



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY

STUDIES ON MODIFIED BUFFALOES MILK FAT

By

TAMER SHAABAN ABDUL ALIM ABDUL HAMID

B.Sc. Agric. Sci. (Dairy Science), Fac. Agric., Cairo Univ., 2003

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ABSTRACT

Buffaloes Milk fat has excellent properties, variable physicochemical properties but its lack of functionality which restrict its uses in food industry. The study was designed to fractionate the buffaloes butter oil (BO) at different temperature (35-15°C) by multi-step dry fractionation to gain three solid fractions (S35, S25, S15) and three liquid fractions (L35, L25, L15). Chemical properties, fatty acids composition, solid fat content (SFC), thermal behavior, texture and microstructure of its fraction was implemented. In addition, production of modified butter spread (MB_s) by using various proportion of milk fat fractions as follow: L15, L25, S25 at ratio (6:3:1 and 7.5:1.5:1), L15:L25: L15 (7:2:1 and 8:1:1) and L15:S15: S25(7:2:1) for MB1, MB3, MB2, MB5 and MB4 respectively during cold storage at 5°C. The physicochemical, oxidation stability, thermal analysis, texture and sensory properties were also studies.

The results indicated that L15 has the lowest SFC, AI, melting and crystal temperature, whereas recorded the highest MUSFA, PUSFA, PUFA/SFA ratio and $\omega_6:\omega_3$ ratio to compared with other fractions and two control(BF&CB). An increasing the L15 level in MB_s samples the MUSFA, PUSFA, spreadable index, $\omega_6:\omega_3$ ratio and DPPH was observed .The MB5 sample had gained the highest sensory attributes when fresh or during at 5°C 90 days.

It can be concluded that functional properties and nutritional value of BO fractions and its products were achieved. Both products can be recommended in functional food preparations.

Key words: Buffaloes butter oil, dry fractionation, Thermal analysis, fatty acids, modified butter and crystals morphology

DEDICATION

I dedicate this work to my parents and brother for all support they lovely offered during my post graduate studies.

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LIST OF ABBREVIATION

IDF=	International Dairy Federation
CLA=	conjugated linoleic acid
MUSFA=	Monounsaturated Fatty Acids
PUSFA=	Polyunsaturated Fatty Acids
TG=	Triglyceride
TAGs=	Triacylglycerides
LMF=	Low melting fraction
MMF=	Medium melting fraction
HMF=	High melting fraction
BMF=	Buffaloes milk fat
BM=	Buffaloes milk
CM=	Cow milk
CLSM=	Confocal laser scanning microscopy
DSC=	Differential Scanning Calorimetry
SFC=	Solid Fat Content
FAs=	Fatty acids
MFGM=	Milk Fat Globule Membrane
MP=	Melting Point
SMP=	Slip Melting Point
AMF=	Anhydrous Milk Fat
BO=	Butter Oil
SCF=	Supercritical fluids
SFE=	Supercritical fluid extraction
SCTAG=	Short Chain Triacylglycerides
MCTAG=	Medium Chain Triacylglycerides
LCTAG=	Long Chain Triacylglycerides
LMTAG=	Low Melting Triacylglycerides
MMTAG=	Medium Melting Triacylglycerides
HMTAG=	High Melting Triacylglycerides
SFA=	Saturated Fatty Acid
USFA=	Unsaturated Fatty Acid
LCSFA=	Long Chain Saturated Fatty Acid
LCUSFA=	Long Chain Unsaturated Fatty Acid
SCFA=	Short Chain Fatty Acid
H=	Hexagonal sub-cell structure

T//=	Triclinic parallel sub-cell structure
2L=	Double stacking Lamella
3L=	Triple stacking Lamella
TEM=	Cryo-transmission electron microscopic
USAXS=	Ultra-small angle X-ray scattering
SAXS=	Small angle X-ray scattering
WAXS=	wide-angle X-ray scattering
XRD=	X-ray diffraction
Iso. T=	Isothermal temperature
CT=	Crystallization temperature
KO=	krill oil
LO=	linseed oil
FO=	Fish oil
RO=	Rapeseed oil
IV=	Iodine Value
SNF=	Solids not Fat
FAME=	Fatty acid methyl esters
GC=	Gas Chromatographic
PV=	Peroxide Value
TBA=	Thiobarbituric acid Value
DPPH=	1,1-diphenyl-2-picrylhydrazyl
RSA=	Radical scavenging activity
OSI=	Oxidation Stability index
TPA=	Texture profile analysis
LSD=	Least significant difference
S=	Solid
L=	Liquid
BF=	Butter Fat
CB=	Commercial Butter
MBS=	Modified Butter Spread
AI=	Atherogenicity index
TI=	Thrombogenicity index
ω6: ω3=	Omega 6: Omega 3 Ratio

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