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## ***PROCESSING TIP . . .***

### **BREAST MEAT WITH LOW PH CAN CAUSE SPOILAGE PROBLEMS**

The pH of boneless-skinless broiler breast meat is determined by how much glycogen is in the breast muscle prior to slaughter and how rapidly the remaining glycogen is converted to lactic acid after slaughter. An easy way to estimate whether the pH of breast meat is high or low is to look at the color of the meat (Figure 1). If the meat is very dark, it will have a high pH. Likewise, if the breast meat is very light, it will have a low pH.

Fletcher (1995) reported that there was considerable variation of pH among breast meat fillets collected from commercial processing facilities. He also noted that there was a direct correlation between the color of the breast fillets and the pH of the meat. As reported by Northcutt in 1999, broiler breast fillet marination pick-up and retention varies with fillet color and initial fillet pH. Allen et al., 1998, compared marination characteristics and water holding capacity of lighter than normal fillets and darker than normal fillets and found that color of fillets and pH were highly correlated with water holding capacity and marination pick-up/retention. Lighter than normal fillets had an initial pH of 5.8, marination pick-up of 6%, 5.88% drip loss, and 34.4% cook loss. Darker than normal fillets had an initial pH of 6.02, 7.67% marination pick-up, 3.34% drip loss, and 32.9% cook loss. Thus, in the Allen et al. (1998) study, lower pH (5.8) fillets had a 2.5% increase in drip loss (purge) over darker fillets. Cornforth (1994) stated that broiler breast meat with a high pH has a higher water binding capacity than meat with lower pH. Because the low pH breast fillets have a higher drip loss, more purge is observed in tray-packed breasts, even when absorbent pads are used.

The question is, can breast color (ultimate meat pH) affect spoilage in marinated products? The answer is an emphatic, yes! It is believed that low pH causes the proteins in the muscle to spread out, causing the light to reflect differently from the surface, resulting in the light color. Because the muscle proteins are spread out, it is possible for the bacteria to utilize the protein in the meat more effectively. Also, because much more purge occurs in trays of marinated breast meat with low pH, more moisture is available to support growth of spoilage bacteria. Newton and Gill (1981) found that high pH does not cause more rapid spoilage but reduces the lag time (time required for bacteria to begin to multiply) of the spoilage bacteria.

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

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Allen et al. (1997) stated that to resolve this problem, it may be advisable for poultry companies to sort breast fillets by color and route extremely light fillets to high volume outlets. For companies with extreme variability in breast color, sorting may be a viable option.



Figure 1: this photograph shows a dark and light breast fillet collected from a commercial processor.

**References:**

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A handwritten signature in black ink that reads "Scott M. Russell". The signature is written in a cursive style.

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**PUTTING KNOWLEDGE TO WORK**