Technical Session 1 – Thursday, 19 May, 11.00-12.30
Chair, Lee-Ann Jaykus

T1-01 Preventing Residues from Leaving the Farm

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Introduction: Animal drug residues and natural toxins are undesirable hazards in food production that can only be prevented through good agricultural practices and early detection and remediation on farm. Simple culture assays for inhibitors have been improved and employed as screening tools but they are still blind to natural toxins, non-antimicrobial animal drugs and are not sensitive to some antimicrobial drugs used in animal treatment. Additional screening methods may complement the gaps in inhibitory method detection.

Purpose: An integrated approach to food residue detection and avoidance, using multiple diagnostic tools, implemented based on farm knowledge will provide greater protection and assurance of food production quality.

Methods: Inhibitory drug detection levels of *Geobacillus stearothermophilus* inhibition assays in milk and tissue are contrasted with MRL levels. Gaps of detection are highlighted and addressed with a series of lateral flow tests.

Results: Farm history with regards to weather/climate, animal health, drugs administered and practices can determine the most likely residues to test for to verify control practices using screening tests. The appropriate tool must be selected based on the residue, its MRL level and the level it could be detected using the screen. Aflatoxin, flunixin, streptomycin, florfenicol and enrofloxacin are potential residues that could escape inhibitor method detection. Results of milk screening tests for mycotoxins are predictive of contamination in feed/grain and screening tests may be employed to eliminate those food sources to the animals and improve their health and milk production. Contents of drug medicine cabinets are indicative of drugs being used and may indicate if additional screening tests should be employed to indicate control of residue on farm. Poor animal drug record keeping may indicate risk that these drugs could be in either milk or tissue and an appropriate screening test selected to mitigate that risk.

Significance: Residues in food create a consumer concern and reflect poorly on the image of the food and the producing corporation. Residue avoidance is most effective and inexpensive early in the food chain. Intelligent application of available screening tools based on audit information can demonstrate that effective controls are in place to minimize residue risks.

T1-02 Dairy Farm Audits Induce a Temporary Improved Bulk Milk Quality

Annet Velthuis, Business Economics Group, Wageningen University, The Netherlands; **Akemi Flores Miyamoto** and **Martine Reij**, Food Microbiology, Wageningen University, The Netherlands

Introduction: Audits aim to ascertain and to improve product quality/safety. But the effect of audits on product quality/safety is hard to demonstrate empirically as data are not easily available. In this study data on dairy farm audits and data about laboratory results of bulk milk deliveries of individual farms are studied to trace a putative relation between audits and product quality.

Purpose: The objective is to study whether the total bacterial counts (TBC) of dairy bulk milk are reduced in the period around a farm audit and/or afterwards.

Methods: The data set contained information about 13,006 audits performed on 12,855 farms as well as TBC counts of bi-monthly tested bulk milk of these farms. A record included: logTBC value, variables indicating the timing of the TBC test relative to the audit date, unique audit number, auditor, type of audit, outcome of the audit, audit checklist items, number of attention points and audit date. A random linear regression model was used to quantify the possible relation between logTBC and the time before, during and after the dairy farm audits and other audit variables.

Results: A significant reduction in logTBC levels were found around the date of the audit and in the period from 1.5 to at least 6 months after the audit. Additionally, logTBC levels were found to depend on: season, total number of attention points given during an audit, audit type (standard, repeated or first audit), audit outcome (approved, rejected or temporary blocked), year of the audit (2006, 2007 or 2008), checklist items related to the maintenance of the milking equipment and/or utility room and tank and some interactions.

Significance: Based on this study we can conclude that there is a temporary decrease in logTBC values due to the audit, whereas this decrease starts 1.5 months after the audit and continues until at least 6 months after the audit.

T1-03 **A Novel Technology for Enhancing Sanitization in Food Processing Operations Based on a Renewable Antimicrobial Coating (RAC)**

Carl W. Erkenbrecher and **Sherrill Nurnberg**, DuPont Clean & Disinfect, Delaware, USA; **Akintayo Adisa**, DuPont Clean & Disinfect, Suffolk, United Kingdom; **William R. Cahill**, DuPont Clean & Disinfect, Delaware, USA; **Shaun F. Malone**, DuPont Clean & Disinfect, Ontario, Canada

Introduction: A unique quat-based antimicrobial coating (RAC) was developed to meet a growing demand for sanitization of hard to reach, vertical and ceiling surfaces in industrial and commercial operations to provide long-term antimicrobial protection for days to months. The coating is easily applied with a portable sprayer (or brush or roller), can contain a dye for easy visualization and overspray forgiveness, has antimicrobial activity against a variety of bacteria and fungi on hard and porous surfaces, is removable with water while leaving low to no coating residue, and has ultra low VOCs.

Purpose: The purpose of this investigation was to determine RAC's efficacy against key surrogate and food pathogens using a variety of microbiological test methods.

Methods: AOAC, ASTM and EPA regulatory tests (e.g., Non-Food Contact Sanitizer, Food Contact Sanitizer, Residual Sanitizing, and Fungistatic tests for porous and nonporous hard surfaces).

Results: Overall ≥ 3 log reductions were obtained in 5-min exposures for *S. aureus*, *K. pneumoniae*, *E. coli* O157:H7, *S. enterica*, *P. aeruginosa* and *L. monocytogenes*. Antiviral activity and fungistatic activity have also been demonstrated (e.g., bacteriophage and *A. niger*). The effects of organic contamination, relative humidity, temperature, contact time, long-term stability and dye addition on microbial activity were optimized to provide a functionality that makes this coating as versatile and robust as possible.

Significance: RAC is an effective non-food contact sanitizer and fungistat providing long-term efficacy for hard to reach, vertical and ceiling surfaces in industrial and commercial operations. Adjustment of the contact time and/or actives concentration allows for the maintenance of the microbial efficacy of different formulations for a variety of applications. In addition, the basic coating formulation (quat-based) can be modified using a variety of antimicrobial actives (e.g., oxidative chemistries) and could provide a platform for different coating technology applications.

T1-04 **Modelling the Use of Different Enforcement Strategies to Improve Food Safety**

Esther van Asselt and **Piet Sterrenburg**, NFA, RIKILT - Institute of Food Safety, The Netherlands; **Sjoukje Osinga**, LDI, Wageningen University, The Netherlands

Introduction: According to the General Food Law, food producers are responsible for the production of safe products. Safe in this regard is often interpreted as compliant with EU food safety legislation. The level of compliance between companies differs and can be improved by measures such as education or sanctions. In order to determine the effectiveness of various enforcement strategies on the level of compliance we developed a simulation tool using Agent Based Modelling (ABM) as a method. This ABM tool allows to simulate with actions and reactions between autonomous agents, yielding an emerging overall effect. This emerging effect will give valuable insight in how the overall behaviour of the system and the individual behaviour of agents mutually depend on each other.