

## **STUDY OF THE RELATIONSHIP BETWEEN ASH CONTENT IN DIFFERENT WHEATS FLOUR AND COLOUR AND ACRYLAMID CONTENT OF BREADS MADE OF THEM.**

Farzaneh Darikvand<sup>1</sup>, Javad Keramat<sup>2</sup>, Atoosa Abdollahi<sup>3</sup>, Ahmad Reza Golparvar<sup>3</sup>

1-Master graduate of food science and technology, Islamic Azad university of khorasgan (Isfahan)

2-Faculty member of IUT (Isfahan university of technology)

3- Faculty member of Islamic azad university of khorasgan (Isfahan)

Responsible author Email: Fdarikvand@yahoo.com

### **Introduction**

In recent decade unwanted production of acrylamid during some important food processes, is known on top of the health problems. In 2002, high levels of a toxic and carcinogenic substance called acrylamid was unexpectedly discovered for the first time in some heat-processed foods by national institute of nutrition in Sweden. Formation of acrylamid is possible when cereals, potatoes and other starchy foods made of plants, are affected by thermal process. At this time, amin groups of amino acids like asparagine reacts with carbonyl group of reducing sugars such as glucose and fructose. So existence and formation of acrylamid in cereal products such as Sangak bread which is one of traditional breads in Iran and has high nutritional properties, is possible and it appears that this bread has the potential to form acrylamid.

### **Materials and Methods**

In this research, ash content of 7 varieties of Iranian wheat which are zarrin, Azar-2, Marvdasht, Toos, Alamoot, Chanab and sardari was measured. Then Acrylamid content of breads made of these 7 varieties was measured.

In this regard, ash content of wheat flour samples was measured according to features standard and testing methods for wheat and acrylamid content of breads made of these wheats was measured using gas chromatography with electron capture detector (GC/ECD).

In addition, the values of bread colour factors ( $L^*$ ,  $a^*$ ,  $b^*$ ), colour intensity

( $c^*$ ), Browning index (BI) in sangak bread samples were evaluated through method of digital image processing using software: Image J146-jdkb. The data were entered the SPSS software and were analysed.

### **Results and Discussion**

Ash content changed in the range 1/4823-1/8265 and the average acrylamid content changed in the range 174-369/3. The maximum ash content belonged to Toos wheat and the minimum ash content belonged to Azar-2 wheat.

In addition the maximum acrylamid content was seen in Marvdasht wheat and the minimum acrylamid content was observed in Toos wheat.

Furthermore, extent of relationship between ash content and acrylamid was 0/473 which is not statistically significant. ( $P$ -value > 0/05).

In other words, ash content has had a direct impact on the extent of acrylamid formation. Moreover, acrylamid concentration has had the most correlation with brown index ( $p=0/664$ ).

Generally by increasing colour factors, acrylamid concentration had enhanced. However, by over colouring and increasing its tendency toward blacking, acrylamid content will be reduced again. But in studied samples, the pleasant colour of sangak bread is lighter than this. (so, acrylamid content has not been reduced). Finally variety Toos was recognized as the best one for baking bread, due to minimum acrylamid content and its appropriate chemical properties (appropriate ash content).

Key word: wheat, Sangak bread, Ash, Browning index (BI), GC/ECD

### **References:**

- FAO/WHO. 2005. Consultation on health implications of acrylamide in food, Report of a joint FAO/WHO consultation, Geneva, Switzerland, Available from: <http://www.who.int/foodsafety/publications/chem/en.Pdf:25-27>.



The 1st International Conference on New Ideas in Agriculture  
Islamic Azad University Khorasgan Branch  
26-27 Jan. 2014, Isfahan, Iran



- International Agency on Research on Cancer (IARC). 1994. In IARC monographs on the evaluation of carcinogenic risks to humans. In some industrial chemicals, Acrylamide, Lyon, France, 60:389-433.
- JECFA .2005 . Joint FAO / WHO Expert Committee on Food Additives.1-47.