

## REDUCTION OF ACRYLAMIDE CONTENT OF BREAD BY SOME HERBS AND PLANTS

Makarim A. Mousa\*, Nahla T. Khalid and Ezuldeen K. Hamood

Department of Food Science, College of Agriculture Engineering Sciences, University of Baghdad, Baghdad, Iraq  
e-mail : makaremali37@yahoo.com

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**ABSTRACT :** The effect of addition of different plants like (spices, herbs) on acrylamide content in bread crust was studied, loaf bread with 3% of green tea, Thyme, anise, garlic and cinnamon powders were prepared, sensory evaluation of loaf bread was done, chemical content of all types of bread were determined, acrylamide content of crust bread was determined by HPLC technique. The results showed that the plants powders of (green tea, Thyme, anise and garlic) decrease acrylamide content of crust bread, acrylamide content of crust bread were (742.0, 525.4, 706.8, 615.0) ppm for bread with 3% (green tea, Thyme, anise and garlic) compared to wheat bread (control) (1758.0) ppm, Cinnamon powder led to increase acrylamide of crust wheat bread (3577.0 ppm). Thyme powder led to increase protein content of bread, plants powder had different effect on quality of bread, the results showed improvement on loaf bread specific volume, sensory evolution showed that all types of bread were acceptance, bread with garlic powder had highest scores (97%) compared to bread control treatment (86%).

**Key words :** Acrylamide, bread, herbs, plants.

### INTRODUCTION

Acrylamide is colorless odorless crystalline solid, acrylamide was detected at 2002 by Swedish National food administration (SNFA) in foods processed at high temperature, The main pathway for the formation of acrylamide in foods was Millard reaction between reducing sugars mainly (glucose, fructose) and free asparagin during high temperature processing (Becalski, 2003), Acrylamide can be found in many foods which heated at high temperature during production processing such as roasting toasting and frying such as cereal products, potato products, roasted coffee (Pedreschi *et al* 2006, Yuan *et al*, 2011).

Acrylamide classified as probably carcinogenic to human by International Agency for research on cancer (IARC 1994), studies have shown that acrylamide ( $\text{CH}_2=\text{CH}-\text{CONH}_2$ ) was toxic to gene and cause cancer (Olmez *et al*, 2008).

Some additive such as asparaginase, antioxidants mono and divalent cation ( $\text{Na}^+$ ,  $\text{Ca}^{+2}$  ovmg) can reduce the acrylamide formation in foods, Some studies explain that antioxidant such as phenolic compound, flavonoids, vitamins and phenolic extracts from different spices inhibit acrylamide formation (Kotsion *et al* 2010)

Different antioxidants like green tea, bamboo leaves and rosemary extracts could reduce acrylamide in different heated food (Zhung, 2007). Garlic powder was effected acrylamide formation in an asparagine/glucose model system, acrylamide was reduce with addition of garlic powder also a garlic powder of 15 g to 500gm wheat flour dough reduce acrylamide formation significantly at ( $p < 0.05$ ) in bread and had no effect on the sensory quality of the bread (Li *et al*, 2016).

Hedegaard *et al*, (2008) study the effect of antioxidants of bamboo leaves and green tea extract and showed that this extracts reduce acrylamide by 83 and 87% respectively

Markova (2012) used various spices (cloves, cinnamon, white pepper, anise, star anise, ginger vanilla, cardamom fennel coriander nutmeg in buckwheat ginger cake, result showed that significant decrease of acrylamide content was observed in sample of ginger cake with nutmeg 23%, also the acrylamide content decrease by 17% in ginger cake with anise or clove but no change in acrylamide content ginger cake with star anise, correlation factor (0.6) was observed between antioxidant capacity of spices extracts and acrylamide content in ginger cake.

Gunduz and Cencis (2014) study levels of acrylamide