

CHAPTER II

LITERATURE REVIEW

2.1. Mocaf (Modified Cassava Flour)

MOCAF (Modified Cassava Flour) is a starch product lots of modifications used in various products food. According to Subagio et al. (2008), MOCAF is cassava flour produced by modifying yam cells fermented wood. Modification is defined as changes in molecular structure done by several methods, either physically, chemically and enzymatically (Koswara, 2013). Modification process on MOCAF production is a process biochemical modification, namely by adding enzymes or microbes enzyme producer (Herawati, 2010). Bacteria lactic acid (LAB) plays an important role in fermentation process, where its activity can produce pectinolytic enzymes and cellulolytic which can destroy cassava cell walls, and hydrolyze starch into organic acids (Subagio, et al., 2008). Cassava is a plant that can be grown with under any circumstances. Fresh cassava has chemical composition consisting of a moisture content of about 60%, 35% starch, 2.5% crude fiber, 1% protein, 0.5% fat, and ash 1%. Therefore, cassava is a source contains carbohydrates and dietary fiber low protein.

Fresh cassava contains compounds cyanogenic glycosides and when the oxidation process occurs by The enzyme linamarase will produce glucose and acid cyanide (HCN) which is marked with a blue spot, will becomes a toxin (poison) if consumed at HCN levels more than 50 ppm. Based on the levels of cyanide acid contained In it, cassava is divided into two types, namely *sweet cassava (Manihot esculenta)* and *bitter cassava (Manihot glaziovii)*. Cassava sweet / sweet cassava contains a small amount of cyanide acid, namely around 15-50 mg/kg, This type of cassava tuber is shaped like a cylinder with ends smaller with an average diameter of 2-5 cm and length around 20-50 cm. Meanwhile, cassava bitter / bitter cassava contains very high cyanide acid,

namely around 50-400 mg/kg, this type of cassava tuber can reach four times bigger than sweetcassava (Gunawan, *et al.*, 2019). MOCAF is a product derived from cassava flour using the principle of cassava cell modification by fermentation, in which the role of microbial enzymes predominates during the fermentation. Technically, processing MOCAF is similar to processing ordinary cassava flour. However, it is accompanied by fermentation, then dried and ground into MOCAF. This flour is commodity cassava flour with fermentation techniques. Product The resulting flour has characteristics similar to wheat flour, which is white, soft, and does not smell of cassava (J.Sulistyo and K.Nakahara, 2019). MOCAF flour has a moisture content of 9.25%, protein content of 1.93%, ash content of 0.30%, starch content of 85.60%, fat content of 2.72%, fiber content of 0.21% (Ika Gusriani, 2021).

2.2. Catfish

Catfish is a type of hybrid fish that has more body growth faster than other types of fresh water fish, including alternative animal protein with low prices, easy to process, highly nutritious and delicious taste, by because of that catfish easily become popular among the people. In general, catfish have morphological characteristics with a slightly rounded body type smooth elongated because it has no scales and is slimy, the color of the body gray to black, has 4 antennae or whiskers on the mouth, mouth located on the head where the catfish has a long head (almost reaches a quarter of the body length), *depressed* head (flattened down) and covered by bone plates at the top and bottom, there is a respiratory apparatus addition in the form of *arborescent* which is located in the cavity space above the gills, It has small eyes and a pair of functioning nostrils as a scent detector, the rounded caudal fin is not joined to the dorsal fin or *anal* fins, *pectoral* fins have a shaft that functions as a protector from outside disturbances (Mahyuddin, 2008).

Catfish live in calm fresh waters, have habits making holes on the banks of rivers or ponds, more active at night day to find food because catfish are nocturnal and have tools additional breathing, namely *arborescent* which functions as an oxygen absorber from the surrounding air (Rachmatun, 2007). Catfish is a type of fish that eats everything (omnivores) with a habit of foraging in the bottom of the waters so that the water in the pond looks cloudy (Hariani et al, 2007).