Determining a solution for your challenge.

In red meats, the combination of heat and lactic acid can denature and oxidize heme pigments in blood, causing a browning of the head or carcass surface that should be trimmed prior to sale. In poultry, harvest interventions can impart a yellow color on exposed fat which devalues the product for retail display. PURAC® CL 21/80 is formulated to buffer against these effects with a blend of naturally fermented citric and lactic acid. Approved at up to 2.5% concentration (by weight), the product does not require or benefit from heating and never achieves the pH level of 5% lactic acid solutions.
Pathogen reduction under simulated industry conditions

In research conducted by Texas Tech University, the efficacy of PURAC CL 21/80 was measured with freshly harvested, pre-rigor beef carcass surface samples (Figure 1 and Figure 2). Inoculums of *Salmonella* and a cocktail of 7 serogroups (O157:H7, O26, O111, O145, O103 and O121) of *E. coli* were separately prepared and applied to the carcass samples to achieve a target population of $10^5$ cm$^{-2}$. After 30 minutes to allow for bacterial attachment, the samples were sprayed with ambient temperature water or a 2.5% solution of PURAC CL 21/80 at either 77°F or 125°F. Surface swabs were collected and analyzed immediately after treatment and after 24 and 48 hours of chilled storage.

Treatment with PURAC CL 21/80 resulted in numerically greater reductions in *E. coli* and *Salmonella*. Treatment differences were not statistically significant. Differences in efficacy between the 77°F and 125°F solutions of PURAC CL 21/80 were variable with the greatest overall reductions in *E. coli* and *Salmonella* observed for the 77°F PURAC CL 21/80 after 48 hours of storage.

Color and pH effects of PURAC CL 21/80

A separate set of samples was prepared and treated with water and PURAC CL 21/80 as described above but with no pathogen inoculation. pH and color measurements were taken at 0, 24 and 48 hours post-treatment (Figure 3). These data demonstrated that PURAC CL 21/80 treatment had no significant effect on meat surface pH or color at any time interval.

Regulatory

PURAC CL 21/80 is approved by the Food Safety and Inspection Services (FSIS) for use as a part of a HACCP plan to reduce pathogenic bacteria on meat and poultry carcasses and parts. It is Generally Recognized as Safe (GRAS) by the Food and drug administration (FDA). FSIS approvals allows for the use of up to 2.5% PURAC CL 21/80 by weight. Beef treatment is regulated as a processing aid and consequently does not require any labeling.