

Mini- Review Article

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Food Loss In Bakery Technology At The Handling And Storage Stage Of Flour

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Introduction

Flour is the basic raw material in bakery and flouring products and wheat flour is the main type of flour used in obtaining bread. Wheat flour is classified in 3 categories depending on:

1. processing technology
2. protein content
3. colour and appearance (Figure 1) [1].

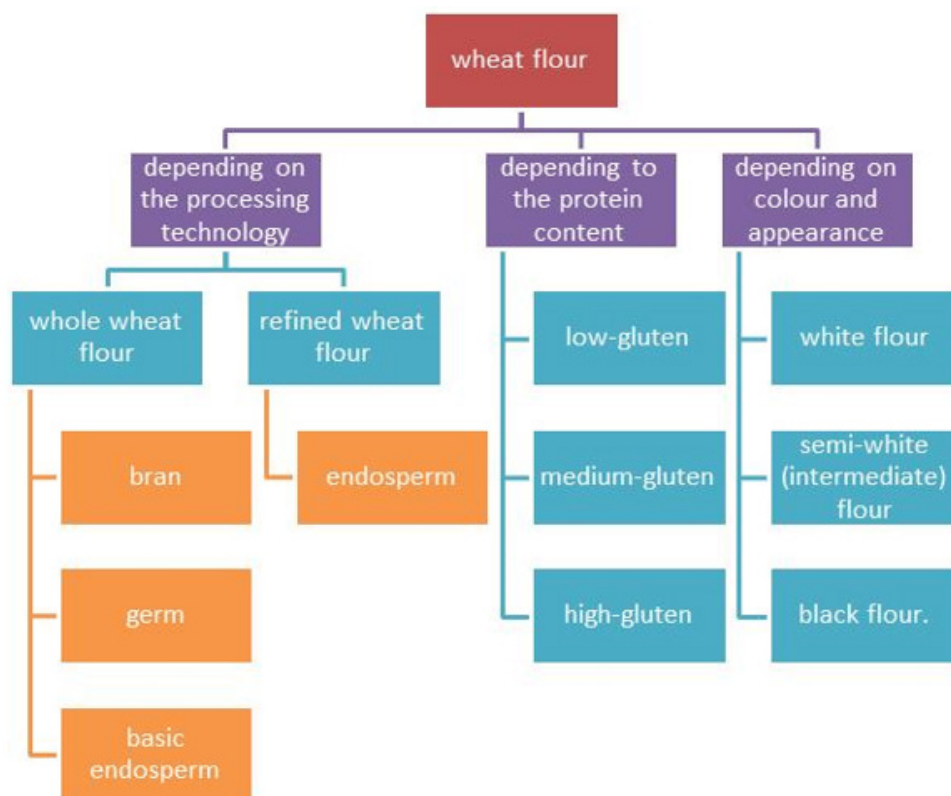


Figure 1: Classification of the wheat flour [1]

In order to obtain high quality products, it is necessary to include quality raw materials in the manufacturing recipe. The quality of the flour is checked during the reception, before storage, by establishing the sensory and physical-chemical characteristics and comparing them with those provided in the standards. The parameters analyzed in order to establish the flour quality are: color, smell, taste, infestation, metal impurities, granulation, wet gluten content, humidity, ash and, acidity. Any deviation from the quality of the flour is reflected in the finished bakery product and leads to products with defects that will later become losses and waste. The

use in the manufacturing process of flours of inadequate quality from a physicochemical, microbiological, rheological or sensory point of view will lead to technological losses, manufacturing and product defects, respectively to economic losses.. Mistakes in the reception of raw materials and incorrect storage conditions of raw materials (wrong temperature, humidity, bad hygiene, poor pest control) may cause significant losses in quality of flour products [2]. The factors responsible for flour quality in order to avoid processing losses in storage stage are presented in the Figure 2.

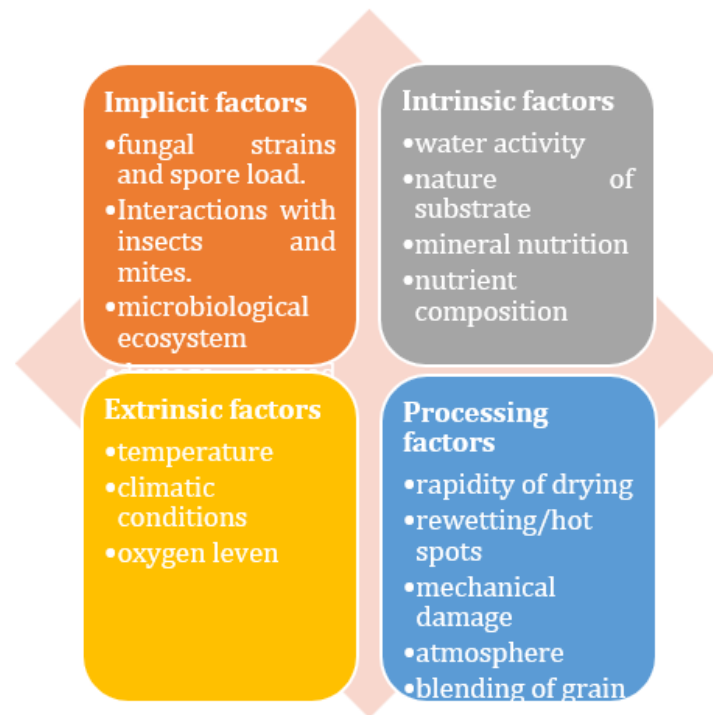


Figure 2: Factors responsible for flour quality in order to avoid processing losses in storage stage [2].

Losses of raw materials during the process of storing and handling flour are due to the following causes:

1. improper storage conditions regarding inadequate humidity and absence of ventilation
2. Improper placement of flour bags
3. infestation with insects
4. Fungal and mycotoxins contamination. Fungal and mycotoxins contamination.

In order to avoid these degradations of flour during the storage and handling process, preventive measures taken in raw material warehouses are necessary:

1. compliance with hygiene conditions in storage spaces. In this regard, the warehouses should be clean, dry, healthy and

well ventilated, the air temperature must be maintained at temperatures between of 10-12°C

2. Regarding storage conditions, flour sacks must be stored on wooden grates to ensure ventilation. Between the bag stacks and the walls or between two stacks, a minimum 0.5 m inspection and ventilation space must be left
3. For insect control, installation of traps are required, infested places must be disinfected with insecticidal substances and separating the flour from insects by sifting using a suitable sieve, removing the larvae, chrysalises and even the adult insects are necessary. The remains of infested flour, together with the broom, are destroyed by burning
4. In order to avoid fungal and mycotoxins contamination, storage conditions regarding optimum temperature, ventilation

must be observed, and in conditions of contamination, optimal physicochemical decontamination measures must be undertaken [3].

Different methods are applied on reducing fungal and mycotoxins contamination currently focusing on physical methods (radio frequency sterilization, microwave sterilization, drying, pulsedlight, and low-pressure mercury lamp treatment) and chemical preservatives (calcium propionate, sorbate, benzoates, nitrites, and sulfites). Although physical methods are better at maintaining taste, they simultaneously destroy the nutritional value of bakery products and are often costly [4].

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