

A STUDY OF LIPIDS OF OAT VARIETIES

by

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TABLE OF CONTENTS

	Page
INTRODUCTION.	1
REVIEW OF LITERATURE.	2
Botanical Classification of Oats	2
Culture and Distribution of Oats	3
Quality Factors and Grading System of Oats	5
Structure and Gross Composition of Oats.	5
Lipids in Oats	7
Proteins	12
Carbohydrates.	18
Minerals	19
Vitamins and Antioxidants.	20
Processing and Enzymes in Oats	22
Usage of Oats and Their Products	27
Air Classification	28
MATERIALS AND METHODS	31
Milling of Oats.	31
Analytical Determinations.	37
RESULTS AND DISCUSSION.	43
The Oat and Groat Samples.	43
Air-classified Flours.	46
SUMMARY AND CONCLUSIONS	75
SUGGESTIONS FOR FUTURE WORK	77
ACKNOWLEDGMENTS	78
REFERENCES.	79

**THIS BOOK
CONTAINS
NUMEROUS PAGES
WITH DIAGRAMS
THAT ARE CROOKED
COMPARED TO THE
REST OF THE
INFORMATION ON
THE PAGE.**

**THIS IS AS
RECEIVED FROM
CUSTOMER.**

INTRODUCTION

Recorded about 4000 years ago, developed as a domestic crop between 1500-500 B.C., oats were extensively established in western Europe at the beginning of the 17th century. In 1602, oat seeds are said to have been carried across the Atlantic Ocean to be planted first in North America (10, 13, 61).

Oat milling is a major industry for the production of breakfast cereals. Rolled oats and oatmeal are high in good quality protein and linoleic acid rich fat (86, 2). They also are the richest source of calcium, phosphorus, iron, and thiamine among cereal foods (10, 13, 49, 53). Their low sodium content makes them eventually useful as a nutrient for sodium-poor diets (5). These high nutritive attributes are partially due to the fact that they are made out of oat groats (shelled oats). The bulk of the bran, the alleurone layer, and the germ, which are rich in proteins, vitamins, and minerals, remain with the portion used as human food (13, 53).

The technique of air classification of cereal flours has been receiving particular attention during the last two decades in the hope that new unique and more useful products can be obtained from cereals. A wide variety of flour fractions of considerable value has been obtained from hard and soft wheat flours and from winter and spring wheats, and constituted a field of intensive investigation (26, 54, 55, 69,

77, 82, 85, 87, 91 among many others). Air classification also was performed on flours from corn, sorghum, rice, and defatted soybeans (85). No work has yet been reported concerning the response of oats to air fractionation.

This study deals with the determination of free and bound lipids of four oat varieties, of their groats and their air-classified fractions, and with the characterization of these lipids by thin-layer adsorption chromatography. Furthermore, it was an attempt to examine the behavior of oat flours upon air classification by following the eventual shifts occurring in the gross composition of the air-classified fractions as compared to the original flours.

REVIEW OF LITERATURE

Botanical Classification of Oats

Brownlee considered the treatise "L'avoine" by DenaiFFE and Sirodot from 1902 as the most comprehensive monograph on oats (10). The botanical classification of the oat plant was summarized by Stanton in 1936.

As outlined by Matz (61), the oat plant is classified as follows:

Phylum:	Spermatophyta
Class:	Angiospermae
Subclass:	Monocotyledones
Order:	Graminales
Family:	Poaceae (Graminaceae)
Tribe:	Avenae
Genus:	Avena

Most of the oats produced today belong to the species *Avena sativa*. The red oat *A. byzantina* is grown in regions