



The University of Georgia

Cooperative Extension Service

College of Agricultural and Environmental Sciences / Athens, Georgia 30602-4356

MAY 2004



PROCESSING TIP . . .

THE USE OF ALKALINE WATER TO REMOVE FECAL MATERIAL FROM CHICKEN CARCASSES DURING PROCESSING

Fecal contamination of broiler carcasses is strictly regulated by the USDA-Food Safety Inspection Service (FSIS). Under current inspection rules, FSIS requires the removal of all visible fecal contamination by trimming or washing the carcass, either on or off the processing line. These carcasses are then subject to reinspection and must meet finished product standards applied by plant employees and verified by FSIS inspectors before the carcasses enter the chiller. In some facilities, when inspectors have observed very small amounts of ingesta or fecal material on the surface of carcasses, the plants were shutdown, the chillers were drained, and each of the 15,000 carcasses in the chiller had to be manually rewashed and disinfected. Because the USDA has a “zero tolerance” rule in effect, the category for “feces” has been removed from the list of defects in the poultry finished product standards. This means that no fecal contamination is allowed.

Contamination of carcasses with feces may occur in two ways. Fecal material may be caked on the breast skin of the chicken coming into the plant and remain on the skin throughout the scalding and picking processes. This problem is especially prevalent during the summer, when humidity is high and growers must spray or mist live chickens with water in the growout houses. Removal of this type of contamination is difficult and must be accomplished using pre-scald brushes and agitation and hot water within the scalding. Companies have experimented with various chemicals applied during scalding to enhance removal. Sodium hydroxide is the most commonly used chemical and has met with mixed results, depending on how it is used. Theoretically, it should be excellent if used correctly, because it will saponify (make soap of) the fats in the skin of the chicken, essentially forming a soapy film. This helps to wash the fecal material from the skin.

Another way that carcasses can become contaminated is when fecal material is released from the intestinal tract onto the surface of the carcass during evisceration and remains on the skin after inside/outside bird washing and final bird washing. Electrolyzed, alkaline (EB) water (dilute solution of sodium hydroxide) has been shown to be effective for allowing incidental contamination with cecal material (much more difficult to remove than fecal material) to be removed later in the

PUTTING KNOWLEDGE TO WORK

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process. Drs. Yen-Con Hung and Chyer Kim conducted a study (unpublished data) to determine if EB water was able to effectively saponify the skin of a chicken carcass post-pick, making it easier to remove cecal material later on in the process. These researchers applied tap water, trisodium phosphate (TSP), or EB water after picking, then applied cecal material to the dorsal skin of the carcass, sprayed the carcasses with tap water, TSP or EB water to determine which combination was most effective for enhancing removal of the cecal material. The results are presented in Table 1.

Table 1. The effect of various washing treatments on the removal of cecal material on the dorsal area of chicken carcasses.

Treatment before applying cecal material	Treatment after applying cecal material	Cecal material score before washing	Cecal material score after washing	Reduction
	Tap water	4.43	2.03	2.40
Tap water	Tap water	4.00	1.60	2.47
	Electrolyzed Alkaline water	4.03	2.28	1.75
Electrolyzed Alkaline water	Electrolyzed Alkaline water	3.77	1.36	2.42
	Trisodium Phosphate	3.97	2.03	1.93
Trisodium Phosphate	Trisodium Phosphate	4.08	1.48	2.60
	Electrolyzed Alkaline water	4.13	1.60	2.53
Tap water	Trisodium Phosphate	3.98	1.62	2.37

The most effective treatments are designated by bold typeface. Drs. Hung and Kim found that pre-treatment with EB water or TSP and post-treatment spraying with EB or TSP were very effective for removing cecal material from carcass skin. Although, in this study, pre- and post-treatment with tap water performed very well, it is believed that scalding in EB water would greatly enhance the release of cecal material during the final rinse process. Moreover, although TSP performed well, it is becoming more difficult to use this chemical because of concerns over discharge of large amounts of phosphate to the wastestream. Use of EB water for scalding, post-pick spraying and final rinse spraying may be an effective means of removing caked on or incidental fecal contamination during processing.


Scott M. Russell

Extension Poultry Scientist

Extension County Coordinator/Agent

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