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are that it is more easily dispersed in mixing, does not cause liquid separation in the mixture or foaming, can prevent the formation of ice crystals, melts in the mouth and is a good stabilizer.

According to (Moranda et al., 2018), there are two ways of making gelatin: using an acid and a base. The difference lies in the immersion stage. The selection of stages of the acid, alkaline process, or other extraction methods will affect the gelatin results to be obtained, and this also applies to the choice of treatments at the time of extraction, such as the selection of the extraction time/duration of the hydrolysis process, the use of pH, the concentration level and type of solvent as well as the temperature at the time of extraction. It will affect the hydrolysis reaction that occurs.

Extraction of gelatin from fish skin generally uses the acid method, according to Samosir et al. (2018), stating that acid can convert triple helical collagen fibers into single chains so that the amount of collagen hydrolyzed by acid solution is more than in alkaline solution.

The procedure for extracting gelatin from fish skin is as follows (Febryana et al. 2018): The fish skin is cleaned of still attached dirt, then immersed in a solution of acetic acid (CH3COOH) with a concentration of 0.5%. For 24 hours. After that, the soft fish skin was washed with water until the pH was neutral (6-7). Furthermore, the fish skin was extracted using aquadest with a ratio of 1: 2 (w/w). In a water bath, the extraction was carried out at 600C for 3 hours. Then filtered using a filter cloth to separate the filtrate from the residue. The gelatin filtrate obtained from the extraction was poured into a tray and dried in an oven at 600C to form gelatin sheets. The gelatin sheets were cut into small pieces, then mashed with a blender to form gelatin powder.

The yield of gelatin extracted from fish skin depends on the type of fish. Febryana et al. (2018) reported that gelatin yield from the extraction of belida fish skin with the acetic acid method was obtained at 3.296%. The yield of gelatin from catfish skin extraction is 9.63% (Paranginangin et al., 2004). Moranda et al. (2018) also reported that the yield of yellowfin tuna (Thunnus albacares) skin gelatin extracted using the acid method was 7.93%.

Conclusion

Fish skin and fish processing industry waste can be processed into food products, additives and functional food. Commercial food products made from fish skin are fish crackers. The food additive made from fish skin is gelatin. Functional food made from fish skin is collagen. In Indonesia, gelatin and collagen made from fish skin are still on a research scale, not yet on a commercial scale.

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