetic ingredients (Euromonitor, 2024). This fact shows the need to develop natural facial wash products to meet the demands of consumers who are increasingly aware of the health and safety of their skincare products.

In addition, the increasing global concern about microplastic waste from chemical facial wash products, which pollute water, cause a clean water crisis, and threaten the ecosystem and human health globally (Ghosh et al., 2023), has also encouraged consumers to switch to more environmentally friendly products. Awareness of the negative impacts of hazardous chemicals on the skin is a strong consideration for consumers to use natural skincare (Rohmalia et al., 2021). Identifying this business opportunity requires in-depth market analysis and understanding of consumer trends. The ability of a product to meet customer wants and needs is critical to its marketing success (Hanifah et al., 2023).

In this context, Avernas wash is present as an innovative solution that is effective in caring for skin, safe, and environmentally friendly, and meets market needs that have not been met by conventional products. Avernas wash is made from natural ingredients with a combination of starfruit and pineapple enzymes. Based on data from the Central Statistics Agency (BPS) in 2024, the harvest of starfruit and pineapple in Indonesia experienced a significant increase during the 2021-2023 period, with starfruit obtaining 119,758 tons and pineapple 3,156,576 tons in 2023 (Central Statistics Agency, 2024). This increase shows the great potential of starfruit and pineapple to be processed into various products, including beauty products such as facial wash.

Avernas wash is a facial wash that combines starfruit and pineapple extracts, specially formulated to clean black spots, sensitive skin, dull skin, acne, and breakouts on the face. This product helps brighten the appearance of the face and maintains skin elasticity. Starfruit contains antioxidants such as vitamins C and E which protect the skin from free radicals and black spots, the water content in starfruit provides hydration and moisturizes the skin (Amelia et al., 2020). Starfruit, which contains acid, functions as an antimicrobial, and can overcome the problem of acne vulgaris (Sitompul et al., 2022). In addition, starfruit contains Alpha-Hydroxy Acid (AHA) which removes dead skin cells and increases skin cell turnover to provide a brighter skin appearance (Hasna, 2023). Meanwhile, the bromelain enzyme from pineapple functions as a natural exfoliator that stimulates the regeneration of new skin cells and relieves skin inflammation (Wiyono et al., 2020). Pineapples, which are available all year round (Firdausi, 2021), contain the enzyme bromelain with exfoliating and anti-inflammatory properties (Dzulqaidah et al., 2021). This enzyme is effective in reducing blackheads, soothing acne, and providing a soft sensation and controlling excess oil production (Putri et al., 2021). Avernas wash excels with natural ingredients that are safe and environmentally friendly, targeting teenagers, students, college students, and beauty professionals such as beauty influencers and make-up artists.

The purpose of developing Avernas wash is to create a high-quality facial wash that meets consumer expectations with better standards than competitors. The benefits of Avernas wash include the use of natural ingredients that are safe and beneficial for the skin, providing

a new experience at a competitive price, and satisfying customer service. This article aims to introduce innovative products made from environmentally friendly materials, the development of effective sales strategies, and easily accessible sales services to ensure consumer satisfaction. In addition, this article raises public awareness of the importance of using environmentally friendly products. Avernas wash products are committed to making it easier for consumers to buy products and access information, while supporting awareness of sustainability.

2. Method

Product development and marketing activities last for 4 months, from April to June 2024, with implementation methods in the form of preparation (raw material survey, preparation of tools and materials), product manufacturing, feasibility testing, product design, packaging, marketing, sales, to business evaluation. The production process is carried out in two locations: the Dasron Hamid Research and Innovation Center Pharmaceutical Laboratory, Muhammadiyah University of Yogyakarta and Quantum Residence D8, Jalan Anggrek, Tegalgrejo, Kasihan District, Bantul Regency, DI Yogyakarta Province.

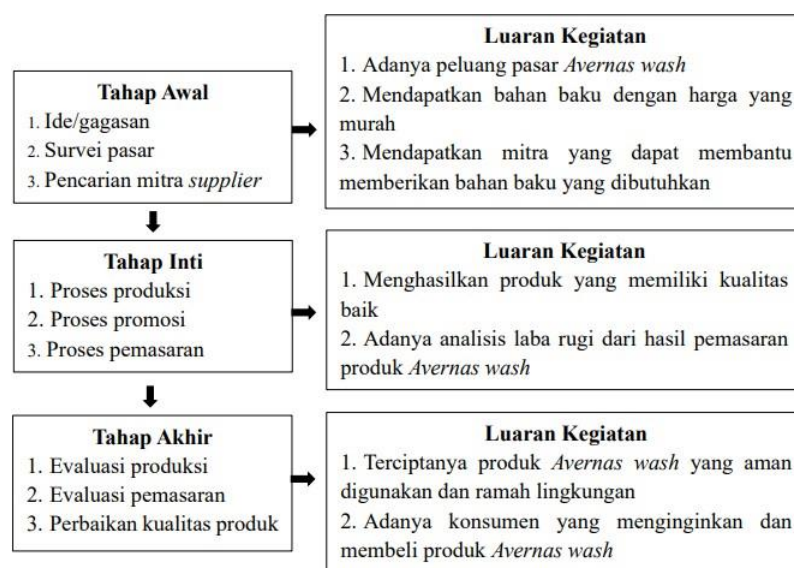


Figure 1. Product Development and Marketing Implementation Diagram Preparation

Preparation begins with creating an idea or product idea which is then formed and agreed upon with the innovation of natural and environmentally friendly facial wash called Avernas wash.

Market Survey

The market survey begins by looking for market opportunities. Analysis of the survey results shows that 103 respondents from students, pupils, and the community are interested in Avernas wash.



Figure 2. Market Survey Result

Supplier Partner Survey

At this stage, we are looking for supplier partners for starfruit and pineapple, working with the community and suppliers in Bantul, and have carried out the process of purchasing raw materials for making facial wash.

Production

The manufacture of Avernas wash is carried out through several stages including:

a. Preparation of Tools and Materials

Pineapple and starfruit used in the Avernas wash product were obtained from Geblagan, Tamantirto, Kasihan District, Bantul Regency, Special Region of Yogyakarta. The production process involves various tools, including a blender, scales, measuring cups, beaker glasses, stopwatches, glass objects, funnels, water baths, stirring rods, droppers, and Erlenmeyer flasks. The materials used consist of pineapple, starfruit, cocamidopropyl betaine, KOH, NaCl, Na CMC, glycerin, methyl paraben, and distilled water.

b. Extract Preparation

Pineapple and starfruit are washed, thinly sliced, and dried in an oven at a temperature of 70-80°C for 24 hours. Once dry, the fruit is mashed, sieved, and weighed. Furthermore, the mashed fruit is put into a container to be macerated with 96% ethanol. The resulting extract is concentrated using a rotary evaporator at a temperature of 30-40°C until it becomes a thick extract. The purpose of concentrating the extract with a rotary evaporator is to remove the solvent to obtain a constant weight and % extract yield value (Sayakti et al., 2022).

c. Making Facial Wash

The preparation was carried out at a temperature of 23.3°C. All ingredients used were weighed according to the formula. Na CMC was developed with hot water, stirred in a mortar until a gel mass was formed. Pineapple and starfruit extracts were added to the mixture, methyl paraben was dissolved with glycerin and then added to the mixture. Citric acid and KOH were dissolved and then added little by little and stirred until homogeneous. Then cocamidopropyl betaine was added and stirred until homogeneous (Astuti et al., 2021).

d. Preparation Evaluation Test

The Avernas wash product that had been made was then subjected to an evaluation test to ensure that the product was safe and met the requirements for distribution. The evaluation test consists of:

1) Organoleptic Test

The organoleptic test was carried out by observing the color, odor, and texture of the preparation to determine the physical form of the facial wash gel preparation made (Yuniarsih et al., 2020).

2) Homogeneity Test

The homogeneity test aims to determine whether the ingredients in the formula are well mixed or not. Requirements based on the 3rd edition of the Pharmacopoeia, gel preparations must show a homogeneous composition and no coarse grains (Herawati et al., 2020).

3) Spreadability Test

When applied to the skin, the gel must be able to spread to the skin easily. The spreading ability is determined by measuring the diameter of the sample. A total of 5 grams of gel is placed in the middle of a petri dish and a cover glass and a weight are placed on top, then left for 1 minute. Then, the diameter of the preparation that spreads in the petri dish is observed and measured. The weights used in this experiment are without load, 50, 100, 200, 300, 400, and 500 grams. Each additional load is carried out for 1 minute and the diameter of the spreading gel is measured (Eugresya et al., 2018).

4) Foam Power Test

A total of 1 gram of gel was put into a test tube and 10 ml of distilled water was added. Furthermore, the mixture was shaken by inverting the test tube and the height of the foam produced was measured (Yuniarsih et al., 2020).

5) PH Test

The pH test was carried out by measuring the pH of the gel using a pH indicator dipped in a 0.1 gram gel sample that had been dissolved in 10 ml of distilled water. The pH is adjusted to the pH of the skin, which is around 4.5-7 because if the pH is too high it can cause the skin to become scaly, while if it is too acidic it will cause skin irritation (Maksumah et al., 2021).

6) Irritation Test

This test is carried out by applying the test substance preparation to the skin of several volunteers with the aim of finding out whether the preparation can cause skin irritation or sensitivity or not (Tama et al., 2022)

7) Stability Test

The stability test of the facial wash preparation is carried out by leaving the preparation for 1 month at room temperature (20-25°C) by making physical observations every week (Nirmala et al., 2021).

8) Water Pollution Test

This test is carried out to determine the quality of water after using facial wash by measuring the pH of the water and comparing it with other facial washes (Sari et al., 2021)

e. Packaging



Figure 3. Avernas wash packaging

After the product passes the test, it is then packaged. There are two types of packaging, namely primary packaging in the form of a tube and secondary packaging in the form of cardboard. Facial wash is put into the primary packaging container one by one, then the tube packaging containing facial wash is put into the secondary packaging.

Marketing

The marketing technique used is by using the social media promotion method. To increase product sales and profits, Avernas wash uses educational marketing techniques by creating educational content and social engineering on Instagram, Facebook, Youtube and TikTok.

Table 1. Marketing

Aspek	Keterangan
<i>Product</i>	<i>Avernas wash, facial wash dengan Bromelain Boost.</i>
<i>Promotion</i>	Promosi dengan melalui seluruh akun media sosial <i>Avernas wash</i> untuk meningkatkan <i>branding</i> dan promosi secara <i>offline</i> .
<i>Price</i>	Harga untuk <i>facial wash</i> yaitu Rp35.000
<i>People</i>	Terdapat pembagian kerja antara CEO, Manajer Keuangan, Pemasaran, Produksi, dan Riset Produk.
<i>Place</i>	<i>Event</i> pemasaran direncanakan di lokasi kampus.
<i>Process</i>	Dengan teknologi <i>modern</i> , <i>Avernas wash</i> diproduksi secara hati-hati untuk menjaga kualitas alami.
<i>Physical Evidence</i>	<i>Avernas wash</i> dikemas dengan menggunakan kemasan yang unik dan mengikuti <i>trend</i> masa kini.

Sumber: (Nurhayaty, 2022)

Marketing strategies include a B2C (Business to Customer) approach through online and offline channels. Online marketing is carried out on Instagram, TikTok, Shopee, and Facebook Ads with a focus on educational content and collaboration with influencers. Offline sales are carried out at the Yogyakarta head office and through partnerships with local beauty stores. This strategy ensures product accessibility and builds customer loyalty through ongoing discounts and promotions.

Product Marketing and Distribution

Marketing is carried out among students and the community. Marketing is carried out using social media such as creating advertisements and placing advertisements on campus by creating special Avernas wash marketing events and collaborating with influencers on Instagram and TikTok.

Sustainability Potential

PKM-K Avernas wash has great potential to grow and be sustainable in producing natural facial wash with pineapple and starfruit extracts. By implementing the right strategy and a strong commitment to curiosity. PKM-K Avernas wash can contribute to environmental preservation and provide added value to the community.

Business Development

For future business development in 2024, we are targeting this facial wash product to obtain a BPOM certificate until we can build partners after being successful with the facial wash product. PKM-K Avernas wash can expand the product line by adding other skin care variants such as toners, serums, and moisturizers that are also based on natural ingredients. Developing a digital marketing strategy through e-commerce platforms and social media will increase the reach and sales of the product. After completing marketing and distribution activities, we will increase the production capacity of Avernas wash by considering consumer input to produce products with a better appearance.

Environmental Aspect

Avernas wash products can be a more environmentally friendly choice than conventional products. By choosing products made from natural ingredients and produced in a responsible manner, it can help reduce the environmental impact of facial skin care routines.

Mass Media Article Publication

The author has successfully published news articles to help raise public awareness about the importance of caring for the face properly and to be a useful reference for skincare users.

Business Identification Number and Micro-Scale Business

The Business Identification Number (NIB) with the number 2406240045489 is used as the right to access customs and social security for employment, as well as proof of fulfillment of the first report of Mandatory Employment Reporting in Companies (WLKP). Avernas wash has also obtained an SME letter as one of the administrative requirements for the Licensing Stages, and is used as a requirement to process the Intellectual Property Rights Certificate (HKI-MERK) at the Directorate General of Intellectual Property, Ministry of Law and Human Rights of the Republic of Indonesia.

Intellectual Property Rights

Avernas wash has obtained the Intellectual Property Rights Certification (HKI-MERK) at the Directorate General of Intellectual Property, Ministry of Law and Human Rights of the Republic of Indonesia.

Business Product Evaluation

Avernas wash product evaluation is carried out through various methods to assess quality and consumer interest. Quality testing includes laboratory tests for safety and effectiveness, as well as performance tests to ensure products meet standards. Surveys and questionnaires, both online and offline, are used to collect consumer feedback on their experiences and satisfaction. Market testing is conducted by launching trial products and analyzing sales to assess market acceptance.

3. RESULTS AND DISCUSSION

Avernas Wash Products

Avernas wash is a facial wash made from starfruit and pineapple extracts, formulated to clean black spots, dull skin, and acne, as well as maintain skin elasticity and make the face look brighter. Avernas wash is sold at a price of Rp35,000 per tube (150 ml), this product has a unique and trendy packaging that lists how to use, ingredients, and logo.



Figure 4. Avernas wash product

Results of Facial Wash Preparation Test

Table 2. Results of Avernas Wash Content Test

No	Uji	Hasil																																													
1.	Uji Organoleptis	Memiliki aroma manis yang khas, dihasilkan warna kuning coklat kSeemasan yang dihasilkan dari ekstrak buah nanas dan belimbing wuluh, tekstur kental berbentuk gel																																													
2.	Uji Homogenitas	Sediaaan tercampur homogen, tidak terdapat gelembung dan tidak terdapat butir-butiran																																													
3.	Uji Daya Sebar	<table border="1"> <thead> <tr> <th>Gel</th> <th>Tanpa Beban (cm)</th> <th>50g(cm)</th> <th>100g(cm)</th> </tr> </thead> <tbody> <tr> <td>Rep I</td> <td>4</td> <td>4,5</td> <td>4,8</td> </tr> <tr> <td>Rep II</td> <td>4</td> <td>4,5</td> <td>5</td> </tr> <tr> <td>Rep III</td> <td>4,5</td> <td>5</td> <td>5</td> </tr> <tr> <td>Rata-rata</td> <td>4,16</td> <td>4,6</td> <td>4,93</td> </tr> <tr> <td></td> <td>200g(cm)</td> <td>300g(cm)</td> <td>400g(cm)</td> <td>500g(cm)</td> </tr> <tr> <td></td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> </tr> <tr> <td></td> <td>5,2</td> <td>5,2</td> <td>5,2</td> <td>5,2</td> </tr> <tr> <td></td> <td>5</td> <td>5,2</td> <td>5,2</td> <td>5,2</td> </tr> <tr> <td></td> <td>5,06</td> <td>5,13</td> <td>5,13</td> <td>5,13</td> </tr> </tbody> </table>	Gel	Tanpa Beban (cm)	50g(cm)	100g(cm)	Rep I	4	4,5	4,8	Rep II	4	4,5	5	Rep III	4,5	5	5	Rata-rata	4,16	4,6	4,93		200g(cm)	300g(cm)	400g(cm)	500g(cm)		5	5	5	5		5,2	5,2	5,2	5,2		5	5,2	5,2	5,2		5,06	5,13	5,13	5,13
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	5,06	5,13	5,13	5,13																																											
4.	Uji Daya Busa	Tinggi awal busa 4,8 cm, tinggi akhir busa 3,2 cm, stabilitas busa 66%																																													
5.	Uji PH	Hasil 5 dengan syarat 4,5 sampai 6,5																																													
6.	Uji Iritasi	Tidak menimbulkan kemerahan dan gatal																																													
7.	Uji Stabilitas	Tidak terdapat perubahan selama penyimpanan																																													
8.	Uji Pencemaran Air	Air hasil pemakaian <i>facial wash</i> memiliki pH 7 yang aman untuk lingkungan perairan.																																													

Market Opportunity

Avernas wash has a large market opportunity in Yogyakarta, especially in the segments of teenagers, students, college students, as well as professionals in the beauty industry such as beauty influencers, vloggers, makeup artists (MUAs), and students in beauty

schools. This product is designed to meet the needs of those looking for natural and environmentally friendly facial wash, with a safe and effective formula for all skin types. Avernas wash can be found offline at our office located at Quantum Residence D8, Jalan Anggrek, Tegalgrejo, Kec. Kasihan, Kab. Bantul, DI Yogyakarta Province, where customers can buy products directly and consult about their skincare needs. In addition, online purchases are available through e-commerce platforms such as Shopee, which allows customers throughout Indonesia to get our products quickly and safely. To reach a wider audience and increase product visibility, we actively promote through social media such as Instagram, TikTok, and WhatsApp. Through interesting and educational digital campaigns, we showcase product advantages, provide skincare tips, and share reviews from customers and beauty influencers who have tried Avernas wash. This approach aims to build customer trust and loyalty, while continuing to expand our market in Yogyakarta and its surroundings.

Market Potential Analysis

a. Market Segmentation

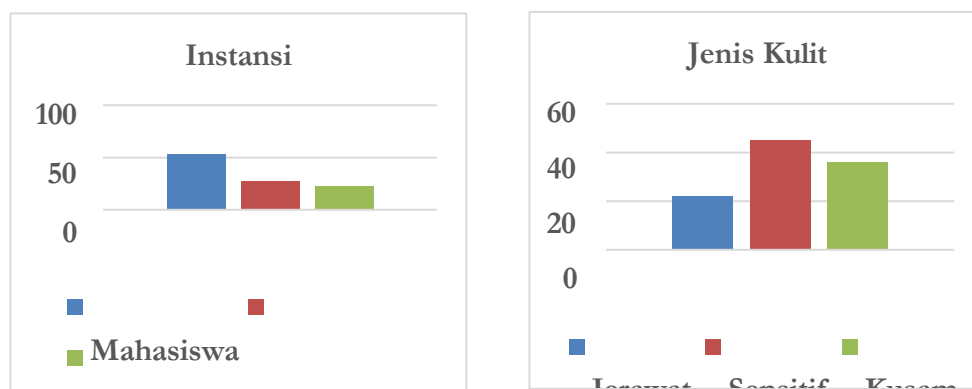


Figure 5. Results of Market Survey Analysis

Based on the analysis of the survey conducted through the distribution of questionnaires, there were 125 respondents who showed high interest among those aged 16 years and above, especially students, college students, and the general public, with the greatest interest in dull skin (31.5%), followed by sensitive skin (29.8%), acne-prone skin (21.8%), and irritated skin (16.9%). This shows the great potential of Avernas wash in meeting market needs that increasingly prioritize natural and sustainable skin care products. Promotions that must be focused on students and student communities, and the public with an approach that is relevant to this age segment, such as promotions through social media and educational campaigns.

Financial Analysis

Table 3. Calculation of Production Costs, BEP, HPP, and Profit/Loss

Biaya Produksi (TC)	HPP
= Biaya tetap (FC)+Biaya tidak tetap (VC)	= TC/Total produk
= Rp300.000,00+Rp2.186.000,00	= Rp2.486.000,00/150 produk
= Rp2.486.000,00	= Rp16.573,33

BEP (unit)

$$= \text{Total Biaya Tetap}/(\text{Harga Jual}-\text{HPP})$$

$$= 300.000/(35.000-16.573,33)$$

$$= 17 \text{ Unit}$$

Laba/Rugi

$$\text{Total Pendapatan}=150 \text{ produk} \times \text{Rp} 35.000 = \text{Rp} 5.250.000,00$$

$$\text{Total Biaya} = \text{Rp} 2.486.000,00$$

$$\text{Keuntungan} = \text{Total Pendapatan} - \text{Total Biaya}$$

$$= 5.250.000 - 2.486.000,00$$

$$= 2.764.000$$

Economic Analysis**Table 4. Calculation of Production Price and Profit**

<i>Facial wash Avernas wash</i>	
Biaya Tetap	Rp300.000,00
Biaya Variabel	Rp2.186.000,00
Jumlah	Rp2.486.000,00
HPP/pcs	Rp 16.573,33
Harga Jual	Rp 35.000,00
Keuntungan 52%	Rp 18.426,67

In 1x production produces = 150 products

Table 5. Turnover Per Month and Per Year

Keterangan	Penjualan	Jumlah (Rp)
Total Penjualan/thn	35.000,00/produk x 150 produk x 12 bln	63.000.000,00
Biaya Produksi/thn	2.486.000,00/bln x 12 bln	29.832.000,00
	Omset per tahun	92.832.000,00
	Omset per bulan	7.736.000,00

Sales**Table 6. Product Sales**

Penjualan				
Jenis Produk	Jumlah Produk	Harga	Laba	Total Penjualan
<i>Avernas wash</i>	155 pcs	Rp35.000	Rp18.426,67	
Total laba			Rp2.856.133,85	Rp5.425.000

Based on Avernas wash sales data, the total products sold reached 155 units with total sales reaching Rp5,425,000. This shows a significant profit contribution from each unit sold and good market interest in this product.

Evaluation Results

The evaluation results show that Avernas wash is of good quality, safe for all skin types, and has received positive responses from consumers. Laboratory and performance tests confirm the effectiveness and safety of the product, while surveys show high

satisfaction. Sales analysis also shows strong demand for environmentally friendly skincare products, indicating promising market potential.

4. Conclusion

Avernas wash is an innovation in natural facial cleanser products that utilize starfruit and pineapple enzymes for optimal benefits. This product is not only effective in cleansing and brightening the skin, but is also safe for all skin types, including sensitive skin. With a focus on natural ingredients and sustainability principles, Avernas wash provides an environmentally friendly alternative to conventional chemical-based facial cleansers. This approach is in line with the Sustainable Development Goals (SDGs) on responsible consumption and production, emphasizing corporate social responsibility in protecting the environment. Sales reaching 155 pcs show strong interest from students, college students, the general public, and professionals in the beauty industry. With an affordable price and the benefits it offers, Avernas wash has great potential to grow and be sustainable in producing natural facial wash with pineapple and starfruit extracts. With the implementation of the right strategy and a strong commitment to our desires, Avernas wash can contribute to environmental preservation and provide added value to society. By choosing Avernas wash products made from natural ingredients and produced in a responsible manner, consumers can help reduce the environmental impact of their facial skincare routine.

5. Thank-You Note

We, the PKM-K Avernas wash Team, would like to express our deepest gratitude to the Directorate of Belmawa and Dikti Vokasi for their support and contribution in this activity. We also express our sincere gratitude to Universitas Muhammadiyah Yogyakarta for the facilities and academic support that have been provided, as well as to our supervisors who have provided invaluable guidance and direction. Every support given has been an important part of our success. We are very grateful for the opportunity to develop and realize this innovation. Thank you for the trust and assistance that have enabled us to achieve satisfactory results.

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