

Abstract

A nondestructive ultrasonic method was used to determine the firmness and sugar content of greenhouse tomatoes (cv. '870') during the Course of shelf life. This method is based on measurement of acoustic wave attenuation in the fruit tissue, by means of ultrasonic probes in contact with the fruit peel. The differences in the acoustic signals transmitted through the tissue of fruits at different states of firmness were measured and analyzed. The fruits for measurement were transferred from storage to room temperature. Experiments were carried out at intervals throughout the storage period. The fruits were subjected to nondestructive ultrasonic tests as well as to destructive penetration measurements of firmness, and the results were analyzed statistically to determine the relationships between the ultrasonic attenuation measurements and the destructive measurements, during the course of shelf life. The measured attenuation was found to be significantly increased and the firmness was found to be significantly decreased in the course of shelf life. A link between the attenuation and the firmness could be observed until the end of the softening process. This suggests that this ultrasonic method might be used as a nondestructive technique for monitoring the firmness of tomatoes during various stages in storage. The results obtained for sugar content measurements found to be unexpected non-significant; this phenomenon needs to be further investigated.