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Project Title: Carcass Washing: First Line of Defense on Beef Pathogen Intervention Strategies

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Objective: Validate the effectiveness of the formulated alkaline wash HOCW EDGE as a carcass wash intervention for the effective removal of debris from beef hides and the reduction of at least 99% (2 Logs) of the hide's microbial load.

Experimental Design & Analysis:

HOCW EDGE was applied to whole beef hides. 40 hides were treated with HOCW EDGE at a pH of 12 – 13 and alkalinity of 0.2 – 0.6% as NaOH. Samples of the chuck area side of random animals were taken using cellulose sponges with buffered peptone (Word BioProducts) on an area of approximately 10 x 10 cm². Samples before the wash cabinet were taken from the upper chuck area, while samples after the wash cabinet were taken from the area directly below the pre-wash sample.

Swabs were analyzed for aerobic plate count (APC) by most probable number (MPN) using tryptic soy broth as the growth media, and for total coliforms using 3M enterobacteriaceae petrifilm. Log reduction was calculated for each animal. In addition, the average and standard deviation in log reduction for the animals within a lot as well as for the entire trial was also calculated. Values were evaluated using a standard student T-test. All differences are reported at a significance level of 0.01.

Key Results:

After treatment with HOCE EDGE, APC showed an average logarithmic reduction of 2.8 ± 0.85 logs MPN/100cm² reducing the total microbial population from 1.6×10^8 MPN/100cm² to 2.5×10^5 MPN/100cm². Similarly, the coliform population showed an average log reduction of 2.5 ± 0.16 logs CFU/100cm², reducing the coliform population from 2.5×10^4 CFU/100 cm² to 7.9×10^1 CFU/cm².

Thus HOCW Edge provides efficient microbial removal from hides, including that of pathogenic populations. Such efficient removal was achieved without affecting the integrity of the hide.

Industry Application:

Hides are a primary source of contamination in meat processing plants. Effective microbial removal on hides has a direct impact on food safety. Transfer of pathogens from the hide to interior surfaces typically during slaughtering and dressing. HOCW EDGE is an effective intervention on carcasses prior to dressing that does not affect hide quality. Reports from current users of HOCW Edge average 99% lower microbial counts on hides washed with this product.

The product tested in this study can be applied using conventional hide -wash cabinets and it is mild enough to not require additional safety precautions or cabinet modifications. Early interventions, such as effective hide-on washes, can yield cumulative effects as each step taken to reduce the presence of pathogens subsequently reduces the demands associated with further steps, thus incrementally reducing risk.

Reducing pathogens in the process environment is a key concern today for beef processors. While there is an additional cost incurred in the use of HOCW Edge when compared with hot water, the value of reducing and/or eliminating a major source of contamination from the plant environment should be taken into consideration when making determinations for the food safety program.

TABLE 1. Geometric mean of aerobic plate count (APC) and coliform count from randomized cattle hides before and after HOCW EDGE treatment.

	APC (n=50) MPN/100cm ²	Coliform (n=40) CFU/100cm ²
Before HOCW EDGE treatment	1.6×10^8 ^(A)	2.5×10^4 ^(A)
After HOCW EDGE treatment	2.5×10^5 ^(B)	7.9×10^1 ^(B)
Average LR \pm StDev	2.8 ± 0.85	2.5 ± 0.16
p (T-test)	1×10^{-27}	1×10^{-23}

^{(A), (B)} Within each column, means with different superscripts are statistically different ($p < 0.01$).