Effects of Beefxide® treatment of beef trim on ground beef properties

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Introduction & Objectives - Beefxide® (Bx) is a blend of lactic and citric acids developed as an intervention treatment on beef trim, to reduce microbial load. Our objective was to determine the effect of Beefxide® treatment and storage time on ground beef properties and consumer acceptability compared to controls.

Procedures – Samples were prepared in the facilities of Stone Meats (Ogden, Utah). Control (C) and Bx-treated ground beef samples (85:15 lean/fat ratio; 680 g/loaf) were placed in Styrofoam trays, wrapped in oxygen-permeable PVC film. Loaves (3/bag) were placed in high oxygen master bags (80% O₂, 20% CO₂), and delivered within 2 hr to USU for testing. Samples were held in the USU Meat Lab cooler at 1°C or less during the 14 day storage period.

Master bag CO₂ and O₂ concentrations, meat color, thiobarbituric acid (TBA values), aerobic plate count (APC), E. coli and coliform counts were measured on days 0, 3, 5, 8, 11, and 14. TBA method of Buege & Aust was used (1). Microbial tests used 3M Petrifilm™ plates (2). The experiment was replicated 3 times (3 separate 14-day trials).

Cooked patty sensory acceptability (>120 panelists/session) was evaluated on storage days 0, 5, and 10 of trial 2.

Results

- % O₂ in master bags declined (76% to 52%; P<0.05) with storage; there was no difference between treatments.
- Ground beef loaves from Bx-treated trim were darker (P<0.05) than controls (pooled mean L* 42.08 vs 43.27), and less brown (b* 17.38 vs 17.95, respectively; Fig. 1).
- TBA values were lower (P<0.05) in Bx-treated samples (1.17) than controls (1.37; Fig. 2).
- Bx-treated loaves had an overall reduction in APC by 0.5 log, and on storage days 8 and 11 had 0.75 and 0.56 log reduction of APC, compared to control samples (Fig. 3 & 4).
- E. coli and coliform counts were also reduced (P<0.05) by Bx-treatment (Fig 5-8).
- After 10 d at 1°C, panel flavor and acceptability scores were higher (P<0.05) for Bx-treated patties than controls, with mean overall acceptability scores of 6.3 and 5.7 respectively; 6.0 = like slightly (Fig. 9-10).

Conclusions

Bx treatment of beef trim was beneficial to improve flavor and color at longer storage time (10 days), and reduce bacterial load and lipid oxidation of ground beef loaves.

References