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Project Title: **In Plant Validation of High and Low pH Centron™ (AFTEC 3000) for use as a Whole Carcass Antimicrobial Intervention**

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Objective: The objective of this study was to validate the effectiveness of applying Centron™ (AFTEC 3000) mixed at high (1.30) and low (1.05) pH, as a whole carcass intervention against natural microflora on beef carcasses.

Experimental Design & Analysis:

Centron™ was applied to whole beef carcass sides at two pH levels, 1.30 and 1.05. Forty sides (n = 40) were treated with the high pH and 39 sides (n = 39) were treated with the low pH. Samples were taken before the cabinet and after the spray cabinet using a D/E sampling sponges by swabbing a 10x10 cm^2 square area on the on the extrinsic side. Bacterial populations were expressed as least-squares means of log CFU/cm^2. This experiment was conducted as a complete randomized design. Data were evaluated using the MIXED Procedure of SAS. All differences are reported at a significance level of alpha = 0.05.

Key Results:

For APC, treatment with high pH Centron™ reduced counts ($P < 0.0001$) from 2.00 log CFU/cm^2 to <0.96 log CFU/cm^2. Of the samples obtained from the after Centron™ high pH treatment, 2.5% of APC counts were below detection limit (BDL). For the low pH Centron™ treatment, counts were reduced (P <0.0001) from 2.32 log CFU/cm^2 to 1.22 log CFU/cm^2. When APC following treatment were adjusted to a common initial plate count via analysis of covariance, 1.16 and 1.02 log CFU/cm^2 of APC remained on samples treated with Centron™ at the lower and higher pH, respectively (standard error = 0.1543). These two adjusted mean values for remaining counts did not differ (P = 0.3760).

Industry Application:

Centron™, both high and low pH, reduced populations of natural microflora on beef carcasses. Both high and low pH Centron™ showed greater than a 1 log reduction, making both treatments microbiologically significant. This study showed that the application of Centron™ at a high and low pH, or any level in between, was an effective antimicrobial intervention against natural microflora on beef carcasses.

Table 1. Least-squares means of aerobic plate counts (APC) (log CFU/cm^2) for samples from beef carcasses before and after Centron™ spray cabinet.

	APC 1.30 pH (n = 40)		APC 1.05 pH (n = 39)	
	log CFU/cm^2	%BDL[2]	log CFU/cm^2	%BDL[1]
Before Trt	2.00[a]	0	2.32[a]	0
After Trt	<0.96[b]	2.5	1.22[b]	0
SEM	0.1802		0.1276	

[1] BDL: below detection limit (-0.6 log CFU/cm^2).
[a, b] Means with different superscripts within a column are different ($P < 0.05$).