

Impact of spiking techniques on the survival of *Staphylococcus aureus* in artificially contaminated condiments

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Contamination ways



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Would the different contaminations ways affect the survival time?



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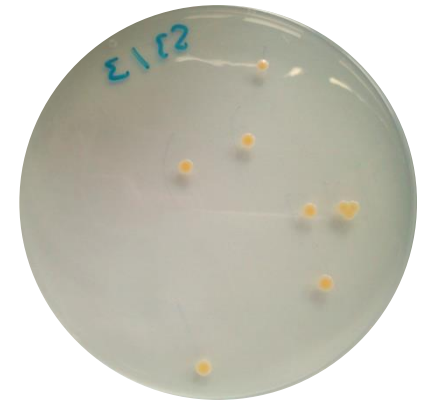
Staphylococcus aureus

❖ Characteristics

- gram-positive, coccal, non-spore forming
- facultative anaerobic
- growth temperature: 6-48°C (optimum: 35-41°C)
- pH: 4-10 (optimum: 4-7)
- tolerance to low available water level (≥ 0.83)
- prominent for the ability to become resistant to antibiotics

❖ Role in disease

- skin infections
- respiratory infections
- food poisoning



S. aureus colonies on Mueller Hinton agar

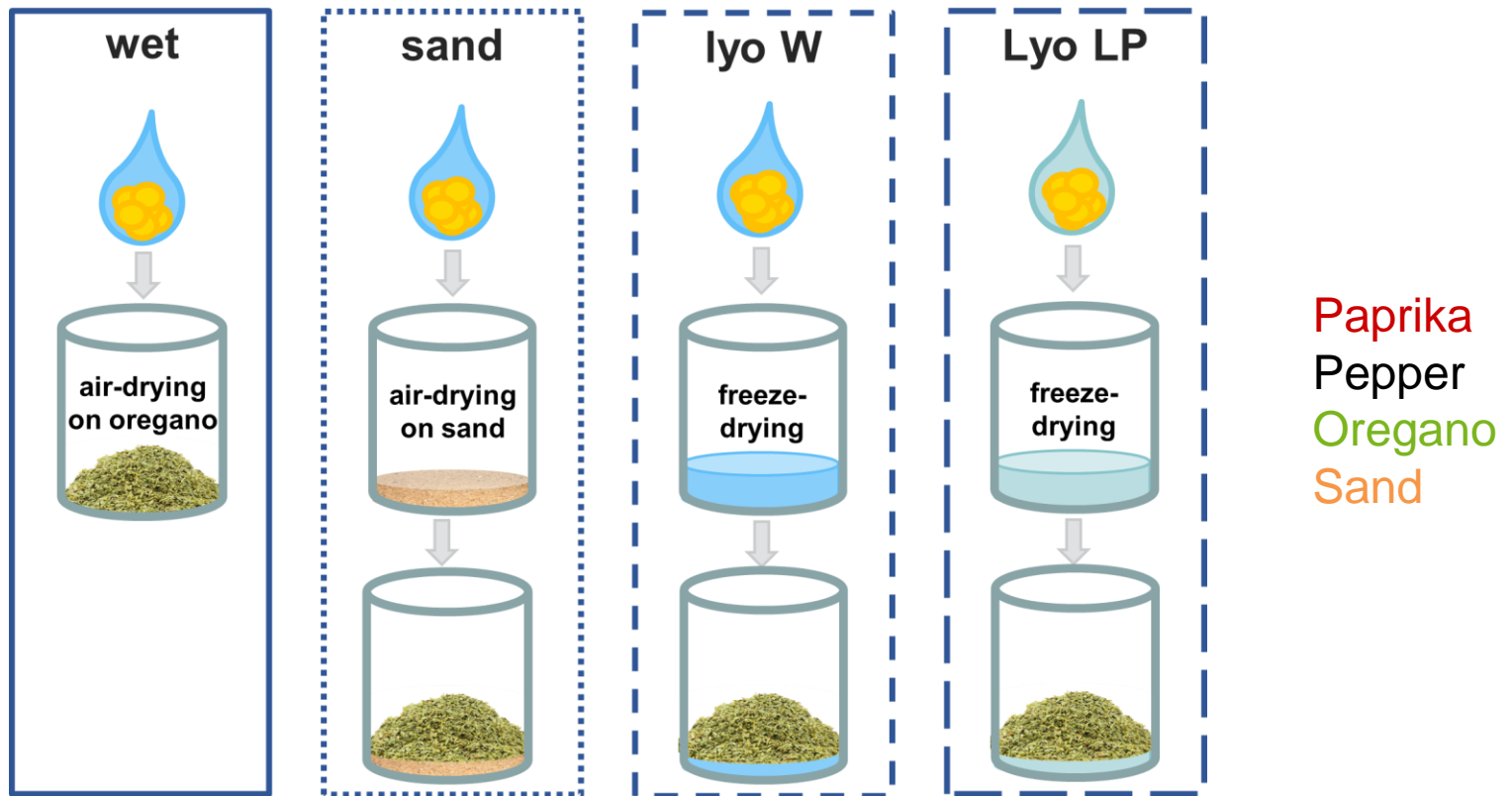


S. aureus colonies on Baird Parker agar



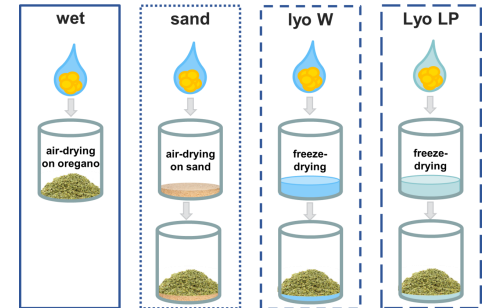
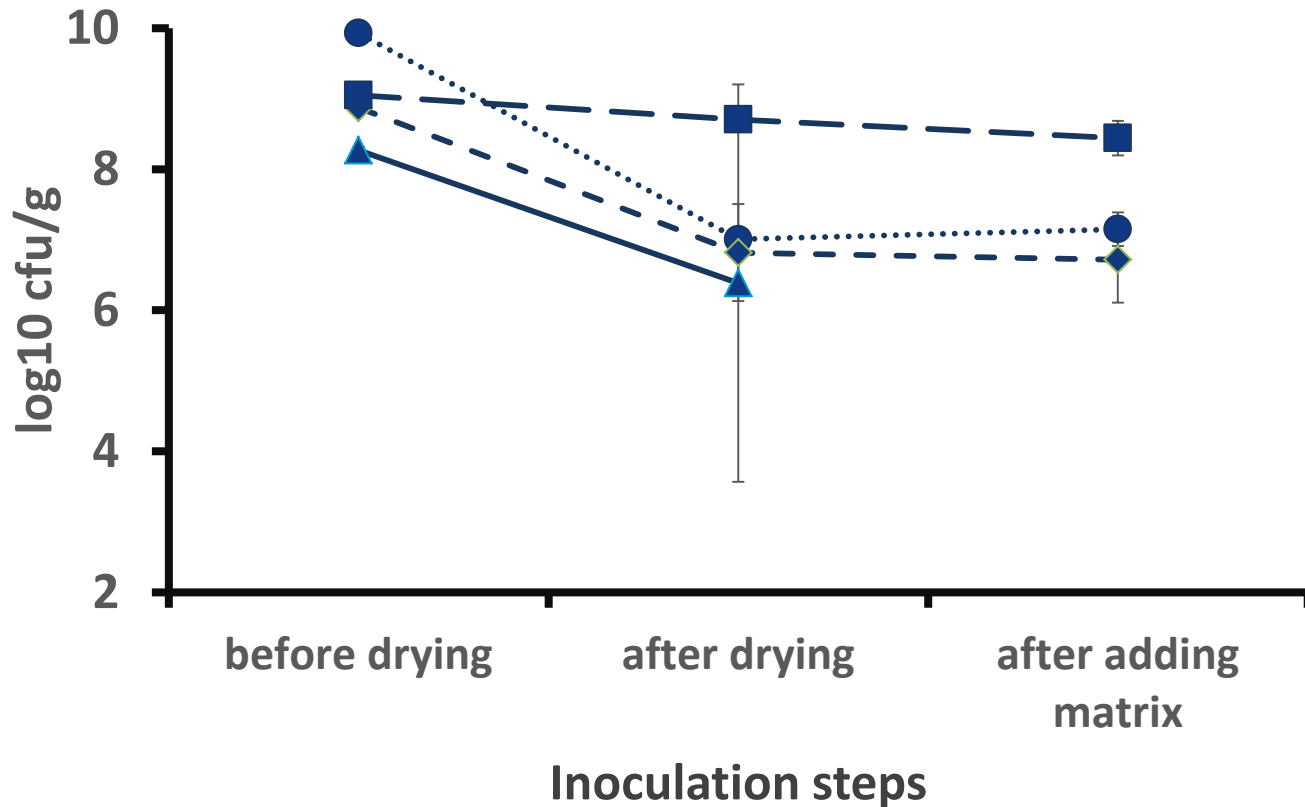
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Inoculation Methods



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Recovery rates after the inoculation steps



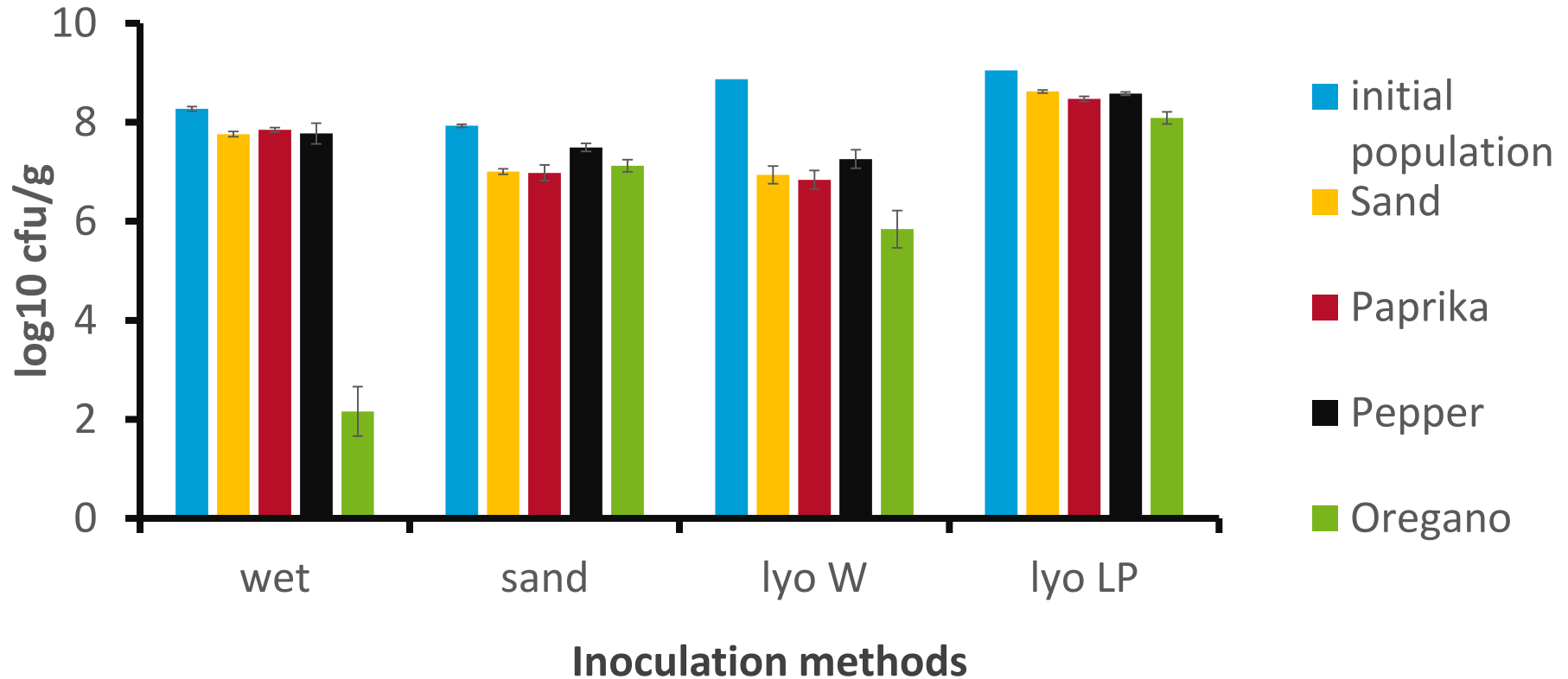
- ▲ wet
- sand
- ◆ lyo W
- lyo LP

n=3



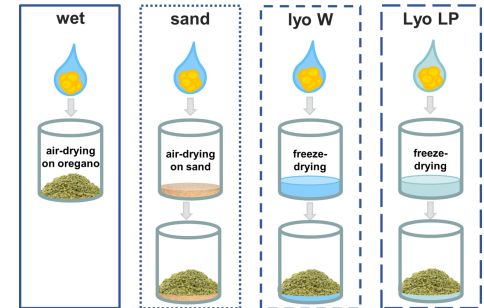
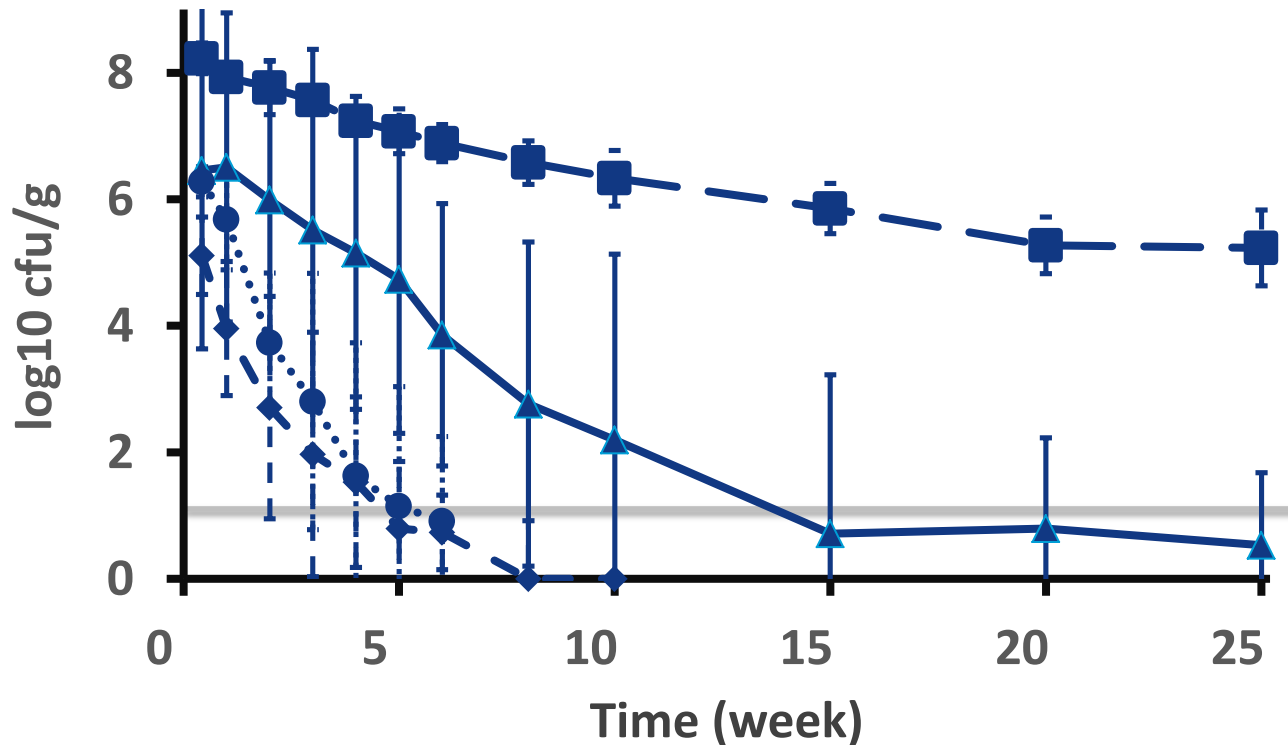
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Recovery rates after adding condiments



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Long term survival of *S. aureus* – different inoculation methods



- ▲ wet
- sand
- ◆ lyo W
- lyo LP

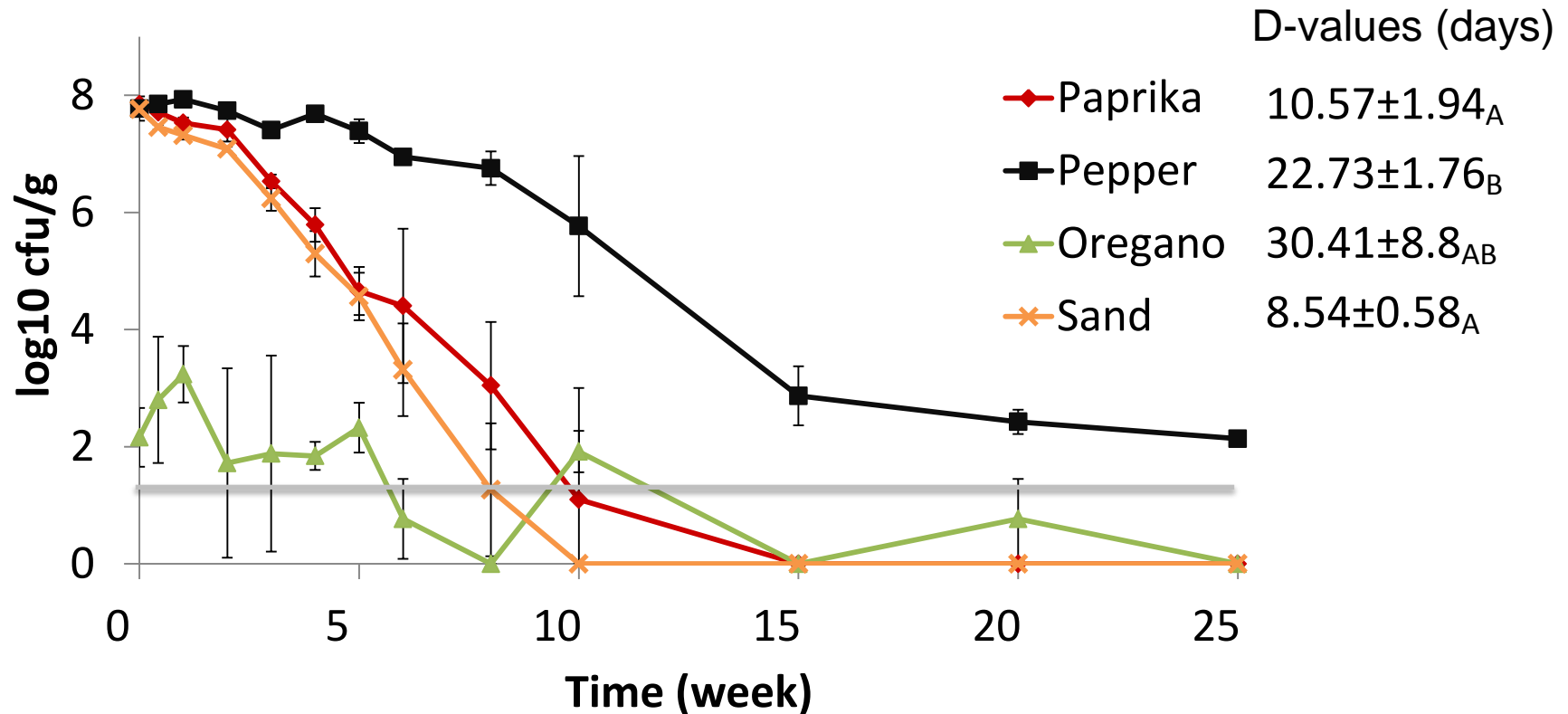
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Long term survival of *S. aureus*

– contamination via water (wet spiking)



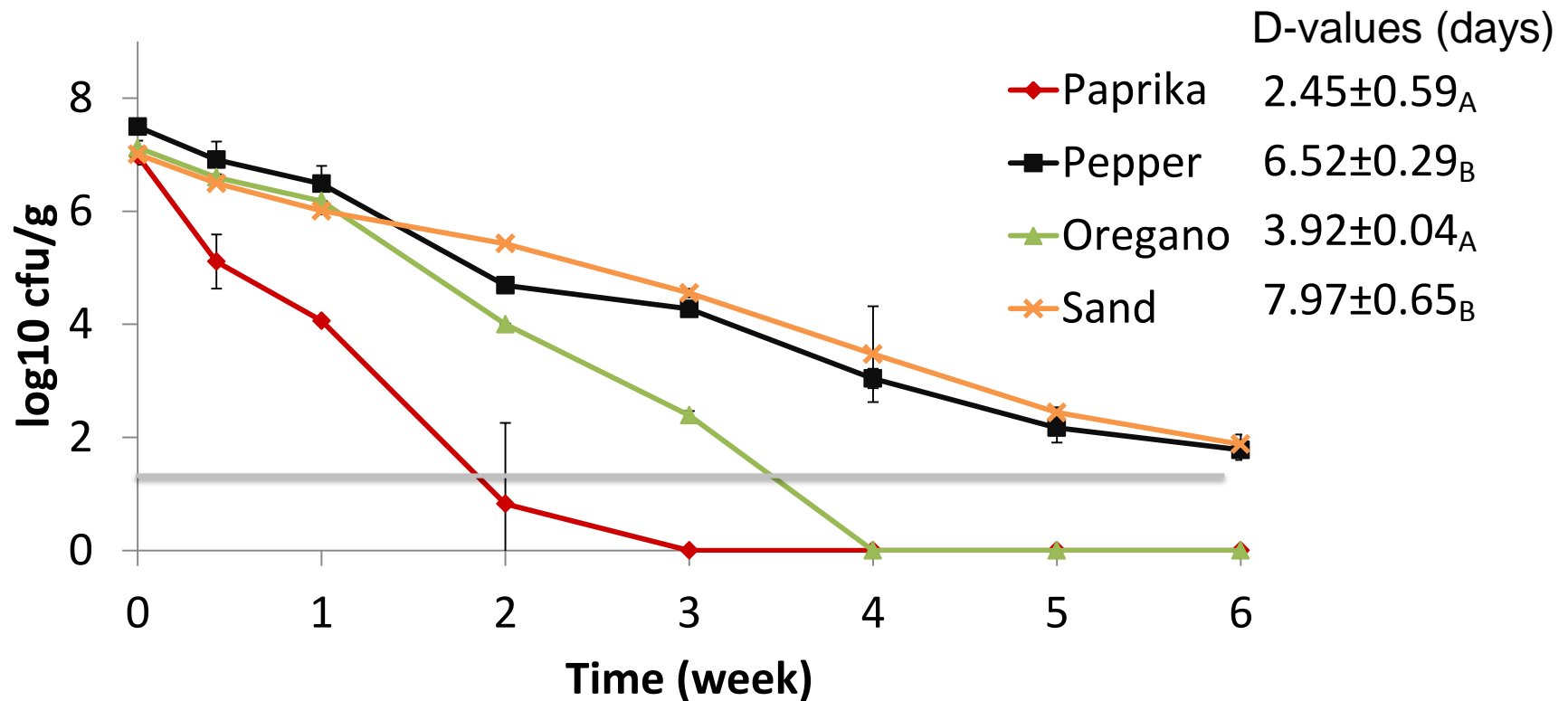
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Long term survival of *S. aureus*

– contamination via sand (sand spiking)



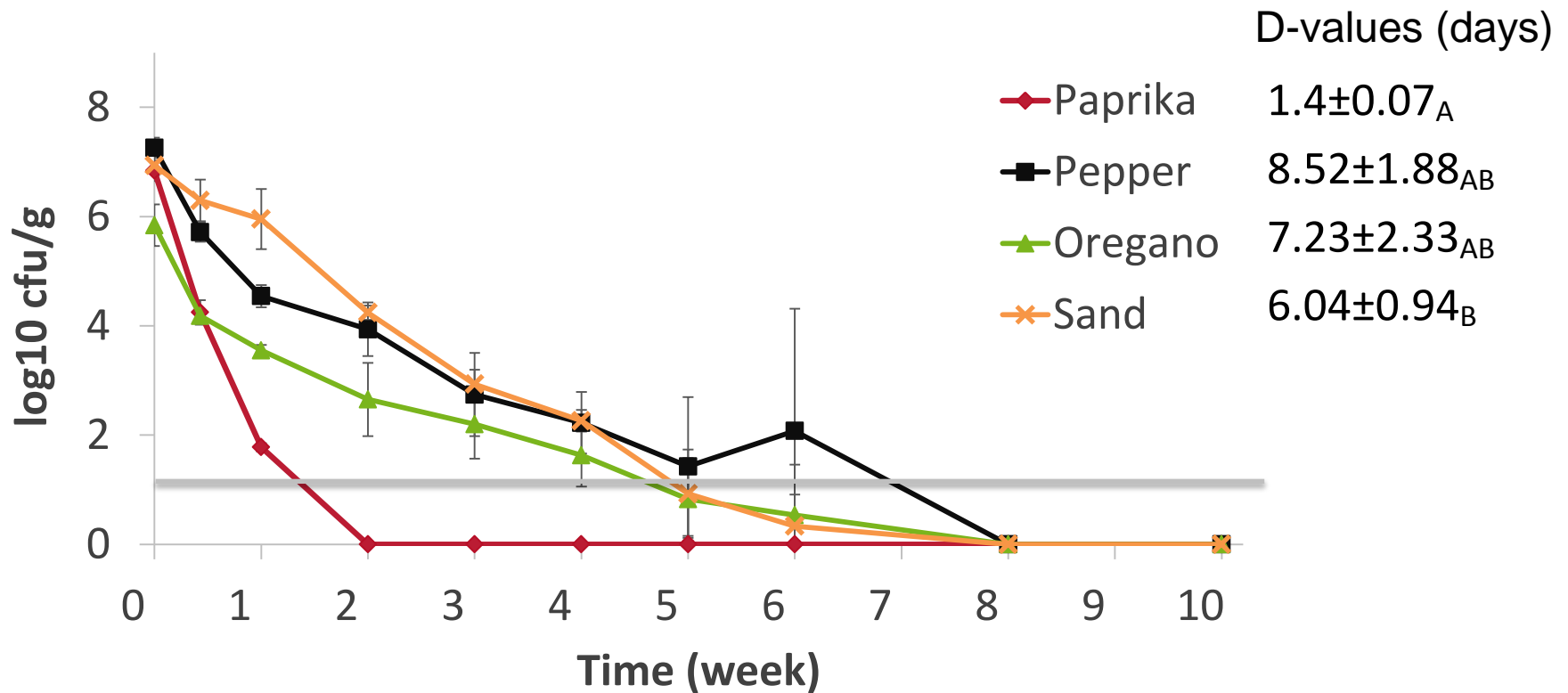
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Long term survival of *S. aureus*

– contamination with freeze-dried bacteria (Iyo W)



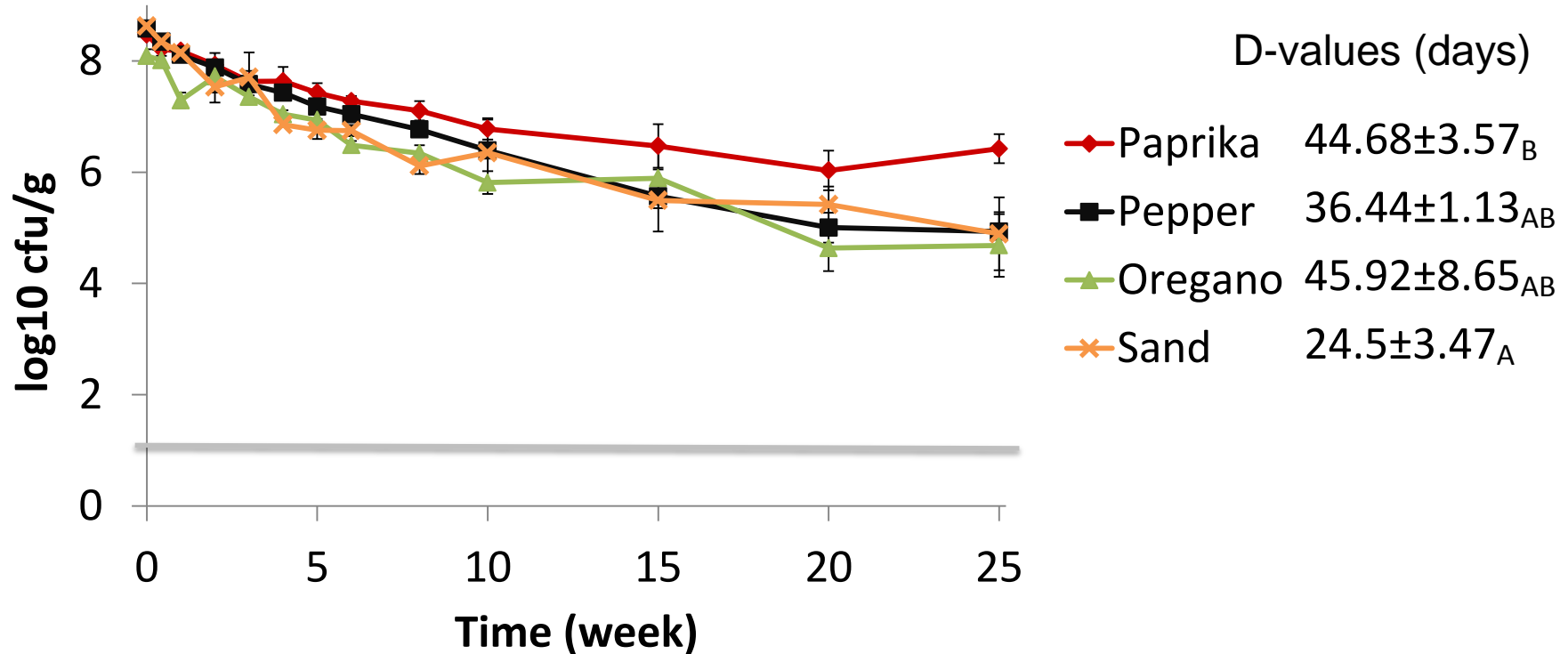
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Long term survival of *S. aureus*

– contamination with freeze-dried bacteria (Iyo LP)



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Summary

Survival of *S. aureus* in dried herb and spice matrices (in weeks)

	Wet spiking	Sand spiking	Lyo W	Lyo LP
Paprika	< 15	< 3	<2	> 25
Pepper	>25	< 10	<8	> 25
Oregano	? (< 25)	< 4	<8	> 25



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Conclusions

- ❖ *S. aureus* has a short life time compared to the storage time of the condiments.
- ❖ Survival of *S. aureus* in artificially contaminated condiments depends on
 - the spiking technique (contamination scenario)
 - the carrier material
- ❖ There is no technique that suits to every investigation purpose. Choosing a proper portfolio of methods is the key to assess potential risks.
- ❖ Recommendation: at least two different spiking techniques should be considered for tenacity studies.



Thank you for your attention. Questions?

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