

## CHAPTER 1

### INTRODUCTION

#### 1.1 Research background

Fish is indeed a popular source of animal protein in Malaysia and many other countries in the Eastern Asian region. Fish contains high-quality protein and is also a good source of omega-3 fatty acids, which are important for maintaining heart health and reducing the risk of certain diseases (Gu et al., 2010). In Malaysia, fish is often consumed in various forms such as grilled, fried, boiled, or even as a curry. It is also commonly served with rice or noodles, as well as in soups and stews. Some popular fish dishes in Malaysia include grilled fish, sour and spicy fish stew, and curry fish head.

Fish consumption can be an essential component of a well-balanced and healthy diet due to its high-quality protein content, as well as its beneficial omega-3 fatty acids, vitamins, and minerals (Mendivil C.O, 2021). In Malaysia, catfish is one of the most important species in aquaculture, and it is widely consumed by the local population. The catfish with the scientific name of *Clarias gariepinus* was imported to Malaysia for aquaculture in the 1970s and was in great demand (Dauda et al., 2018). Physicochemical properties of catfish are influenced by the environment where the fish live either in wild habitat or farm raised (Gebrekiros, 2016). As wild-caught catfish have a more diversified diet from aquatic habitat, it is preferable than farm-raised catfish due to better flavour (Noordin et al., 2019). Wild-caught fish including catfish are continually

moving in search of food and eat natural food such as algae, small fish, and aquatic plankton. These are making it the most efficient for improving physicochemical properties such as nutritional value, fillet quality, texture, and colour by boosting amino acid content while minimally modifying the fatty acid profile (Fenkes et al., 2015; Kiessling et al., 2005; Li Xiu-Ming et al., 2016). However, consumers generally find the taste of wild-caught catfish to be unappealing because of its metallic taste and lack of sweetness in the fillet. Taste preferences can vary among individuals, and some people may indeed find the flavor of wild-caught catfish less desirable compared to farm-raised catfish. On the other hand, modes of feeding and meal composition for farm-raised catfish affect nutritional value and sensory quality of the fillet (Grigorakis, 2007; Wu et al., 2016). For instance, farm-raised catfish obtains proper protein intake from their feeding and more abundant of amino acids composition in the catfish fillet such as glutamic acid, aspartic acid, alanine, and glycine which are related to the characteristic flavour, and make the taste is good than the wild-caught (Nkrumah et al., 2021). In conclusion, the sensory properties and nutritional content in both wild-caught and farmed-raised catfish fillet are affected by changes of chemical composition due to different feeding style and habitat condition (Johnsen & Carol A. Kelly, 1990).

## **1.2 Problem Statement**

Catfish-based dishes are quite popular in Malaysia, especially in the Peninsula. Furthermore, depending on where it is caught, is very nutritious, flavourful, and readily digestible, and it is much desired by a wide range of the world's population. However, many individuals dislike the taste of catfish, particularly those from wild habitat due to the bad water condition and pollution that led to metallic taste and earthy odour

(Herlambang Wahyu et al., 2016). Generally, all fresh-caught catfish from their natural habitat or farm-reared typically have a sweet, plant-like, metallic, and fishy aroma due to catfish are bottom-dwelling fish that live in freshwater bodies such as rivers, lakes, and ponds. They often inhabit muddy or silty environments, which can contribute to the earthy smell. These aromas are mostly produced by oxidative enzymatic processes and the self-oxidation of lipids. This is because the muddy-earthly aroma from wild-caught catfish may be influenced from habitat salinity, natural food, and temperature that can alter the fillet chemical and fatty acids composition which is related to lipid degradation and contribute the development of flavor such as rancidity by production of volatile compounds. In this study, both catfish samples of wild-caught and three farm-raised catfish from different places were determined their sensory quality followed by the nutritional values and physicochemical properties using proper analytical methods on catfish fillet.

### **1.3 Research Objective**

- 1) To determine the physicochemical properties of farm-raised and wild-caught catfish such as chemical composition and texture.
- 2) To determine the fatty acid composition of farm-raised and wild-caught catfish using Gas Chromatography.
- 3) To evaluate the sensory quality of farm-raised catfish and wild-caught catfish using Qualitative Descriptive Analysis (QDA).