

## 2018 Reciprocal Meat Conference – Undergraduate Research Competition

Meat and Muscle Biology™



## Pomegranate Rind Extract Limits Ground Beef Color Discoloration and Lipid Oxidation

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### Objectives

Meat color has a substantial influence in purchasing decisions as consumers associate color with freshness. Discoloration of beef at retail has resulted in a loss of about \$1 billion annually. Many additives, including antioxidants, have been utilized in products such as ground beef to increase their shelf life. Therefore, the overall goal of this study was to evaluate the effects of pomegranate rind extract on ground beef color stability and lipid oxidation.

### Materials and Methods

The pomegranate rind extract was prepared by mixing dried ground rind powder in boiling water. The mixture was centrifuged to extract the pomegranate rind extract. Course ground beef (80% lean) was mixed with 0, 1, and 1.5% of pomegranate rind extract. The pomegranate rind extract was included into the sample, reground and then formed into a 100 g patty, utilizing the adjust-a-burger patty press. Patties from each treatment were then assigned to 4 different packaging types: PVC, Hi-Ox, CO, and vacuum. Patties packaged in CO and vacuum bags were stored in dark storage 5 d prior to display. The vacuum patties were removed from the bags, packaged in PVC and allowed 1 h to bloom prior to evaluation. Patties packaged in PVC, CO and vacuum were on display for 3 d while patties packaged in Hi-Ox were left on display for 5 d. Patties were evaluated each day by trained color panelists (6 members). Patties were evaluated for display color and surface discoloration. Thiobarbituric acid values were used to indicate lipid oxidation. Lipid oxidation was measured on the control patties on d 0 and then evaluated

on all treatments at the end of their assigned display time. The experiments were replicated 6 times ( $n = 6$ ). The data were analyzed using the Mixed Procedure of SAS, and considered significant at a level of  $P < 0.05$ .

### Results

Display color was brighter cherry red for samples with pomegranate solution compared to the control samples ( $P < 0.05$ ). Similarly, surface discoloration decreased for patties with the addition of pomegranate solution compared to the controls ( $P < 0.05$ ). Patties packaged in Hi-Ox maintained color stability longer ( $P < 0.05$ ) than patties packaged in PVC, CO, and vacuum. There were decreases ( $P < 0.05$ ) in the lipid oxidation levels of the patties enhanced with 1.0 and 1.5% pomegranate solution compared to the control patties, for all packaging types. Samples enhanced with 1.5% pomegranate solution in vacuum and PVC packaging had 50% less lipid oxidation after display than the control. Similarly, samples with 1.5% pomegranate solution packaged in CO had 65% and Hi-Ox had 75% less lipid oxidation compared to the controls.

### Conclusion

The use of pomegranate as an antioxidant in ground beef patties had major positive impacts on both color stability and overall freshness (lipid oxidation). The addition of pomegranate will increase the shelf life of ground beef and ultimately decrease the economical loss that results from discoloration of meat.