

## SURVIVAL OF *PSEUDOMONAS FLUORESCENS* ON HOT AND COLD BEEF CARCASS SURFACES

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### 1 **Summary:**

2 Meat products are highly perishable foods, which unless correctly stored, processed and  
3 distributed, spoil quickly and may potentially become unsafe due to microbial growth. Microbial  
4 attachment is the first step in meat contamination. Understanding the mechanisms of attachment  
5 to various surfaces is critical in finding new methods for inactivating or removing attached  
6 microorganisms from those surfaces. This study investigated the influence of the structural  
7 properties of beef carcass surface tissue (fascia), cut lean surface and fat on bacterial adhesion.  
8 Cold and hot beef surfaces were inoculated with a common spoilage organism (*Pseudomonas*  
9 *fluorescens*) and stored at 4°C for 72 h.

### 11 **Methods:**

12 A 5 µl inoculum containing  $\cong 3 \log_{10}$  cfu of *P. fluorescens* (resistant to 10 µg ml<sup>-1</sup> of  
13 nalidixic acid) was inoculated onto the surface of four 5 cm<sup>2</sup> areas on each sample. Samples were  
14 left at room temperature for 30 min to permit cell adherence (Warriner *et al.*, 2001) and then  
15 stored in a refrigerated incubator with a mean temperature of 3.9°C. At time zero (t<sub>0</sub>), an  
16 inoculated and uninoculated 5 cm<sup>2</sup> piece of tissue was excised using a sterile scalpel and tweezers,  
17 transferred into separate sterile stomacher bags containing 10 ml maximum recovery diluent  
18 (MRD) and pulsified for 30 s using a Pulsifier<sup>TM</sup> model PUL 100, Canada. Samples were plated  
19 onto *Pseudomonas* CFC selective agar containing 10 µg ml<sup>-1</sup> of nalidixic acid, incubated at 30°C  
20 for 48 h and examined for typical *Pseudomonas* colonies. Samples were treated in the same  
21 manner at t<sub>24</sub>, t<sub>48</sub> and t<sub>72</sub>.

### 23 **Results & Discussion:**

24 Following inoculation of cold and hot beef cuts/fat with *P. fluorescens*, the main effect  
25 observed was on the fascia and fat i.e significantly higher numbers were recovered from the cold  
26 fascia than from the hot at all times (P<0.05) and from the cold fat than from the hot at t<sub>24</sub>  
27 (P<0.05). These differences are not considered to be due to death of the organism on hot surfaces.  
28 It is most likely that the decreases are related to physical changes in hot surface structures during  
29 chilling, where organisms become unavailable for recovery and counting due to changes in surface  
30 properties of the meat.

### 32 **References:**

33 Warriner, K., Eveleigh, K., Goodman, J., Betts, G., Gonzales, M. and Waites, W. M.  
34 (2001) Attachment of bacteria to beef from steam-pasteurized carcasses. *Journal of Food*  
35 *Protection*, **64**, 493-497.