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Alternatives to biocides: Downstream users perspectives

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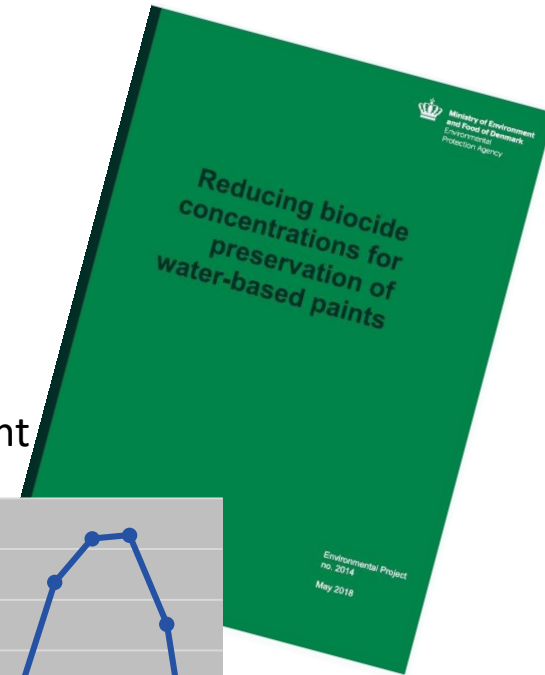
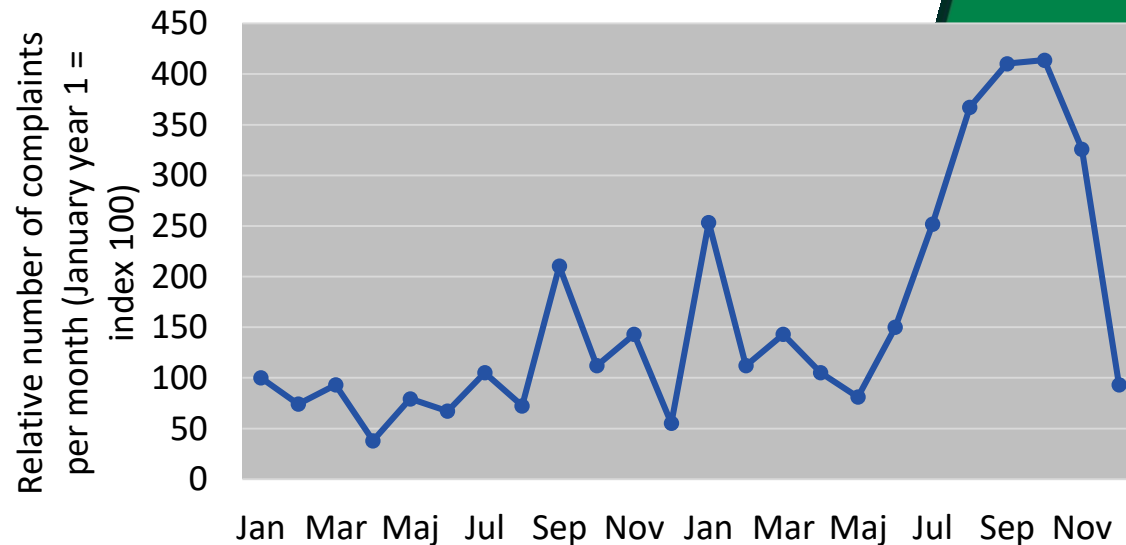


Contamination of paint

- An on-going challenge
→ DK EPA projects



Registered claims for contaminated paint





Why do we need in-can preservation?

- Bacteria can grow in paint
 - Water, organic carbon, nutrients
- Bacteria will enter paint
 - In raw materials
 - During production
 - During use





Production & contamination

- Routine & special microbiological control
- Linking production to contaminated paint

Paint	Bacterium
A	Enterococcus sp.
B	Pseudomonas sp.
C	Pseudomonas sp.
E	Pseudomonas sp.
F	Citrobacter sp.
G	Pseudomonas sp.



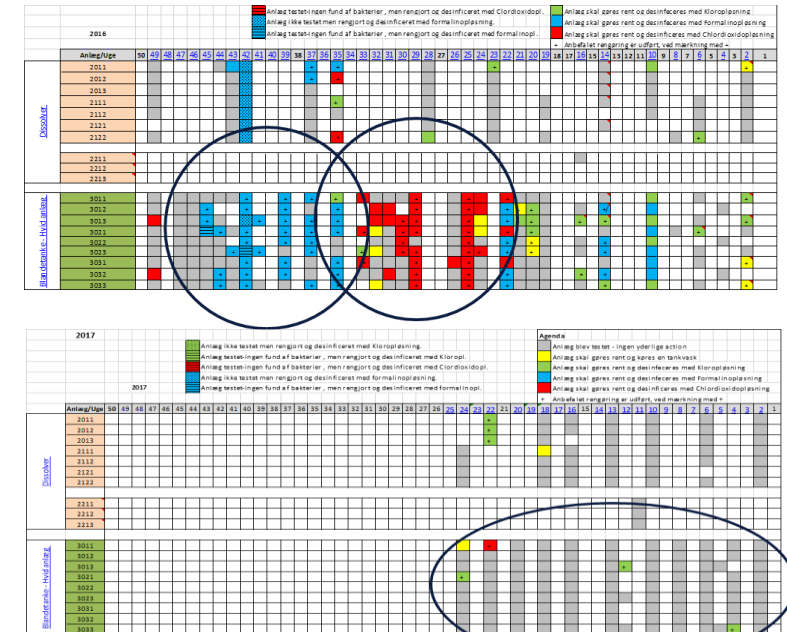
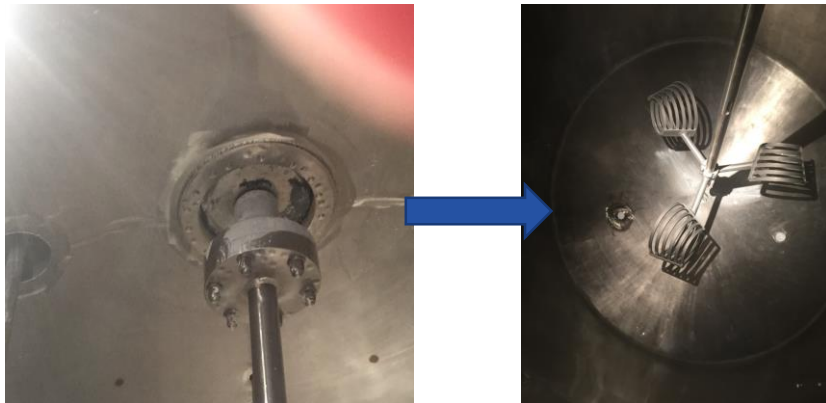
Production	Bacterium
Filling station	Stenotrophomonas sp.
Filter	Stenotrophomonas sp.
Filter	Pseudomonas sp.
Filter	Citrobacter sp.
Filter	Acinetobacter sp.
Filter	Pseudomonas sp.





Factory hygiene

- Hot spot localisation
- Improvement of cleaning and cleanability





Paint development

- Raw materials contain microbes & sustain microbial growth
- Components interact with biocides

New paint

- Raw material selection can improve preservation

Raw material	Score
Talc 1	1.3
Talc 2	1.8
Talc 3	2.0
Talc 4	2.3
Talc 5	4.0
CaCO ₃ 1	0.0



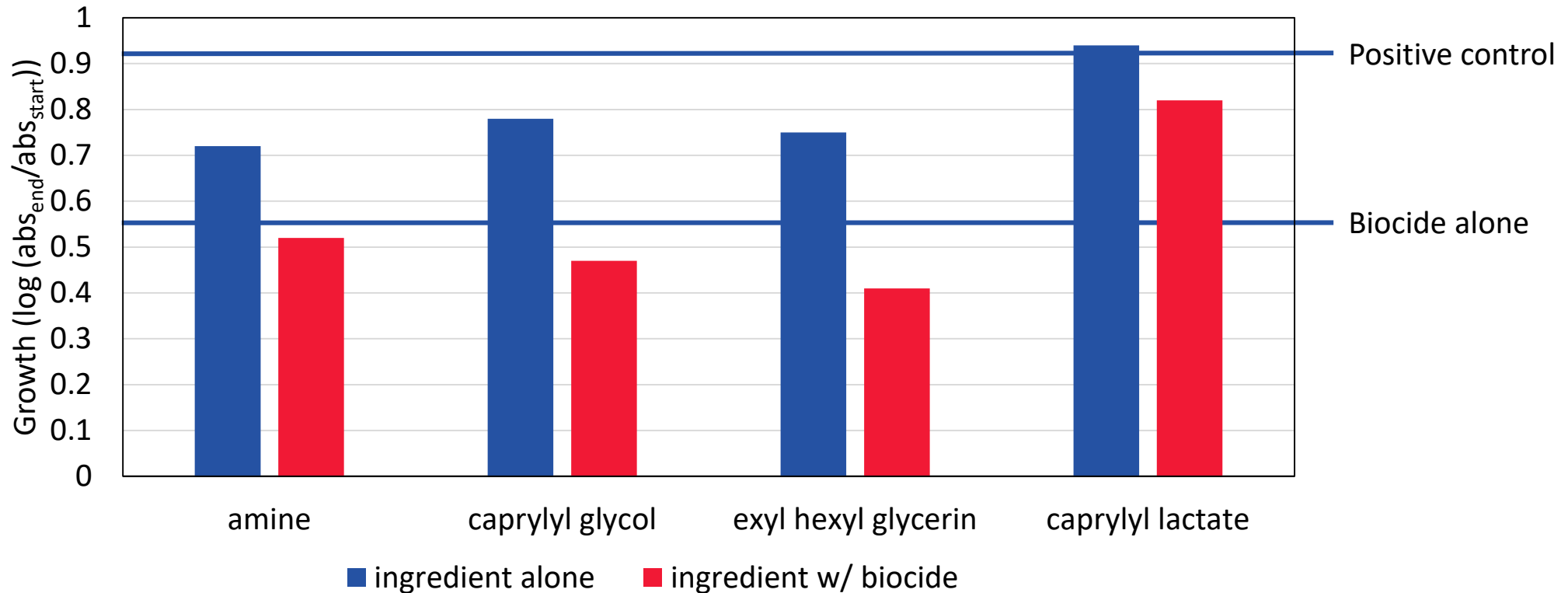
Type	Function
SiO ₂ A	Filler
Dolomite A	Filler
CaCO ₃ C	Filler
Co-polymer A	Antifoam agent
Thickener E	Anionic thickener
Dispersion Agent C	Non-ionic dispersant



Recipe	Score
Standard 81-014	2.6
Test 81-013	2.1
Test 81-012	1.8



Improving biocide effect

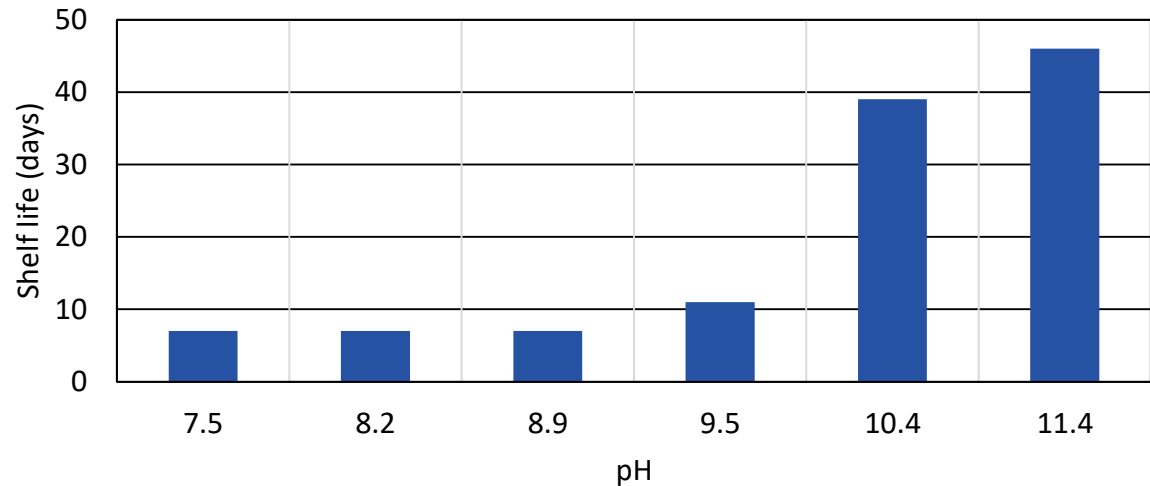




High pH

- Silicate paint w/ high pH 
- Unpreserved interior white matt wall paint w/o added bacteria
 - Not a universal solution

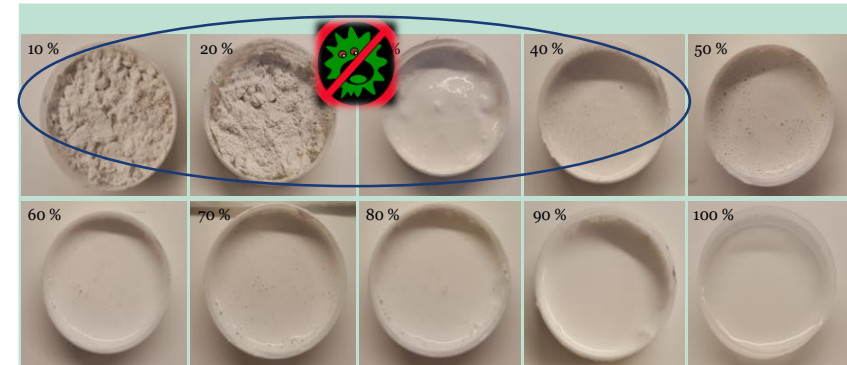
Influence of pH on shelf life of unpreserved paint





Non-biocide preservation

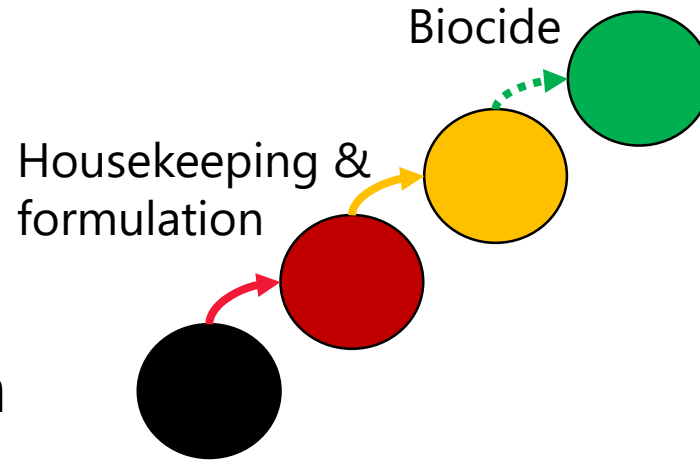
- Pasteurisation → destroys paint
- Adding salts → poor quality paint
- High solid paint → poor quality paint
- High pH → only matt paint
- No water → powder paint





Conclusions

- Paint allows bacterial growth
- Reduce microbial load
 - Raw materials & paint formulation & production hygiene
- Improve biocide effect
 - Paint formulation?



We cannot do without residual biocide effect in-can



Acknowledgements

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Ecoinnovation - MUDP
 - Reducing biocide concentrations for preservation of water-based paints
 - Environmentally friendly production of water-based paint



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Thank you!

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