Development of an Effective and Practical Biosecurity Entrance

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Industry Summary

The objectives of this study were to evaluate effectiveness of various biosecurity interventions, including air showers (AS), disinfectant spraying (DS), disinfectant fogging (DF), and their combinations on reducing bacterial and viral contamination on cloth, skin, and hair surfaces, using both traditional and modified protocols. Treatments were tested with and without the Danish Entry System (DES), hair nets (HN), and a modified DES (MO.DES, using hand sanitizer). Three surfaces, coverall or t-shirt, leather or pigskin (represents human skin), and faux fur (represents human hair), were contaminated with two bacteria, *Staphylococcus aureus* (Gram-positive) and *Escherichia coli* (Gram-negative), and two viruses, Canine distemper virus (CDV, enveloped) and feline calicivirus (FCV, non-enveloped), to assess the efficacy of the treatment methods. While single-step methods (AS, DS, DF) were largely ineffective on their own, integrating DES or HN significantly enhanced both bacterial and viral reductions. For bacteria (*E. coli* and *S. aureus*), DS and AS+DS achieved over 2-log reductions, with DES- or HN-enhanced combinations reaching 3–4-log reductions. While the full showering remained most effective, particularly for hair (~5-log reduction), the AS+DS+HN treatment performed similarly. Interestingly, the MO.DES eliminated bacteria to undetectable levels on hands. For viruses (FCV and CDV), only DES- or HN-based combinations achieved meaningful reductions, with AS+DS+DES and AS+DS+HN performing close to the shower protocol. Overall, DES and HN are critical additions for effective microbial control, while MO.DES and multi-step alternatives can offer practical, effective substitutes when full-body showering is impractical.