Title Effects of pressure processing on strawberry studied by nuclear magnetic resonance

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Abstract

Two different nuclear magnetic resonance techniques, namely magnetic resonance imaging and ^{1}H-HR-MAS NMR spectroscopy, have been employed to study the extent of the damage caused by relatively low pressures (100–200 MPa) in strawberry. MRI maps showed important changes in the relaxation behavior of water molecules in pressurized samples. These differences increased with the pressure level applied. ADC values clearly showed the destruction of biological barriers and the loss of cell compartments produced by pressure. This induced major water redistribution in the tissues and; therefore, substantial changes in the interactions between water molecules and their environment. Relaxation times in T_1 and T_2 maps clearly depicted these pressure induced modifications. Moreover, NMR spectroscopy showed significant differences in the main sugars content in control and pressurized samples. Sucrose hydrolysis seems to be enhanced by the pressure treatment.