ROASTING CHARACTERISTICS OF PEANUT CULTIVARS GROWN IN GUJARAT

ABSTRACT

Keywords: peanut, roasting, hot air oven method, microwave method, quality evaluation

Peanut (Arachis hypogaea L.) is a pod of the Leguminosae family and the second most harvested legume in the world. India is the second largest producer of peanut in the world. Peanuts are a good source of proteins, lipids and have a desirable fatty acid profile and are rich in vitamins, minerals and several bioactive compounds.

Roasted peanuts is one of the most popular snack foods, in which roasting is a key step in the process that directly impacts its quality especially crispness, taste and flavour as well as shelf-life of the final product. Roasting is critical to the development of colour, flavour and texture through chemical reactions, heat transfer and drying which occur during the roasting. Understanding of the roasting process is important because the critical roasting parameters (roasting time and temperature) greatly influence the roasted product characteristics.

Among the various cultivars of peanut, three peanut cultivars namely GJG9, GG11 and GG20 were selected on the basis of growing condition as bunch, spreading and semi-spreading type. The pods of the selected peanut cultivars were procured in the required quantity of kharif-2017 season from the Main Oilseeds Research Station of Junagadh Agricultural University, Junagadh. The pods were decorticated manually to obtain whole kernels with minimum damage. The two different methods namely hot air oven and microwave oven method were employed for roasting. A Completely Randomized Design with three replications was used for statistical analysis.

The hot air oven roasting was performed at 160 °C for three different roasting time which were 15 min, 30 min and 45 min. The microwave oven roasting was carried out at 2450 MHz for three different roasting time which were 3 min, 4 min and 5 min. Roasting characteristics of peanut kernels were determined in terms of biochemical, functional and organoleptic properties. The fatty acid profile for raw samples and the roasted samples which retained better biochemical properties were analysed by GCMS.

The mean value for 100-pod weight, kernel weight and shelling percentage for variety GJG9 were 124.60±6.47 g, 88.59±7.42 g and 71.01±3.06 per cent, respectively; for variety GG11, these values were 105.88±7.20 g, 70.83±6.10 g and
66.03±1.70 per cent, respectively; and variety GG20 contained 162.50±8.75 g, 116.77±6.40 g and 71.86±1.00 per cent, respectively.

The moisture content for hot air oven roasted peanut kernels decreased in the range of 2.9 to 0.4 per cent whereas as that of microwave oven roasted peanut kernels was reduced in the range of 3.5 to 2.0 per cent. The decrease in moisture content for hot air oven roasting method was higher than microwave oven roasting. The total carbohydrate content for all the treatments was higher than raw samples. However, in comparison between two methods, the carbohydrate content was higher in case of microwave oven roasted treatments. The effect of microwave oven roasting duration on total free amino acids was found to be non significant. Whereas, hot air oven roasting showed a significant decrease in amino acids with roasting time.

Regarding true protein content, there was a significant effect of hot air oven roasting i.e., protein content of roasted peanut kernels decreased with increase in roasting time. Microwave oven roasting showed a non significant effect on protein content of roasted kernels i.e., there was no particular trend with increase in roasting time. The oil content of roasted peanut kernels in hot air oven method was higher for treatments at 15 minutes roasting time. For microwave oven roasting, it was higher for 3 minutes roasting time. Also peanut kernels of microwave oven roasting yielded higher oil content than that of hot air oven roasting. GCMS analysis for comparison of oil obtained from raw and roasted peanut kernels detected presence of various saturated as well as unsaturated fatty acids.

The results for biochemical parameters of oil obtained from roasted peanut kernels for all the samples showed that free fatty acids, peroxide value and iodine number were better retained at lower roasting time i.e., at 15 min for hot air oven roasting and at 3 min for microwave oven roasting.

The results for sensory attribute of hot air oven roasting method concluded that for variety GJG9 and GG11, superior sensory attributes were obtained at 30 minutes roasting time. The sensory attributes for variety GG20 were highest for 45 minutes roasting time. The results for sensory characteristics of microwave oven method revealed that roasting duration of 5 minutes was beneficial to variety GJG9 while for variety GG11, 4 minutes duration gave higher sensory values and for variety GG20, it was higher at 3 minutes roasting time.

Considering the overall aspects of the study, it may be concluded that irrespective of method employed for roasting, biochemical parameters of roasted peanut kernels were better retained at lower roasting times. Microwave oven method showed superior attributes as compared to hot air oven method in roasting the peanut kernels.