

**Title** Effects of storage conditions on hazelnut (*Corylus avellana* L.) textural characteristics  
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### **Abstract**

Texture analysis is a very important new tool to define the characteristics of foods as its responses could be correlated to consumer evaluations. In this work texture analysis was applied to samples of the hazelnut cultivar 'Tonda Gentile Romana' (*Corylus avellana* L.), harvested in 2005 and stored for one year in a refrigerating room, in a freezer and under a nitrogen-enriched atmosphere, in order to define the effect of these treatments on textural characteristics of the products. The analyses were performed on the fresh product and after 4, 8 and 12 months of storage. Raw and roasted products were examined. Rupture force (N), rupture energy (mJ) and nut specific deformation (N/mm) were measured by a Universal Testing machine TA.XT2i<sup>®</sup> Texture Analyser under three compression loading positions (x, y and z axes). In comparison to the fresh samples, the textural parameters showed the highest differences after four months of storage. After 12 months of storage, the values of the force required to break the nuts ranged from 84.8 to 103.1 N for raw hazelnuts and from 80 to 98 N for roasted. The lowest values of force were generally obtained in raw frozen hazelnuts, while in the same storage conditions roasted hazelnuts had the highest values. The lowest values of rupture force were usually noticed along the x-axis (length), the highest along the y-axis (width). The obtained results showed that rupture force and nut specific deformation were the most discriminating parameters for raw hazelnuts, while rupture energy was the most discriminating parameter for roasted hazelnuts. Finally, rupture force was strongly correlated with both rupture energy ( $R^2=0.95$ ) and nut specific deformation ( $R^2=0.94$ ). These results show that texture analysis is a very suitable method for hazelnut analysis and for the study of storage effects on the textural characteristics of this fruit.