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Thermal process development to ensure the safety of a home-canned lemon curd product

E. M. D'Sa¹, E. L. Andress¹, J. A. Harrison¹, and M. A. Harrison². (1) Dept. of Foods & Nutrition Extension, University of Georgia, 208 Hoke Smith Annex, Athens, GA 30602. (2) Dept. of Food Science & Technology, University of Georgia, Food Science Bldg., Athens, GA 30602.

Canning techniques for specialty foods such as fruit curds are currently highly requested by home canners. In recommending a home canning process to consumers, the issue of primary concern to the Extension educator is to ensure a microbiologically safe, high-quality shelf-stable product.

The objective was to experimentally calculate a boiling water thermal process and determine the effect of consumer procedural variation on heat penetration patterns of lemon curd.

A standardized lemon curd formulation (equilibrium pH 3.7) was hot-filled into half-pint home canning jars. The cold spot was determined with Ecklund Harrison copper-constantan thermocouples, inserted through lids, monitoring product temperatures at four potential cold spots in 16 canner loads. Sealed jars were placed in the canner and temperatures recorded using Ellab software, through come-up, cool down, and a processing time that heated all jars to a minimum of 2°C below canner temperature. Analyses of $f(h)$ values (slope of the straight line portion of a heating curve) located the cold spot at the geometric center of the jar. Cold-spot temperatures were then monitored through confirmation canning processes that produced a minimum final temperature of 90.5°C, for both standard filling and low-initial temperature filling variations. $f(h)$ values were used to calculate the effect of consumer-induced procedural changes on the thermal process.

A boiling water process recommendation of 15 min was calculated for this product. Up to a 15 minute post-cook delay prior to filling jars did not significantly change $f(h)$ values when compared with the standard treatments. Confidence in science-based thermal processing recommendations is essential for novel home canned food products similar to commercially available high-demand items. A 15-minute boiling water canning process for this lemon curd ensures a safe, shelf-stable product.

This study produced a research-based home canning recommendation for a highly sought-after, distinct product category.