

FLAX SEED **for**

HEALTH



# **USE OF FLAXSEED IN BAKED PRODUCTS**

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# INTRODUCTION

- **Wheat processing industry is the biggest food industry in Kuwait, with flat bread and pan breads being their major products.**
- **Baked products are based on wheat and other grains**
- **Flaxseed (Linseed) is one such grain, rich in:  
Soluble fiber, Phenolics, Lignans,  $\omega$ -3 fatty acid**
- **Provides health benefits (laxation, anticancer, CHD and stroke)**
- **Use of flaxseed in baked products has not been tried here in Kuwait.**
- **Because of these health benefits, we plan to investigate the use of flaxseed in a few important bakery products such as flat bread and pan breads.**

# **BACKGROUND LITERATURE**

- **Flaxseed has been used in German breads and is now becoming popular in other developed countries.**
- **Relationship between diet and health is gaining wider attention and the literature on these topics is accumulating.**
- **We all know that prevention is better (and cheaper) than cure.**
- **Recently many functional foods are being produced using phytochemical-rich grains.**
- **So far no scientific study is reported on the use of flaxseed in baked goods (flat and pan breads) from this area of the world.**

# COMPOSITION OF FLAXSEED

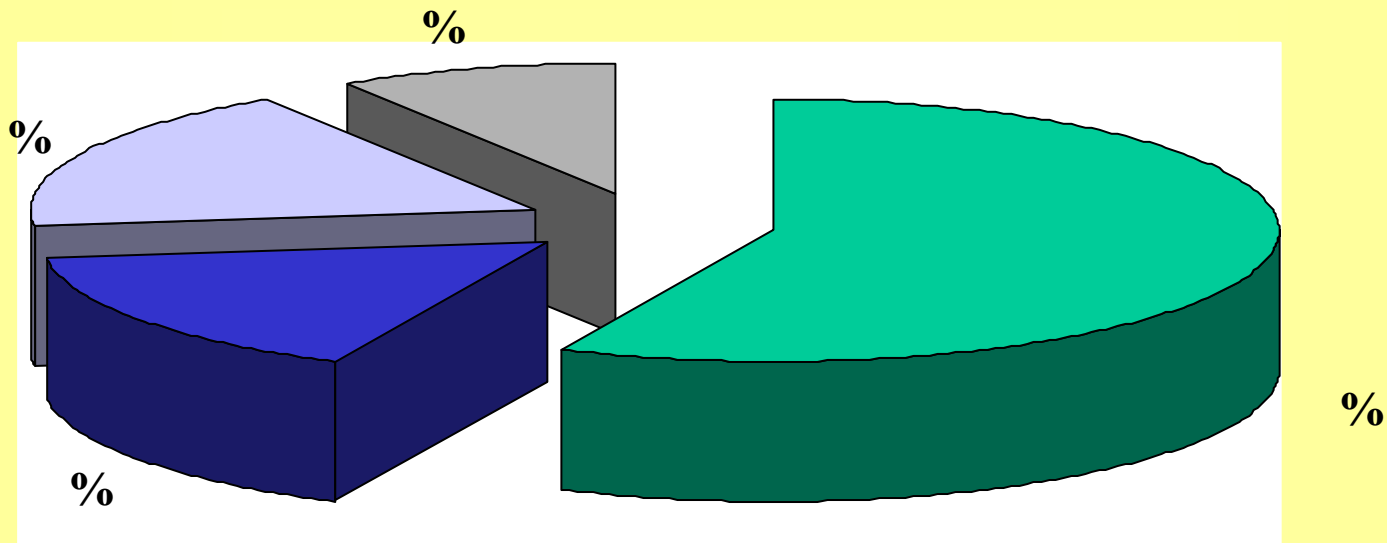
*(on dry weight basis)*



<b>Protein</b>	<b>21%</b>
<b>Fat</b>	<b>41%</b>
<b>Dietary Fiber</b>	<b>28%</b>
<b>Ash</b>	<b>4%</b>
<b>*Other Carbohydrate</b>	<b>6%</b>

**\* Other carbohydrates include sugars, phenolic acids, lignans and hemicelluloses**

# Fatty Acid Composition Of Flaxseed Oil



- Polyunsaturated fatty acids Omega-3
- Polyunsaturated fatty acids Omega-6
- Monosaturated fatty acids
- Saturated fatty acids

# OBJECTIVES

**The major objective of this study is to incorporate flaxseed into flat bread and pan breads to produce wholesome foods with superior nutritional and sensory qualities for Kuwaiti consumers.**

**The specific objectives are:**

- 1. To study the effect of adding different levels of flaxseed to baked products (flat bread and pan breads) on their baking quality**
- 2. To study the effect of flaxseed addition on their sensory quality.**
- 3. To compare the suitability of using whole or milled (crushed) flaxseed in baked products.**
- 4. To train Kuwaiti manpower in the production of functional foods.**

# OUTPUT

**On the completion of this research work, the following output is expected:**

- **New formulations of baked products (flat bread and pan bread) with healthy ingredients.**
- **Information on the effect of flaxseed addition on the quality of baked products.**
- **Suitable technology for the production of superior quality baked products for local consumption.**
- **Trained national manpower in this important area of food production.**



# JUSTIFICATION

**Current health advice supports the use of plant-based foods for reducing risk of various chronic diseases such as CHD, type-2 diabetes, cancers, cataract and age-related macular degeneration. Flaxseed is one such food ingredient known for providing benefits against many of these diseases.**

**When used either as whole or milled seeds, it imparts characteristics flavor to baked products. People who include flaxseed in their daily diet can enjoy it's good taste and bring their diets in line with current dietary recommendation to help reduce the risk of chronic diseases.**

**Production of flaxseed enriched baked products will open up new avenues for variety goods for the industry.**

# **BENEFITS TO KUWAIT**

**Kuwaiti diet is largely white flour and polished rice based, both of which are low in health-promoting phytochemicals. These bioactive compounds are present mainly in the outer layers of grains which are lost during milling of these cereals. Use of flaxseed would supplement some of these phytonutrients to Kuwaiti diet. So health conscious consumers will be able to select baked products containing high amounts of fiber, phytoestrogens, lignans, proteins and  $\omega$ -3 fatty acid (ALA). Our main goal in this study is to improve the intake of these phytochemicals, by adding flaxseed to baked products (flat bread and pan bread) as it is rich in these bioactive compounds.**

# RESEARCH PLAN



**Task I:** Mobilization

**Task II:** Chemical analysis of wheat flour and flaxseed

**Task III:** Developing baked products formulations

**Task IV:** Reporting

# TASK I

## **Mobilization:**

Procure chemicals and other baking supplies needed for the project



## **TASK II**

### **Chemical Analysis of Wheat flour and flaxseed:**

- **Flaxseed:** will be analyzed for proximate analysis, fatty acid profile, and dietary fiber.
- **Some of the optimized formulations will also be analyzed for these parameters.**
- **Flour:** will be analyzed for proximate composition (moisture, fat, ash, protein) and water absorption using standard AACC methods.

# TASK III

## **Developing baked product formulations:**

- **Flat and pan breads (with whole or crushed flaxseed)**
- **Different levels (0, 2, 4, 6 and 8% levels) of flaxseed**
- **Emulsifiers (SSL,DATEM)**
- **Bread volume, baking loss**
- **Sensory quality (9-point hedonic scale)**
- **Objective color and instrumental texture of pan and flat breads**
- **Storage quality for five days at room temperature (Sensory characteristics)**

# TASK IV

## Reporting

**Final technical report containing the experimental data, conclusions and recommendations for the baking industry will be prepared and submitted.**



# TRAINING

- **The research staff members, especially the junior Kuwaiti staff, assigned to these tasks will be given training in the following areas:**
- **Preparation of flat bread and pan breads containing various levels of whole as well as crushed flaxseed, using a dough mixer, moulder, fermentation cabinet, sheeting rolls, dough divider and reel-type baking over, and measurements of loaf volume, crust and crumb characteristics.**
- **Evaluation of dough quality as affected by the addition of oxidants and emulsifiers.**
- **Principles and techniques of sensory analysis as used for assessing the acceptability of flat and pan breads.**
- **Analysis of flour, flaxseed and baked goods for proximate composition.**
- **Objective measurement of texture and color of baked products.**



# TASK SCHEDULING

Task	Month											
I.	X											
II.		X	X	X	X	X	X	X	X	X	X	
III.		X	X	X	X	X	X	X	X	X	X	
IV.											X	X

# MANPOWER REQUIREMENTS

## Researchers:

<b>Dr. J. S. Sidhu (Principal Investigator)</b>	<b>0.6 MM</b>	<b>5% of 12M</b>
<b>Mrs. S. Al-Hooti</b>	<b>2.4MM</b>	<b>20% of 12M</b>

**Total = 3.0MM**

## Professionals:

<b>Mrs. J. Al-Ghanim (Project Leader)</b>	<b>4.8MM</b>	<b>40% of 12M</b>
<b>Ms. Hanan Al-Amiri</b>	<b>1.2MM</b>	<b>10% of 12M</b>
<b>Ms. Amani Al-Othman (NSTIC)</b>	<b>0.3MM</b>	<b>5% of 6M</b>

## Technician:

<b>Mr. Mohammed Al-Foudari</b>	<b>3.6MM</b>	<b>30% of 12M</b>
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# ANTICIPATED BUDGET (Kuwaiti Dinars)

<b>A. Salary</b>	<b>1<sup>st</sup> Year</b>	<b>Total</b>
Researchers	6540	6540
Professionals	6048	6048
Technicians	<u>2376</u>	<u>2376</u>
Total=	14964	14964

## **B. Operating Expenses**

Laboratory Supplies	700	700
Misc.(petty cash)	<u>300</u>	<u>300</u>
Total=	1000	1000

<b>C. Capital Expenses:</b>	4000	4000
Total (A+B+C)=	19964	19964

**Grand Total = 19964**

## **Duration of the Project**

**The duration of this research project will be 12 months from the starting date (tentative starting date: April 1, 2003)**

### **Budget summary (Kuwaiti Dinars)**

	<b>1<sup>st</sup> Year</b>	<b>Total</b>
<b>Salary and wages</b>	<b>14964</b>	<b>14964</b>
<b>Operating expenses</b>	<b>1000</b>	<b>1000</b>
<b>Capital expenses</b>	<b><u>4000</u></b>	<b><u>4000</u></b>
<b>Total=</b>	<b>19964</b>	<b>19964</b>

### **Funding Plan**

<b>KISR</b>	<b>19964</b>	<b>19964</b>
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# Equipment Required

Approx. Cost (KD)

Flat bread baking oven with steam provision 4000



# CONCLUSIONS

Since the flaxseed grain is rich in various phytochemicals such as dietary fiber, lignans, and omega-3 fatty acids, it will be useful to prepare commonly consumed baked products (flat bread and pan bread). This would provide a variety of choices for healthy foods to the Kuwaiti consumers.





*Thank  
you*

