



**TECHNOLOGICAL, CHEMICAL AND
BIOLOGICAL STUDIES ON SOME
FUNCTIONAL FOODS**

By

Ahmed Rabie Mohamed Maray

A thesis submitted in partial fulfillment

Of

The requirements for the degree of

Master of Science

In

Agricultural Science

(Food Technology)

Department of Food Science and Technology

Faculty of Agriculture, Fayoum

FAYOUM UNIVERSITY

٢٠١١

ABSTRACT

The present investigation was carried out to utilize the healthy benefits of barley in the preparation of some functional food products. Barley is an excellent source of both insoluble and soluble fibers. Barley β -glucans, in particular, have been implicated in serum cholesterol and blood glucose reduction, and are thought to have some anti carcinogenic properties.

Chemical analysis showed some variations between barley and wheat flours (82% and 72% extractions) in particular their contents of moisture, fiber and ash. Blends of wheat and barley flours showed a higher capacities to absorb more water (water holding capacity) comparing with wheat flour. The important process of gas production during dough fermentation did not adversely influenced due to the partially replacement of wheat flour with barley flour. Meanwhile, farinograph data showed that increasing barley replacement level resulted in increasing water absorption and mixing time, while dough stability decreased.

Barley flour was incorporated with wheat flour in the preparation of some bakery products included balady bread and biscuit. Chemical analysis indicated that barley balady bread and barley biscuit were characterized by their higher contents of moisture, fiber and ash. The organoleptic properties of balady bread and biscuit made from barley / wheat blends with a replacement level of 45% showed a consumer acceptance. It could be improve the quality characteristics of barley enriched - bread and biscuit by using some commercial preparations of baking improvers. Barley balady bread showed a bitter retaining of freshness during storage at room temperature

Barley enriched – balady bread was biologically evaluated using the animal biochemical method to assess the healthy functional properties of barley bakery products. Barley bread showed considerable lowering effects for triglycerides and total serum cholesterol. Moreover, barley bread was found to be more effective in lowering the level of low density lipoprotein cholesterol (known as bad cholesterol), with maintaining the normal level of high density lipoprotein cholesterol (good cholesterol) without change. Liver function tests revealed that barley bread was effective in decreasing the elevation of liver enzymes (AST and ALT)

Key Words:

Barley balady bread, Water holding capacity, Gas production, AWRC, Crumb color, Serum cholesterol, Triglycerides. LDLc. Liver function tests. AST, ALT.