CHAPTER I INTRODUCTION

1.1 Background

In Indonesia, maize is an agricultural product used as a food and feed product. Maize is the second strategic commodity after rice (Badan Pusat Statistik, 2020). Maize production in West Sumatra has increased since 2019 by as much as 920 130.47 tons, in 2020 increasing to 939 465.95 tons, and in 2021 to 948 063.16 tons (Dinas Tanaman Pangan, 2021). The increasing demand for maize kernels is in line with the fulfillment of raw materials for feed, supported by adequate market potential (Kristanto, 2008); Widaningrum *et al*., 2010). Along with the increasing demand, there are problems faced by the corn farmers in West Sumatra, the discovery of mold contamination that can produce aflatoxin, caused a decrease in the quality of maize products, resulting in a reported case of rejection of maize raw materials by one of the animal feed producing companies in West Sumatera, due to the detection of aflatoxin content that exceeds the limit set by the Indonesian government. (Marlida *et al*., 2022)

Maize contamination can occur in the field, post-harvest period, or when transporting raw maize materials to suppliers. An initially small amount of maize pollutant inoculum will be able to grow and infect broadly in favorable conditions, and it substantially damages the grain (Mohapatra *et al*., 2017). Several factors support the fungus growth, such as the seed water content, humidity, temperature, invasive insects or parasites, sun exposure, etc. The presence of contaminant fungi, if left unnoticed will produce secondary metabolites that produce mycotoxin that affect the quality of the

products. Variations in the quality of maize raw materials must comply with standards set by the authorities before being distributed including moisture content, aflatoxin/mycotoxin content, kernel condition (broken kernels, damaged kernels, moldy kernels), and foreign matter (Anggraini and Novita, 2011). Infected maize that does not meet quality standards will undoubtedly get rejected by factories or companies and can affect livestock production, which will be financially detrimental to many parties. In addition, the side effects of mycotoxin-producing toxigenic fungi, such as aflatoxins that are carcinogenic, can endanger the health of humans who consume livestock products given contaminated (Musita, 2018)

Toxigenic fungi that produce mycotoxins are usually made by specific species. Therefore, identification, characterization, and detection of mycotoxin-producing fungi are essential steps to developing future prevention strategies (Fakruddin *et al*., 2015). It is known that *Aspergillus* is a toxigenic fungus with several types of species, including *Aspergillus flavus,* which can produce secondary metabolites in the form of aflatoxins. FAO estimates that around 25% of food and feed from agricultural commodities are contaminated with aflatoxins yearly, causing economic losses in various countries (ICRISAT, 2022). *A.flavus*, which frequently contaminates maize, rice, beans, sorghum wheat, and their by-products such as oilseeds, is reported to cause several human diseases. In contrast, these frequently contaminated crops are significant constituents in feed (Okoli *et al*., 2006).

The indications of *Aspergillus* growth usually occur during the storage period. Generally, this stage is still handled traditionally in Indonesia and is not optimal, so the

quality and quantity of maize-based feed are not controlled. Therefore, a post-harvest handling strategy is needed to maintain crop quality so that maize farmers do not experience significant losses (Adiputra, 2020). *Aspergillus* usually contaminates maize grain for a long time but grows and spreads rapidly through airborne conidia. This is one of the reasons for the importance of monitoring and observing toxigenic fungi in agricultural products, which are the essential ingredients of feed and food.

The animal feed that is ready to be sold in feed stores is not necessarily free from mold contamination. Usually, mold contamination is not physically visible. Many farmers or feed business owners do not pay attention to the contamination of this fungus on maize grains they only separate maize that looks contaminated with *Aspergillus*, where the visible characteristics are the color of yellowish green or brownish green colonies. This research was conducted to determine the type of *Aspergillus* mold contamination. It is expected to prevent and reduce quality and economic losses caused by this fungal contamination. This situation is also the reason for carrying out an inventory of *Aspergillus* fungi in feed maize that can provide guidance on the type of mycotoxins produced.

1.2 Problem Formulation

How is the existence of the *Aspergillus* species that contaminate maize feed distributed in Padang city?

1.3 Research Objective

To inventariate the presence of *Aspergillus* species in feed maize distribution in Padang city.

1.4 Research Benefit

The benefit of this research is to provide scientific information for the development of science, as well as one of the steps for improving the post-harvest process and storage of maize and a reference for preventing mould contamination of the genus *Aspergillus*.