

THE CENTER FOR FOOD SAFETY IN CHILD NUTRITION PROGRAMS

Best Practices for Maintaining the Temperature of Milk Served Outside of the Cafeteria

Tracee Watkins, MBA, Michelle Alcorn, MS, Kerri Cole, Paola Paez, PhD, Kevin R. Roberts, PhD, Kevin Sauer, PhD, RDN, LD

Introduction

- Alternative service models, like Breakfast in the Classroom and Second Chance Breakfast, increase participation in the USDA School Breakfast Program and may require transportation of milk outside of the cafeteria (Hewins & Burke, 2014).
- Milk service procedures vary in schools, often by milk packaging (carton, bottle, pouch), service container type (sheet pan, milk crate, cooler, steam table pan), and use of ice (loose ice, ice sheet, no ice) (Cole, Watkins, Alcorn, & Paez, 2016).
- Failure to keep the milk below 41°F during the transportation and service procedures could result in milk quality reduction or an increased food safety risk (Allen & Joseph, 1985; Ravanis & Lewis, 1995).

Purpose

- Determine how the internal temperature of milk is impacted by milk packaging and commonly used holding procedures in school nutrition settings.
- Determine best practices to maintain milk temperatures during service outside of the cafeteria.

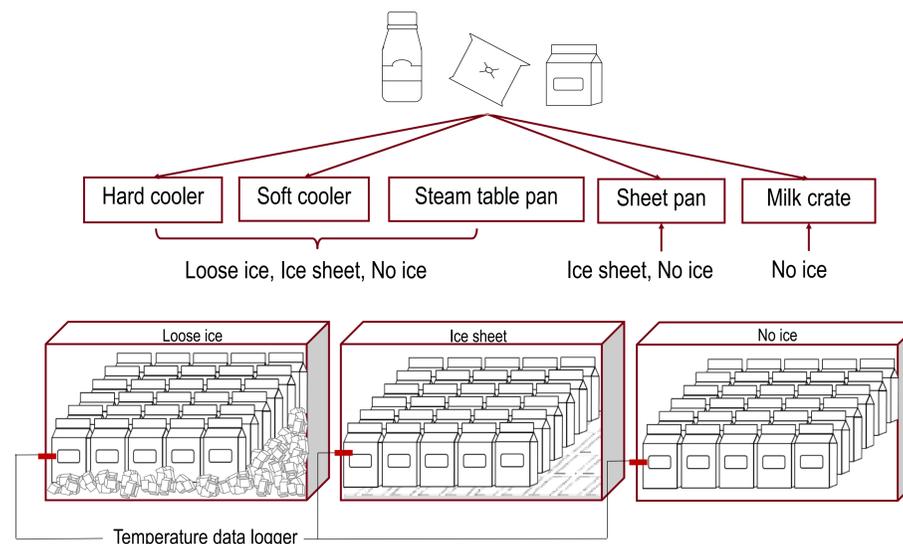


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Methods

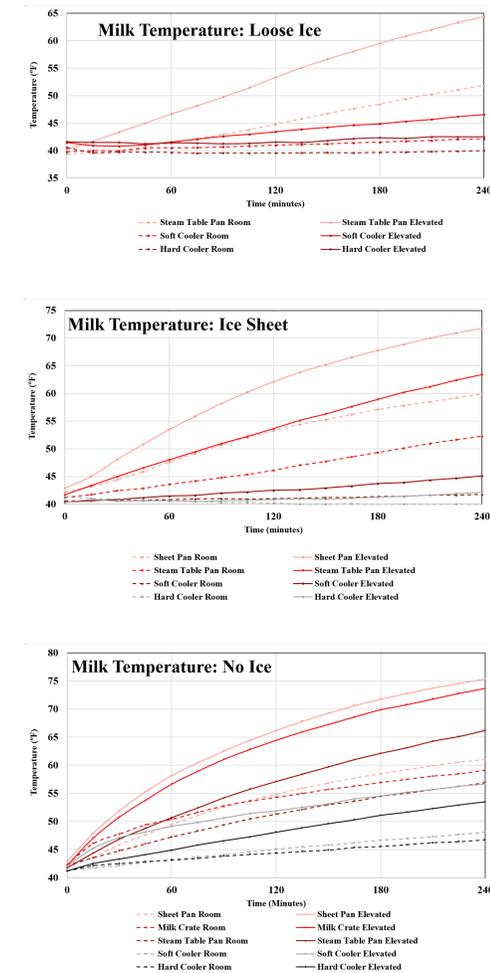
- Survey results with 32 school nutrition directors nationwide indicated:
 - Milk temperature checked when returned to cafeteria (n=14)
 - Unopened milk restocked for later service (n=20)
- Common milk holding conditions were simulated based on the survey results.
 - Milk transported in hard or soft coolers (n=25)
 - Loose ice used to hold milk (n=3)
- Thirty single servings of each milk packaging type were placed into five types of containers with 32 oz. of loose ice, ice sheets, or without any ice.



- Packed containers were exposed to room (74°F) and elevated (89°F) ambient temperatures for a total of 72 data groups.
- Data loggers tracked milk temperatures at five minute intervals for four hours.
- Temperature data were analyzed using SPSS MIXED procedure, 3 repetitions.

Results

- Hard and soft coolers maintained the lowest temperatures.
- Milk temperature varied by container and cooling method ($p < 0.05$), but not by milk packaging or ambient temperature.
- Sheet pans were least effective ($p < 0.05$) at maintaining low temperatures.
- Loose ice was the most effective at maintaining low temperatures ($p < 0.05$).



Applications

- Because most (n=20) unused milk is restocked, effectively packing milk for service outside the cafeteria is important for quality and safety.
- Best practices to maintain low temperatures while serving milk outside of the classroom include:
 - Packing milk in hard or soft coolers
 - Using loose ice in coolers with milk
 - Monitor temperatures of milk that is restocked for future service