

UTILIZATION OF EGG SHELL WASTE INTO A BEAUTY FACIAL MASK

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ABSTRACT

Egg shell remains are often found for several reasons related to the consumption or processing of eggs by humans. Following are some common causes of human consumption of eggs. Many people consume eggs directly, and after breaking the egg, the shell is often simply thrown away. Eggs are often used in cooking, both as a main and additional ingredient, so egg shells are a common waste.

Food Industry Processing. In the food industry, eggs are often used in large quantities for the production of processed foods, such as cakes, bread and other food products. This egg processing process usually involves separating the white and yolk from the shell, which is then discarded. These unused egg shells usually become waste in production facilities. **Egg Shell Removal.** Used egg shells are immediately thrown into the trash or thrown into nature without further processing. This causes egg shells to become a type of rubbish that is easy to find, especially in rubbish bins or around restaurants.

The use of natural ingredients in skin care has become a growing trend along with increasing awareness of the potential of natural ingredients that are environmentally friendly and have minimal side effects. One natural material that is starting to be looked at for this purpose is egg shells which are generally considered household waste. Even though egg shells are often thrown away, it turns out that egg shells contain a number of important substances that are beneficial, especially for skin health.

The aim of community service in using egg shells for face masks covers various aspects, starting from community empowerment, reducing waste, improving skin health, to education about natural ingredients that are more environmentally friendly.

Keywords: egg shell waste, beauty masks, waste utilization.

History Article

Incoming articles : 15 Oktober 2024

First revised : 25 Oktober 2024

Second revised : 28 Oktober 2024

Third revised : 29 Oktober 2024

Articles accepted : 11 November 2024



I. Introduction

Egg shell remains are often found for several reasons related to the consumption or processing of eggs by humans. Following are some common causes of human consumption of eggs. Many people consume eggs directly, and after breaking the egg, the shell is often simply thrown away. Eggs are often used in cooking, both as a main and additional ingredient, so egg shells are a common waste.

Food Industry Processing. In the food industry, eggs are often used in large quantities for the production of processed foods, such as cakes, bread and other food products. This egg processing process usually involves separating the white and yolk from the shell, which is then discarded. These unused egg shells usually become waste in production facilities. **Egg Shell Removal.** Used egg shells are immediately thrown into the trash or thrown into nature without further processing. This causes egg shells to become a type of rubbish that is easy to find, especially in rubbish bins or around restaurants (Marmur, E. S., & Kim, B. S. 2012)..

The Existence of Shells in Nature. In some cases, eggshells from birds or other animals can be found in nature, such as on beaches or around bird nests. For example, after an egg hatches, shell residue may remain around the animal's nest or habitat. Overall, egg shells are a natural waste that is easy to find because eggs are a food that is widely consumed by humans and animals.

The use of natural ingredients in skin care has become a growing trend along with increasing awareness of the potential of natural ingredients that are environmentally friendly and have minimal side effects. One natural material that is starting to be looked at for this purpose is egg shells which are generally considered household waste. Even though egg shells are often thrown away, it turns out that egg shells contain a number of important substances that are beneficial, especially for skin health (Eisenberg, D. M., & Johnston, K. A. 2016)..

Even though egg shells have many potential benefits, such as for agriculture, health and industry, the fact is that there are still many people who do not utilize egg shells to their full potential. Several reasons why egg shells are not widely used in society include lack of knowledge and awareness. Many people don't know that egg shells can be used for various purposes, such as organic fertilizer, calcium supplements, or industrial raw materials. Knowledge about the benefits of egg shells is not yet widespread among the general public.



Therefore, most people just throw them away without thinking about their potential uses (Jung, Y. H., Lee, J. H., & Choi, Y. W. 2020).

The second reason is Practical Disposal. In everyday life, many people prefer to throw away egg shells because they are considered useless waste. Typically, egg shells are not considered for recycling or reuse, except by individuals or groups who have a higher environmental awareness. The reason is that the processing process is not practical. To use egg shells effectively, they need to go through certain processes, such as cleaning them, drying them, and grinding them into powder form for fertilizer or calcium supplements. This process may be considered troublesome by some people because it requires additional time and effort. For many people, this is impractical compared to purchasing a ready-made, ready-to-use product.

Limited processing infrastructure is also another reason. Although egg shells can be used in industry or agriculture, in many places there is no infrastructure to support egg waste processing. Collecting and processing eggshells into useful products (such as organic fertilizer or building materials) requires special facilities, which are not available in every region.

Hygiene and Safety Issues. Egg shells, if not cleaned properly, can contain bacteria or germs, especially those from the inside of the egg. This can be a problem, especially if the eggshells are used in products for human consumption (for example, as a calcium supplement). Therefore, many people prefer to throw them away rather than bother cleaning them properly.

Egg shells are not widely used in society also due to the lack of market for egg shells. In some areas, although there is potential to utilize eggshells, the lack of a clear market and demand for products made from eggshells hinders their utilization. If there is not enough demand, society is less likely to view eggshells as a valuable resource. There is still a view that organic waste, including egg shells, is something that should be thrown away or considered as trash, not as a valuable material. This is related to old habits in society which are not used to recycling or reusing ingredients from food products (Sosnik, A., & Carvajal, M. 2014).

Solutions and Potential Use of Egg Shells. Although there are various reasons why egg shells have not been widely used, there are several efforts that can be made to change this

situation, such as Product Innovation Developing products that utilize egg shell waste in a more practical and easier way (for example, face masks, calcium supplements in tablet form or powder) may increase its use.

With the right approach, eggshells can be a very useful and environmentally friendly resource. Egg shells consist almost entirely of calcium carbonate, a compound that is also used in various cosmetic and skin care products for exfoliation, or sloughing off dead skin cells. Apart from that, egg shells also contain other important minerals such as magnesium, phosphorus and zinc, which are known to have benefits for skin regeneration and providing moisture. This makes it an attractive ingredient to use in beauty products that can help clean pores, shrink large-looking pores, and prevent skin problems such as blackheads and acne (Kuno, S., & Yoshikawa, M. 2018).

The background to using egg shells as a skin care ingredient stems from ancient beauty traditions that utilize natural ingredients from the natural environment. Some cultures, such as those in Asia and Europe, have long used crushed egg shells as an ingredient in facial masks or body scrubs to improve skin texture and keep skin clean. In recent years, the natural ingredient-based beauty trend has become increasingly popular, with many people seeking alternatives to the chemicals found in commercial cosmetic products.

Seeing the potential and claimed benefits, this community service activity aims to review in more depth how egg shells can be used as a natural ingredient in skin care, especially for skin masks to clean and care for pores. This community service will also discuss various processing methods, benefits, and considerations that need to be considered when using egg shells for beauty. Egg shells, which are usually considered household waste, actually have various benefits that are not widely known, one of which is in the world of beauty. As a natural ingredient that is easy to find, egg shells contain calcium carbonate which is believed to help clean skin pores. The use of eggshell waste in skin care is well known in beauty traditions, and many argue that it can be used as a natural ingredient for exfoliating and cleaning pores (Singh, M., & Gupta, P. 2021).

Egg shells are often used in various traditional beauty applications, one of which is as an ingredient to help clean the skin, including pores. Egg shells contain calcium carbonate, which is believed to help remove dead skin cells and clean pores. Usually, egg shells are crushed until smooth and used as a scrub or facial mask. Increased interest in the use of



natural ingredients in skin care, including organic waste such as egg shells, is driven by increasing awareness of the negative impact of chemicals in commercial beauty products. As the trend of "green beauty" or beauty based on natural ingredients becomes increasingly popular, various studies are starting to reveal the potential of ingredients that were previously considered useless, such as egg shells (Vishwanath, V. 2015).

One relevant study was conducted by Marmur & Kim (2012) which showed that calcium carbonate contained in egg shells plays a role in the skin exfoliation process. These compounds help remove dead skin cells and unclog pores, which can reduce skin problems such as blackheads and acne. Another study conducted by Eisenberg et al. (2016) also indicated that calcium carbonate has mild abrasive properties, which makes it ideal for use in natural exfoliation products.

Several studies have also found that other mineral content in egg shells, such as magnesium, phosphorus and zinc, can speed up the skin regeneration process. These minerals are known to play a role in maintaining the pH balance of the skin and stimulating collagen production, which plays a role in keeping the skin elastic and preventing premature aging. Zinc, for example, has anti-inflammatory properties that can help soothe inflamed skin and reduce acne formation.

In 2020, a study by Jung et al. in South Korea studied the use of specially processed egg shells in skin care products and found that finely crushed egg shells could significantly improve skin texture, as well as help reduce the size of large pores. This research shows that the calcium carbonate in egg shells can function not only for exfoliation, but also to prevent pore blockage which can cause skin problems such as acne.

These studies confirm that eggshells have potential as a natural ingredient that can be utilized in pore cleansing and overall skin care. However, most of this research is still limited to laboratory tests or animal experiments, so more research involving clinical trials in humans is needed to confirm its effectiveness and safety in daily use. With scientific evidence and supporting research, the use of egg shells in skin care, especially for cleaning pores, is now increasingly gaining attention as an attractive alternative in the world of natural beauty. However, as with other natural ingredients, proper and safe use remains a key factor in getting maximum benefits from egg shells.



Partner Issues

The problems faced in the field are:

1. the problem of accumulated egg waste
2. the problem of egg waste has no selling value
3. systems and techniques for increasing production,
4. Knowledge regarding the use of eggs to make descaling powder mask is still very limited, while the amount of egg waste continues to grow
5. the problem of lack of training regarding the practice of making descaling mask powder derived from egg shells
6. The problem is that we have not yet mastered marketing to market the production of mask powder from egg shells.

Efforts to handle problems include:

1. Increasing knowledge about the use of egg shell waste
2. Converting leftover eggs into powdered facial mask which has sales value
3. Providing knowledge about systems and techniques to increase production.
4. Providing knowledge capital regarding innovations in processing powdered facial mask products from egg shells
5. Provide training and direct practice on how to make powdered facial mask products from egg shells

Method of community service

Community service regarding making face masks from egg shell waste is an effort to provide knowledge and skills to the community in utilizing materials around them, as well as providing solutions to waste problems. The following is an explanation of the stages of community service activities that can be carried out in making face masks from egg shell waste (Sulistyaningrum, 2023):

1. Preliminary Preparation

- Problem Identification: Before carrying out community service activities, it is important to identify existing problems in society, such as egg shell waste which is often thrown away. In addition, the public's need for affordable and natural skin care can be identified.



- Activity Objective: Disseminate knowledge about the use of egg shell waste which contains calcium and collagen for facial skin care.
- Preparation of Training Materials: Create training materials that include theory about the benefits of egg shells for skin and how to make safe and effective facial masks.

2. Socialization and Counseling

- Education about Egg Shell Waste: Educating the public about the benefits of egg shells, especially the calcium and collagen content which can be useful for skin care, such as increasing skin elasticity, rejuvenating the skin, and brightening the face.
- Education about Face Masks: Providing information about natural ingredients that can be used for face masks and how egg shell masks can be an environmentally friendly and economical alternative.



Figure 1. Initial Preparation Process for Socialization and Counseling

3. Practice of Making Face Masks from Egg Shells

- Material Collection: Collect egg shells to be used. Before processing, egg shells must be cleaned first to remove egg residue (Sulistyaningrum, 2024).
- Egg Shell Processing Process:
 1. Wash the egg shells and dry them in the sun until dry.



Figure 2. Egg shells have been washed and dried in the sun to dry



Figure 3. Sun-dried egg shells

2. Once dry, the egg shells are finely ground until they become powder. The ground shells will contain calcium carbonate which is beneficial for the skin. Grind until smooth using a blender or grinder. Shells that have been finely ground are safer to use to avoid irritation to the skin, because the rough texture can damage the outer layer of the skin (Sulistyaningrum, 2024).



Figure 4. Egg shells ground with a blender



Figure 5. Sifting egg shells that have become powder

3. Facial Mask Making Process:

- 1) Eggshell powder is mixed with other natural ingredients such as honey (to moisturize the skin), yogurt (for a skin-soothing effect), or olive oil (for hydration and anti-aging). Honey has antibacterial properties that can help cleanse pores, while yogurt provides moisture to the skin and helps soothe irritation.
- 2) Stir the mixture well until it becomes a paste that can be applied to the face.





Figure 4. Mixing egg shell powder with honey, yogurt and olive oil

4. Training and Demonstration

- Demonstration on Using a Mask: Provides a live demonstration on how to apply an egg shell facial mask. Make sure the mask is used carefully, by applying it evenly to the face and leaving it for 10-15 minutes before washing off with warm water.
- Application Technique: Teaches correct facial mask application techniques so that the mask can work optimally and provide benefits for the skin.

5. Trial and Evaluation

- Mask Use Trial: Encourage participants to try the face masks that have been made, both on themselves and their families.
- Evaluation of Results: After several uses, evaluate the benefits felt by participants, for example whether their skin feels smoother, brighter, or fresher.
- Collect Feedback: Receive feedback from participants regarding their experience using eggshell masks (Suryadi, 2023)

6. Mentoring and Empowerment

- Sustainable Assistance: Providing further assistance and guidance to the community, especially for those who are interested in making face masks from egg shells independently and continuing this business economically.
- Economic Empowerment: If people are interested, they can develop a business making face masks from egg shells for sale, which could be an alternative business based on natural and environmentally friendly ingredients.

7. Closing and Distribution of Results

- Results Reporting: After the activity is completed, a report covering all stages, results and evaluation of the activity is prepared and distributed to related parties, such as government institutions or organizations related to community empowerment.
- Information Dissemination: Using social media or local community forums to spread information about how to make face masks from egg shell waste, and its benefits.

Thus, this community service stage does not only focus on utilizing waste, but also on empowering the community to develop skills and businesses based on natural ingredients. Egg Shell Processing Process for Cleaning Pores.

II. Results and Discussion

Egg shells consist of about 95% calcium carbonate, which is also found in many beauty products. In addition, egg shells contain various minerals such as magnesium, phosphorus and zinc which are beneficial for the skin. The calcium carbonate content in egg shells can provide a mild exfoliating effect, helping remove dead skin cells and keeping pores clean. In some cultures, egg shells have been used as a natural ingredient to care for the skin, given its ability to improve skin texture, shrink pores, and brightens the skin. In recent years, the use of natural ingredients such as egg shells has become increasingly popular as a more natural and environmentally friendly alternative for facial care.

Egg shells contain several benefits that can help with skin care, especially in keeping pores clean and preventing skin problems such as blackheads or acne. Here are some of the main benefits of egg shells as a pore cleanser:

1. Light Exfoliation

Finely ground egg shells act as a natural exfoliant that can help remove dead skin cells from the surface of the skin. By removing dead skin cells, egg shells can help prevent clogged pores that can cause blackheads or acne.



2. Shrink Pores

The calcium carbonate in egg shells can help shrink pores that appear large by removing dirt and oil that clog pores. Apart from that, using egg shells regularly can make your skin look smoother and more cared for.

3. Brighten Skin

Several studies show that the mineral content in egg shells, such as zinc and phosphorus, has a positive effect in increasing skin cell regeneration and giving the impression of brighter and more radiant skin. Regular use can help skin look fresher.

4. Preventing Acne

Egg shells have antibacterial properties which can help kill acne-causing bacteria in the pores. Using egg shells as a facial scrub can help prevent acne from occurring due to clogged pores.

Considerations and Effectiveness of Egg Shells in Skin Care. Although eggshells have many claimed benefits, it is important to understand that their effectiveness in skin care may vary depending on each individual's skin type. Here are some considerations that need to be taken into account before using egg shells as a pore cleanser.

1. Safety of Using Egg Shells

Egg shells that are not processed properly can cause skin irritation, especially for those with sensitive skin. Therefore, it is very important to grind the egg shells finely and do a test on a small area of skin first to ensure there is no allergic reaction or irritation.

2. Risk of Infection and Bacteria

Egg shells can harbor bacteria if not washed and processed carefully. Make sure that the egg shell is completely clean and has gone through sufficient drying and heating to kill any bacteria or microorganisms that may be present.

3. Other Alternatives for Pore Cleaning

There are many more tested pore cleansing products available on the market, such as clay masks, other natural scrubs, and products containing salicylic acid or glycolic acid that are effective in cleaning pores without the risk of irritation. If you are in doubt, consult a dermatologist or esthetician to choose products that suit your skin type.

Benefits of this dedication:

1. Waste Reduction: People can reduce eggshell waste which is usually thrown away, thus helping to keep the environment clean.
2. Increased Knowledge: Increase public knowledge about natural ingredients that are useful for skin care.
3. Economic Empowerment: Providing new business opportunities for people who want to develop facial mask products as natural beauty products.
4. Skin Health: Provides a natural and safe skin care alternative, reducing dependence on chemical products.

However, even though egg shells have benefits, there are several things you need to pay attention to:

1. Hard Texture: Coarsely crushed egg shells can cause skin irritation if not processed properly. It is important to grind the egg shells very finely so as not to damage the skin or clog the pores.
2. Calcium Content: The calcium carbonate in eggshells has a mild exfoliating effect, but there is not enough scientific evidence to support the claim that eggshells can directly clean pores effectively.
3. Safety: Make sure the egg shells used are clean and free from germs or dangerous materials, because egg shells can become a breeding ground for bacteria if not washed properly.

III. Conclusion**Benefits of this dedication:**

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4. Skin Health: Provides a natural and safe skin care alternative, reducing dependence on chemical products.

Suggestion

Suggestions for further service are to carry out training with a wider scope, not just limited to small ones.

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