<u>Contents</u>

	Page
INTRODUCTION	
REVIEW OF LITERATURE	4
1.Health benefits of fish oil	4
2. Fatty acid composition and attributes of fish oil	20
3.Phospholipids of fish oil	28
4. Vitamins of fish oil	32
5.Oxidation of fish oil	38
6.Smoking of fish	53
7. Fish oil properties as affected by smoking of fish	59
8.Fish oil attributes as affected by cooking methods	64
9. Fish oil as affected by processing of fermented-salted	
fish (Feseekh)	70
10.Effect of pretreatment of fish (glazing with	
antioxidants and frozen storage of fish oil attributes	73
MATERIALS AND METHODS	83
I- Materials	83
II-Technological methods	84
A-Smoking of fish	84
*Liquid smoking	85
*Cold smoking	85
*Hot smoking	86

B-Frying of fish	86
C-grilling and roasting of fish	86
D-Fermentation and dry salting of fish	87
E-Freezing of fish	88
III-Storage and analysis of fish and its products	88
IV-Analytical methods	89
1- Moisture, salt and ether extract	89
2- Determination of thiobarbituric acid (T.B.A.)	90
3- pH value	90
4-Determination of acid value (AV) and free fatty acids	
(FFA)	90
5-Ks value	90
6-Phenol determination	90
7-Separation and identification of fatty acids	91
* Separation of fatty acids	91
* Methylation of fatty Acid	91
* Identification and Determination of fatty acids	91
methyl Ester by GLC	
8-Extraction, separation and identification of lipids and	92
phospholipids	
* Extraction of total lipids	92
* Fractionation of total lipids by thin layer	93
chromatographic technique(T.L.C.)	
*Extraction of phospholipids	93

*Separation and identification of phospholipids using	93
thin layer chromatography (T L C)	
9- Determination of fat-soluble vitamins	93
*Apparatus and chromatographic conditions:	94
10- Statistical analysis	95
RESULTS AND DISCUSSIONS	96
I- Smoking of fish	96
A- Moisture, fat, phenols thiobarbituric acid (TBA)	96
contents	
B- Oil constants	102
C-Fatty acid composition and fractions	107
D-Lipid fractions	117
E-Phospholipid fractions	122
F-Fat-so lub le vitamins	125
G-Statistical analysis	127
1-Oil constants	127
2-Lipid and phospholipid fractions	130
II_Cooking of fish	136
A-Chemical properties	136
B-Oil constants	139
C-Fatty acid composition and fractions	140
D-Lipid fractions	146
E-Phospho lip id fractions	149
F-Fat-soluble vitamins	152

G-Statistical analysis	152
1-Oil constants	152
2-Lipid and phospholipid fractions	155
III-Effects of dry-salting conditions during processing	
offermented-salted bouri (Feseekh)	158
A-Chemical properties	158
B-Oil constants	161
C-Fatty acid composition	163
D-Fatty acid fractions	165
E-Lipid fractions	167
F-Phospholipid fractions	170
G-F at-so luble vitamins	173
H-Statistical analysis	175
1 -0 il constants	175
2-Lipid and phospholipid fractions	175
IV- Effect of pretreatment (glazing with antioxidants)	
and frozen storage (at - 18°C for 6 months) on fish	
oil attributes:	179
A-Chemical properties	179
B-Oil constants	182
C-Fatty acid composition	185

D-Fatty acid fractions	190
E-Lipid fractions	192
F-Pho spho lip id fractions	196
G-Fat-soluble vitamins	199
H-Statistical analysis	201
1-Oil constants	201
2-lipid and phospholipid fractions	203
Summary	207
References	224
Arabic summary	