

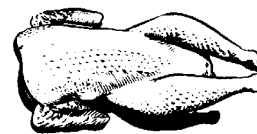


The University of Georgia

**Cooperative Extension Service**

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

SEPTEMBER 2003



## **PROCESSING TIP . . .**

### **WATER REUSE CONSIDERATIONS**

The USDA-Food Safety Inspection Service (FSIS) recently changed the regulations regarding the use of water in poultry processing facilities. Previous regulations required that water used in a particular process, such as washing or chilling, be disinfected (free from pathogenic bacteria) prior to reusing the water for equipment rinsing or product contact further upstream in the process. However, new regulations allow for the water to be used upstream without any stipulations regarding the presence of pathogenic bacteria in the water prior to reusing.

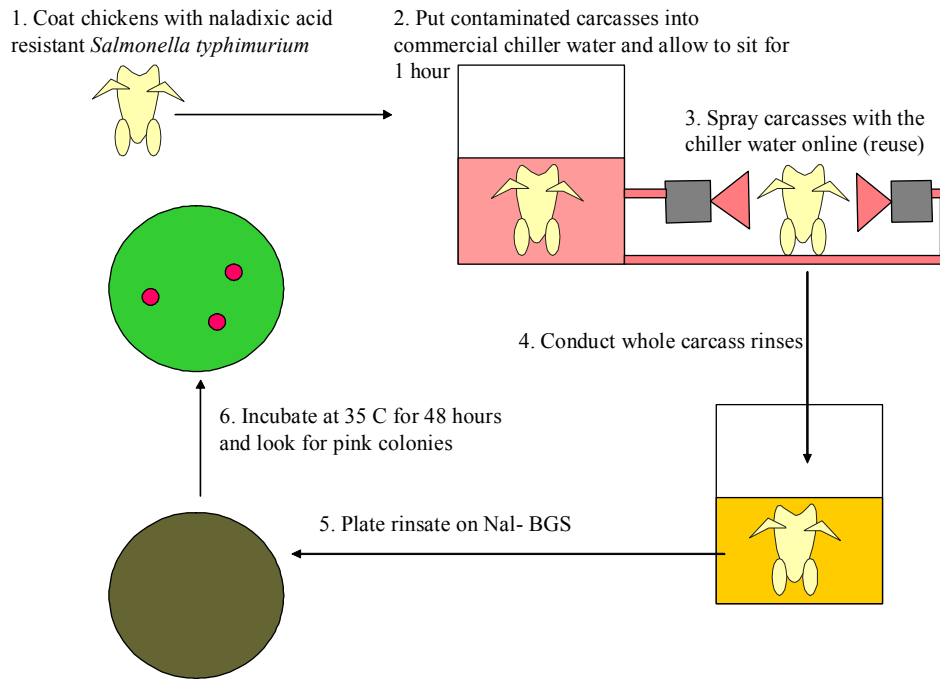
We wanted to determine if the new regulations are sufficient to prevent cross-contamination of pathogenic bacteria from carcasses in the chiller to carcasses upstream if the water that is reused is not fully decontaminated. We collected 90 chickens from a commercial processing facility prior to the automated reprocessing system and after the inside/outside bird washer. These carcasses were transported to the Poultry Research Center (PRC) laboratory at The University of Georgia. Ten of the carcasses were coated with actively multiplying naladixic acid resistant (Nal-) *Salmonella typhimurium*. The carcasses were allowed to remain at room temperature for 30 minutes to allow the *Salmonella* sufficient time to attach to the carcass skin. We also collected 15 gallons of chiller water from a commercial processing facility. The chiller water contained 39 ppm of total chlorine when evaluated at the PRC. The chiller water was kept cold and was placed into a sanitized 44-gallon trash container (to mimic a chiller). The carcasses coated with *Salmonella* were placed into the chiller water and allowed to remain there for 1 hour (similar to a commercial chilling operation). The water was then pumped into a commercial type spraying system that recirculated the chiller water from the trough below the spray system through the spray nozzles.

Twenty carcasses were hung on the processing line and sprayed with the chiller water. This was done 4 times, such that all 80 carcasses were sprayed. After spraying, each carcass was rinsed using the whole carcass rinse procedure and the rinsate was plated onto brilliant green sulfa (BGS) agar plates containing 200 ppm of naladixic acid. These plates were incubated at 35°C for 48 hours. BGS plates are green if *E. coli* or other coliforms grow on them; however, if

### **PUTTING KNOWLEDGE TO WORK**

The University of Georgia and Ft. Valley State College, the U.S. Department of Agriculture and counties of the state cooperating.  
The Cooperative Extension service officers educational programs, assistance and materials to all people without regard to race, color, national origin, age, sex or disability  
An equal opportunity/affirmative action organization committed to a diverse work force..

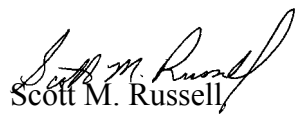
*Salmonella* grow on them, the medium turns pink, due to fermentation of the sugars in the medium (see Figure 1 for drawing of research protocol).



**Figure 1. Drawing of research protocol.**

The results indicated that, out of the 80 chicken carcasses evaluated, the marker organism (*Salmonella typhimurium*) could be recovered from 38 (42 %) of the carcasses after spraying with recycled chiller water. Hence, from only 10 contaminated carcasses, 38 became contaminated upstream of the area where the water was collected for reuse. The *Salmonella* were easily observed on the BGS plates using this method and were not *Salmonella* that might have been natural contaminants of the carcass, because we used a specific marker strain that was naladixic acid resistant. Because the BGS medium contained 200 ppm naladixic acid, only the *Salmonella* we used in the study were able to multiply on the BGS plates.

The results from this study indicate that there is a clear danger to using process waters that have not been thoroughly disinfected because pathogenic bacteria, such as *Salmonella*, may be transmitted from contaminated carcasses in the chiller to uncontaminated carcasses upstream in the process. In fact, the number of *Salmonella* contaminated carcasses went from 10 to 38 using a model scale of this type of water reuse. From these results, one would conclude that reusing water upstream should be done with caution and reuse water should be decontaminated prior to use upstream.

  
Scott M. Russell  
Extension Poultry Scientist

County Extension Coordinator/Agent