

The Activity of Water in the Fresh and Pre Treated Melons

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Abstract

Uzbekistan is considered as an agrarian country with an economy heavily depending on agriculture. Agriculture sector provides a living habitat and source of employment for the rural population which makes about 60% of the total population, as well as is the main provider of food to the people and raw materials for the subsequent processing industrial sectors. Due to this issues research on this area is very important. The current article aims of the determination one of the most critical parameters in determining the quality and food safety. Main attention here gives for study of the activity of water in the fresh and pre-treated melons. In the result of scientific studies was found that an increase in temperature limit and humidity conditions limit during storage of pretreated melons (without adding chemicals).

Keywords: Uzbekistan; Agriculture; Melon; Activity of water

Introduction

The term “water activity” (English “water activity”-Aw) was first introduced by Scott in 1952, who proved that there is a relationship between the state of water in the product and the growth of microorganisms in it. It is known that, there is an interaction of various kinds between water, chemicals and biological structure of the food. So, drop in Aw between 1 and 0.2 leads to a significant slowing of chemical and enzymatic reactions, except for the oxidation of lipids and the Maillard reaction.

Water activity-one of the most critical parameters in determining the quality and food safety. Water activity affects their shelf life, quality, texture and organoleptic properties [1-3] because the activity of water is so important, you need to measure it accurately and quickly. The magnitude of the activity of water, fresh melon belongs to products with high humidity (Aw=0.9) and dried melon to the products of intermediate humidity (Aw=0.6) and below.

The concept of activity in the food includes the ratio of partial pressure of water vapor over the product to the partial pressure of water vapor above pure water at a given temperature, i.e., $A_w = P_1/P_w$. The aim of this work is to study the water activity in both fresh and in the drying process and in the final dried product where the weight of product is constant. Laboratory experiments on the determination of water activity were carried out at the laboratory of the Department “Technology of public catering and Biotechnology” of the Bukhara Technological Institute with the help of laboratory equipment “Rotronic Hygro Palm” [1,4-7].

Results and Discussion

In fresh water melons indicators of activity directly related to the ambient temperature, the initial moisture content of melons, as well as its ripeness. For example at the temperature of environment 25°C and 87% humidity melon water activity Aw in the range of 0.844 and at the temperature of environment 31°C Aw in the range of 0.920. In damaged (blackened ground melon) where there is a “biodry” and isolated from the healthy parts of the index of activity of water is lower than in other parts of the healthy tissues of melon for example: at the temperature of environment 25°C water activity is equal to 0.836 the higher maturity of the product, the higher the water activity: at the ripe

melon water activity at 25°C is equal to 0.844, in the very ripe state at the same temperature is 0.856.

After processing, the pulp in sugar syrup

Performance depends on the humidity of the water activity of the product at 25°C (Figure 1).

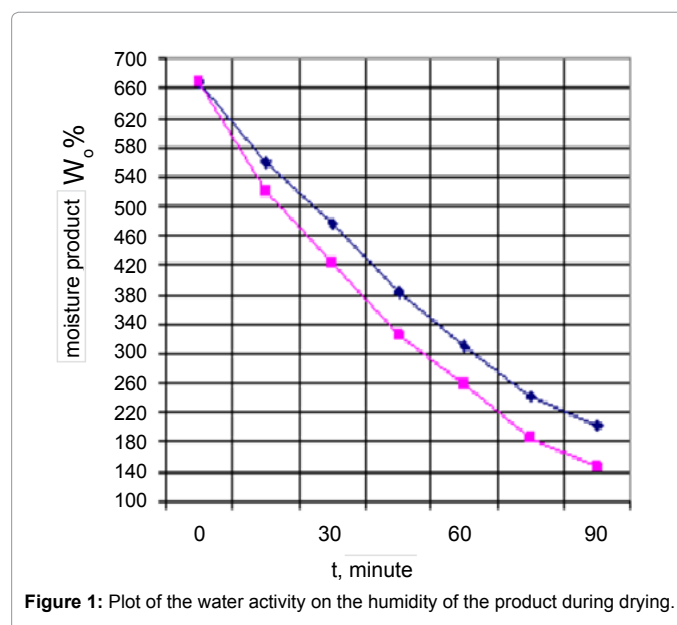


Figure 1: Plot of the water activity on the humidity of the product during drying.

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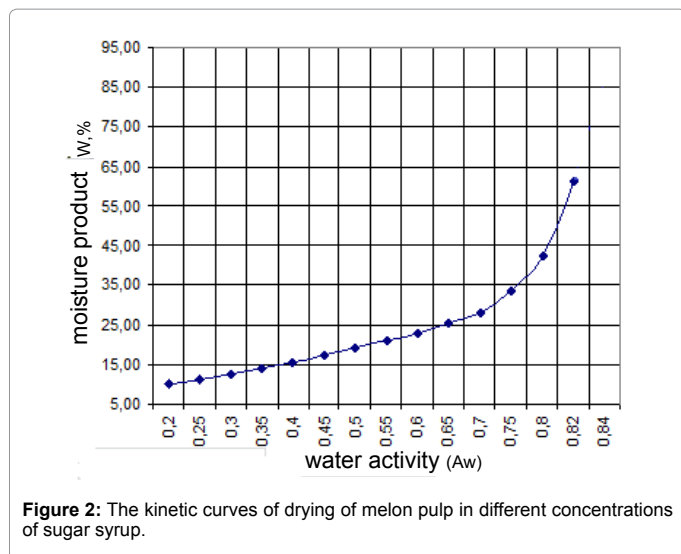


Figure 2: The kinetic curves of drying of melon pulp in different concentrations of sugar syrup.

Humidity of the product

Thus, controlling the functional and technological characteristics of the product and, in particular, the indicator A_w , we can predict its ability to store, which will create a “map of stability” and to determine the optimal conditions for their storage. In the result of scientific studies was found that an increase in temperature limit and humidity conditions limit during storage of pretreated melons (without adding chemicals) (Figure 2).

Conclusion

Indicators of water activity in dried melons at ambient temperature 25°C, and final moisture content of melon pulp from 10% to 25% of the activity of the water oscillates from 0.3 - 0.65. These figures are valid for early and middle- maturing varieties of melons. Thus, controlling the activity of water in dried melon below 0.6, which is necessary during storage of dried melon from the equilibrium moisture content of 10% to 28% at 25°C and ambient relative humidity 60-70%.

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