

Title Combined treatment of apples by pulsed electric fields and by heating at moderate temperature  
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### **Abstract**

In this work, the specific influence of combined pulsed electric fields (PEF) and thermal treatment on the textural properties of apple tissue and apple juice expression are discussed. Force relaxation curves were analysed for different regimes of PEF and thermal pretreatment of apple tissue. The concept of the effective relaxation time  $t_{\infty}$  was used to characterise the different modes of treatment. Heating of apple tissue in a juice at moderate temperature of 323 K for 10 min resulted obvious softening of the tissue. The combined effect of mild thermal and PEF treatments was shown to give more effective damage of apple tissue than application of PEF treatment alone. The apple tissue pretreated at moderate temperature (323 K) and moderate PEF ( $E \approx 500 \text{ V cm}^{-1}$ ,  $t_{\text{PEF}} = 10^{-2} \text{ s}$ ) showed a noticeable enhancing of juice extraction by pressing.