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EFFECT OF ADD SOME AROMATIC PLANTS ON THE STABILITY OF THE OXIDE FRYING OILS AND INTERNAL ORGANS OF RATS

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1. INTRODUCTION

Deep-fat frying is one of the most commonly used practices in food preparation and manufacture all over the world. The increased consumption of fired foods is due to an increased number of restaurants serving convenience foods such as fried chicken, French fries and potato chips. More than 500 million pounds of edible fats and oils, for example, are used annually for the manufacture of potato chips in the United States alone **(Irwandi & Che Man 1999)**.

Deep fat frying is a popular way to prepare a variety of foods. When food is fried in heated oil, many complex chemical reactions occur and the oil begins to degrade. The triglyceride molecule breaks down into both volatile and nonvolatile compounds which are soluble in the oil. These components contribute to both the desirable and undesirable sensory characteristics of food fried in oil. Natural triglycerides comprising an oil are considered non polar material. The products of the oil degradation are defined as polar compounds **(Hassan, 2001)**.

The scientific literature is replete with studies questioning the safety of heated fats and oils. It is will established that heating of fats can results in formation of compounds with antinutritional properties. Compounds formed may be enzyme inhibitors, vitamin

destroyers, lipid oxidation products, gastrointestinal irritants and/or potential mutagens **(Hassan, 2001).**

When workers have limited their experimentation to frying fats which actually had been used for frying foods such as potato chips, French fries and fish as well as other local fried products (falafel, pepper and eggplant), the results have been different from those found for laboratory-heated fats and oils **(Hassan, 2001)**.

Controlling frying oils and fats all over the world are still. unsatisfactory. Most legistations and regulations in many countries only ensure that fats and oils used in food service establiaments are obtained from unapproved source and are not adultrated.

Deep-fat frying may be defined as the process of cooking foods by immersing them in an edible oil or fat maintained at a temperature of about 150-200°C **(Yamsaengsung & Moreira 2002)**.

A number of reactions occur in the frying oil when foods are fried causing oxidative and hydraulytic degradation as well as polymerization of the oil. The question is whether these oxidized and polymerized materials in frying oil might cause adverse effects when consumed by human beings. The extent of these reactions depends on the frying conditions, principally temperature, duration, moisture

content in the fired product, kind of food being fried and aeration involved **(Komoda *et al*., 2005)**.

Several European countries have specific regulations for frying fats and oils, as well as procedures and guidelines are particularly important for the most EEC.

Aim of Study

The present study was carried out to achieve the following objectives:

1- Studying the time-temperature relationships during frying operations using designed frying protocol.

2- Investigating the effect of frying process on the quality parameters of frying oilused.

3- investigating the effect of feeding rats on a balanced diet containing 10% of different oils (exposed to a certain number of fryings) on histological alterations occur in liver, kidney and heart organs.

4- Designing mathematical models to better estimation of frying oil quality.

2. REVIEW OF LITERATURE

2.1. Effect of deep- frying on the quality of frying oils:

In some countries, such as China and USA, oils and fats manufacturers normally treat the refined oils with antioxidants to retard the undesirable changes during storage and frying operations and, in eventuality, to prolong the shell-life of the fried products. It is believed that antioxidants protect the fat from oxidation during the time that the oil is exposed to high temperature **(Augustin & Berry I983a)**. To avoid or delay the lipid oxidation in food processing, antioxidants have been used for over 50 years **(Cuvclier *et al.*, 1994)**. They play an important role in the manufacturing, packaging and storage of fats and fatty foods and have been proven to retard oxidation **(Lin *et al.*,1981)**.

Deep-fat frying is one of the most common methods used worldwide for foodpreparation and production.It is extensively used both at home and on a commercial scale to enhance the organoleptic characteristics of food.In commercial deep-fat frying operations, fat is exposed continuously to heat, air and light for hours per day at temperature around 180 °C and it may be used to cook some varieties of food **(Gwo *et al.*, 1985)**.

Deep-fat frying is a process of cooking and during frying in hot oil with simultaneous heat and mass transfer many changes have occurred in frying oil. A number of chemical changes occur