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Heat penetration studies of stewed tomatoes in 6, 8, and 17 quart household pressure retorts

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Most current home pressure canning recommendations were developed using standard 17 to 21 quart pressure retorts. Today's marketplace offers a variety of smaller pressure-based cookers/canners. Retort size has the potential to affect come up and cooling times, which contribute to the sterilizing value of a pressure process. As heating and cooling times are reduced so is total lethality.

The objective of this study was to compare $f(h)$ values, cumulative lethalties, and potential safe process times during pressure processing of stewed tomatoes in 6, 8, and 17 quart household pressure retorts.

Stewed tomatoes were prepared and packed into 8 oz glass home canning jars. Jars were processed at 121.1°C for 25 minutes in 6, 8, and 17 quart pressure retorts after a 10 minute exhaust of the retort. Heat penetration data were collected at the cold spot, previously determined to be the geometric center of the jar. Continuous temperature profiles from 15 replications were collected using copper-constantan needle thermocouples connected to an electronic data logger. Potential process times and cumulative lethal rates were calculated for the destruction of *Clostridium botulinum* spores.

The cumulative lethal rate did not reach the target F_0 (3.0) during the process. The majority of the lethality was achieved during cooling. Processing in smaller retorts resulted in lower $f(h)$ values ($p < .001$). Calculated process times from the data collected so far were found to be equivalent but due to the need to verify some data with additional work, a final conclusion about process schedules cannot be made at this time.

Home canning in very small retorts should be avoided until safe process recommendations can be determined.