

This Final Year Project report entitled “**Microbial profile in flour milling process: Yeast and Moulds analysis**” was submitted by Siti Nurul Fitriah Ahmad, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Food Science and Technology, in the Faculty of Applied Sciences, and was approved by

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ABSTRACT

MICROBIAL PROFILE IN FLOUR MILLING PROCESS: YEAST AND MOULDS ANALYSIS

A survey was undertaken to determine the mycological status of the wheat flour and the distribution of mycological in the flour milling fractions and end products. A total of 8 milling stages and end products was obtained from a flour mill factory in Klang. Yeast is 10^4 Cfu/ml, with 43.13 % of 51 plates of the total plates tested. Mould is in the range of 10^3 to 10^4 Cfu/ml, with 31.9 % of plates of the total plates tested. The mode for yeast and mould was 10^3 and 10^4 respectively. The common mould growth observed were *aureobasidium*, *aspergillus*, *cladosporium spp*, *penicillium*, *Rhizopus spp*. In milling operations, water can encourage mycological growth in residue on mill machinery. Mycological count are higher after conditioning. The percentage of positive plates for the presence of yeast and mould was 17.4 % and 17.6 % respectively. Yeasts showed a low count in early incoming wheat. After first break stage the count started to increase from 10^3 to 10^4 until it is reached the higher level of 6.0×10^4 Cfu/ml in wheat germ and 1.1×10^4 Cfu/ml in bran end products. As wheat layers are separated, surface-adhering contaminants are concentrated in end products bran and wheat germ, which comprise the outer layer of the grain. Consequently, the inner endosperm fractions contain lower mycological counts and flour is the cleanest end products of the milling process. Generally flour mycological, is one of the factors that reduce the quality of the product, and high-quality flour products requires the implementation of a thorough, well-planned cleaning and sanitizing program aimed at controlling and/or reducing the amount of microbiological entering products during and after processing/preparation.

CHAPTER 1

INTRODUCTION

1.1 Background and problem statement

Flour is the product obtained by grinding wheat kernels or “berries.” The kernel consists of three distinct parts: bran, the outer covering of the grain; germ, the embryo contained inside the kernel; and endosperm, the part of the kernel that makes white flour. During milling, the three parts are separated and recombined accordingly to achieve different types of flours. There are six different classes of wheat: Hard Red Winter, Hard Red Spring, Soft Red Winter, Hard White, Soft White and Durum.

The end products are determined by the wheat’s characteristics, especially protein and gluten content. The harder the wheat, the higher the protein content in the flour. Soft, low protein wheat is used in cakes, pastries, cookies, crackers and oriental noodles. Hard, high protein wheat is used in breads and quick breads.

Durum is used in pasta and egg noodles. Although it is generally agreed that flour and bakery products are microbiologically safe foods the growing attention on food safety has resulted in increased demands for microbiological specifications on flour and bakery products, which has challenged many flour