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The Process of Making Fiber from Soybean Inside

Arya Mahendra Sakti[1,*]

[1] *Study Program D4 of Mechanical Engineering, Vocational Program, Universitas Negeri Surabaya, Indonesia*
[*] *Corresponding author. Email: aryamahendra@unesa.ac.id*

ABSTRACT
Utilization of natural fiber from soybean husk waste in the processing of dairy, tempeh, and tofu is very suitable to be development. Soybean husk waste has not had too high economic value, it can be used for making soybean husk fiber. Fulfillment of basic ingredients to produce environmentally friendly materials, a basic material made from natural vegetable fibers was developed. This fiber has two categories, namely one with protein origin and the other with cellulose origin. Fiber derived from protein comes from vegetable proteins such as corn, soybeans, beans, etc. Soy-based processed products are a good source of vegetable protein, and dietary fiber, have high oligosaccharide content, contain vitamins and minerals and can reduce the risk of coronary heart disease, and carcinogenesis type diabetes, reduce negative symptoms due to menopause and improve bone health. The soybean seed husk contains a lot of crude protein 17.98%, crude fat 5.5%, crude fiber 24.84%, and metabolic energy 2898 kcal/kg. We clean the soybean husk by soaking it using guides for 2 hours, 3 hours, and 4 hours, then dried it. After that, we puree the dimensions, we give alkali treatment by soaking in NaOH solution, then drying at room temperature. For fiber from soybean husk that has been dried, we add cellulose to increase the strength of the fiber. The more mixture of soybean husk composition, the lower the mechanical properties of the fiber. The more mixture of cellulose composition, the mechanical properties of the fiber will be harder and more ductile. The longer the heating process in the manufacture of fiber dough, the more ductile the mechanical properties of the fiber will be.
either.

Keywords: *soybean husk, natural fiber, waste utilization.*

1. INTRODUCTION

Utilization of natural fiber from soybean husk waste in the processing of dairy, tempeh, and tofu is very suitable to be development. Soybean husk waste has not had too high economic value, it can be used for making soybean husk fiber. Eco-friendly fiber made from soybean husk dregs also has a soft and light material, can reflect light, does not wrinkle and does not shrink easily, is UV resistant, and is also antimicrobial. Fulfillment of the basic ingredients to produce environmentally friendly fiber-making materials, a basic material made from natural vegetable fibers was developed. This fiber has two categories, namely one with protein origin and the other with cellulose origin[1]-[4]. Fiber derived from protein comes from vegetable proteins such as corn, soybeans, beans, etc. Soy-based processed products are a good source of vegetable protein, dietary fiber, high oligosaccharide content, contain vitamins and minerals, and can reduce the risk of coronary heart disease, and carcinogenesis type diabetes, reduce negative symptoms due to menopause and improve bone. .The soybean seed husk contains a lot of crude protein 17.98%, crude fat 5.5%, crude fiber 24.84%, and metabolic energy 2898 kcal/kg. Soybean has a high protein content, and this fabric is very receptive to natural dyes, so there is no need for synthetic dyes[5]-[7].

2. METHODS

Flowchart of the process of making tempeh and tofu, from Soybean husk waste can be seen from the flow chart in the figure 1. In this research the Soybean husk dregs in the soybean processing industry in the Sidoarjo area. The research variable consist of Independent variable is Soybean husk composition (100 grams, 125 grams, 150 grams) with Immersion time (1 hour, 2 hours, and 3 hours). However the dependent variable is Wettability test and variable control is dimensional uniformity of soybean raw materials.

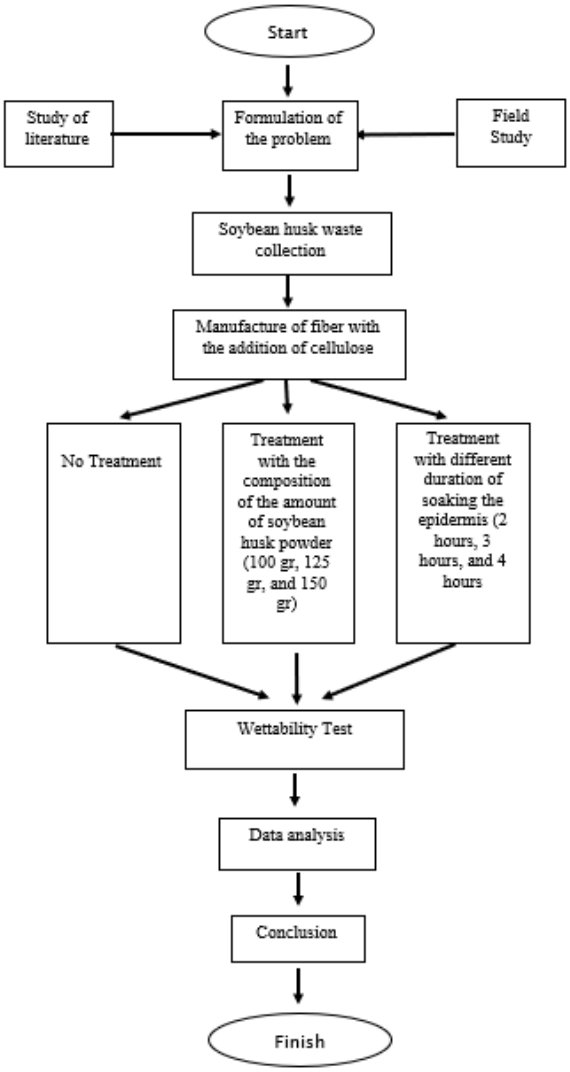

Figure 1 Research Flowchart

3. RESULTS AND DISCUSSION

The process of making natural fiber from soybean husks requires several stages that require patience and thoroughness. The stages are as follows:

1. The process of preparing tools and materials

Figure 2 Research Tools and Materials

The materials used in this research are solid waste tofu (soybean husk), aquadest, NaOh, cellulose.

2. Preparation of raw materials for soybeans used by tofu and tempeh entrepreneurs.

Figure 3 Soybeans

3. Soybeans are cooked at a temperature of 80 0C for approximately 2 hours.

Figure 4 Cooking Soy Beans

4. After that, we soak the cooked soybeans in cold water, so that the skin peels off easily.

5. We rub the soybeans that have been soaked in cold water using our hands or other tools so that the skin of the soybeans can be peeled off from the soybeans.

Figure 5 Soybean Aris Skin

6. We clean the soy bean husk that is still wet with water, and then soak it with distilled water for 2 hours, 3 hours, and 4 hours. Then we dry the skin of the soybeans.

7. Tofu solid waste drying process

Figure 6 Drying the Soybean Ari Skin

8. The drying process is carried out by drying in the sun, until the soybean husk has become dry and there is no visible water content in the soybean husk.

9. Material reduction process

Figure 7 Shrinking Soybean Ari Skin Size

10. The process of reducing the soybean husk is done by grinding until smooth or using a blender.

11. After that, the results of refining the soybean husk are filtered, to obtain a uniform dimension of the soybean husk.
12. The alkaline process is carried out by mixing the skin of soybeans that have been smooth and dry as much as (100 grams, 125 grams, and 150 grams) mixed with 12% 1000 ml NaOH solution.

13. The process of heating at a temperature of 80 oC and stirring slowly and constantly for 60 minutes.

14. After that, the process of filtering and rinsing again is carried out to obtain uniform dimensions of soybean husk.

15. Heating drying process.

16. Cellulose mixing process.

Figure 8 Mixing Soybean Ari Skin with Cellulose

17. Mixed material printing process

Figure 9 Fiber from Soybean Arid Skin

18. The process of drying the prints using heating or sunlight.

4. CONCLUSION

The conclusions of this study are:

1. The more soybean husk mixture, the lower the mechanical properties of the fiber.
2. The more mixture of cellulose will make the mechanical properties of the fiber will be harder and more ductile.
3. The longer the heating process in the manufacture of fiber dough, the more ductile the mechanical properties of the fiber will be.

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