Evaluation of food safety and shelf life of fresh cut fruit at retail sale

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Objectives

- To determine the shelf life of fresh cut fruit considering possible temperatures abuses in its marketing and retail.
- To evaluate the lethality effect of different disinfectants in melons inoculated on the surface with E.*coli* and L.*monocytogenes* and the cross-contamination in the pulp and growth during storage at 5 and 10ºC.

Introduction

- There is currently a growing demand among consumers for natural fresh cut fruit.
- Once the fruit is cut, its shelf life decreases.
- Melons have been associated with various outbreaks due to microorganisms contamination. This contamination can come from various sources such as water, equipment and humans.
- To minimize microbial risk, food industries use chemicals to disinfect the food from possible outbreaks. The most common is chlorine, but it causes toxic byproducts in the presence of organic matter. An alternative chemical, peracetic acid, which has been demonstrated to be highly stable in presence of organic matter, has been approved by the Food Drug Administration and in France, although it is currently not authorized its use in Spain.

Materials and methodology

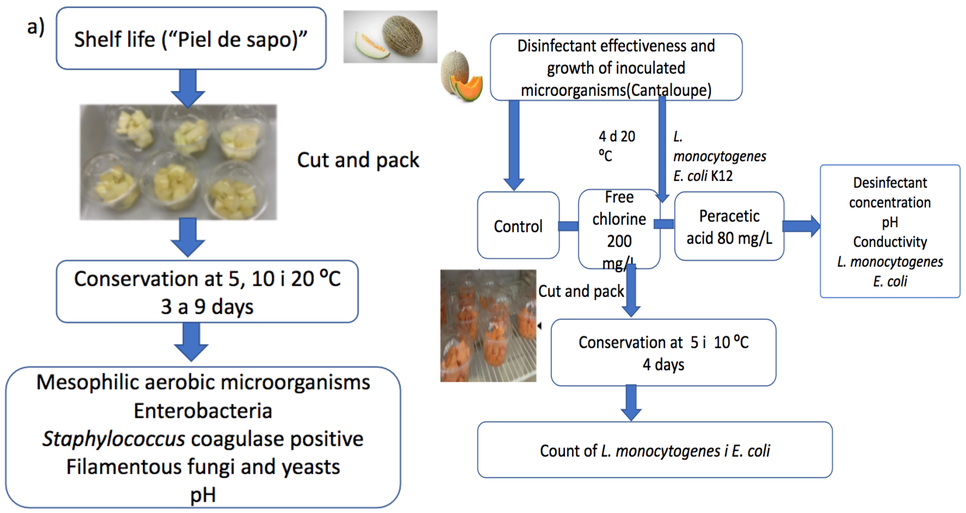

Figure 1. Outline of the experimental design of the shelf life (a) and efficacy of disinfectants (b).

Results

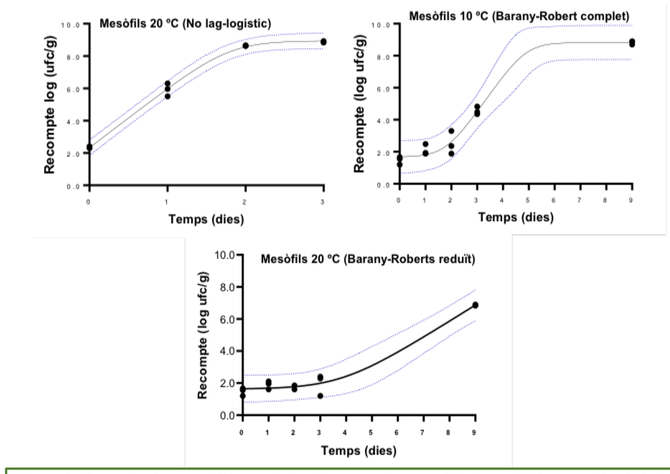

Figure 2. Growth of mesophilic aerobic microorganisms at 20,10 and 5ºC stored for 3-9 days.

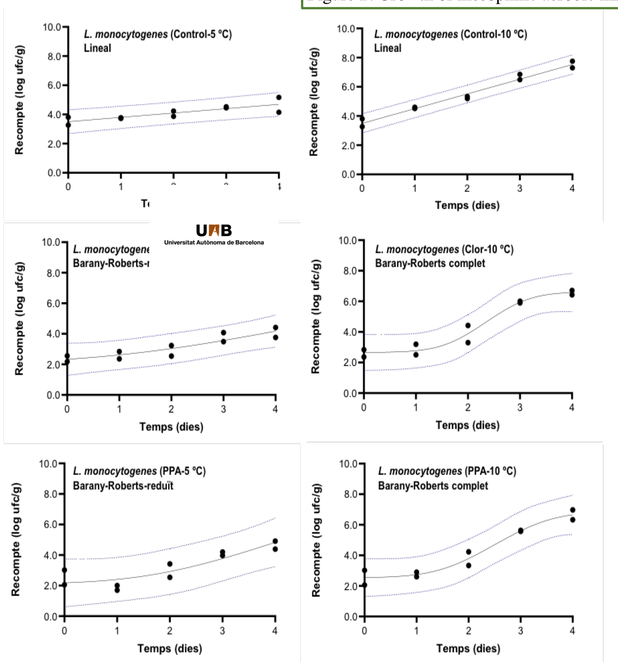

Figure 3. Growth of L.*monocytogenes* in melon treated with water, acidified chlorine (200 mg/L) and peracetic acid (80 mg/L).

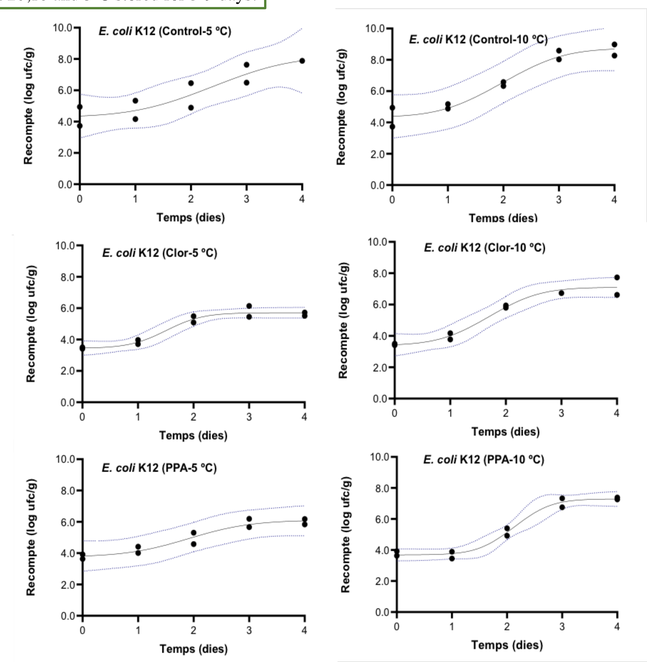

Figure 4. Growth of E.*coli* in melon treated with water, acidified chlorine (200 mg/L) and peracetic acid (80 mg/L).

Conclusion

- The results establish that considering the native microbiota and pathogenic microorganisms, the shelf life was settled to less than 3 days at 5ºC and less than 2 days at 10ºC.
- Microorganisms present on the surface were transferred to the edible part.
- Disinfectants were able to reduce the contamination on the surface of melon and at 5ºC the growth of microorganisms slowed down.
- Neither the temperature nor the disinfectants were sufficient to inactivate the microorganisms completely.