

DEVELOPING A TRADITIONAL BEDDA LOTONG BODY SCRUB FROM SOUTH SULAWESI MADE FROM EGG SHELLS

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Abstract

The objectives of this study are to determine: 1) the formulation of BeddaLotong traditional powder body scrub with egg shell skin, 2) how to make BeddaLotong traditional powder body scrub with egg shell skin, and 3) the characteristics and feasibility of Bedda Lotong traditional powder body scrub with egg shell skin. This study uses the Research and Development (R&D) method with a 4-D model which includes: 1) the define stage, involving analysis and needs analysis, 2) the design stage, including designing the body scrub formula, product label, packaging and BEP; 3) the develop stage of the body scrub using roasting method, product laboratory test, as well as product and packaging validation tests, and 4) the disseminate stage, involving a product acceptance test with 30 female panelists aged 19 to 40 years in Yogyakarta. The results of the study include: 1) the creation of a traditional scrub formula with the addition of 20% of egg shell skin. 2) The product development uses roasting technique to dry the ingredients and refine the product. 3) The Bedda Lotong traditional scrub product has a dominant aroma characteristic of coffee with a slightly coarse texture and a dark brown hue. Based on the results of the cosmetic and packaging validation tests, it can be concluded that the product and packaging are deemed feasible. Moreover, this product is well-received based on the results of testing by 86% of panelists; hence, it is categorized as very feasible and acceptable by the public.

INTRODUCTION

Indonesia has a tropical and hot climate, located on the equator, and is therefore exposed to intense sunlight. Ultraviolet (UV) radiation from the sun can cause various skin problems, including dullness and damage to dead skin cells, leading to dryness, premature aging, dark spots, and skin pigmentation disorders.(Wijayadi et al., 2024).Skin aging is a natural part of the overall aging process. As we age, our skin's ability to regenerate diminishes, leading to a decrease in collagen and elastin production. Collagen, which provides strength and elasticity to the skin, becomes thinner and more elastic.(Aisha et al., 2023).

The skin is the outermost part of the body that covers almost the entire body. The skin has the function of protecting the organs underneath from external stimuli or disturbances. The skin has three levels of skin layers: hypodermis (the bottom layer or fat layer), dermis (middle layer), epidermis (top layer of skin), the

skin regenerates cells for 28 days, dead skin cells that accumulate will make the skin darker.(Mutmainnah & Maida, 2021) Skin health is an important aspect of human life because it is the basis for a person's ability to live a good and productive life.(Prabandari, 2019).

For women, maintaining healthy and well-groomed skin is crucial, as well-groomed individuals are characterized by beauty and attractiveness, particularly when it comes to a good and attractive appearance. A key focus is healthy, radiant, and well-groomed skin.(Rahmawaty Adira, 2020)However, in this era, it's not only women who want clean and healthy skin, not only women, but men also insist on doing treatments at home or at beauty clinics.skin care such as skin care and cosmetics

Cleanser is a facial cleansing product that has a light texture. This product is designed to clean dirt from dust, excess oil, and make-up residue without drying out the skin and making the skin clean and smooth.(Tranggono, 2007).Skin-thinning cosmetics are useful for removing or eliminating accumulated dead skin cells. These cosmetics are used for deep cleansing, as they contain coarse granules called scrubs.

Body scrubs should be used once a week, but not every day. Skin needs time to regenerate and produce new skin cells. With regular use, body scrubs can make skin appear healthier and clearer. However, excessive use can cause irritation or disrupt the skin's natural balance. Therefore, it's important to use body scrubs wisely to experience their benefits immediately and optimally.(Wayan Eka Puspitaningsih & Putu Mahyuni, 2021).

Based on the results of an interview with Fuang Andi Barhamang Tetua (descendant of Raja Tua Wajo) on April 19 2025, the meaning of bedda lotong is Bedda in Bugis which means powder or scrub, Lotong in Bugis which means black which in Indonesian means black scrub. He said there was no definite history about when Bedda lotong was discovered, but based on customs and stories passed down from generation to generation, bedda lotong is a tradition in the Bugis tribe in South Sulawesi which has been known since ancient times as a beauty ritual that was only used on royal princesses and prospective royal brides.

Based on the results of the interview with Fuang Andi Barhamang, the philosophy of Bedda lotong is more than just a black body scrub because the bedda lotong body scrub has a deep meaning and significance regarding cultural values, traditions and hopes for purity and beauty, especially for Bugis princesses who are about to get married. The following is the philosophy of bedda lotong, namely 1) the black color in bedda lotong symbolizes purity and cleanliness spiritually and physically. The process of making it, which involves roasting black sticky rice until it is black, is believed to be cleansing oneself before getting married. 2) the use of natural ingredients such as black sticky rice, jicama, ginger and other spices shows the philosophy that beauty comes from nature and is believed to be a harmonious balance with nature that has provided natural ingredients for health and beauty. 3) the use of bedda lotong, especially for prospective brides and grooms, is a series of preparatory rituals before the wedding begins. The process of scrubbing has the meaning of preparing oneself physically and mentally to enter a new, holy and blessed married life. 4) the process of making bedda lotong which involves roasting with a long process and time to get optimal results. This creation indirectly teaches the meaning of patience and perseverance in achieving life goals. 5) bedda lotong is a cultural heritage that is passed down directly from generation to generation and is a form of respect for ancestral values that teaches how important it is to maintain and respect one's own traditions and culture.

According to Maestri, in 2016 the Bedda Lotong body scrub was a form of preserving traditional cosmetic products. Bedda Lotong is made from natural ingredients which have been passed down from ancient times and used by noble daughters who have Arung Paria descent, which is famous for its Lamp gase na Pria (the beautiful women of the ancient Paria Kingdom) not only noble daughters, prospective brides and grooms in ancient times also used the Bedda Lotong scrub.(Zaenal et al., 2023). From this rich traditional culture, the cosmetic product that can be developed is Bedda Lotong from the Bugis-Makassar tribe(Bahri & Tati, 2019).Bedda Lotong, a traditional product of the Bugis tribe, functions as a natural body scrub. This scrub is made from natural ingredients, such as fruit and plants with a slightly rough grain texture, this scrub is effective in removing dead skin cells, apply to the skin and rub gently to get maximum results. This product not only cares for the skin, but is also part of a valuable cultural heritage that we must protect(Ayu et al., 2022).Bedda Lotong is made from natural ingredients such as white rice or black sticky rice which is roasted and mixed with various spices such as Javanese ginger, jicama, tamarind, pandan leaves and lime so that it changes color to a thick black color, making it like the aroma of burnt coffee.(Ali et al., 2019).

The main ingredient of Bedda Lotong is usually made from black sticky rice (*Oryza sativa* var glutinous), according to(Hairiyah et al., 2020)Black glutinous rice has a blackish-purple color and contains the best nutrients compared to other types of rice. The bioactive component found in black glutinous rice is anthocyanin, which acts as a very powerful antioxidant (Purnamasari et al., 2016).

Temulawak (*curcuma xanthorrhiza* Roxb) is a rhizome plant that is often used as medicine for things like jaundice, digestive disorders, vaginal discharge, sore throats and to increase body resistance and maintain body health. It is classified as a member of the ginger family (Zingiberaceae) which is often found in tropical forests such as in Indonesia.(Aldizal Mahendra Rizkio Syamsudin et al., 2019)The main ingredients in

temulawak such as curcumin, polyphenols, essential oils, proteins and various minerals are very useful for use in beauty products.(Sumiati et al., 2021).

Jicama (*Pachyrhizus erosus* L.) Contains vitamin C and vitamin B which can improve skin health and prevent premature aging. The water in jicama has a calming effect and can be useful for making skin look brighter and moisturizing dry skin.(Sumiati et al., 2021)Jicama is a fruit containing antioxidants, flavonoids, and saponins, which act as natural sunscreens to prevent skin damage from free radicals. The phenolic compounds in jicama are quite effective in inhibiting melanin formation, thus preventing and reducing pigmentation caused by hormones, acne scars, and sun exposure.(Na'imah et al., 2022).

Pandanus leaves (*Pandanus amaryllifolius* Roxb) Besides being used as a fragrance and food coloring, pandan leaves are also often used in beauty cosmetics due to their distinctive aroma derived from the amino acid denyl alanine 2-acetyl-1-pyrroline. The antibacterial activity in pandan leaves has also been developed as a medicinal ingredient to treat disorders/diseases and food poisoning caused by bacteria.(Anung Anindhita et al., 2020)

Tamarind (*Tamarindus indica*) is a suitable plant for use in cosmetic mixtures because it contains alpha-hydroxy acids (AHA) which can stimulate the growth of new skin cells so that the skin looks brighter and smoother, antioxidants such as flavonoids and polyphenols which can help protect the skin from damage due to direct exposure to sunlight and environmental pollution, and vitamin C which will help repair damaged skin tissue and increase collagen production.(Ahmad et al., 2022)

Lemon (*Citrus Llimon* L.) is a plant that has a distinctive aroma because it contains essential oils in it, commonly used as food and beverage ingredients, lemon is also commonly used as an additional aroma in beauty cosmetics, detergents, and aromatherapy. Lemon peel is also used to maintain skin health because it contains collagen, collagen is one of the components of human skin that is affected by the body's vitamin C content. Vitamin C in lemon peel is very high and can maintain skin health and detoxify the body, brighten the skin, control excess oil(Ariyani, 2017).

Eggshell waste that is not properly decomposed will become a breeding ground for bacteria and pests, causing an unpleasant or foul odor, polluting the environment and disrupting the existing ecosystem. However, by utilizing eggshells as raw materials in various products, such as organic fertilizers that will provide benefits to plants, this process can also reduce waste while providing benefits to the sustainability of the overall ecosystem health.(Lestari Dewi et al., 2021).In the development of the traditional Bedda Lotong body scrub, additional materials are used from various types of household waste, such as city/race chicken egg shells, free-range chicken eggs, duck chicken eggs and omega eggs. The following are various studies of eggs that will be selected in the development of the traditional Bedda Lotong body scrub from egg shells.

Chicken eggs are one of the most widely consumed foods because they are very easy to prepare and can be used to make various processed foods. Chicken eggs have very good nutritional value, especially for the growth and development of children.Chicken egg shells have a high nutrient content. There are several main benefits of chicken eggshells in skin care such as being able to exfoliate the skin naturally when crushed which can help remove dead skin cells so that the skin looks brighter, the membrane in the eggshell contains calcium carbonate in the eggshell plays a role in the skin regeneration process, which can help fade dark spots, collagen is an important protein that supports skin elasticity and firmness, eggshells contain 10% collagen which functions to stimulate the production of natural collagen in the skin as well as tighten and repair the skin structure to help prevent signs of premature aging(Kamar & Nurlaila, 2024).

Free-range chicken eggshells tend to exhibit greater variability in size, shape, color, and thickness compared to those of broiler chickens raised under more uniform conditions. Several studies have compared the mineral content of free-range chicken eggshells with broiler chickens. Results have varied, but some studies suggest potential differences due to differences in natural diet and rearing environment. Free-range chicken eggshell color can vary widely (white, cream, brown, even greenish) and has been the focus of research regarding the pigments involved (such as protoporphyrin and biliverdin) and the genetic factors that influence them. Free-range chicken eggs are one of the food ingredients derived from free-range chickens with high nutritional value.

Among the eggshells studied, those from urban chickens are readily available and widely consumed by housewives. The focus on chicken eggshells is often due to resource availability, ease of standardization for research, economic impact, and established research traditions. Research on other egg types also exists and provides valuable insights into their unique characteristics.

*Bedda lotong*The original one has a thick and slightly liquid texture, with this the author wants to make Bedda Lotong from egg shell skin and replace the original thick texture of Bedda Lotong into powder, so that it is easy and safe to travel with and is not heavy if put in a bag or suitcase because the body scrub does not contain liquids that can weigh down your luggage, and can last longer if stored below room temperature.

Based on the results of a preliminary study with a survey during an interview by a therapist at the Sheraton hotel, it was concluded that (1) the therapist did not know about Bedda Lotong body scrub, (2) the therapist did

not know about traditional body scrubs made from black sticky rice, (3) the therapist knew that eggshells could be processed as an additional scrub in body scrubs, (4) the therapist had never used a body scrub that used eggshells as the basic ingredient, (5) the therapist answered that this traditional body scrub was very good to be developed because, in addition to preserving culture, it also introduced an original product that had been passed down from generation to generation to the wider community who had never known what Bedda Lotong body scrub was and where it came from, (6) the therapist answered that they were very interested in the product that was developed and gained new knowledge that there were many cultural heritages that were not yet known, (7) the therapist answered that the development of a traditional body scrub with eggshells as the basic ingredient was very unique and a good idea to be developed because it was still rare to find beauty products that used eggshells as a cosmetic ingredient,

Based on the results of a preliminary study conducted on the general public, it was concluded that (1) 53.3% of panelists answered that they did not know about traditional body scrub products made from black sticky rice, (2) 100% of panelists answered that it was very good because the development of this traditional body scrub was mixed with egg shells as a natural scrub, (3) 86.6% of panelists answered that it would be efficient if the development of this traditional body scrub was developed, (4) 100% of panelists answered that this traditional Bedda Lotong body scrub needed to be developed, (5) 93.3% of panelists answered that it was very rare for Bedda Lotong body scrubs to use egg shells as a basic ingredient, (6) 100% of panelists answered that it was important to develop the traditional Bedda Lotong body scrub with additional egg shells as a basic ingredient for cultural preservation, (7) 80% of panelists said they were very interested in trying this traditional Bedda Lotong body scrub product, (8) 73.3% of panelists answered that they did not know that egg shells could be used as a natural skin care cosmetic ingredient, (9) 93.3% answered that very interested if the development of this traditional body scrub is developed.

Based on the results of the questionnaire distributed by the author, most panelists want the "Bedda Lotong" body scrub product to be developed and do not know that household waste or garbage can be processed properly such as egg shells which are only thrown away and can cause environmental pollution and damage the ecosystem if not processed and disposed of properly, the development of the traditional cosmetic body scrub product "Bedda Lotong" was made with the aim of developing and adding other natural ingredients such as from household ingredients which according to others are useless and no longer used but still have the content according to the function of the body scrub.

METHOD

The author used research and development (R&D) as the method for this research. Research and development, commonly referred to as R&D, aims to produce new products through a development process. The 4D method consists of four stages: define, design, develop, and disseminate.(Thiagarajan, 1974)This method and model were chosen to develop a beauty product in the form of a traditional Bedda Lotong body scrub made from eggshells. The product development research method and mode used R&D with a 4D model (define, design, develop, and disseminate).

RESULTS AND DISCUSSION

The implementation process stages include making the traditional "Bedda Lotong" body scrub, conducting validation tests with the supervising lecturer, conducting laboratory tests, conducting expert validation tests, conducting product validation tests, conducting expert packaging validation tests, and revising the validation results. The implementation process stages are as follows.

Development of the formulation of the traditional body scrub product "Bedda Lotong" by utilizing kitchen ingredients and household waste, the development of this product uses the Research and Development (R&D) research method with the 4D Development model (define, design, develop and disseminate)

Define

In this study, researchers used problem analysis, needs analysis, reference product analysis, and reference product design. Problem analysis was used to identify problems faced by several people, including women, caused by factors such as frequent direct exposure to sunlight and air pollution, etc., which cause dry skin, accumulation of dead skin cells, causing the skin to look dull and dark, and decreasing self-confidence. This problem can be overcome by carrying out regular body care for the skin, such as exfoliating the skin with preparations containing antioxidants by means of body scrubs. Therefore, researchers developed a traditional Bedda Lotong body scrub using natural spices with eggshell waste as the basic ingredient to conduct validation tests according to standards.

Problem analysis to identify problems that have been faced by several people including women caused by factors such as frequent exposure to direct sunlight and air pollution and others, causing dry skin, accumulation of dead skin cells causing the skin to look dull and dark Making self-confidence decrease. This problem can be

overcome by doing regular body care for the skin such as exfoliating the skin. with preparations containing antioxidants by means of body scrubs. Therefore, researchers developed a traditional Bedda Lotong body scrub by utilizing natural spices with eggshell waste as the basic ingredient to conduct validation tests according to standards.

Design

DesignProduct Packaging



Figure 1 *Selected Product Packaging*
(Source: Salsabil Falah Bariyyah, 2025)

The packaging for the traditional body scrub “Bedda Lotong” chosen by the supervising lecturer is to use a standing pouch packaging with a blue zipper clip measuring 10x17cm with a net weight of 150gr which is inside it in the form of aluminum foil to maintain the quality of the product inside from direct sunlight and other hazardous materials that can damage the product.

DesignPackaging Label

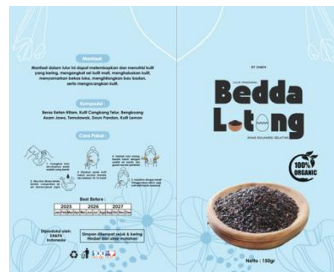


Figure 2 *Selected Product Packaging Labels*
(Source: Salsabil Falah Bariyyah, 2025)

Body Scrub Formula Design

Table 1 *Body Scrub Formulation Design*

Bahan Baku	Formulasi (gr/gram)		
	F(1)	F(2)	F(3)
Beras Ketan Hitam	150gr	150gr	150gr
Bengkoang	30gr	30gr	30gr
Temulawak	30gr	30gr	30gr
Asam jawa	20gr	20gr	20gr
Kulit Lemon	20gr	20gr	20gr
Daun Pandan	10gr	10gr	10gr
Cangkang Telur	10gr	20gr	30gr

(Source: Salsabil Falah Bariyyah, 2025)

Body scrubs are skin-cleansing cosmetic products available in a variety of textures, including thick creams, solid creams, liquids, and slightly coarse powders. These scrubs, which contain small particles, help remove dead skin cells, creating a homogeneous mixture. These scrubs are dark brown in color, similar to coffee, and have a distinctive aroma reminiscent of burnt coffee.

In a product, packaging is also very important to meet the standards of cleanliness and safety of a product to avoid bacteria, dirt and dust, body scrub products usually only use primary packaging. Primary packaging is packaging that comes into direct contact with cosmetics, which is useful for protecting the product from external damage when the product has been produced and consumed, the form of primary packaging is like a strong zipper clip plastic material which is lined with aluminum foil inside or in the form of a round container with a plastic lid which is lined with aluminum foil inside to maintain product hygiene.

Body cleansing product developed with basic ingredients of chicken egg shells, with the characteristics of a powdery texture, and has the appropriate size. The composition in this traditional scrub is black sticky rice, jicama, ginger, pandan leaves, lemon, tamarind, brown chicken egg shells with an aroma like burnt coffee because they have been roasted for approximately 1.5 hours, fine powder texture, scrub weight 250gr, with aluminum foil standing pouch packaging, combined with a dark brown sticker logo name according to the color of the scrub, depicting traditional clothes of the Bugis tribe of South Sulawesi which has been equipped with the benefits of Bedda Lotong, composition, how to use and store the scrub.

The packaging for the traditional body scrub “Bedda Lotong” chosen is a standing pouch with a blue zipper clip measuring 10x17cm with a net weight of 150g, which is enclosed in aluminum foil to maintain the quality of the product inside from direct sunlight and other hazardous materials that can damage the product.

Develop

The validation test was carried out by 3 expert validators, namely 1 supervising lecturer, 1 beauty product expert and 1 packaging expert. The results of the beauty product expert assessment are presented in the following table.

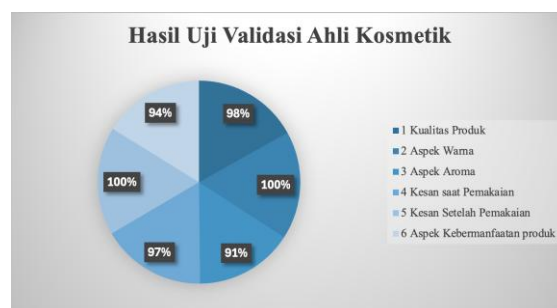


Figure 3 *Cosmetic Expert Validation Test Results*
(Source: Salsabil Falah Bariyyah, 2025)

Table 1 and Figure 3 above show that the results of the expert assessment of beauty products on the “bedda Lotong” powder body scrub product from egg shells based on product quality aspects are 98%, color aspects 100%, aroma aspects 91%, impressions during use 97%, impressions after use 100%, product usefulness aspects 94%. Based on the results of the assessment by cosmetic product expert validators, overall it is 97% (very worthy).

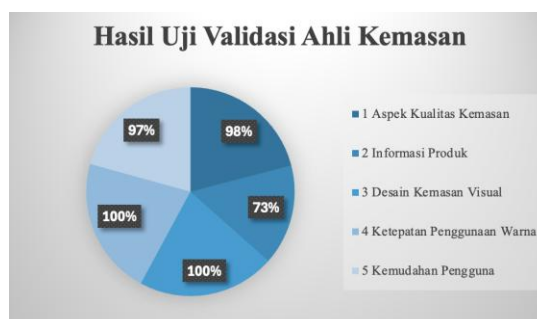


Figure 4. *Cosmetic Expert Validation Test Results*
(Source: Salsabil Falah Bariyyah, 2025)

Based on Figure 3 and Figure 4 above, it shows that the results of the expert assessment of beauty products on the powdered body scrub product “Bedda Lotong” from eggshells based on aspects of packaging quality 98%, product information 73%, visual packaging design 100%, accuracy of color use 100%, user ease 97%. Based on the results of the overall expert validation assessment of 97% (very worthy)

Laboratory Tests

Homogeneity Test

Table 2 Homogeneity Test

No	Sampel	Parameter Uji				
		Organoleptis				Homogenitas
		Bau	Bentuk	Warna	Tekstur	
1.	Lulur bubuk tradisional "Bedda Lotong"	wangi	Bubuk	Cokelat tua	Sedikit kasar	Homogen

(Source: UGM Laboratory Test, 2025)

Water Content Test

Table 3 Homogeneity Test

No	Parameter Uji	Satuan	Hasil Analisa		Standar Deviasi
			UL 1	UL 2	
1.	Uji Kadar Air	%	3,37	3,35	0,01

(Source: Salsabil Falah Bariyyah, 2025)

The water content parameters in the traditional powder body scrub "Bedda Lotong" have met the quality requirements for water content contained in powder units with a range of 3.37% to 3.35% using the gravimetric method.

pH test

Table 4 pH Test

No	Parameter Uji	Satuan	Hasil
1.	Uji pH	-	4,0

(Source: Salsabil Falah Bariyyah, 2025)

. Based on the pH test results obtained, namely 4.0, it has met the National Standardization Requirements. From the results of laboratory tests, all of which meet SNI requirements, the traditional body scrub product... "Bedda Lotong" that has been produced is safe to use

Adhesion Test

Table 5 Adhesion Test

No	Parameter Uji	Satuan	Hasil
1.	Uji Daya Lekat	Detik	17,33 dtk

(Source: Salsabil Falah Bariyyah, 2025)

After that, the load was released and recorded to determine the time required for the two plates to release and fall. Based on the results of the adhesion test, the obtained 17.33/s is in accordance with the adhesion test requirements.

Spread Power Test

Table 6 Homogeneity Test

No	Parameter Uji	Satuan	Hasil
1.	Uji Daya Sebar	(gram)	5,6cm

(Source: Salsabil Falah Bariyyah, 2025)

The requirement for this spreadability test is a cream base spread diameter of 4-7 cm. Based on the results of the tested product, the spreadability of 5.6 cm met the spreadability test requirements.

Disseminate

The distribution of the Bedda Lotong traditional body scrub product was carried out offline by obtaining 30 respondents from the general public background. female panelists aged 19 to 40 years in Yogyakarta.

The assessment results obtained from 30 panelists (general public and target consumers) on the powdered body scrub beauty product "Bedda Lotong" from egg shells

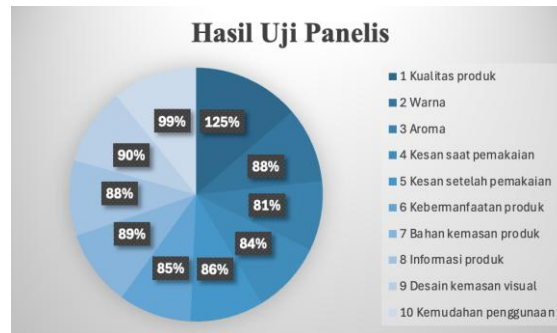


Figure 6. Percentage of Respondent Assessment Results
(Source: Salsabil Falah Bariyyah, 2025)

Based on the product quality aspect 125%, color 88%, aroma 81%, impression during use 84%, impression after use 86%, product usefulness 85%, product packaging material 89%, product information 88%, visual packaging design 90%, and user friendliness 99%. Based on the overall results obtained by the 30 panelists, 90% (really like) and some of the panelists want to buy the product when it is ready to be marketed.

CONCLUSION

Based on the results of the research that has been carried out, the following conclusions were drawn from the development of the traditional Bedda Lotong body scrub from South Sulawesi from egg shells:

Based on the research results and data analysis results that have been carried out, the following conclusions were obtained:

1. In conclusion, the results of this development with natural raw materials such as 150g black glutinous rice, 30g jicama, 30g ginger, 20g lemon peel, 20g tamarind, 20g egg shell, 10g pandan leaves, this measurement becomes 280g total of all ingredients, which can make 1 pcs of "Bedda Lotong" body scrub after going through a roasting process for 60 minutes to 174.4g net weight of the scrub obtained.
2. The making of the traditional "Bedda Lotong" body scrub is divided into two parts in part 1) boil the eggshells for up to 20 minutes after boiling, peel off the soft skin attached to the inner shell of the eggshell one by one until clean, 2) The method used is the "Roasting" technique / roasting with fire at a temperature of up to 60 minutes of roasting by stirring continuously until the raw material becomes brownish. How to see how the black glutinous rice has been cooked, the roasted black glutinous rice is divided into two parts if the inside is brownish then it is cooked and ready to be processed. After the roasted ingredients have cooled, blend the ingredients until slightly smooth then stir the powdered body scrub until homogeneous. The finished "Bedda Lotong" powdered body scrub is put into packaging with a net weight of 150 grams. 60°70°
3. The "Bedda Lotong" powder scrub product has a dominant characteristic of coffee aroma with a slightly coarse powder texture with a dark brown color. The results of the feasibility test of the "Bedda Lotong" traditional scrub product which has been tested by a beauty cosmetic product expert validator obtained a percentage of 97% which has been categorized as a (very feasible) product, and the packaging expert validator obtained a percentage of 94% which has been categorized as a (very feasible) packaging. And the results of distributing questionnaires to 30 panelists obtained a percentage of 86% which has been categorized (very feasible) and can be accepted by the community and the intended target market.

Suggestion

Based on the results of research that has been carried out on the development of the traditional Bedda Lotong body scrub, typical of South Sulawesi, from egg shells, the following suggestions can be given:

1. The results of this study are expected to be a basis for comparison and reference for further research, as well as suggestions for future researchers by adding more studies to complement the theory being developed.
2. For future researchers, it is hoped that they will create a formula with other additional ingredients such as additional aromas to get better results.

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