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MAKING ENVIRONMENTALLY FRIENDLY LIQUID DISH SOAP TO INCREASE STUDENT PRODUCTIVITY IN THE FIELD OF ENTREPRENEURSHIP

Nabila Amelia Kurnia Putri[1*], Aziza Anggi Maiyanti[2], Atika Anggraini[3], Ratna Wahyu Wulandari[4], Korhan Cengiz[5]

[1] Institut Agama Islam Negeri Kediri, Indonesia
[2] Institut Agama Islam Negeri Kediri, Indonesia
[3] Institut Agama Islam Negeri Kediri, Indonesia
[4] Institut Agama Islam Negeri Kediri, Indonesia
[5]College of Information Technology, University of Fujairah, Uni Emirat Arab

***Correspondence E-mail:** amelianabila567@gmail.com

Abstract: This research aims to increase students' knowledge and skills in producing environmentally friendly liquid dish soap while developing entrepreneurial aspects. The process of making this soap uses chemicals such as texapon, salt, citric acid, and other ingredients that are processed with structured methods to produce quality and environmentally safe products. The results showed that this eco-friendly dish soap is not only effective in cleaning dirt, but also has economic value that can be developed as a business opportunity. This product has the potential to become a business with high competitiveness because it offers environmentally friendly advantages that are in demand by the market. In addition, this innovation also equips students with entrepreneurial skills, such as production management and marketing, which can help them achieve economic independence. Thus, this research has a positive impact both in terms of economy and environmental preservation.

Keywords: Liquid Soap, Dishwashing, Eco-friendly, Innovative

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INTRODUCTION

In his research (Ningrum, 2021) revealed that, soap is a product that is often used in everyday life. Soap has various types, one of which is a soap product that will not escape for household needs (Deri, 2020). Especially if it's not dish soap? As the name implies, dish soap is a soap that functions as a cleaner of dirt and fat that sticks to the surface of tableware, such as plates, spoons, forks, glasses and other kitchen utensils. Soap, made through a chemical process commonly called a saponification reaction or also known as a saponification reaction. In this process, fatty acids will be hydrolyzed by a base that will form glycerin and raw soap. From this process, it will then be further processed to perfect it (Suprianto Pasir, 2014).

In the past, traditional communities only used coconut fiber and scouring ash as a means of washing dishes and other kitchen utensils. But along with the times, people can now use sponges and ready-made laundry soaps with various forms and advantages offered (Lase, 2022). The use of soap in households is very much in demand, as is the case with dish soap which is needed to help clean up the problem of tableware and kitchen in particular. One type of soap that is quite in demand is liquid soap.

Based on Indonesian National Standard (SNI) Number 06-2075-1996, liquid soap is defined as a liquid cleaning preparation made from soap or detergent base material with the addition of other permitted ingredients and used without irritating the skin (Ramadani, 2021). Liquid soap that has criteria that are in accordance with safe standards for skin health The demand for liquid soap today, tends to experience a very significant increase from year to year. This is because liquid soap is considered a more practical, hygienic and economical soap (Mulyani, 2022).

The cleanliness of kitchen utensils, especially dishes and cooking utensils, is an important aspect in the daily lives of Indonesians (Setiawati, 2019). Along with the increasing awareness of the importance of preserving the environment, the need for environmentally friendly cleaning products will inevitably become more urgent (Rosmainar, 2021). The majority of liquid dish soaps on the market today contain chemicals that have the potential to pollute the environment and endanger aquatic ecosystems.

Seeing this phenomenon, the development of environmentally friendly liquid dish soap is not only a solution to the problem of environmental pollution, but also a promising business opportunity (Wardani, 2019). By utilizing chemicals that are easily biodegradable, making environmentally friendly dish soap can be a concrete step in realizing the concept of a green economy while encouraging the growth of the entrepreneurial sector (Emawati, 2020).

Thus, making environmentally friendly dish soap is not only a practical solution for daily needs, but also makes a real contribution to the welfare of the community in the field of entrepreneurship (Amalia, 2018). Through continuous research innovation and development, the business of making environmentally friendly liquid dish soap is expected to continue to grow following market needs and increasingly stringent environmental standards. So, it is targeted to be able to open opportunities for young entrepreneurs to create and innovate in creating cleaning products that are not only effective in their uses, but can also be environmentally responsible.

The link between this innovation and entrepreneurship becomes clearer through several aspects. First, the huge market opportunity due to the increasing public awareness of environmentally friendly products, creating vast business potential. Second, the competitive advantage where environmentally-based products have added value compared to conventional soaps. Third, there are opportunities for innovation and product differentiation that allow entrepreneurs to develop safer formulas as well as biodegradable packaging that is more environmentally friendly.

In addition, the production of eco-friendly dish soap can be started on a small scale with relatively affordable capital, so students and MSMEs can start a business without large investments. This business concept also supports a sustainable economy because it allows businesses to not only earn profits but also contribute to environmental sustainability. On the other hand, this innovation has the potential to increase economic independence by providing dish soap production skills that can be developed into independent businesses, creating jobs, and improving community welfare.

Thus, making environmentally friendly dish soap is not only a solution for daily needs, but also has a positive impact in the field of entrepreneurship. Through continuous innovation and development, this business is expected to continue to grow, open opportunities for young entrepreneurs to be creative, and create products that are not only effective but also environmentally responsible.

METHOD

This research was conducted using the theoretical approach of laboratory experiments to produce environmentally friendly liquid dish soap. The experimental method is a laboratory activity that is part of a scientific research of a scientific nature. The approach in this study was chosen because it was felt to be able to provide opportunities for researchers to regulate what variables are included in the manufacturing process and directly observe the results of

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each production stage. This research was conducted by a team of seven students, located in the chemistry laboratory of the Kediri State Islamic Institute on December 6, 2024.

According to (Kerlinger, 1990), what is meant by laboratory experiments is a study that examines variables from all or almost all independent variables that may have an effect, while variables that are not relevant to research problems must be kept to a minimum. This is done by isolating the research in a physical situation separate from the routine of everyday life and by manipulating one or more independent variables that are specified, operationalized, and controlled carefully and thoroughly. Meanwhile, the field experiment itself according to him is a research study in a real situation by manipulating one or more free variables by the researcher in conditions when the situation allows.

In the other hand in his research, (Isaac, 1977) suggests that in laboratory experiments, researchers bring research subjects to the laboratory. Meanwhile, field experiments researchers come to research subjects. Furthermore, it is said that the physical control that occurs on research subjects is stronger in laboratory experiments compared to field experiments. Both can be distinguished because of the procedures and rules for controlling the subject's condition, so that the subject can feel or not feel the control. If the researcher exercises strict control over the subject's behavior and the subject is placed in a situation where they feel a striking difference from their daily life, this situation is more appropriately referred to as a laboratory experiment. Conversely, if their daily social life and environment (subjects) receive little (minimals) interference from researchers, this situation is more appropriately referred to as a field experiment.

This research method uses a laboratory experimental approach that aims to produce environmentally friendly liquid dish soap. The soap making process is carried out through several stages, starting from the preparation of raw materials, formulation, mixing, to the product quality test stage. The main ingredients used in this study include texapon as a surfactant, salt as a thickener, citric acid as a pH regulator, and other additives that support the cleaning power and safety of the product to the environment. All of these ingredients are processed by a gradual mixing method using a mechanical stirrer to ensure the homogeneity of the solution.

After the mixing process is complete, the resulting liquid dish soap is tested for quality based on viscosity, cleaning power, foam stability, and biodegradability. The biodegradability test is conducted to ensure that the soap can decompose naturally without polluting the environment. In addition, skin safety testing is also conducted to ensure that the product does not cause irritation to the user. In an effort to improve the entrepreneurial aspect, marketing

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strategies and product development are also part of this research. One way to increase the selling value of the product is to innovate the packaging, such as using refillable or biodegradable bottles. In addition, digital marketing strategies through social media and e-commerce can be used to reach a wider market.

To improve product competitiveness, entrepreneurs can conduct market analysis to understand consumer preferences for eco-friendly dish soap. By identifying product advantages, such as natural and eco-friendly formulations, marketing can be more effective in attracting buyers. In addition, training and workshops on eco-friendly soap making can be held to empower communities to start small businesses based on green products. With the right methods in production and effective entrepreneurial strategies, making eco-friendly liquid dish soap not only contributes to protecting the environment, but also opens up sustainable business opportunities for students and the wider community.

FINDING AND DISCUSSION

Dish soap is one of the most important household items. As the name implies, this soap functions as a remover of stubborn dirt on cutlery and other kitchen utensils, due to fat and other cooking ingredients that are carried over from the foods that have been served usually. In addition, this dish soap is also considered effective for removing bacteria that live on the surface of cutlery and other kitchen utensils (Sianiar, 2021). Dish soap is a cleaner made from the reaction between alkali and fatty acids as a washing agent (ALfandy, 2021).

The existence of this liquid dish soap turns out to be able to provide a plus, when compared to other colek soap or cream soap. This is because liquid soap dissolves easily in water, is soft on the hands or minimizes the risk of irritation to the hands, provides a fresher and fresher aroma and is environmentally friendly (Amalia, 2018). In addition, liquid dish soap is also easy to store in bottles that can be tightly closed. Of course, this is able to maintain the hygienic level of the laundry soap. Considering the many pluses of liquid dish soap, that's what makes people prefer liquid dish soap as a complement to household needs.

Making liquid dish soap can be utilized as a creative and innovative productive activity (Nasution, 2022). Given, the use of dish soap which can be said to be routinely used daily to meet household needs. As in general, where the most important household expenses are in the world of soap. Whether bath soap, laundry soap, dish soap, hand soap and many more types of soap are important for household needs.

The increase in demand for liquid dish soap is also due to a shift in people's habits, which want an easy and practical way (Putra, 2018). This can be seen from consumers who

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have slowly begun to abandon the traditional way of washing cutlery and kitchen utensils, namely using colek soap or creamy dish soap (Purwaniati, 2021). In fact, the previous community used scouring ash with coconut husk as a dishwasher and kitchen utensils (Dewi, 2020). The following is a table containing the tools and materials that the research team used in making environmentally friendly liquid dishwashing soap products;

Table 1. Tools and ingredients used to make dish soap

Tools	Materials
Beaker glass (100 mL and 500 mL) Complainant rod Stirrer/shaker (a sturdier tool than a glass stir bar) Spoon Basin	Water 500-600 mL Kitchen salt 30gr Texapon 60 gr Needle 20 gr EDTA (preservatives) 1 gr Citric acid (citrun) 5 gr Lemon fragrance (conditional) 3 mL Colorant (optional) → using the color red

First, in the research that the team conducted, the presence of salt used in the process of making dishwashing soap, functions as an additional ingredient that can increase the effectiveness of cleaning against dirt and fat that sticks to the surface of cutlery and other kitchen utensils. Not only that, here salt also functions as a water hardness reducer, and strengthens the ability of soap to lift dirt and residual fat in cooking that sticks to the surface of cutlery and kitchen utensils. More broadly, salt also plays a role in reducing excess foam and preventing the soap from becoming too thick. In the manufacturing stage of eco-friendly liquid dish soap, salt is essential to regulate the viscosity of the soap ingredient mixture. Thus, the addition of salt to the dish soap mixture, not only improves the quality of the dish soap, but also plays an important role in controlling and improving the effectiveness of the product.

The second is Texapon. Texapon itself is a brand of chemical products, usually available in two forms: powder and gel, with the main content of surfactants. In the research of making environmentally friendly liquid dishwashing soap conducted by the research team, the texapon used is texapon gel. Here, texapon functions very effectively as a dirt lifter. Not only that, the raw material of texapon itself turns out to be a coconut oil derivative. So, its advantages are that it is easily reusable, can be tolerated by the human body, and has a much better cleaning power, although not as strong as products made from ABS or LAS. The amount used can be adjusted to the needs or the desired amount of the final product, but in this study, our team only used 60gr of texapon gel.

Third, there is needle. Sodium Lauryl Sulphate or SLS (Needle) is a type of surfactant that is very strong and commonly used in oil and dirt stain removal products. As the name

implies, needle is a needle-shaped surfactant and has dirt-lifting properties. So, with this needle, environmentally friendly liquid dish soap products will be more effective in their effectiveness in lifting dirt and residual food fat attached to the surface of cutlery and other kitchen tools.

Fourth, there is EDTA which is a kind of white crystalline powder and functions as a preservative for environmentally friendly liquid dishwashing soap made by researchers. Not only that, EDTA here also plays an active role in extending the shelf life of liquid detergents and maintaining the quality of the formulation for a long time. In order to attract more consumers, here researchers also add fragrances and colorants to the product. Fragrance, serves as a soap fragrance so that when soap is used the fragrance is able to extinguish the unpleasant aroma of food debris that is still attached to the surface of tableware and kitchen. Meanwhile, the colorant is clear as an attractant for consumer interest in the products offered. For example, red or orange colours with the aroma of fresh lemon fruit extract, surely consumers are interested in buying these products.

The fifth is the importance of the dose of water as a solvent for the ingredients used in making environmentally friendly liquid dish soap. Here, water also functions as an enhancer of the volume of soap produced as a result with the desired quality later. If the product made is not added with water as a solvent, the chemicals used earlier will not mix well, and can even have a clumpy texture. Therefore, water here is an ingredient that must be really considered in order to carry out the successful manufacture of a product.

In this research, our team used just one recipe to produce an environmentally friendly liquid dish soap product. For the manufacture of one recipe that our team did, seven bottles of liquid dish soap were obtained, each bottle with a volume of 100mL. Researchers also observed changes in the form of soap after letting it sit overnight, in order to streamline the chemical reactions in it. On the first day of packaging, or when finished making the product, the soap is still very thick and foams a lot. But after letting it sit overnight, the soap becomes very clear without foam and slightly thinner than the first day. If these conditions have been found, it means that the environmentally friendly liquid dishwashing soap is ready for further packaging to be marketed or can be used directly.

Entrepreneurship is the process of creating, developing, and running a business with the aim of making a profit and providing benefits to society. In making liquid dish soap, there are several aspects of entrepreneurship that can be developed. One of them is innovation and creativity, where individuals or groups can create unique formulas that are more environmentally friendly, have a distinctive aroma, or use natural ingredients that are safer for

the skin. In addition, the market opportunity is also huge as the demand for liquid dish soap continues to increase. This opens up opportunities for entrepreneurs to produce and market products at competitive prices.

From the production side, a good understanding of the ingredients and manufacturing process can help optimize production costs so that the profits earned can be greater. These products can also be marketed through various channels, such as grocery stores, supermarkets, and online platforms such as social media and marketplaces. Not only that, the use of environmentally friendly ingredients can be an added value, especially for consumers who care about the environment. Thus, the liquid dish soap business is not only profitable but also has a positive social impact.

This experiment proves that making liquid dish soap can improve entrepreneurship. One proof is that the products produced can be sold. From one recipe made, the research team managed to produce seven bottles of liquid dish soap with a volume of 100 mL each, which can be packaged and sold to local markets or online. The production process also proved to be efficient, as with the right composition of ingredients, the soap produced has a good texture after sitting overnight. This consistency allows production in larger quantities.

In addition, the competitiveness of the product can be improved by adding fragrance and coloring to make it more attractive. Consumers tend to be more interested in products that have an attractive appearance and fresh aroma. From a business perspective, the efficient calculation of production costs allows this product to be sold at a promising profit. Moreover, public awareness of environmentally friendly products is increasing, so the chances of attracting more consumers are even greater.

By considering various aspects of entrepreneurship and the evidence that this experiment has good business potential, making liquid dish soap not only provides benefits to households, but can also be a promising business opportunity. Therefore, this experiment can be the first step for anyone who wants to enter the business world in the field of household cleaning products. The following is a portrait of an environmentally friendly dishwashing soap product that has been further packaged for marketing and a portrait of the research team together with the lecturer teaching the Advanced Chemistry course;

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Figure 1. Image of an environmentally friendly liquid dishwashing soap product that is ready to be marketed to increase student productivity in the field of entrepreneurship.

Figure 2. Image of the research team with the lecturer of the advanced chemistry course and the resulting product, namely environmentally friendly liquid dish soap.

CONCLUSION

After conducting this research and experiment, the conclusion that can be drawn is that the manufacture of environmentally friendly liquid dishwashing soap products can increase students' knowledge, skills, and productivity in the fields of science and entrepreneurship. In addition, this research is expected to foster the interest and entrepreneurial spirit of the younger generation, especially students of the State Islamic Institute of Kediri, to become entrepreneurs independently in a creative and innovative way. In the aspect of entrepreneurship, this research proves that making liquid dish soap can be a potential business opportunity. By utilizing chemicals that are easily biodegradable, such as Texapon, salt, citric acid, dish soap essential fragrances, dyes, and water, and applying

theoretical approaches from laboratory experiments in stages, the resulting product has optimal quality and can be marketed to consumers. The advantages of this product, such as its effectiveness in cleaning dirt, oil, and unpleasant odors, as well as its thick texture, easy dissolution in water, abundant foam production, and safe use, make it highly competitive in the market. In addition, the success of this experiment shows that the production of liquid dish soap can be done efficiently at an affordable cost, thus providing attractive profit opportunities for aspiring entrepreneurs. With the right marketing strategy, such as online marketing through social media or marketplaces, this product can reach more consumers. The increasing public awareness of the use of environmentally friendly products is also a supporting factor in the development of this business. Thus, this research not only provides benefits in terms of product innovation, but also opens up promising entrepreneurial opportunities. It is hoped that the results of this research can encourage students to be more courageous in starting their own businesses, developing creative business ideas, and contributing to creating new jobs in the future.

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