

Title Effect of radio frequency (RF) heating on the texture, colour and sensory properties of a comminuted pork meat product

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Abstract

Radio frequency (RF) cooking is a form of dielectric heating in which products are heated by subjecting them to an alternating electromagnetic field between two parallel electrodes. Although similar in some respects to Microwave heating, RF has been proposed to be more suitable for industrial heating of meats because of the greater penetration depths possible with this technology. In this study an RF cooking protocol was developed and its effect on selected quality attributes of pork based white pudding was examined. Whilst cooking of the product in air proved unfeasible due to arcing, use of a polyethylene cell with circulating hot water (80 °C) facilitated successful heating of the product. Application of RF using an optimised cooking protocol (RF power = 450 W, cell volume = 500 ml and continuous circulation) resulted in a mean end-point temperature of 73 °C after 7 min 40 s. Similar mean end-point temperatures in water bath and steam oven heated products were achieved after 29 and 33 min, respectively. A factorial experiment was conducted to assess selected quality attributes of the cooked puddings. Results show that RF heated puddings were not significantly different ($P > 0.05$) from water bath and steam oven heated products with regard to instrumental colour, instrumental texture (Kramer shear and texture profile analysis) and expressible fluid. Furthermore, results of a sensory similarity test involving 60 panellists indicated that panellists were not able to detect differences between puddings cooked by RF and conventional methods. Overall this suggests that RF heating technology could have potential in pasteurisation of meat products though further work is needed to verify this.