

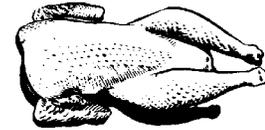


*The University of Georgia*

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## **PROCESSING TIP...**

### **A COMMON MISTAKE WHEN EVALUATING POULTRY PRODUCTS AND SURFACES FOR BACTERIA**

Poultry companies sporadically battle premature spoilage of their products. Freshly slaughtered and processed poultry may have a shelf-life of between 2 and 14 days depending upon holding temperature, number of spoilage bacteria on the product immediately after processing, or the part of the chicken that is being evaluated (i.e. breast, thigh, or wing). The purpose of this article is to address the one variable that seems to cause the poultry industry the most difficulty—the initial number of spoilage bacteria on products. The reason why this variable is more difficult to deal with than the other factors, is that most people in the industry are aware of the fact that the colder the product holding temperature, the longer it will last. In addition, industry professionals are familiar with the fact that breast meat has a longer shelf-life than thighs or wings. However, when it comes to identifying the initial number of spoilage bacteria on products, there is much confusion.

Most poultry microbiologists and quality assurance personnel use the aerobic plate count (APC) as a means of determining how well their sanitation procedures are working or how well their process is in control. For example, high APC on equipment swabs immediately after sanitation, indicates that the sanitation crew did not clean the equipment well. A high APC on a poultry carcass may indicate fecal contamination, inadequate amounts of fresh water input into the scalding or chiller, or inadequate use of chlorine in rinse or chiller waters. The APC method has been used for decades and is very familiar to almost all poultry professionals.

The APC method has one major flaw. This flaw can be identified by examining the way in which the method is conducted and by providing an example of its failure. To conduct an APC, the technician collects a sample, plates the sample onto nutrient agar, and allows the bacteria that were obtained in the sample to multiply and produce a visible colony. These colonies are then counted. The number of colonies on the plate can be evaluated to determine if the surface or product was contaminated. The problem with the APC method is that plates are incubated at a temperature of 35 C (95 F). This is near our body temperature and is the temperature which is best to grow bacteria such as *E. coli* and

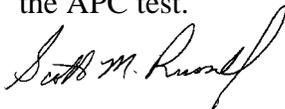
#### **PUTTING KNOWLEDGE TO WORK**

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coliforms. However, bacteria that produce spoilage defects on poultry often do not multiply at 35 C and are not counted using the APC method. Thus, many spoilage bacteria may be found on equipment surfaces and products that have been shown to be clean using an APC test.

For example, a Quality Assurance Director for a poultry company once contacted me concerning premature spoilage of their freshly processed wings. The wings coming from this plant were only able to remain shelf-stable for 2-3 days after slaughter. I asked the individual what his APC's indicated. He conducted a series of APC's and found the number to average about 105 (100,000) colony forming units per milliliter of carcass rinse. While this number was a bit high, it was not sufficient to explain the incredibly fast spoilage the company was experiencing. I had the individual conduct psychrotrophic plate counts (PPC) by plating the carcass rinses and incubating them at 7 C for 10 days. At this low incubation temperature, only the bacteria that produce spoilage on the chicken are able to multiply, thus giving a better indication of the number of spoilage bacteria present on the skin of the chicken. When PPC tests were conducted on the same chicken rinses that showed an APC level of 105, it was found that the PPC counts were 108 (100,000,000) colony forming units per milliliter of rinse! Therefore, when he was conducting APC to indicate how clean his equipment and carcass samples were, he was missing 99.9 % of the bacteria, simply because the wrong incubation temperature was used.

When spoilage problems arise, it is best to test the processing environment and products using PPC. The PPC test will greatly assist processors in detecting the source of contamination as opposed to the APC test.



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*\*\*Consult with your poultry company representative before making management changes.\*\**

“Your local County Extension Agent is a source of more information on this subject.”