# REVIEW ON COLLAGEN EXTRACTION METHODS

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| **ABSTRACT**  Collagen is a valuable protein with a wide variety of uses. It has wide applications in medicine, medical products, biomedical materials, food supplement, cosmetics and aesthetics. Interest in collagen have been increased in recent years. The most commonly used raw materials for collagen extraction are skin or hides, bones, tendons and cartilages [1]. Most commercial collagens are obtained from byproducts of mammals, especially cattle and pigs. Fish scales are a by-product/waste product containing significant collagen. [2].  Moreover, there is a shift towards the use of marine sources for collagen production instead of pork and beef skin&bone which are traditional sources of collagen. Health risks such as bovine spongiform encephalopathy and religious beliefs also have a significant impact on this swift. In addition, studies on collagen extraction from poultry slaughter waste are also available in the literature. [3].  Collagen extraction process consist of mainly pretreatments and hydrolysis; acidic hydrolysis, enzymatic hydrolysis and ultrasound supported acidic hydrolysis are commonly used methods. Acetic acid is most preferred source of acid there are also studies with citric acid. Recent studies are focused on ultrasound supported acidic or enzymatic hydrolysis which increases the yield of extraction and decrease the time of extraction. [4] Enzymatic hydrolysis has the advantage of preserving the original helix structure of collagen when compared to aggressive acidic hydrolysis. Extraction of collagen is to be conducted at temperatures below the denaturation temperature of collagen which is usually preferred below 25°C to 4°C. NaOH or Ca(OH)2 solution is used for removal of proteins followed by oil removal via butyl alcohol solution when using fish scales as collagen source. FTIR, UV spectrum, amino acid analysis, X-ray diffraction analysis are widely used for characterization of collagen  **References:**  [1] Gómez-Guillén, M. C., Giménez, B., López-Caballero, M. E., Montero, M. P. (2011). Functional and bioactive properties of collagen and gelatin from alternative sources: A review. *Food Hydrocoll*, 25(8): 1813-1827.  [3] Arumugam, G. K. S., Sharma, D., Balakrishnan, R. M., Ettiyappan, J. B. P. (2018). Extraction, optimization and characterization of collagen from sole fish skin. *Sustainable Chem Pharm*, 9: 19-26  [2] Liu, D. C., Lin, Y. K., Chen, M. T. (2001). Optimum Condition of Extracting Collagen from Chicken Feet and its  [4] Li, D., Mu, C., Cai, S., Lin, W. (2009). Ultrasonic irradiation in the enzymatic extraction of collagen. *Ultrason sonochem*, 16(5): 605-609. |

# Keywords: Collagen, Acidic Hydrolysis, Fish Scales, Extraction, Ultrasound

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