

## **ABSTRACT**

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<b>Title</b>	<b><i>PRE-DESIGN COLLAGEN FACTORY OF TILAPIA SCALE WITH CAPACITANCE OF 1.000 TONS/YEAR</i></b>

Collagen comes from the Greek, namely the word "kolla" which means to be sticky or produce an adhesive. Collagen is a protein with a fibrous structure which is the main component of the extracellular matrix of a living organism, which accounts for 25-30% of the total protein and plays an important role in maintaining the integrity of the biological structure of several tissues. Collagen extracts are used for the cosmetic, pharmaceutical (wound healing) and food industries because collagen has high tensile strength, low antigenicity and good biocompatibility.

Domestic production of collagen itself is still not optimal. The data states that in 2003 Indonesia still imported more than 6200 tons of collagen with a price per gram of approximately US\$1. One of the potential alternative raw materials that can be used as collagen production is Tilapia Fish Scales. Organic compounds in fish scales consist of 40-90% and the rest is collagen. Currently, fish scales can be obtained from fish sales or fish processing companies, especially freezing companies that process their products in frozen scale-off form. The need for collagen is focused on the cosmetic industry which is growing very rapidly. With the need for collagen for cosmetic raw materials of 6%, the determination of collagen production capacity from tilapia fish scales obtained for cosmetic raw materials is 1,000 tons/year.

It is planned that a collagen factory from tilapia scales will be established in Tugu sub-district, Semarang, Central Java. This location was obtained because it is close to the source of raw materials from PT. Aquafarm Nusantara. The raw material used is tilapia skin with a raw material capacity of up to 4.000 tons/year.

The preparation of collagen was carried out using the Acid Soluble Collagen method, which was extracted with 1 M Acetic Acid for a certain period of time, at room temperature and 1 atm pressure.

This company is a limited liability company (PT) headed by a managing director with a total of 136 employees. Based on the economic feasibility analysis carried out, the total required capital (TCI) is Rp. 306,344,343,638.55 with a capital composition of 60% own capital and 40% bank loans. The minimum payback period (MPP) is 4 years 9 months 2 days, so investment returns before the factory reaches 10 years of age and the Internal Rate of Return (IRR) is 30.3% which is higher than the prevailing interest rate (10%) and the total value of the net cash flow rate (NCF PV) at 10% interest is Rp. 477,182,821,530,-. It can be concluded that the design of a collagen factory made from tilapia skin to be built is feasible.

*Keywords: Collagen, Tilapia Scales, Soluble Acid.*