

CULTURES AND PRODUCTS



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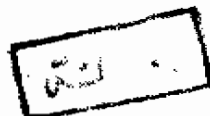
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UTILIZATION OF YEAST CULTURES AND THEIR USES IN FOOD PRODUCTS

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THESIS

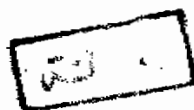
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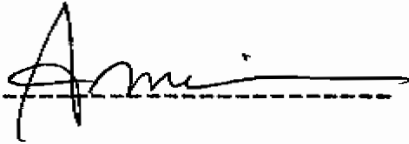
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C O N T E N T S

	Page
INTRODUCTION	1
REVIEW OF LITERATURE	5
1. General View Points	6
2. Protein and Amino Acids	18
3. Organoleptic Properties	26
MATERIALS AND METHODS	30
A. Materials	31
1. Wheat flour of 72% extraction	31
2. Refined cane sugar	31
3. Oil and butter	32
4. Egg	33
5. Salt	33
6. Vanilla	33
7. Full cream milk powder (NIDO)	33
8. Yeast	34
B. Methods	35
1. Technological methods	35
a- Suggested formula for "Buns bread"	35
b- Suggested formula for "Crackers"	39
2. Analytical methods	47
a- Major chemical constituents	47
b- Minerals determinations	47
c- Amino acids determinations	47
d- Chemical score	50

	Page
e- Essential amino acid index	50
f- Biological value (B.V)	50
g- Organoleptic tests	51
RESULTS AND DISCUSSION	52
PART I:- GENERAL VIEW ASPECTS OF BUNS BREAD AND CRACKER SAMPLES	53
1- Major chemical constituents	53
2- Mineral contents	60
PART II:- AMINO ACIDS, CHEMICAL SCORES, ESS- ENTIAL AMINO ACID INDEX AND BIOLO- GICAL VALUES	72
PART III:- ORGANOLEPTIC EVALUATIONS	96
SUMMARY AND CONCLUSION	124
REFERENCES	135
APPENDICES	151
Appendix 1:- Cracker formula	152
A- Suggested Recipes of Crackers based on 2% yeast.	153
B- Suggested recipes of Crackers based on 5% yeast.	154

	Page
Appendix 2:- Amino acids profiles of Buns bread and Cracker samples.	155
Appendix 3:- Regression analysis of overall quality %	163
ARABIC SUMMARY	-

INTRODUCTION

12

INTRODUCTION

Yeasts are usually regarded as a group of free living microorganisms used in the wellknown, age-old processes of leavening bread doughs, fermenting fruit juices, brewing beer, and fermenting cereal mashes. In recent years, capabilities of yeasts in protein-synthesizing have received world wide attention as a means of alleviating the protein shortage, either in the form of dried food and feed yeasts, or as isolated single-cell protein.

The popular view of yeast power is a rational one, since fermentations and their products are a significant fraction of the domestic economy which touches us daily in many food stuffs.

The main ingredients of any given dough normally used in bakery products are wheat flour, water, yeast and salt. Other ingredients which may be added include malt flour, soya flour, milk and milk products, fat, fruit and gluten.

When these ingredients are mixed in correct

proportions to make a dough, two processes commence :
(1) The flour protein begins to hydrate, i.e. to combine with some of the water, to form a cohesive material called gluten, which has peculiar extensible properties. It can be stretched like elastic, and possesses a certain degree of recoil or spring (2) Evolution of the gas carbon dioxide by action of the enzymes in the yeast upon the sugars and so "Bread is fundamentally foamed gluten"; (Atkins, 1971).

Biscuits are probably classified as being of hard dough or soft dough origin. The hard dough group are savoury, unsweetened, or semi-sweet, and include all types of Crackers, puff dough biscuits. On the other hand, the semi-sweet varieties include Marie, Rich Tea, and Petit Beurre. In addition to having a low sugar content, or none at all, the fat rarely exceeds 22.0% of the flour except in the case of puff doughs (but even these have a very low fat content at the mixing stage). The soft dough group includes all the sweet biscuits, whether they are plain biscuits, shells, or flow type such as ginger-nuts. Soft dough biscuits fall naturally into

three sections: fermented doughs, puff doughs, and the semi-sweet doughs, (Peter 1971). He also proved the possibility of using yeast in biscuit instead of leavining agent.

Most of the Egyptians depend on bakery products as a source of energy and subsequently improvement of these items is one of the thesis goal. This was aimed by using yeast with two levels; normal level of 2% and 5% in relation to flour weight.

It is of importance to clarify that while Buns were the suggested form of manufactured bread, Crackers recipe were used in biscuit samples.

REVIEW OF LITERATURE

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1. General View Points:

Fedorove et al. (1978) noticed that baker's yeast enhanced fermentation rate of glucose solution by 20 to 40% when a 30% water suspension of the yeast cells had been preliminarily heated at 30-40°C for 10-20 min. after preheating the cells at 35-40°C for 5 min, and for flow suspensions the values were : 10% fermentation rate increase at 40°C heating for 15 min. The fermenting solutions containing the preheated cells had lower redox potentials than did solution with control cells.

Mixing of water with a dry bread to form a dough was suggested by Pomper (1983). The dry mix comprises flour, 1.5-2.5% quick-leavening active dry yeast, 2-10% balanced chemical leavening system, and 0.1 - 0.75% dough conditioner selected from calcium or sodium stearyl-2 lactylate, or their mixtures. The dough could be shaped, proofed for 15-30 min and baked in the form of pumpernickel, French bread, rye bread and white bread.

Losses of potassium ions, nucleotides and protein substances were studied by Ramietze et al. (1978) upon rehydration of Saccharomyces cerevesiae cells grown on a defined nutrient medium with ethanol and glutamic acid (0.075%) and subjected to dehydration. Considerable amounts of K^+ (75-82% of the total), nucleotides and protein substances were found to be released into distilled water upon rehydration of the dehydrated yeast cells. If a higher percentage of yeast cells survived, these lost less nucleotides and nitrogen-containing substances. Glutamic acid being added to the growth medium did not decrease specifically the permeability of the dehydrated yeast cells upon rehydration.

Belderok (1982) proved that two wheats of good breadmaking quality could be milled (with one French wheat of moderate baking quality) under different conditions i.e. roller mills and a pin-mill to provide flours with starch damage in the range of 1.9-16.2%. However, a 1% increase in starch damage improve water absorption by 0.8% in dough and 0.45%