

UTILIZATION OF COMPOSITE WHEAT AND SAFFLOWERS FOR BALADY BREAD MAKING

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5, 10, 15 and 20 percent of the normal wheat flour content in balady bread was replaced with equivalent amounts of defatted safflower (DSF) of 75% extraction. Farinograph absorption, dough development time, dough weakening and mixing tolerance index increased and dough stability decreased as the amount of safflower in the blends were increased. With increase in the level of safflower, dough strength, resistance to extension and proportional number decreased and dough extensibility increased. The incorporation of 10% DSF into balady bread resulted in increase of ~20 and 60% in protein and crude fibre respectively. The quality of balady bread was within extra standard at 15% level of DSF incorporation, but 20% addition of DSF the bread was rated as standard. Flavour was adversely affected at 10% or greater replacement level of defatted safflower.

Key words: Wheat, Safflowers, Balady bread.

Introduction

Safflower seed is primarily grown for its oil. The seed contains nearly 35 - 40% oil, 15 - 20% protein and 35 - 45% hull fraction Betschart, *et al.* [1]. The proteins from the safflower seeds are of good nutritional quality [2,3]. The utilization of the safflower proteins and protein isolates for food and feed purposes has been attempted [1]. However, utilization of safflower in food has been limited, because of poor colour, production of bitter principles and high amount of crude fiber [4].

Zagibalov and Zaritskaya [5] reported that protein product in the form of a paste, made from safflower cake, contains 26% dry matter, comprising 90 - 92% protein and 2.25% ash and has physico chemical properties resembling those of the soy protein concentrate (Promine R). This product was free from antinutritional substances and may be used either in baking industry or in production of pasta products.

Latha and Prakash [6] studied the chemical characteristics of safflower seed and flour. However, Latha and Prakash [7] reported, that protein isolate from safflower seed is globular in nature and rich in acidic and hydrophobic amino acids, but has low lysine concentration.

Thus, the present study was designed to investigate some chemical composition and amino acid content of wheat flour and safflower as well as the rheological characteristics of the dough and to evaluate the baking properties of defatted safflower flour in balady bread making.

Materials and Methods

Australian wheat flour of 82% extraction was purchased from El-Sharabiah Mill, Cairo, Egypt.

Safflower seeds, were obtained from Field Crops Research Centre, Ministry of Agriculture, Cairo, Egypt.

Preparation of defatted safflower and flour blends. Safflower seeds were cleaned, ground and defatted by hexane in a Soxhlet apparatus and were air dried to remove the residual solvent. The meal obtained was sieved to obtain flour of 75% extraction and blended with wheat flour at the 5, 10, 15 and 20% levels. All samples were stored in air tight containers at 5-7° until required.

Preparation of balady bread. 500 grams of wheat flour/defatted safflower blends, 1.5% sodium chloride and 1.5% compressed yeast were mixed with water thoroughly by hand for 1 min., then the dough was completely mixed in a laboratory mixer for about 8 min. to form the needed dough. The dough was left to ferment for 1 hr. at 30° and 85% relative humidity and was then divided into 125 g pieces. The individual pieces were placed on a tray sprinkled with bran and allowed to ferment for about 45 min. The fermented dough pieces were flattened to about 20 cm in diameter. The flattened loaves were proofed at 30 - 35° and 85% relative humidity for 15 min. and baked at 450 - 500° for 1 - 2 min.

Analytical methods. Moisture, protein, fat, ash and crude fiber were determined by the AOAC [8] methods. Amino acids were determined through the acidic and alkaline hydrolyzate prepared according to Moore *et al.* [9] using amino acid analyzer (Model Beckman 118 CL). Tryptophan was determined spectrophotometrically by the method of Opienska *et al.* [10].

Rheological properties of the doughs were carried out with a Farinograph and Extensograph according to AACC [11] methods.

Organoleptic evaluation. Ten panelists were asked to evaluate bread loaf appearance, separation of layers, shape, crumb distribution, taste, odour and crust colour according to the method of Kramer and Twigg [12].

(mg/g N) did not vary markedly. Lysine is the limiting amino acid in SPI. Major decrease in non-essential amino acids occurred in glutamic acid and proline.

From these results, it could be recommended that defatted safflower be used to supplement wheat flour in balady bread making at less than 10% level.

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