ROLE OF LIPIDS IN SOME BAKERIES

BY

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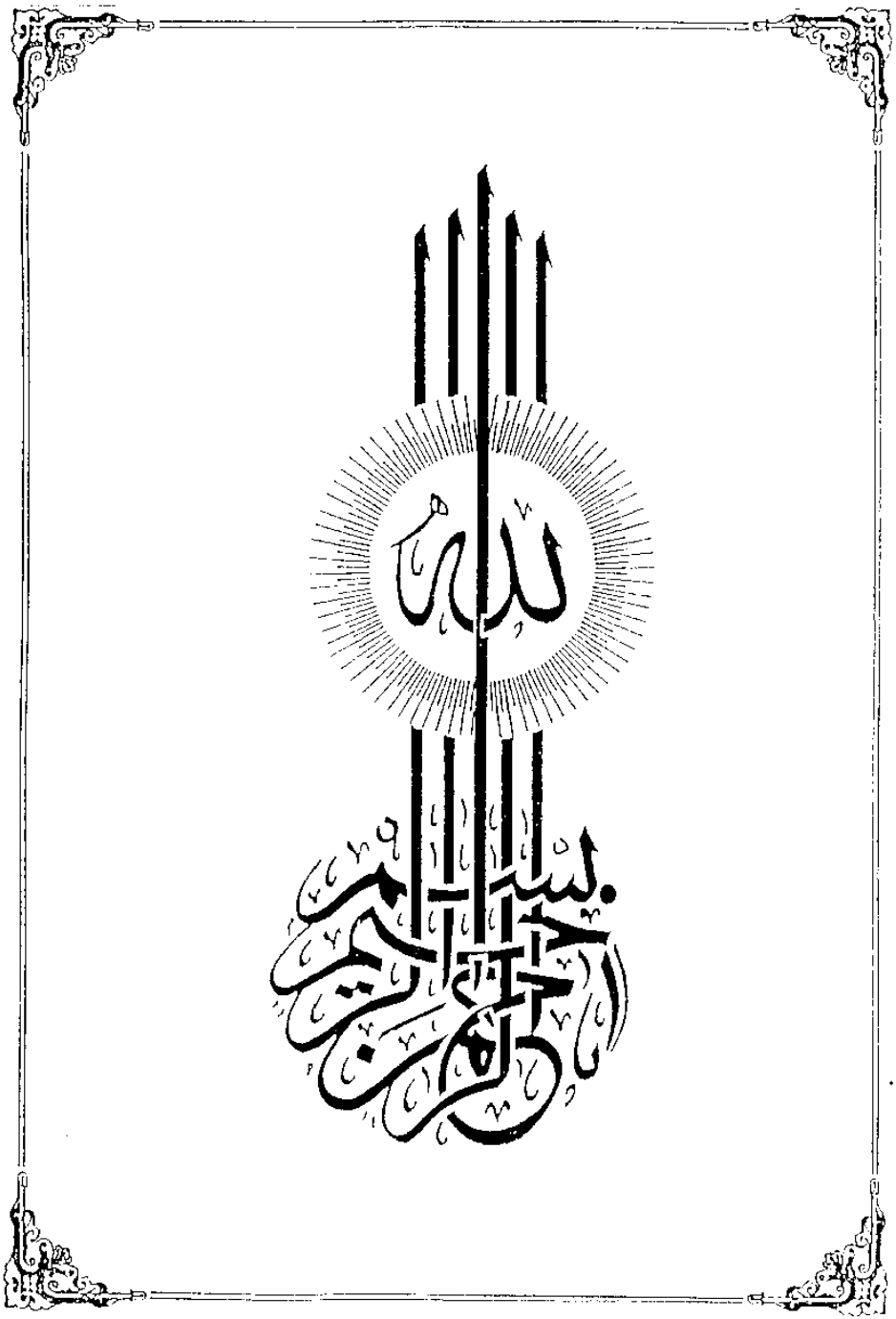

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ABSTRACT

The present investigation was designed to study the effect of storage of French and American flours, defatting, addition of edible oils, wheat flour lipids and emulsifiers on breadmaking. Giza 164 wheat flour was also used to evaluate the effect of defatting and addition of wheat germ oil, as well as wheat flour lipids on bread characteristics. The effect of some vegetable oils as a fat phase in cake batter and emulsifier concentration on cake making was also evaluated.

The data revealed that American flour characterized by higher crude protein, ether extract, gliadin, glutenins, glutin and lipids acid value than French flour. All the above parameters except gliadins were gradually increased versus storage period. It was generally found a gradual decrease in unsaturated fatty acids with corrsponding increases in saturated ones. The farinograph data of undefatted French flour improved after 1.5 months of storage. Amongst American flour, the farinograph data were in negative relationship with prolonging storage period. Defatting was positively affected the farniograph data.

The results of main treatments and their first and second order of interactions and their effects on bread characteristics were differed due to the kind of flour. The most favorable interaction was for undefatted French flour stored for 1.5 months with adding 2% palm oil, and unstored undefatted American flour treated with 2% palm oil. The addition of 2, 3% palm oil or 2% palm olein to

unstored undefatted French flour increased the bread characteristics. However, the addition of 0.5% DATEM to defatted French flour in the presence of 2% palm olein monitored the highest loaf volume, while bread characteristics were closed to that baked from undefatted flour with 3% palm oil.

On the other hand, adding 2% bound lipids to the dough affected consistently the loaf volume. This effect is closely related to the presence on or absence of free lipids (undefatted and defatted flour). The presence of free lipids (undefatted flour) had a synergestic effect with bound lipids on increasing loaf volume. Meanwhile, in the absence of free lipids (defatted flour), the bound lipids decreased markedly the loaf volume.

The studies on what flour cultivar Giza 164 showed significant increases in bread characteristics due to the addition of 0.5% free lipids with 0.5% bound lipids to undefatted flour. Also the addition of 3 or 4% germ oil to undefatted flour improved loaf measurements and based sensory quality.

It was also found that using palm olein in batter formula and addition of 1% DATEM was the most favorable interaction affected cake quality compafing to other oils and DATEM concentration.

Key words :
Bakery shortenings - Baking - Flour lipids - Germ oil - Surfactants - wheat flour.

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ABBREVIATIONS

β	Beta
b.p.	Boiling point
Br.	Brabender
C	Carbon
°C	Degree centigrade
cm	Centimeter
Co.	Company
CSL	Calcium stearoyl-2-lactylates
DATEM	Diacetylartaric acid ester of nonaglyceride
DGDG	Digalactosyldiglycerides
e.g.	For example
FA	Fatty acid
FFA	Free fatty acid
g	Gram
GL	Glycolipid
GLC	Gas liquid chromatography
GMS	Glycerol monostearate
HCl	Hydrochloric acid
HRS	Hard red spring
i.e.	That is
Kg	Killogram
KDH	Potassium hydroxide
LPC	Lysophosphatidyl choline
LSD	Least significant differences
Ltd	Limited
LV	Loaf volume
meq	Milliequivalent
mg	Milligram
MGDG	Monogalactosyldiglyceride
min	Minute
ml	Milliliter
mm	Millimeter
N	Nitrogen
N	Normal

NFE	Nitrogen free extraction
NL	Nonpolar lipid
NRS	Non-reducing sugar
NS	Non-significant
NSP	Non-soluble protein
PC	Phosphatidyl choline
PE	Petroleum ether
PEGA	Polyethylene glycol adipate
PhL	Phospholipid
PI	Phosphatidylinositol
PL	Polar lipid
PS	Phosphatidylserine
PUFA	Polyunsaturated fatty acid
RS	Reducing sugar
Sp. vol.	Specific volume
SSL	Sodium stearoyl-2-lactylate
TG	Triglyceride
TL	Total lipids
TS	Total sugars
V	Volume
W	weight
WSB	water-saturated 1-butanol