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**PREDICTING CLEANING: ESTIMATE FLUCTUATIONS IN SIGNAL FROM ELECTROCHEMICAL WALL SHEAR STRESS MEASUREMENTS USING CFD**

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**ABSTRACT**

Predicting cleaning in components and pipe-lines is of great interest food producers and equipment manufacturers. The manufacturers of equipment has an interest for optimizing designs with respect to hygienic performance and the society of hygienic design can use such information to suggest new guidelines or underline already established guidelines on the design of closed processing equipment. Different hydrodynamic parameters are suggested in the literature and some has been tested to see if the magnitude of these at areas of different cleaning characteristics can explain the difference in cleaning results. Earlier work by Lelièvre et al. has shown that levels of cleaning can be correlated to the level of fluctuations in the signal recorded during measuring wall shear stress with an electrochemical method. This information is potentially of great interest, however, alone the measurements has only limited application since they are performed in discrete points on a surface. To use such information for actual optimization of equipment with respect to cleaning, levels of fluctuation must be estimated locally on the entire surface of a piece of equipment. This paper presents a method to estimate measured fluctuation profile trends using steady-state CFD simulations. The simulations prove the suitability of the methodology in theory, however, more tests are needed on different geometrical shapes in order to judge if it is generally applicable or not. Also the sensitivity of the trend in the CFD estimated fluctuation profiles has to be considered before a definite conclusion can be drawn.