

1 **Inactivation effects of different antimicrobial substances against**
2 **pathogens in fresh produce during washing and sanitation**
3 **process**

4 陳字雲 (5139)

5 **OUTLINE**

01/05/2022

- 6 1. Introduction
7 2. The effect of antimicrobial substances against *E. coli* and *Listeria*
8 *monocytogenes* in fresh vegetables during washing and sanitation process
9 3. The efficacy of sodium acid sulfate on controlling *L. monocytogenes* on
10 apples in a water system with organic matter
11 4. Conclusion

12 **ABSTRACT**

13 The aim of this study was to review the current investigation of the efficacy of
14 antimicrobial substances on controlling or inactivate pathogens in fresh produce during
15 washing and sanitation process. The investigation was done by inoculating *E. coli* and *Listeria*
16 spp., on fresh lettuce and *Listeria* spp., in apple. The water used for washing and sanitizing
17 processes was treated by adding antimicrobial substances, including lactic acid/phosphoric
18 acid-based antimicrobial (LPA), neutral electrolyzed oxidizing water (NEOW), sodium acid
19 sulfate (SAS), and chlorine. The efficacy of these antimicrobials was evaluated using confocal
20 laser scanning method (CLSM), widefield bioluminescence imaging, and microbial analysis
21 test. The results of this review shows that (i) the use of NEOW shows greater reduction against
22 *E. coli* and *L. monocytogenes* in lettuce only under low volume processing, (ii) increasing the
23 volume of water will significantly increase the population of *E. coli* and *L. monocytogenes* in
24 the fresh produce under the washing and sanitation process, (iii) the use of LPA shows greater
25 reduction only against *L. monocytogenes*, (iv) The number of bacterial cells on the disks
26 decreased as the high shear stress process, while the increase of exposure times will
27 significantly increase the population of the initial pathogen. In this case, the contact time crucial
28 than the shear stress in inactivation of the pathogen, (v) SAS at 1.0% demonstrated a better
29 efficacy than 25 ppm chlorine, indicate that SAS could be the alternative antimicrobials to be
30 used after the chlorine ones. In conclusion, soaking fresh produce with NEOW and SAS
31 demonstrated them as the greatest antimicrobials to inactivate *E. coli* and *L. monocytogenes*
32 during the washing and sanitation process.

References

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