I. INTRODUCTION

Dates (Phoenix dactylifera) are considered one of the most popular fruits. Total world production of date fruits was about 5 millions and 125 thousand tons, (FAO, 1999).

Egypt represented the second country for dates production and its production was 850 thousand tons (FAO, 1999).

Siwi date is one of the important semi-dry variety in Egypt and its production reached 116,776 thousand tons in 1997 (Anon, 1998).

Dates are classified into three groups: dry, semi-dry and soft dates.

The first group (dry dates) include:

Sakkot, Barakawi, Bartamoda, Gondeila, Shameya, Malakabi, Dekna and Baladi (in upper Egypt) (Cook and Furr, 1952 and Abd El-Azim and Marey, 1961).

The second group (semi-dry dates) includes:

Amry, Eglany and Siwi dates.

The third group (soft dates) includes:

Zaghloul, Amhat, Samani, Hayani, Bent Aisha, Sargi, Kobby, Kaboushy and Kattowy.

The major ripening stages are Grimri (green stage), Khalal (yellow or red stage), Rutab stage and semi-dry or dry stage.
Dates in the Gimri stage are very astringent which is related to a layer of tannin (a little below the skin). Also tannins are present in the Khalal stage of the main varieties.

When the dates were ripened the tannin was deposited and the astringency disappears. According to the variety and type of dates it could be consumed in one or more stage (Khalal, Rutab and Tamre); physical and chemical changes limit the quality and acceptability of dates. (Assous, 1999).

Dates are source of nutrients mainly sugars, vitamins, sodium, iron, magnesium and other minerals (Yossif et al., 1987).

Because of the relatively short season of dates and their large production, their processing becomes very important. Moreover, improving their processed product should increase their economical value.

Mudgett (1989) noted that the microwave cooking and processing have increased over the years because of the convenience and time saving. Recently, improvements in the design of high powered microwave oven offer rapid and economic methods for manufacturing food products of high organoleptic properties and nutritional value.

Sale (1976) and Decareau (1986) reported that in food industry microwave is used for pasteurization of packaged products, for sterilization, tempering of frozen foods, precooking of poultry products and also snack foods.

Mills and Morgen (1990) found that the microwave became of great importance, because its extensive utilization at homes for cooking, thawing and reheating are very important.
This work was carried out to study:

The use of different heat sources (two thermal process) to enhance the date fruit quality as follows:

The first: thermal process of canning dates:

1- Preservation of Amhat dates variety (Rutab stage) in cans without solution by thermal process at different heating temperature and periods.

2- Preservation of Siwi dates variety (Khalal stage) in a sugar solution (25%) packed in cans by thermal process at different heating temperatures and periods.

3- Studying the effect of heat resistant of canned Amhat, Siwi dates and the optimum thermal process time (tB) required to maintain a rate of spoilage of less than one per thousand in different canned (Amhat and Siwi date).

The second: thermal process of microwave heating:

Siwi date variety (dry stage “Tamre”) and pressed (Agwa product)

1- Using of microwave heating for lowering the total count of microorganisms which lead to more sanitation.

2- Studying the effect of microwave heating on the retention of the essential nutrients mainly proteins, free amino acids and other components related to nutritive value characteristics.

3- Studying the effect of microwave heating on the chemical changes of every components of model system.