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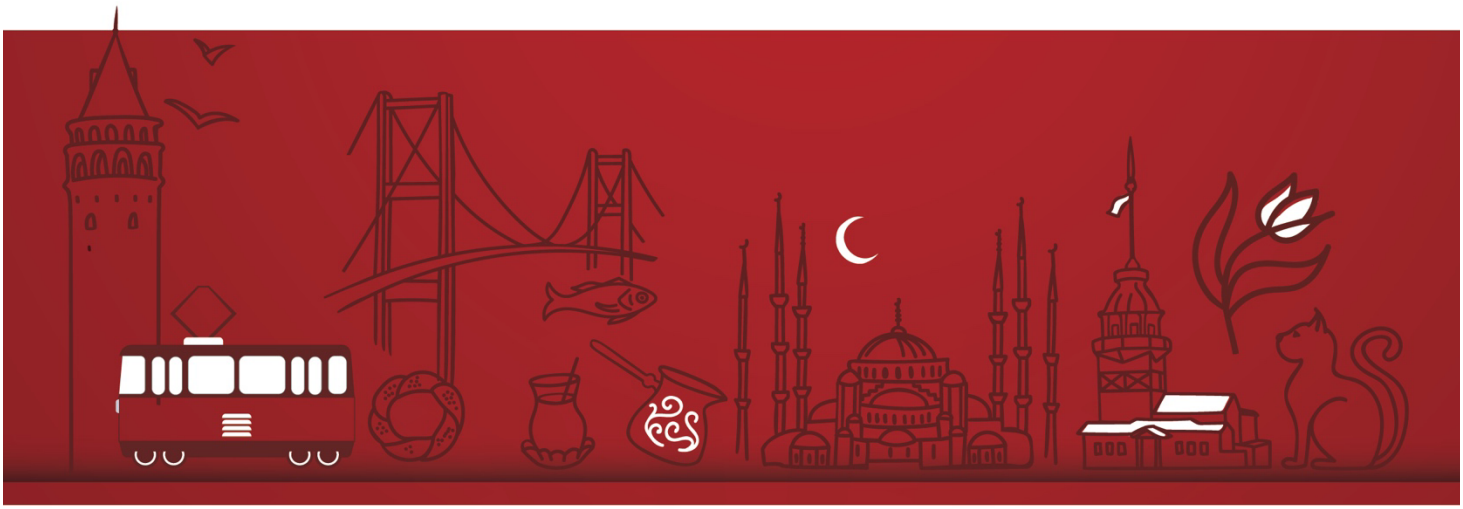
"Safe food for now and future"

ABSTRACT BOOK



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define this concept based on expected outcomes. However, the consistent reality is that proper cleaning relies on effective implementation of a valid process. This includes several steps of sanitation including both Cleaning and Sanitizing, that must be done well in a defined order. In addition, there are several important considerations that need to complement these steps to ensure sanitation is optimally carried out. Among these are sanitary design, choosing the right products, and following the proper procedures. In addition, we need to be aware of sanitation challenges such as biofilms. So, the presentation will also explore what biofilms are, how to combat them using sanitation, and how certain microorganisms could react against cleaning chemicals especially with prolonged use. This knowledge can be leveraged to address and defeat biofilm concerns. Finally, to ensure that sanitation is effective, verification must be done. This relies on application of methods, procedures, tests, and other evaluations, in addition to monitoring, to determine compliance.

All of these factors applied together will help to make certain that the plant is clean and public health is better assured.

Biofilm Forming Bacteria in Meat Processing Facilities

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Industry environments could be a carrier of a wide range of microbial contaminants which can cause adverse effects on food deterioration as well as compromise the safety of food products. Meat processing facilities are particularly important as a potential source of contamination, not only with food spoilage bacteria but also with food-borne pathogens. Considering that, the cleaning process can remove 90% or more of microorganisms associated with the surface, but they cannot be completely destroyed with the cleaning process. Hence, the aim of this study was to determine residual bacteria after cleaning and disinfection and the ability of isolated strains for forming biofilms.

Method: Swab samples from the food contact surfaces were taken after cleaning, washing and disinfection procedures. Sampling was conducted after cleaning and disinfection which increased the likelihood of targeting residential bacteria, according to the standard method using swab-sampler, with neutralizing buffer. Swabbing was conducted on 60 surfaces in meat processing facilities (slicing machines, cutting boards, knives or hatchets). From each surface of the equipment and tools, were performed microbiological analyses of aerobic plate count, total Enterobacteriacee count, *Staphylococcus* spp., *Listeria monocytogenes, Pseudomonas* spp., and *Salmonella* spp. following standard ISO methods. The results of the microbiological analyses were expressed as a number of bacteria per cm2 (CFU/cm2). Isolated microorganisms were further tested for biofilm-forming ability using biofilm biomass formation (crystal violet) assay at 25°C, the optical density of the wells was measured at 595 nm (OD595 nm).

Results: The results showed that the washing and disinfection procedures were not effective enough to eradicate microorganisms in most retail facilities. Out of 60 swabs examined, 20 (33.3%) were positive to the presence of microorganisms. Next to high aerobic plate count and number of *Enterobacteriaceae* the most of the tested surfaces were positive to presence *E. coli*, (10), *S. aureus* (5), and *Pseudomonas* spp. (2). All tested isolates were capable of biofilm production on polystyrene microtiter plates after 48h incubation at 25°C but to various extents. The highest biofilm ability was shown in strains of *Pseudomonas* spp. followed by *S. aureus*, and *E. coli*. On the basis of the obtained ΔOD595 values at 25°C tested strains were classified into two categories – strong and moderate biofilm producers. At the temperature of 25°C *Pseudomonas* spp. and *S. aureus* isolates were classified as strong biofilm producers with ΔOD595 that ranged from 0.802 to 1.222. *E. coli* isolates were classified as moderate biofilm producers with ΔOD595 values that ranged from 0.301 to 0.418. According to results obtained, it can be concluded that proper sanitation will be a very important step for food safety. Disinfection and sanitation of food contact surfaces in meat processing facilities is a challenging task, aggravated by the great antimicrobial resistance of biofilm-associated bacteria. Furthermore, the existence of bacteria in biofilms in the food industry may cause cross- and post-process contamination and economic losses by reducing the shelf life of food products, increasing food spoilage, impairing heat transfer, and increasing corrosion rate.

Nitrite-free Products as New Challenges for Food Safety: Growth Potential of *Clostridium botulinum* and *Clostridium perfringens* in Ham Model During Cooling in Thermal Abuse Conditions

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Research hypothesis: Proteolytic *Clostridium botulinum* (*Cb*) and *Clostridium perfringens* (*Cp*) are spore-forming bacteria, which can contaminate meat products and their growth is usually inhibited by conventional additives such as nitrites. The increasing demand for clean label products has prompted the food industry to study non-conventional additives or to provide nitrite-free products. The objective of this study was to evaluate the growth of *Cb* and *Cp* in cooked ham during the cooling in thermal abuse conditions.

Methods: Two different challenge tests were performed separately for each pathogen. For each test, two batches of 15 kg of minced meat were divided in a) Meat (M), b) Meat with Salt (2.5%) (MS), c) Meat with Salt+Sodium Ascorbate (0.03 %) (MSA), d) Meat with Salt+Sodium Nitrite (0.015 %) (MSN) and e) Meat with Salt+ Sodium Ascorbate (0.03 %)+Sodium Nitrite (0.015 %) (MSNA). Each group was separately inoculated with 1 % v/w of spore suspension (mix of three strains). Samples (100 g of vacuum-packed meat) were cooked at 75°C for 20