592d Comparative Study of Heat Penetration Parameters Using Miniature Remote Temperature Sensors Vs. T-Type Thermocouples

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Accurate time-temperature data are required in designing thermal processes to assure product safety. Recent industrial demands to optimize thermal processes call for accurate temperature recording/monitoring devices that guarantee product quality, consistency, stability and safety. Traditionally, heat penetration data are gathered using T-type thermocouples (needle or rod-in-tube). An alternative to T-type thermocouples is the self-contained "remote" sensor that has evolved in complexity and been reduced in size over the years. These sensors may provide more realistic heat penetration parameters and eliminate the need to apply correction factors in thermal process calculations. To address the above needs and concerns, heat penetration tests were conducted with remote sensors and T-type thermocouples in four different can sizes containing model food products that simulate either conduction or convection heating. Remote data collection sensors from three different manufacturers were tested. An Allpax R&D retort under still or agitating (end-over-end) mode at 250 ^{o}F was used. This presentation will focus on potential similarities or differences in estimated heat penetration parameters (f_h, j_h, f_c, j_c) and the Ball process time (B_b) for a target cumulative lethality (F_o) of 6 min.