

**Protocol for evaluating retained water
in the following single ingredient poultry product: Young Chicken Carcasses**

Note: The following is an example protocol and should not be used verbatim. Because each establishment is unique, each establishment should design their protocol to reflect the individual characteristics of their operations.

1.0 Purpose Statement

1.1 The purpose of this protocol is to determine the amount of water absorption and retention in young chicken carcasses that is unavoidable while achieving the regulatory pathogen reduction performance standard for Salmonella (as set forth in the PR/HACCP regulations – 9 CFR 381.94(b) and the time/temperature requirements set forth in 9 CFR 381.66.

2.0 Type of washing and chilling system

2.1 The facility evisceration lines utilize a series of two pre-chiller external sprays, one inside-outside bird washer, immediately followed by the trisodium phosphate antimicrobial system. This is followed by a 60 second drip period prior to entering the cold-water chiller. The chiller is a Stork Gamco model RS-6 which uses a drag-through type mechanism to transport the birds through the chiller. It has a prechiller section, which receives water from the main body of the chiller. Chilled water from the fresh and recirculated sources is added.

3.0 Configuration and modification of the chiller system components

3.1 The prechiller length is 50 feet with a dwell time of 20 minutes. The main chiller length is 100 feet with a dwell time of 45 minutes. The number of evisceration lines feeding into the chiller system is 2.

4.0 Special features in the chilling process:

4.1 The chiller uses chlorine as an antimicrobial at 20 PPM. After exiting the chiller system the birds are placed on a drip line that is 100 feet in length and drains the whole carcasses for 5 minutes before reaching whole carcass packaging.

5.0 Variable factors that affect water absorption and retention

5.1 The scalding temperature used is approximately 138° F. The birds are in the chiller system for 65 minutes. The water temperature of the pre-chiller is 65 degrees Fahrenheit. The water temperature in the main chiller is 36 degrees Fahrenheit. The chiller uses air type agitation.

6.0 Standards to be met by the chilling system:

6.1 The current FSIS *Salmonella* pathogen reduction performance standards, as set forth in the PR/HACCP final rule, will be met.

7.0 Testing methodology

7.1 Water absorption and retention

7.1.1 Samples will be collected immediately prior to the two pre-chiller rinses on the evisceration line.

7.1.1.1. *(insert number) random A-grade carcasses will be tagged and weighed in *(insert number) groups of *(insert number) carcasses. The *(insert number) groups will be distributed evenly throughout the production period (beginning, middle, and end) with the production period being defined as sanitation to sanitation.

- 7.1.2 Samples will be collected from carcasses at point of packaging.
 - 7.1.2.1 The tagged carcasses from 7.1.1.1 will be weighed immediately prior to packaging.
 - 7.1.2.2 These postchiller weights will be compared to the pre-chiller weights to determine the retained water gained using a mathematical difference calculation (prepackaging weight minus pre-chiller weight) as a percentage.

7.2 Pathogen reduction measurement

- 7.2.1 *(insert number) groups of *(insert number) carcasses will be randomly selected post-chiller from the same flocks as those tested in Section 7.1. The *(insert number) groups will be distributed evenly throughout the production period (beginning, middle, and end) with the production period being defined as sanitation to sanitation.

- 7.2.1.1 The percent salmonella positive rate will be determined using the post-chiller carcass rinse salmonella performance standard methodology.

7.3 Evaluation of chiller factors

7.3.1 Water temperature

- 7.3.1.1 Two chiller settings will be evaluated.

- 7.3.1.1.1 Temperature setting of 36°F

- 7.3.1.1.2 Temperature setting of 39°F

7.3.2 Air agitation

- 7.3.2.1 Two chiller settings will be evaluated.

- 7.3.2.1.1 Air agitation setting of 80 RPM

- 7.3.2.1.2 Air agitation setting of 40 RPM

7.3.3 Study design

- 7.3.3.1 A two-by-two factorial table will be used to evaluate the effect of these chiller settings on the percent moisture retention (Section 7.1) and on the pathogen reduction measurements (Section 7.2).

- 7.3.3.2 Each of the four chiller setting combinations will be evaluated for three processing periods (defined as sanitation to sanitation). Each processing period will be considered a replicate.

8.0 Evaluation and Reporting of Data

- 8.1 The results achieved from the three replicates per chiller setting combination will be averaged and reported as the final result for each chiller setting combination.

- 8.1.1 Carcass weight differences will be determined using a mathematical difference calculation (prepackaging weight minus pre-chiller weight) for each carcass group resulting in recorded weight difference results. The weight difference obtained per carcass group will be divided by the pre-chiller wash weight per carcass group to determine the % moisture retention prepackaging per group. The results will be averaged to obtain the estimated average % moisture retention at point of packaging.

- 8.1.2 The salmonella data will be reported as the number of positive samples/number of samples tested x 100 (% positive).

9.0 Explanation of how the conclusions will be determined.

- 9.1 Conclusions will be determined by comparing the baseline pathogen reduction levels achieved pre-protocol implementation with the post-protocol implementation pathogen reduction results. This comparison will be evaluated according to the specifications detailed in section 6.1.

9.2 The amount of moisture retention that is unavoidable to achieve the above food safety criteria will be reported.

(*) Each establishment should insert statistically significant and verifiable information that reflects their unique operations.