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# Comparison of Neutralizing Buffer and Sampling Sponges on Hot Beef Carcasses

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## Objectives

This study was conducted to investigate the capabilities of 2 sampling sponge types in neutralizing samples and recovering bacterial cells obtained from beef carcasses following antimicrobial interventions. A cellulose sponge hydrated with Dey-Engley (D/E) and a polyurethane sponge hydrated with High Capacity (Hi-Cap) neutralizing buffer were compared.

## Materials and Methods

Samples were evaluated on pH and bacterial cell recovery to determine neutralizing capabilities. Sampling was conducted over 2 d at a commercial beef slaughter plant. For pH analysis, ($n$ = 30) D/E and Hi-Cap sponges were used to swab beef carcasses following antimicrobial acid treatment. The pH samples were obtained by swabbing on the allotted area for a total of 15 samples per sponge type, per day. Cell recovery was tested with over 2 d ($n$ = 70, 35 of each sample type a day). Both pH and cell recovery samples were obtained by swabbing a 100 $cm^2$ area (10 × 10 cm). To standardize samples, 10 horizontal passes were taken then the sponge was flipped and 10 vertical passes were made. Samples were transported in an insulated cooler to the Colorado State University Food Safety Laboratory for immediate plating and analysis. The pH samples were homogenized using a Stomacher Paddle Blender. A pH probe was then used to obtain pH readings for the neutralized solution in each sample. Prior to microbiological analysis, Butterfield's diluent was added to the sampling bags for a total of 20 mL diluent, including each of the tested buffers, and subsequently homogenized. Samples were then serially diluted 10-fold in 0.1% buffered peptone water and surface plated on tryptic soy agar (TSA) to enumerate total plate counts. Plates were incubated for 72 h at 25°C, then counted. All plate counts were log converted and differences were assessed using the PROC Mixed Procedures in SAS version 9.4 (SAS Inst. Inc., Cary, NC); difference were reported at $P < 0.05$.

## Results

D/E neutralized samples to an average pH of 6.83 and Hi-Cap to an average of 5.90. Though D/E did have a statistically ($P < 0.05$) higher neutralizing ability, both sponge types had a neutralizing effect raising the pH above 5.4–5.8, the average pH of beef carcasses. Furthermore, there was no difference ($P = 0.34$) in cell recovery between D/E and Hi-Cap buffered sponges.

## Conclusion

Both D/E and Hi-Cap had similar cell recovery and successful neutralization pH above the average pH of a beef carcass. Either sponge is appropriate for plant testing of acidic antimicrobial interventions and subsequent transport to an off-site laboratory for further processing and analysis.

 