



Biofilms- What Are They and How Do We Prevent Them?

Proper Cleaning and
Sanitizing Procedures in a
Food Service Setting

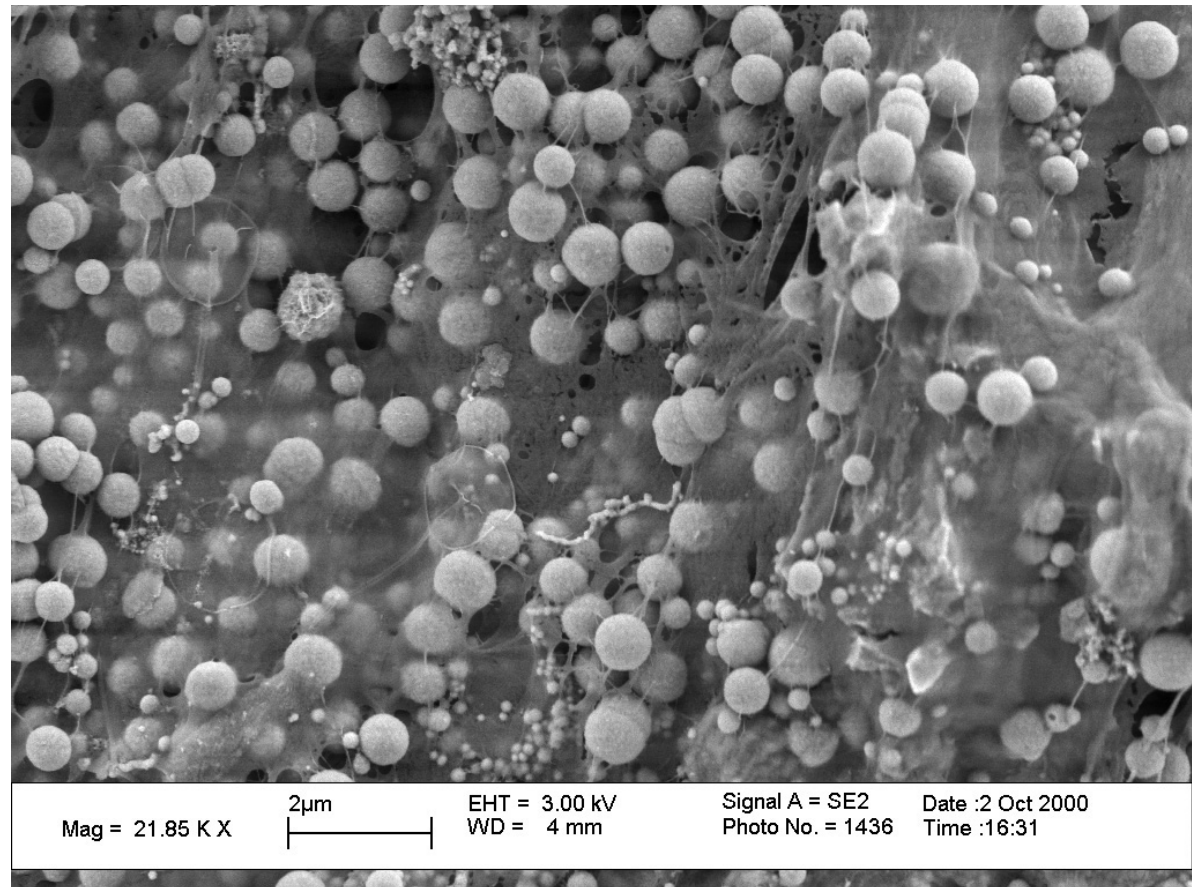
Loreena Hilton & Jessica Jutz

Agenda

- What is a biofilm?
- Are biofilms harmful?
- How do they form?
- Biofilms in the kitchen?
- How do we prevent them?

What is a biofilm?

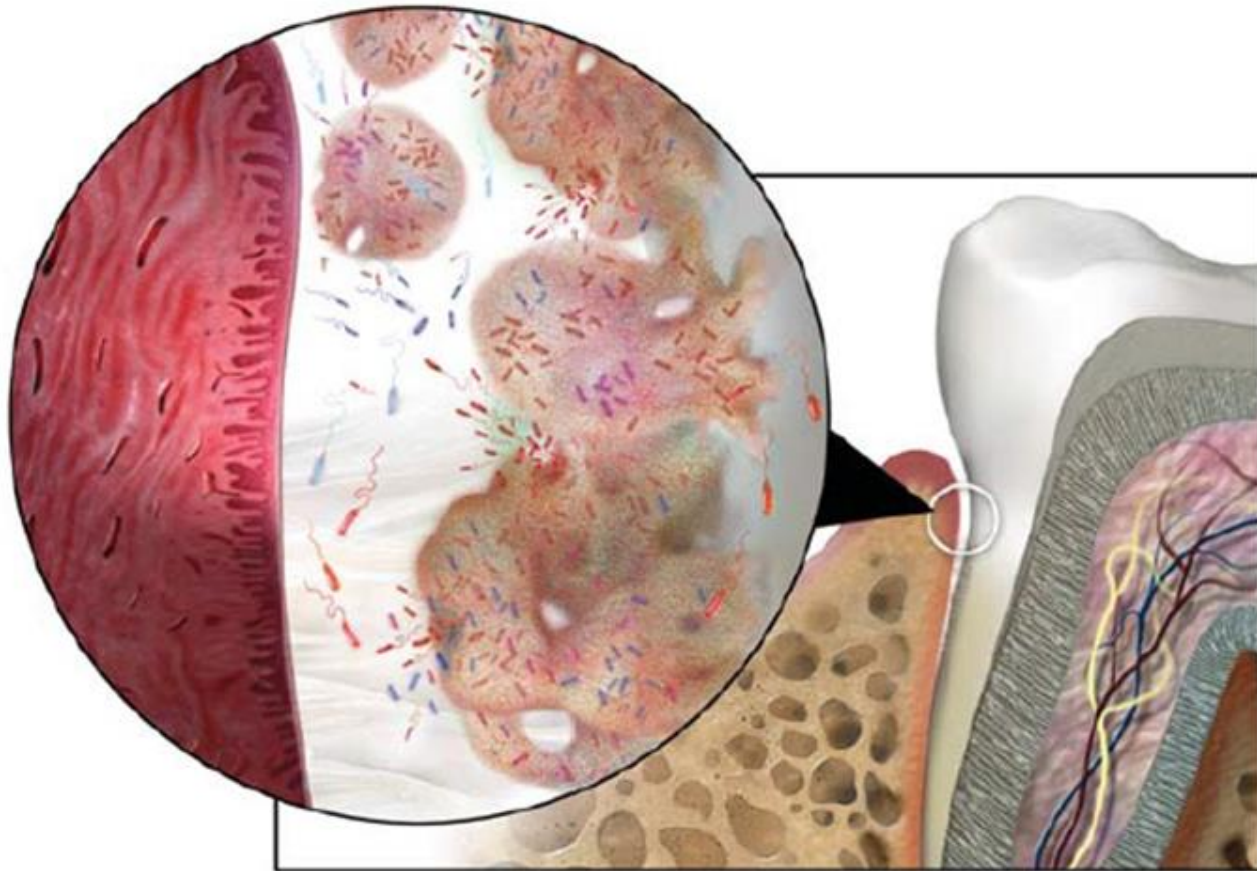
99% of
bacteria
live in
biofilms



Biofilms in the world



Biofilms in the world



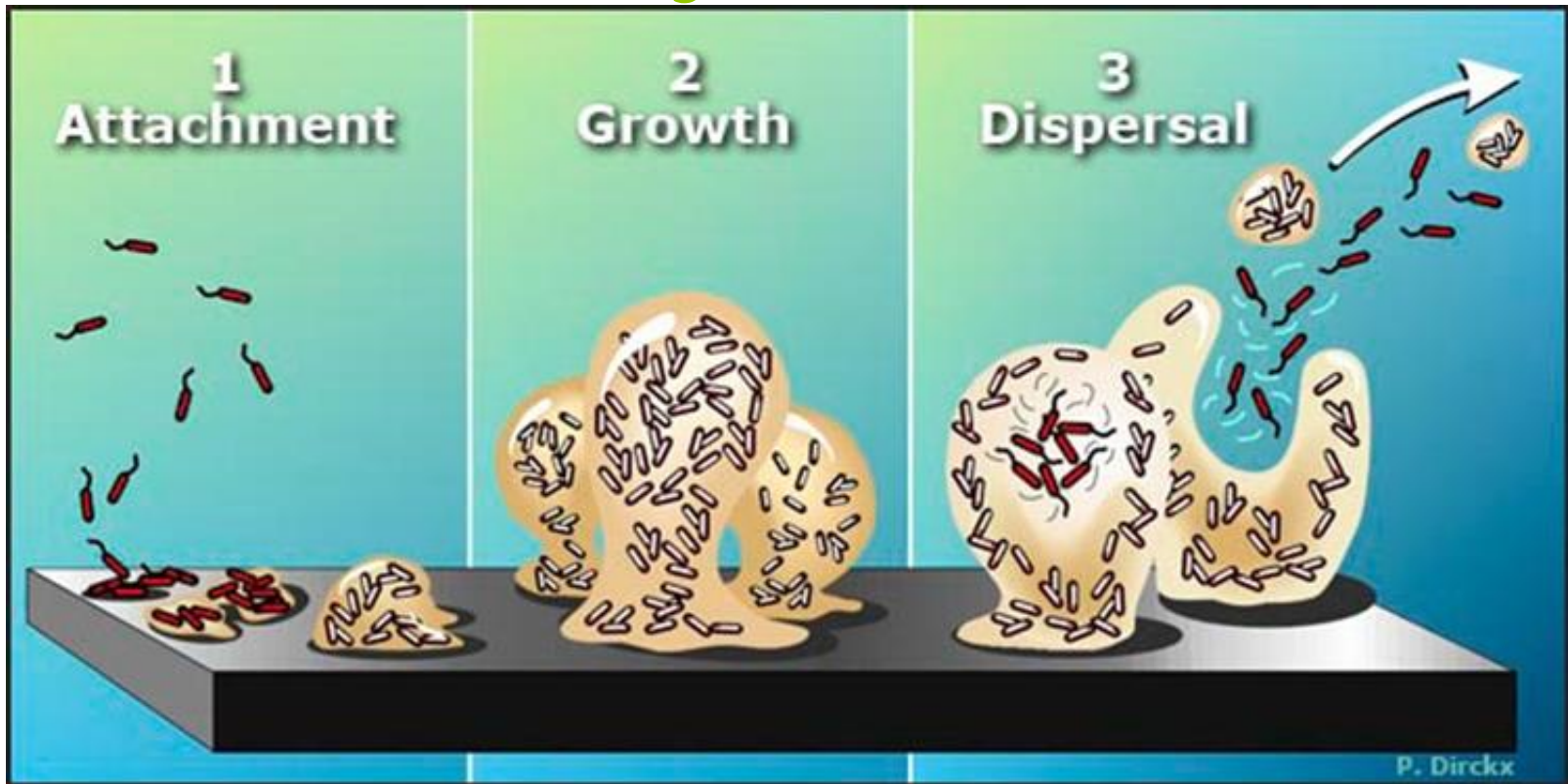
Biofilms in the world

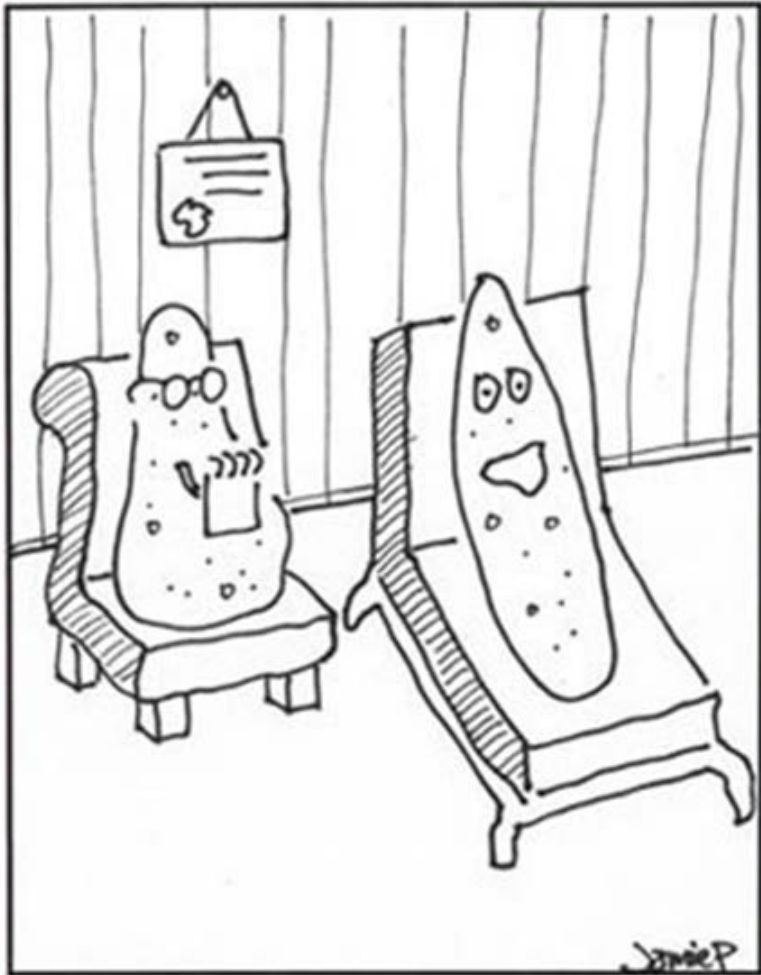


Are biofilms harmful?

- Can cause illness in humans.
- Can damage equipment.
- Can help with water filtration.
- Can help with decay of materials.

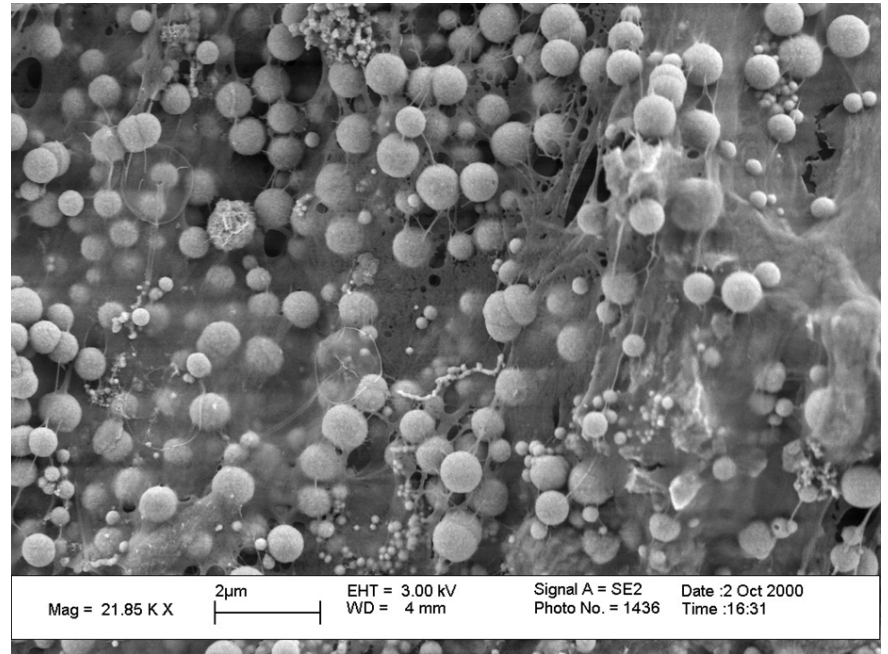
How do they form?





I just can't go with the flow anymore.
I've been thinking about joining a biofilm.

This Slime Smile created by Jamie Pennington



Mag = 21.85 K X

2µm

EHT = 3.00 kV
VWD = 4 mm

Signal A = SE2
Photo No. = 1436

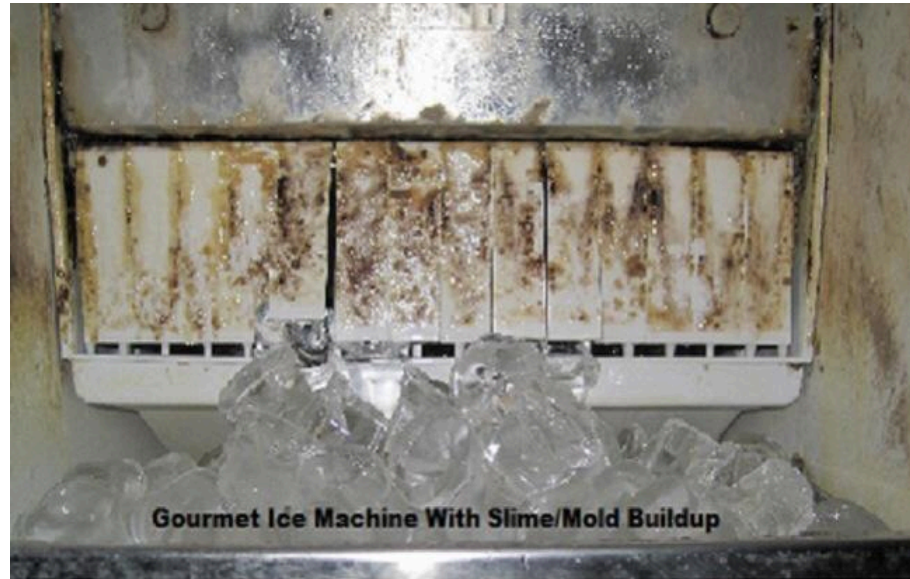
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Biofilms protect member bacteria

- <http://www.biofilm.montana.edu/resources/movies/2005/2005m02.html>

Where can Biofilms be found in the Kitchen?

- Ice machines
- Slicers
- Waste lines
- Floor Drains
- Prep tables
- Cutting boards



How to tell if a Biofilm is present

- Rainbow sheen on stainless steel
- Slimy feel or visual slime build-up
- Odor- due to lack of cleaning



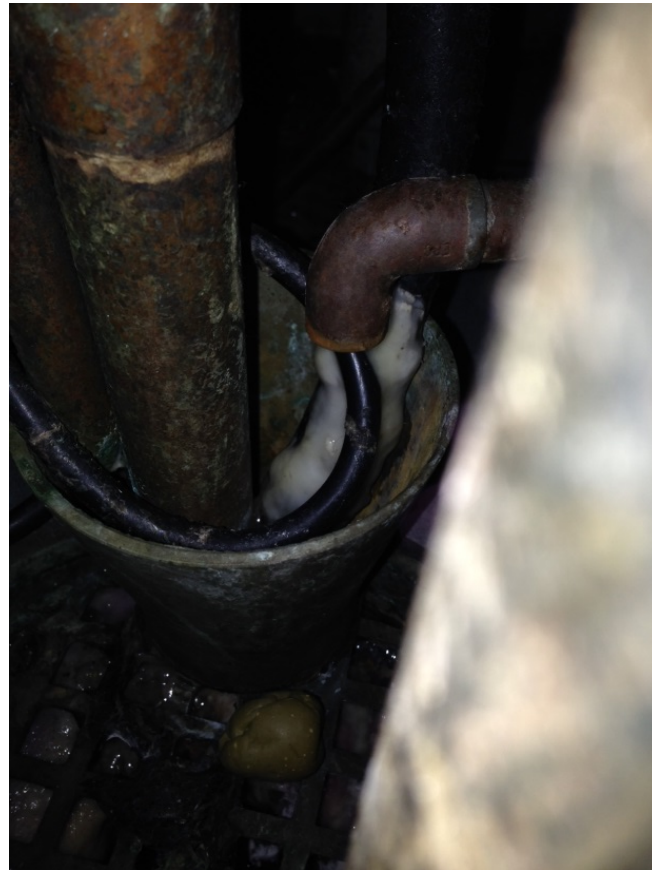
Implications of Biofilms in a Food Service Setting

- Foodborne illness: bacteria such as *Listeria*, *Salmonella*, *Pseudomonas*, and *Bacillus Cereus* all form biofilms
- *Listeria*- wet environments, *Pseudomonas*-stainless steel
- Non-food contact surfaces



Implications Continued

- Pests: fruit flies and other insects
- Damage to equipment and facility (corrosion of pipes)



More Biofilms....



Ice Video

- <http://www.youtube.com/watch?v=9TSoPAgofkk>

Proper Cleaning Steps to Prevent and Remove Biofilms

- Dry-clean:
Remove any visible scraps of food and debris
- Potable Rinse:
Rinse off any remaining debris with potable water



Proper Cleaning continued

- Wash with Detergent/soap: Use mechanical action (scrubbing) to remove any organic matter



Proper Cleaning Continued

- Second Rinse: Rinse off soapy water and organic matter
- Sanitize: Use an effective sanitizer at the correct concentration
 - Chlorine: 50-100ppm
 - Quaternary Ammonium: 200-400ppm
 - Higher concentrations may be used if removing a visible biofilm
- Air dry: Allow equipment and surfaces to air dry

How to prevent Biofilms

- Use approved equipment: NSF approved, smooth and easily cleanable, free of pits and scratches
- Maintain facility: smooth floors, walls, and ceilings



Prevention Continued

- Proper cleaning and sanitizing procedures
- Frequency of Cleaning



Questions???

References

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