

Influence of time-temperature interactions on physicochemical attributes and microbiological safety of traditional buffalo meat dishes

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The present work aimed to study the time-temperature interaction effect on the physicochemical characteristics and microbiological safety parameters of buffalo meat dishes at the household level. Two minced meat dishes, Keema, and meatballs, and one meat cubes dish, stewed meat, prepared according to the authentic traditional recipe. The microbiological parameters (total aerobic count, total coliform count, *Staphylococcus aureus* count, lactic acid bacteria) and physicochemical (pH, titratable acidity, water activity) were studied. Results indicated that all meat dishes meet the international reference time-temperature duration for ensuring food safety (65 °C for 15 min). Initially, raw meat had a total aerobic count of 5.12 ± 0.16 (log₁₀ cfu/g), whereas, after cooking, the value was reduced considerably, even though the higher count was detected in Keema at 1.93 ± 0.15 (log₁₀ cfu/g) while lower was in meatballs 1.25 ± 0.18 (log₁₀ cfu/g). Likewise, a higher total coliform count was detected in Keema dish 0.67 ± 0.22 (log₁₀ cfu/g), while the lowest was found in stewed meat dish 0.37 ± 0.24 (log₁₀ cfu/g). Lactic acid bacteria, yeast, and *Staph. aureus* count was not detected in cooked buffalo meat dishes. Results regarding pH, water activity (aw), and titratable acidity were in the range of 5.53 ± 0.07 to 5.69 ± 0.09 , 0.88 ± 0.08 to 0.94 ± 0.27 , and 0.69 ± 0.11 to $0.78 \pm 0.19\%$, respectively. Meatballs have higher pH and water activity values, while meat cubes have higher titratable acidity. This study suggests that adopting hygienic practices and avoiding cross-contamination could prolong the shelf life of dishes.