STUDY ON SOME PEANUT PRODUCTS

By:

Hilmy Mohammed Elkhishin

B.Sc. Agriculture

Thesis Submitted In Partial Fulfillment

of the Requirements of the Degree of

M. Sc.

In Food Technology

Faculty of Agriculture

University of Ain Shams

Cairo, A.R.E.

1972

This Thesis for the M. Sc. Degree

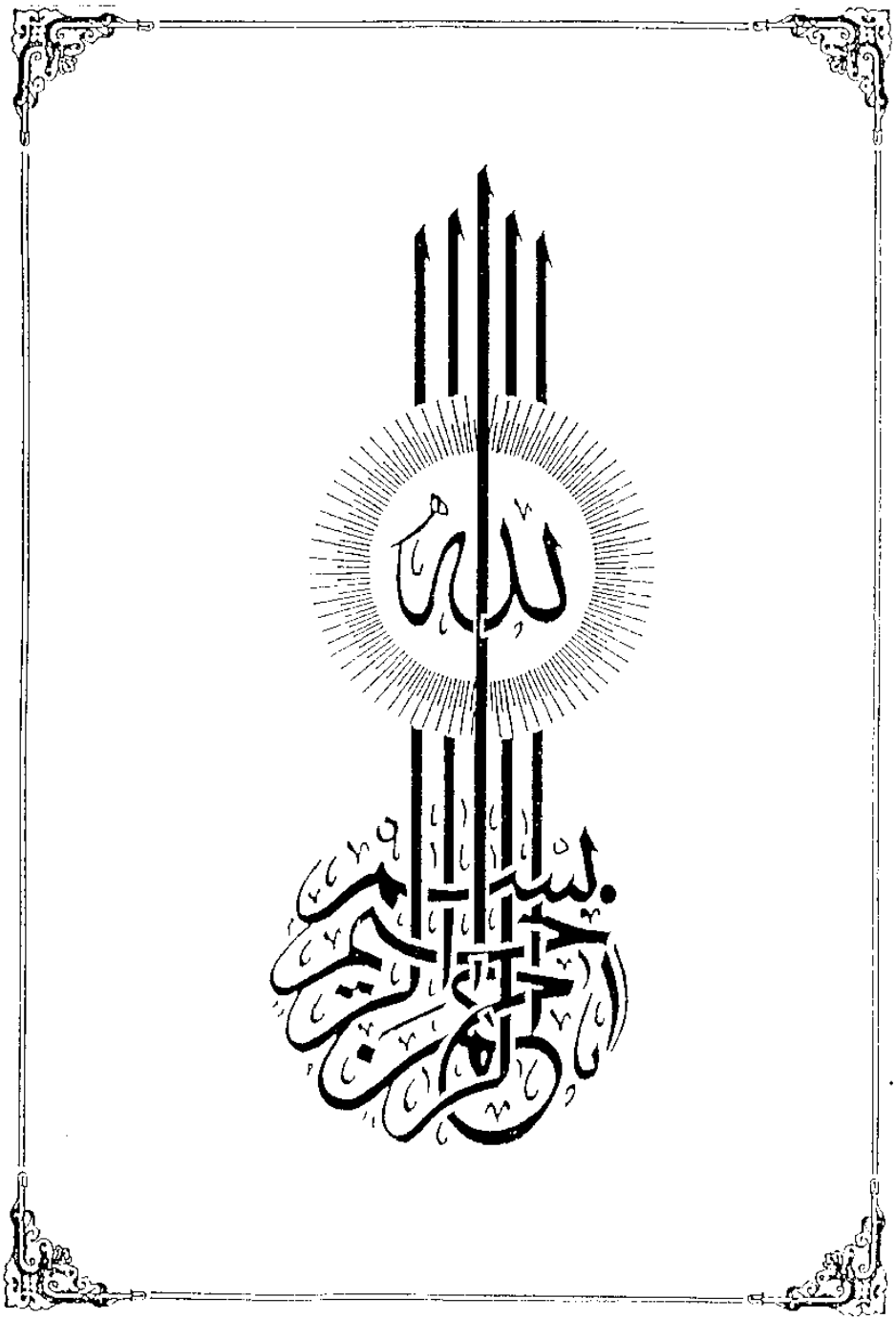
has been Approved by :

.....

.....

.....

Date : / /1972



ACKNOWLEDGMENT

The author, who is extremely indebted for
rof. Dr. Y. H. Foda, prof. of Food Sci., Food Sci.
ept., Faculty of Agric., Ain Shams University,
nder whose direction this research was conducted,
ishes to express his sincere appreciation to him
or his highly effective guidance, helpful sugges-
ions and discussions.

He also acknowledges Dr. M. A. Abdallah,
ecturer at the same department for his continuous
luable help and constructive criticism.

The author wishes to express his gratitude
o the staff members of the Food Sci. Dept. Faculty
f Agric., Ain Shams University and the Military
echnical Faculty for facilities offered.

TABLE OF CONTENTS

INTRODUCTION

The peanut, or sometimes called groundnut, ranks among the most important oilseeds of the world. India, China, West Africa, and United States are considered to be the largest peanut producers in the world.

Botanically, peanut is more akin/or and related to beans and peas than it is to the other nuts, whereas according to its constituents, particularly the high oil content, it is more like nuts than related to most other legumes.

It is worthwhile to shed light upon the fact that peanut was used in the hazardous journey of Apollo 11 to the moon in 1969. It was introduced, however to the space pyoneers in the form of peanut cubes, especially at breakfast in the first and second days of the journey. This indicates the importance of the peanut as one of the most nutritive single foods and emmergency rations. It is interesting to know that one pound of peanut butter contains more calories, protein, minerals, and vitamins than a pound of beafsteak. (U.S. Dept.of Agric., 1950 - 1951a).

The approximate general composition of peanut hernel showed somewhat high percentage of protein, and fat

ein. 28.1 and 49 % respectively as reported by Bruce A. Widdowson, (1954).

Thiamine, riboflavine, and nicotinic acid were found in peanuts with the following amounts: 750, 150, and 7.4 µg. per 100 g. sample. Other food constituents, such as glutamic acid (19.5 %), and tocopherol (11.2 mg./100 ml. of oil), were present in the peanut flour protein and peanut oil respectively.

Peanut, however, is considered as an excellent base for several products and mixtures, besides it participates in food and non-food uses and products. The characteristic forms of the sold peanuts are roasted types, shelled or unshelled. However large amounts are shelled, roasted and purchased in the salted condition, and sometimes peanuts are employed extensively in baked goods and confectionary.

In addition to the formentioned uses, great quantities of peanuts are made into peanut butter, and others are crushed for oil production which is used as food in the form of margarine, shortening and cooking oils. (U.S.Dept. of Agric., 1950 - 1951-A).

Peanuts are sometimes incorporated with other

foods, i.e., a diet was made of boiled unroasted peanut in a manner as beans were used, (Stevenson and Miller, 1950).

On the other hand, peanut oil is added for cooking sardines prior to canning, and also in mayonnaise emulsions.

The non-fatty portion of peanut, peanut cake, is extensively used for cattle feeding for its high proportion of digestible protein (about 45 %), carbohydrates (30 %), and mineral matter of about 4 %. It could be suggested that the obtainable peanut cake should be used in human nutrition, such as in special rations like baby foods, emmergency rations for armed forces, confectionery, and as a fortifying agent of flour for both bread and cake production. This could be considered as one of the successful solutions of protein deficiency in diets.

A valuable protein supplement could be obtained when peanut is incorporated in the diet due to its high content of protein.

Peanut flour, which is better described as a highly concentrated vegetable protein food could be compared, from the nutritional viewpoint, with dried milk solids or powdered eggs.

Other possible utilizations of peanuts were employed in many recipes to raise the nutritive value of the products. However, the following products and mixtures were experimentally carried out in this field :

1. A ration composed of peanut paste, salt, glucose syrup, sugar, chick-pea powder, and dry skimmed milk.

2. A tinned ration which is composed of peanut paste, coarsely crushed peanuts, dry skimmed milk, baking powder, chick-pea powder, dried dates, sugar, and cinnamon powder.

3. Tinned peanuts in brine or in syrup.

4. A mixture of peanut paste and fruit jam, as a nutritive jam mixture or as a filling agent between biscuit layers, or spread over toast surface.

5. Peanut biscuits in which the normal recipe of biscuit is used for preparation, but including a considerable amount of crushed peanuts or peanut paste.

6. Peanut-chocolate bar that was composed of roasted shelled peanuts, sugar, dehydrated skim milk, and chocolate.

7. Peanut vegetable milk, which is the sweetened extraction

... the peanut paste ... [illegible] ... and ... vanilla or cinnamon powder ... [illegible] ...-tate.

- Peanut jel , which was prepared by boiling peanut paste in a small quantity of sugar solution, and cooling.

- Peanut jam in which a quantity of sugar is added to a small quantity of water, and the mixture is laterly added to a quantity of peanut paste that gives a final product with a suitable texture after boiling and keeping at room temperature.

- Peanut ice cream , which is manufactured by boiling peanut paste in a suitable quantity of water and adding to the ice cream mixture instead of milk. Crushed peanuts may be added.

The common uses and products of peanuts in A.R.E. are:

1. Roasted, shelled or unshelled, salted or/and unsalted.
2. Sugar-coated peanuts in the form of candy.
3. National sweet, locally called "Moulia," in the form of bars, bricks, or disks. In addition, it may be coated with a solid sugar mixture or biscuits as esterifying layers which is known in the later form by "goufrette.
4. In pies and some other baked products.

Table (1): Peanut production in A.R.E. from 1967 to 1971.

Year	Cultivated area	Skinned peanuts	
		Average production for feddan	Total production
	(Feddans)	(kg.)	(Tons)
1967	40794	541.84	22103.82
1968	42466	592.28	25151.76
1969	49452	600.60	29700.87
1970	42537	621.92	26454.61
1971	37503	613.60	23011.84

The quantities produced in recently cultivated areas are not included.

(After Ministry of Agriculture, Statistical Department, A.R.E., 1972).

AIM OF INVESTIGATION

The aim of this research could be divided into he following, two major items :

A- The possibility of using peanut paste as a replacement for egg in cake industry.

B- Manufacturing national sweet "Foulia" as an emmergency ration for the use of the armed forces under certain ircumstances.

However, the work includes the technology of peanut ake with different recipes as well as the chemical analyis of the resulted products. On the other side,the study n foulia aims to utilize it as a simple, cheap, and nutrive emmergency ration as well as its stability during storge at room temperature.

REVIEW OF LITERATURE

The peanut (Arachis hypogaea L. Leguminosae) grows n a one to several seeded pot which ripens underground. It s known also as groundnut and sometimes named the goober. t originated in tropical America, (Jacobs, 1951).

Eckey, (1954) stated that peanuts consist of three rincipal parts, the shell or hull, the seed coat or testa, ommonly referred to as the "red skin", although its color aries among different varieties from perl white to deep ed, and the kernel or embryo. The hulls are always separa- ed before the nuts are utilized. However, the pericarp hull) represents 21 to 29 % from the weight of the whole ut , whereas the kernel (freed from germ) showed a value f about 68.9 - 72.4 %.

History of peanut :

U.S. Dept.of Agric., (1950 - 1951a) announced that he peanut is a pea, not a nut, and belongs to the bean amily. Its fruit, or pod, grows underground and by the ime it reaches maturity; The cellulosic pod or shell

contains 1 to 3 nuts or kernels. The shell is 30 to 35 percent of the weight of the mature peanut. Peanuts grow best when a loose surface of the soil can be maintained.

In 1863, U.S.A. produced about 10,000 tons of peanuts. Peanuts, however, have become one of the south's leading cash crops. During the 1920's, production averaged 395,000 tons annually with a farm value of about 39 million dollars. During the 1930's, and again during the war years production increased sharply. The average annual production has been more than 1 million tons in 1942, with a farm value of about 200 million dolars,(U.S.Dept.of Agric.,(1950-1951a).

Mckey,(1954) showed that peanut ranks under the order Rosales, the family Leguminosae (Pea),Arachis hypogaea (Peanut). He added that the peanut, or groundnut as the British graphically term it, ranks among the two or three most important oilseeds of the world, coconuts, peanuts, and cottonseeds, in terms of tonnage produced. Acreages planted and tonnages produced are especially large in India, China, West Africa, and the United States.

An interresting history has been traced of how the peanut spread eastward from South America to Africa by the Agency of Portuguese slave traders who used it as rations