

Production of Gelatin from Red Tilapia Skins



Award Winner

Gelatin is one of the most versatile and utilized gelling agents in food application due to its special texture, thermo-reversibility and the 'melt-in-mouth' perception. Its application as an ingredient in frozen foods manufacturing such as ice creams and pie-fillings are highly sought after since its functional properties are highly stable at low temperatures (e.g. at -30°C) and the properties are maintained even when the product is brought up to an elevated temperature. Its unique functional properties as stabilizers, emulsifiers, thickeners, flavor carriers and as an aid in juice clarification process normally surpass those of other natural and synthetic biopolymers. In addition to foodstuffs, gelatin has found a variety of applications in the pharmaceutical and photographic industry. The type of application is dependent on the grade of the gelatin, which in turn is dependent on the processes involved in the production of the gelatin itself.



Gelatin powder



Applications of gelatin in food industry

Gelatin is traditionally produced from bones and skins or hides of mammalian origin such as bovine and porcine by acid or alkaline treatment to give type A and type B gelatins, respectively. However, due to the need arise from religious issues such as for the Jewish, Hindus and the Muslims has brought about the need to produce gelatin from non-traditional sources.

Gelatin from marine sources (fish skin, bones, fins and scales) has been looked upon as possible alternatives besides fulfilling the need of zero waste concepts in the manufacturing industries. Fish skins, bones and scales are the by-products of fish processing industry. The on-going research has also proven that the skins of cultured freshwater fish such as red tilapia are promising alternative sources of commercial gelatin. There are two main issues to be addressed in the production of gelatin from red tilapia skins. First, the process cannot be directly adapted from the mammalian derived gelatin due to the different chemistry of the skins and bones; secondly, the character of the tropical fish skin and bones have not been reported. Modified and improved procedures for the extraction of gelatin using both organic acid and alkaline washing treatments have been accomplished in our laboratory.

The research conducted at UPM reveals that the gelatin exhibited excellent snowy-white color and barely detectable fishy odor. Physical properties such as gel strength, viscosity and melting point of tilapia skin

gelatin are compatible to those of mammalian gelatin commercially available. The proximate and amino acid composition have also been looked into.

Based on these properties, it is deemed that gelatin from tilapia skin has competitive market potential offering food manufacturers wider selection and application of the protein.

For further information, kindly contact:

Prof. Dr. Jamilah Bakar
Department of Food Technology
Faculty of Food Science and Technology
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor
Malaysia

Tel: +603 8946 8396, Fax: +603 8942 3552

E-mail: jamilah@putra.upm.edu.my