

LETTUCE DISINFECTION WITH PERACETIC ACID AND ITS SYNERGY WITH LACTIC ACID

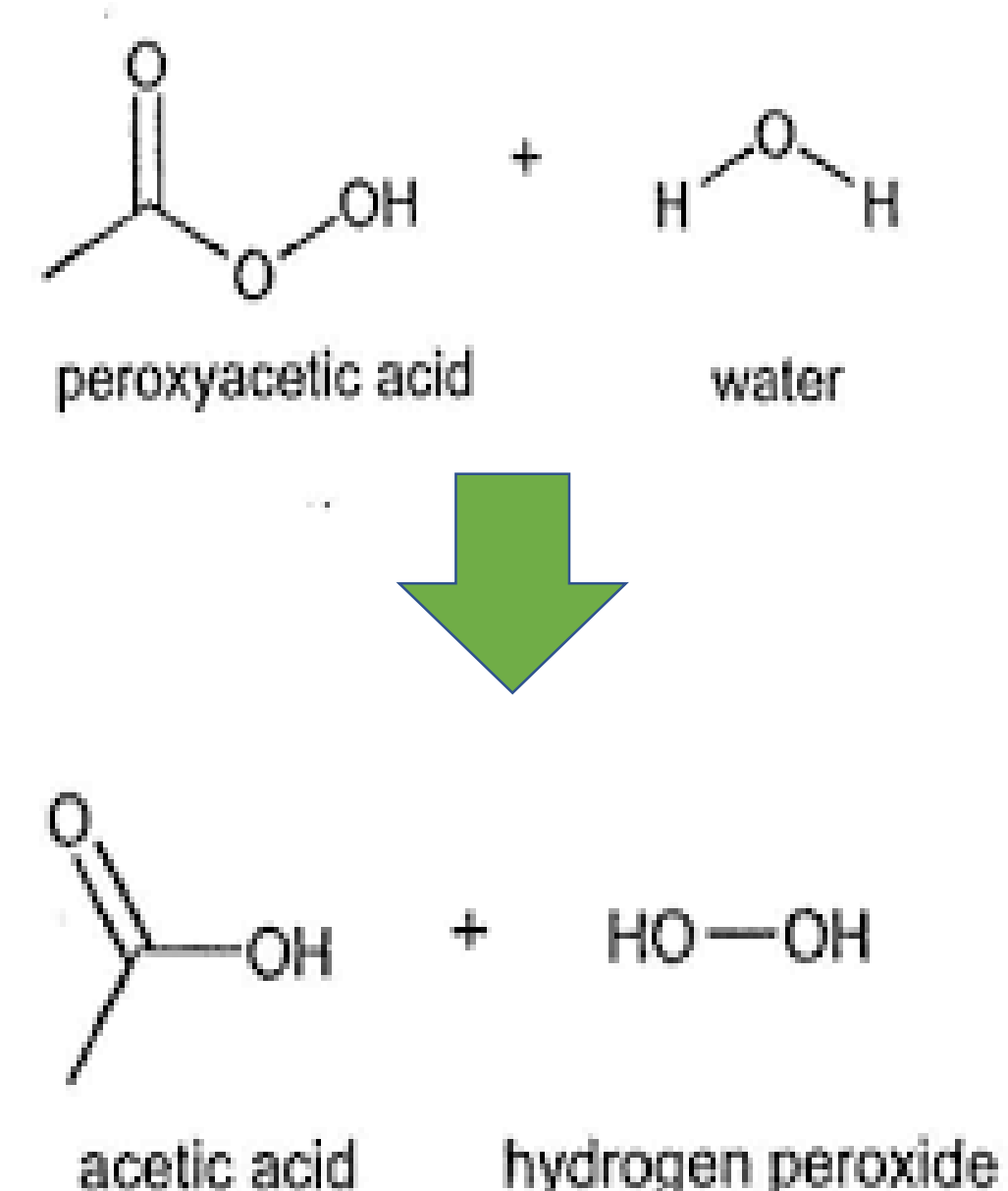
Lluís Gifra Prieto Final Degree Project – June 2021

Objectives

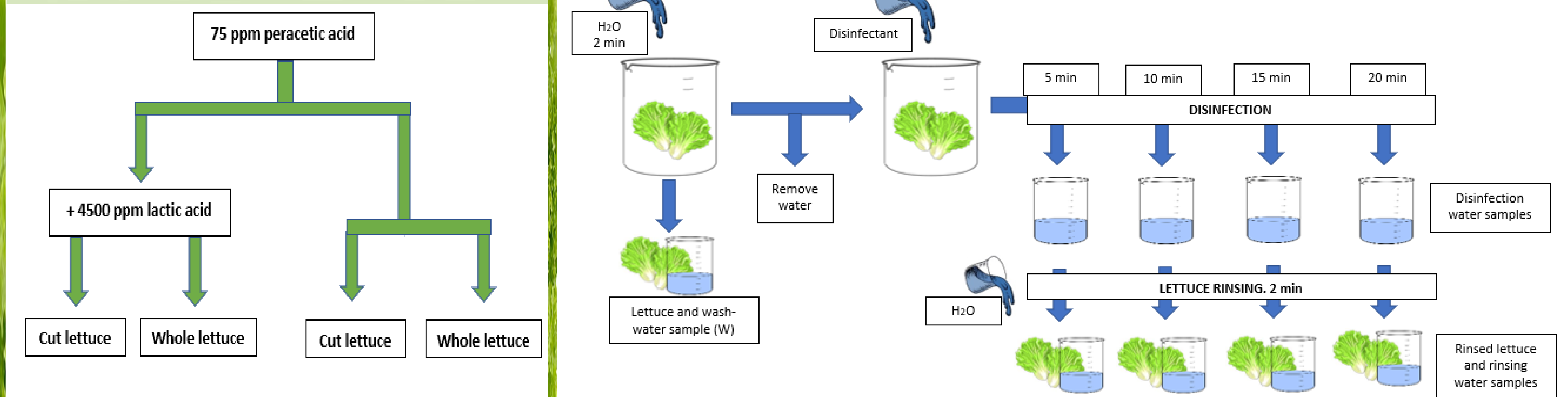
- To test the effectiveness of peracetic acid and its synergy with lactic acid as disinfectants in lettuce.
- To test the effectiveness in whole or cut lettuce.

Context

- The use of chlorine in industry is being evaluated in the European Union as its use causes toxic byproducts and its effect decays in the presence of organic matter.
- As a possible solution, new methods of disinfection are being studied to replace chlorine.
- Peracetic acid is an organic acid which doesn't produce harmful byproducts and it has a high stability in the presence of organic matter.
- Its use as food disinfectant is still being tested, despite having its use approved by the FDA.



Materials and methodology



Results

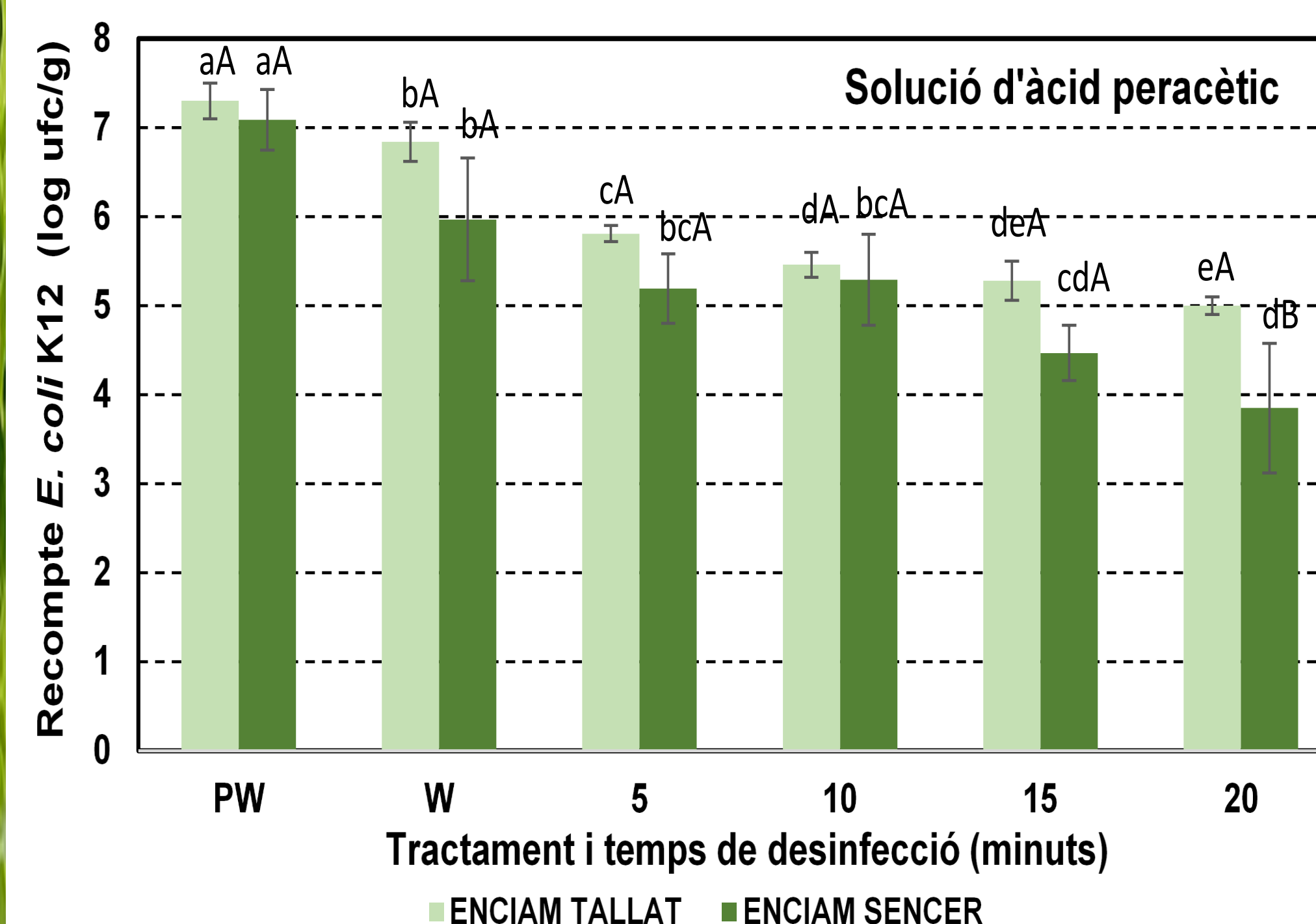


Table 1: Effect of peracetic acid (75 ppm) in lettuce disinfection

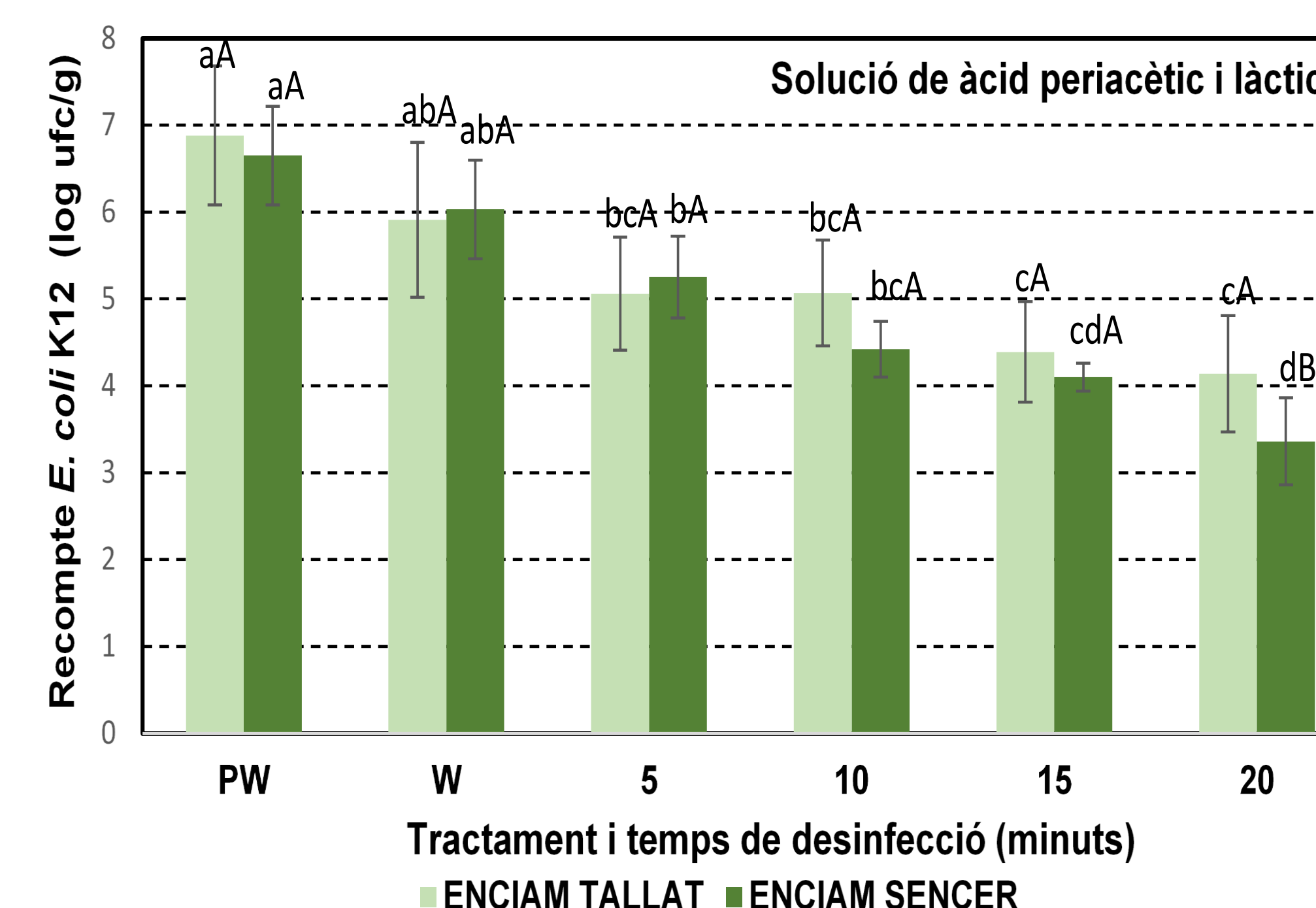


Table 2: Effect of peracetic acid (75 ppm) and lactic acid (4500 ppm) in lettuce disinfection

Experiment	Tractament	Recompte (log UFC/mL)
Control	Rentat inicial ¹	3.79 ± 1.97a
	Desinfecció amb aigua (20 min)	3.09 ± 1.89a
	Esbandit	0.86 ± 1.40b
Desinfecció	Peracètic tallada	ND ²
	Peracètic sencera	ND
	Peracètic+àcid làctic tallada	ND
	Peracètic+àcid làctic sencera	ND
	Esbandit Peracètic tallada	ND
	Esbandit Peracètic sencera	ND
	Esbandit peracètic+àcid làctic tallada	ND
	Esbandit Peracètic+àcid làctic sencera	0

1. Recompte de l'aigua de rentat inicial, tant de les mostres control com les del tractament amb desinfectants.
2. ND: no detectat en 1 mL de mostra

Table 3: Microbiological count (UFC/mL) of water in every experiment

Conclusions

- In all experiments microbiological reduction was significant starting after 20 minutes.
- Disinfection water presented absence of the pathogen ensuring non cross-contamination.
- Peracetic acid didn't present any signal of synergy with lactic acid.
- Reduction was higher in whole than cut lettuce.
- Peracetic acid presents a high stability and its concentration is constant during all the process.