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REVIEW ARTICLES; UTILIZATION OF SURIMI INDUSTRIAL LIQUID WASTE FOR EDIBLE FILM

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ABSTRACT

This article aims to examine the use of liquid waste from the surimi industry to make edible films. Based on the results of the literature study, information was obtained that there have been several researches that utilize the surimi industrial liquid waste for the manufacture of edible films. The liquid waste from the surimi industry is mixed with NaOH, glycerol, starch, elmusifier and vegetable oil then made into a suspension, after being dried in the oven, it becomes edible flim.

Keywords : *glycerol, elmusifier, drying, Surimi, protein, edible film, cup.*

Introduction

Fishery industry waste can be grouped into two main groups, namely liquid waste in the form of liquids that are wasted from the process of weeding and washing fish, especially those containing blood, fat and other substances, as well as liquids wasted from the washing process of pulverized fish meat which mainly contains blood, water soluble proteins (sarcoplasmic proteins), fats and other substances. Solid waste can be in the form of offal, fins and tails, bones, scales, pieces of fish meat and fish in whole form.

Poor waste management is a problem in the business of an industry, including the fisheries industry. The handling of fishery industry waste so far is generally only buried and dumped into the river.

The main waste from the production of surimi is liquid waste, this happens because the process of making surimi involves large amounts of water for the washing process. Surimi wastewater discharge in Japan can reach 5000 tons annually (Iwata et al., 2000). Surimi washing water contains not only sarcoplasmic proteins, but also myofibril proteins, proteases, hemepigments, and other potential bioactive components. Recovery of bioactive components from surimi washing water, such as proteases, can increase the added value of surimi industrial waste. This article aims to examine the use of liquid waste from the surimi industry to make edible films

The process of making edible film made from surimi industrial wastewater

In surimi waste water there is protein that can still be used, most of the surimi waste is only used as an additional ingredient for the manufacture of fish feed (Iwata et al., 2000). Several studies related to the utilization of surimi waste include, "Recovery of Catechins Enzymes from Surimi Liquid Waste" (Nurhayati et al., 2015) and "Utilization of Red Bigeye (Priacanthus macracanthus) Surimi as Alternative Fish Feed" (Safitri et al., 2016). Surimi wastewater can be used for the manufacture of bioplastics, one of which is as a basic material for making edible films. Trilaksani (2007) stated, Surimi wastewater can be used as a basic material in the manufacture of edible films. Edible films can form well at pH 10 conditions.

Minced fish washing process is the most important step to produce high quality surimi. Washing was carried out to increase gel strength, improve color appearance, remove fishy odor and increase surimi stability during frozen storage. The minced fish washing process causes the concentration of myofibril protein in surimi to increase and sarcoplasmic proteins, fats, pigments, blood lipids, and protease enzymes dissolve with washing water. Minced fish washing water is a by-product or even waste for the surimi processing industry, so it has the potential to cause water pollution if not handled properly because it contains high organic matter.

The manufacture of edible films is done with composites. As for how to make edible film of surimi washing water, according to Shinta et al. (2016) are as follows:

a. 6% surimi washing water
b. The addition of aquadest and 1M NaOH to pH 11 was then stirred and heated at 55 oC for 30 minutes.
c. Addition of 3% glycerol

d. Making suspension with the addition of 4 g of canna starch in 100 mL of distilled water and heated at 65 oC until complete gelatinization occurs.
e. Mixing the work of points c and d is then stirred until homogeneous
f. Addition of 1.5 grams of CMC emulsifier
g. The addition of 3% palm oil, the stirring process is still carried out using a magnetic stirrer
h. Suspense edible film is degassing for 1 hour
i. The suspension was put into a petri dish with a diameter of 11 cm as much as 40 ml
j. The suspension is oven-dried at 70 degrees C for 10 hours
k. The film is removed and put in a desilator then ready for analysis

Edible film making Edible film making with composites (Marsega 2015). The workings of making edible film of rice eel surimi washing water are as follows.

1) Surimi washing water as much as 6%
2) The addition of aquadest and 1M NaOH to pH 11 was then stirred and heated at 55 oC for 30 minutes.
3) Addition of 3% glycerol
4) Making suspension with the addition of 4 g of canna starch in 100 mL of distilled water and heated at 65 oC until complete gelatinization occurs.
5) Mixing the work of points c and d is then stirred until homogeneous
6) Addition of 1.5 grams of CMC emulsifier
7) The addition of 3% palm oil, the stirring process is still carried out using a magnetic stirrer
8) Suspense edible film is degassing for 1 hour
9) The suspension was put into a petri dish with a diameter of 11 cm as much as 40 ml
10) The suspension was dried in an oven at 70 oC for 10 hours
11) The film is removed and put in a desilator then ready for analysis

Product quality

The use of surimi washing water for rice eels and tilapia when compared to industrial standards is sufficient to meet the quality. The higher the value of the thickness of the edible film, the lower the value of the water activity of the edible film. The lower the value of water activity, the less free water for microbial growth.

In addition to being able to overcome the problem of environmental pollution, the use of surimi wastewater as a basic material for making edible films can reduce management costs, as well as increase the added value.

Market segmentation

Bioplastic products, especially edible films made from surimi waste, have not been widely used or utilized in Indonesia Indonesia, research related to this is also still rarely done so that there is not much demand for bioplastic products made from surimi waste.

Conclusion

Based on the results of the literature study, information was obtained that there have been several researches that utilize the surimi industrial wastewater for the manufacture of edible films. The liquid waste from the surimi industry is mixed with NaOH, glycerol, starch, elmusifier and vegetable oil then made into a suspension, after being dried in the oven, it becomes edible flim.

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