Attachment of *Listeria monocytogenes* to an Austenitic Stainless Steel with Three Different Types of Surface Finish

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**SUMMARY**

The attachment of *Listeria monocytogenes* to an austenitic stainless steel 304 with three different types of surface finish, i.e., No. 2B (mill), No. 4 (satin), and No. 8 (mirror), has been investigated. The study was based on wettability phenomena, in which the combined properties of a surface, a liquid, and a vapor phase were assumed to play an important role in the attachment of bacteria. A previous study on the effect of accelerated corrosion on bacterial attachment of the same material indeed had shown that wettability plays a key role. In contrast, in the present study the role of wetting phenomena was not clear, indicating that other factors need to be considered. One finding that needs to be explained further is that when the contact angle of the liquid on a surface increased to a certain degree, detachment of bacteria on that surface became more difficult. The results showed that polishing a surface to a certain smoothness may give rise to more adhesion of bacteria. This study also verified that No. 2B (mill) finish is a better choice than the other two for food contact surfaces in limiting the initial attachment of *L. monocytogenes*.

**INTRODUCTION**

Austenitic stainless steels are the material of choice for sanitary design of food processing equipment (19). Austenitic stainless steels are generally inert, easily cleaned and corrosion resistant (11, 13, 14, 20). Surface finish can impact bacterial attachment either directly or via adhesion of food debris and ease of sanitization, so the use of a suitable surface finish can be of great importance to the hygiene of food contact surfaces (2). Thus, the sanitary standard for austenitic stainless steel intended for food contact is that it must have a surface roughness (Ra) of ≤ 1 μm (16). Stainless steel surface finishes are produced by three basic methods (1): (i) rolling between polished or textured rolls, (ii) polishing and/or buffing with abrasive wheels, belts, or pads, and (iii) blasting with abrasive grit or glass beads. In the United States, surface finish No. 4 (satin) is preferable, whereas No. 2B (mill) finish is commonly used for equipment in the food industry in Europe (4). The No. 4 (satin) finish is a polished finish produced by initial grinding with relatively coarse abrasives, finished with abrasives of approximately 120 to 150 grit. The No. 2B (mill) finish is a bright finish, which results from cold rolling followed by annealing and descaling and which receives a final light cold rolled pass on polished rolls. In addition to these two...