

Seed feeder hygiene: what we know and where we need to go

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Mycoplasma Conjunctivitis

- *Mycoplasma gallisepticum*
- House Finches
- Swollen, crusty eyes
- Leads to blindness & death



(Friend and Franson 1999)



Kutztown, PA
October 16, 2016

Mycoplasmal Conjunctivitis spread and impacts

- 1st detected 1994
- Rapid spread in eastern US
- ~60 % decline in House Finch Population



(feederwatch.org)



Transmission of Mycoplasma

- Strongly linked to feeders (Adelman et al. 2015)
- Bird to bird contact
- Bird to feeder to bird (Dhondt et al. 2007)
- No risk to humans



(backyardbirdlover.com)

Salmonellosis

- *Salmonella enterica*
- Causes lesions in digestive tract
- Leads to diarrhea, lethargy, loss of coordination and death



(Friend and Franson 1999)



(onandagaaudubon.com)

Salmonellosis outbreaks at birdfeeding stations in U.S.



Figure 9.2 Locations of reported outbreaks of salmonellosis at birdfeeding stations within the United States. (From National Wildlife Health Center database.)

(Friend and Franson 1999)

Transmission of Salmonella

- *Salmonella* shed in feces
- Transmitted through contaminated food
- Strongly linked to feeders with fecal contamination (Davidson 2006)
- * May be transmitted to humans
- ** Human infection in Norway linked to cleaning bird feeders (Kapperud et al. 1998)



Aspergillosis – *Aspergillus fumigatus*

- Respiratory infection - fatal
- Not transmitted bird to bird
- Seed contamination from wet, moldy seed
- * Humans susceptible



(Friend and Franson 1999)



(georgiawildlife.com)

How to Clean Your Feeder? Current Recommendations

how to clean bird feeder - ... X +


https://www.google.com/?gws_rd=ssl#q=how+to+clean+bird+feeder

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Soak the **feeder** in the solution for ten minutes. Next, use a scrubbing brush and gloves to remove any stuck-on dirt. Then, rinse the **feeder** in **clean** water. Empty the bucket and fill it with **clean** water and four cups of vinegar. Jul 10, 2012



How To Clean A Bird Feeder In A Few Easy Steps | Huffington Post
www.huffingtonpost.com/2012/07/10/clean-a-bird-feeder_n_1659979.html

About this result • Feedback

Bird Feeder Care & Cleaning - Wild Birds Unlimited | Wild Birds ...
www.wbu.com/bird-feeder-care-cleaning/ ▼

In most cases, feeders simply need to be cleaned regularly with warm water and dried completely before refilling with fresh seed. If mold or debris has accumulated, or you have noticed sick birds at your feeder, use a ten parts water to one part bleach solution to clean the feeder.

Wild Birds Unlimited | Feeder Cleaning Guide | Columbus, OH
columbusoh.wbu.com/content/show/27313 ▼

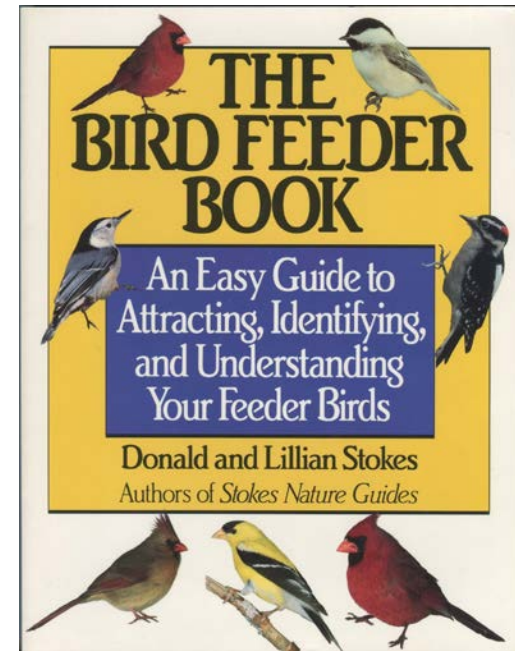
Clean Feeders Keeping your feeders clean and fresh is one of the most important factors in attracting birds to your yard. A dirty feeder is not only unappealing to ...

Bird Feeder Cleaning Tips and Tricks
birding.about.com > ... > [Feeders and Feeding](#) > [All About Bird Feeders](#) > [Feeder Care](#) ▼

Tips for effectively cleaning bird feeders to attract more birds and minimize diseases.

How to Clean Your Bird Feeder | All About Birds
<https://www.allaboutbirds.org/how-to-clean-your-bird-feeder/> ▼

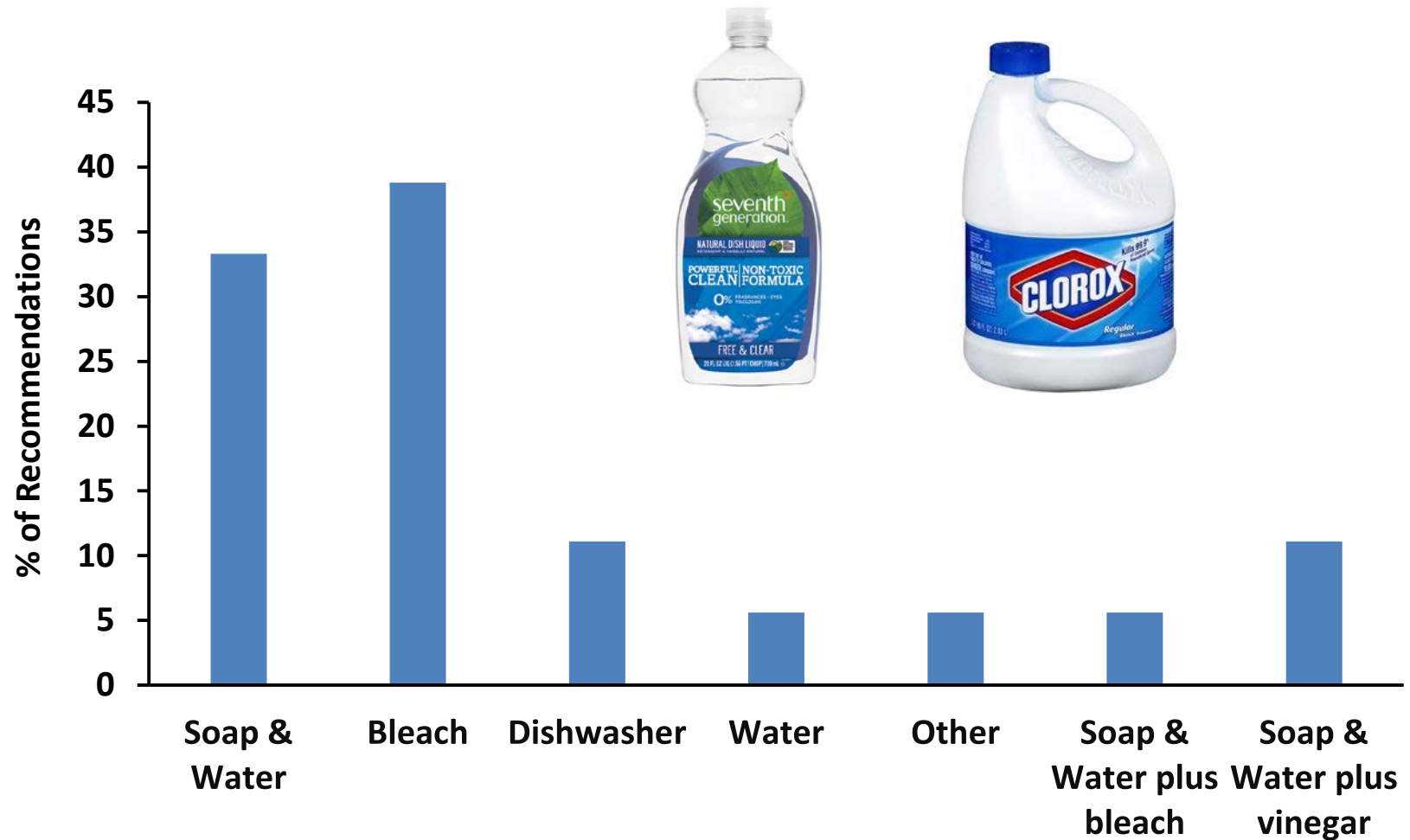
Apr 20, 2009 - Clean feeders at least once a week with hot water and a bottle brush. Don't use soap or a detergent. You can also clean hummingbird feeders by filling with a dilute bleach solution, but make sure to rinse them thoroughly and allow them to air dry before refilling.



- Surveyed 18 web and book recommendations

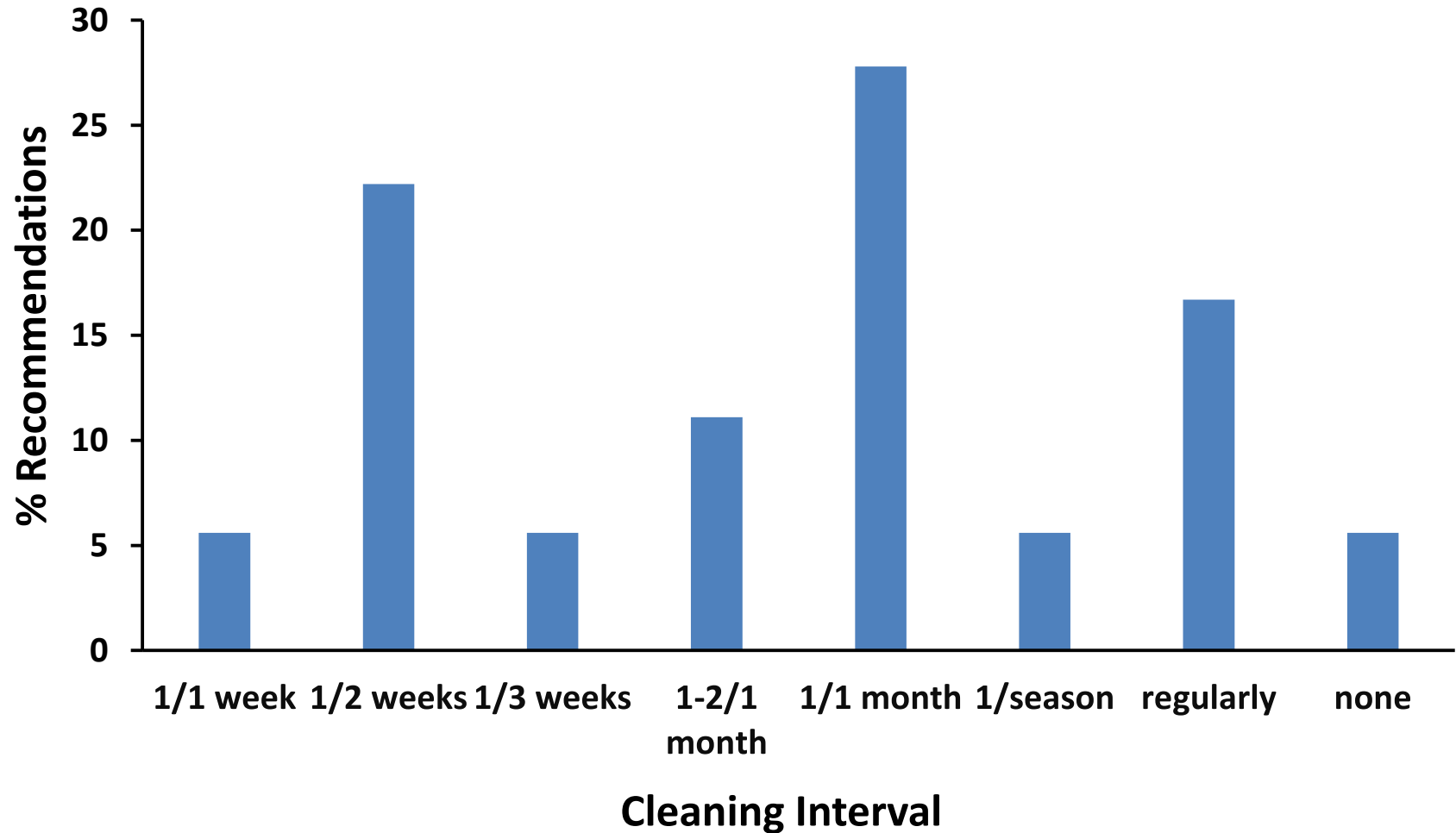
Feeder Cleaning Recommendations

1. Cleaning Products - primary



Feeder Cleaning Recommendations

2. Time Interval



Feeder Cleaning Recommendations

3. Ground Debris



72% recommend cleaning up debris below feeders

Cleaning Recommendation Summary

- **Cleaning Recommendations vary widely**
- **None based on published research**
- ***Need to evaluate effectiveness of products/methods**

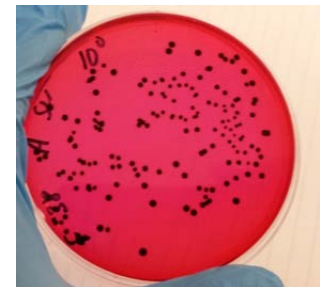
My Research Objectives

To Determine:

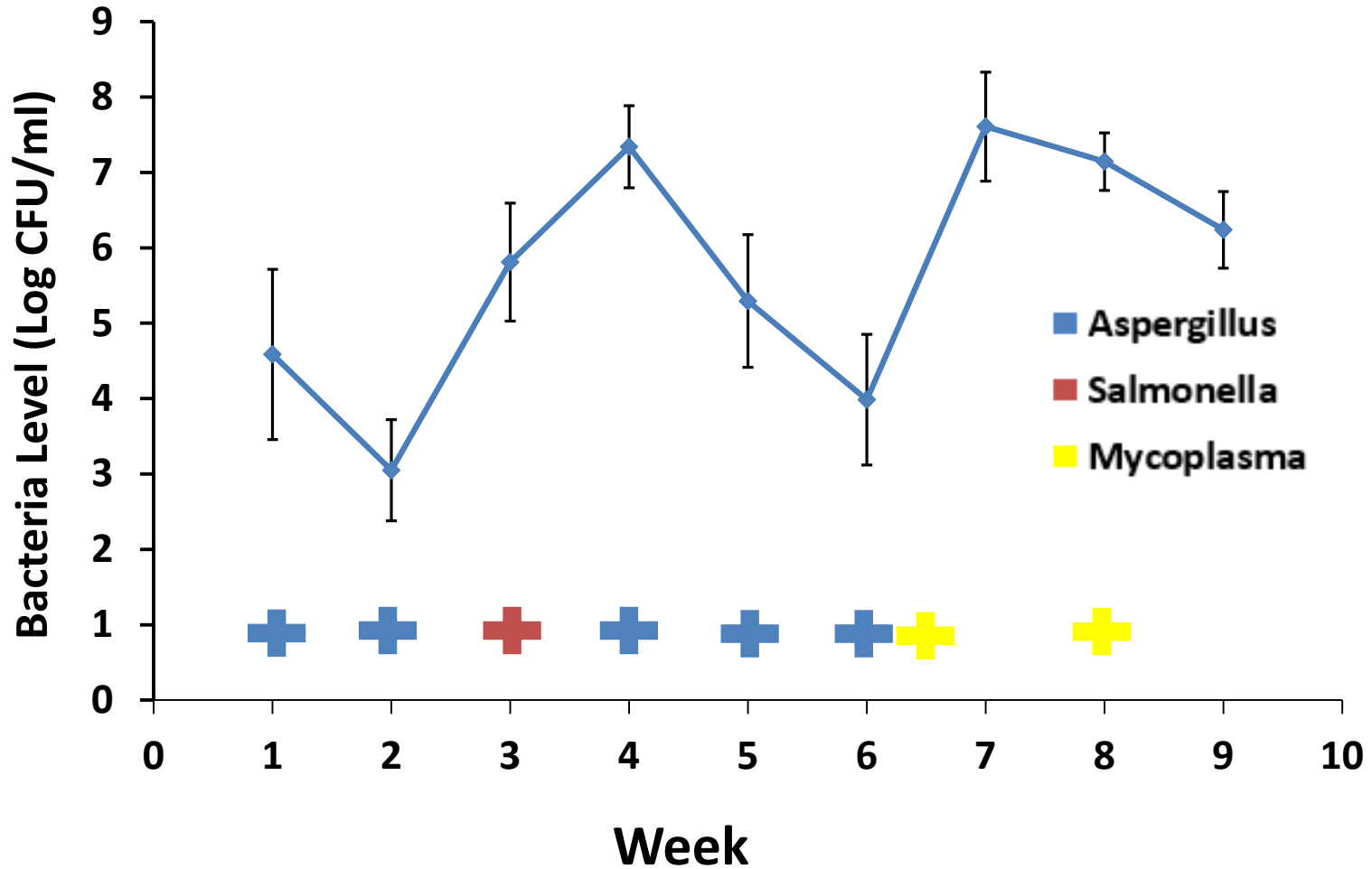
- **Interval to clean feeders**
- **Which cleaning products are most effective**
- **Standard seed feeder cleaning recommendation**
- **What methods people actually use**

How often to clean feeders?

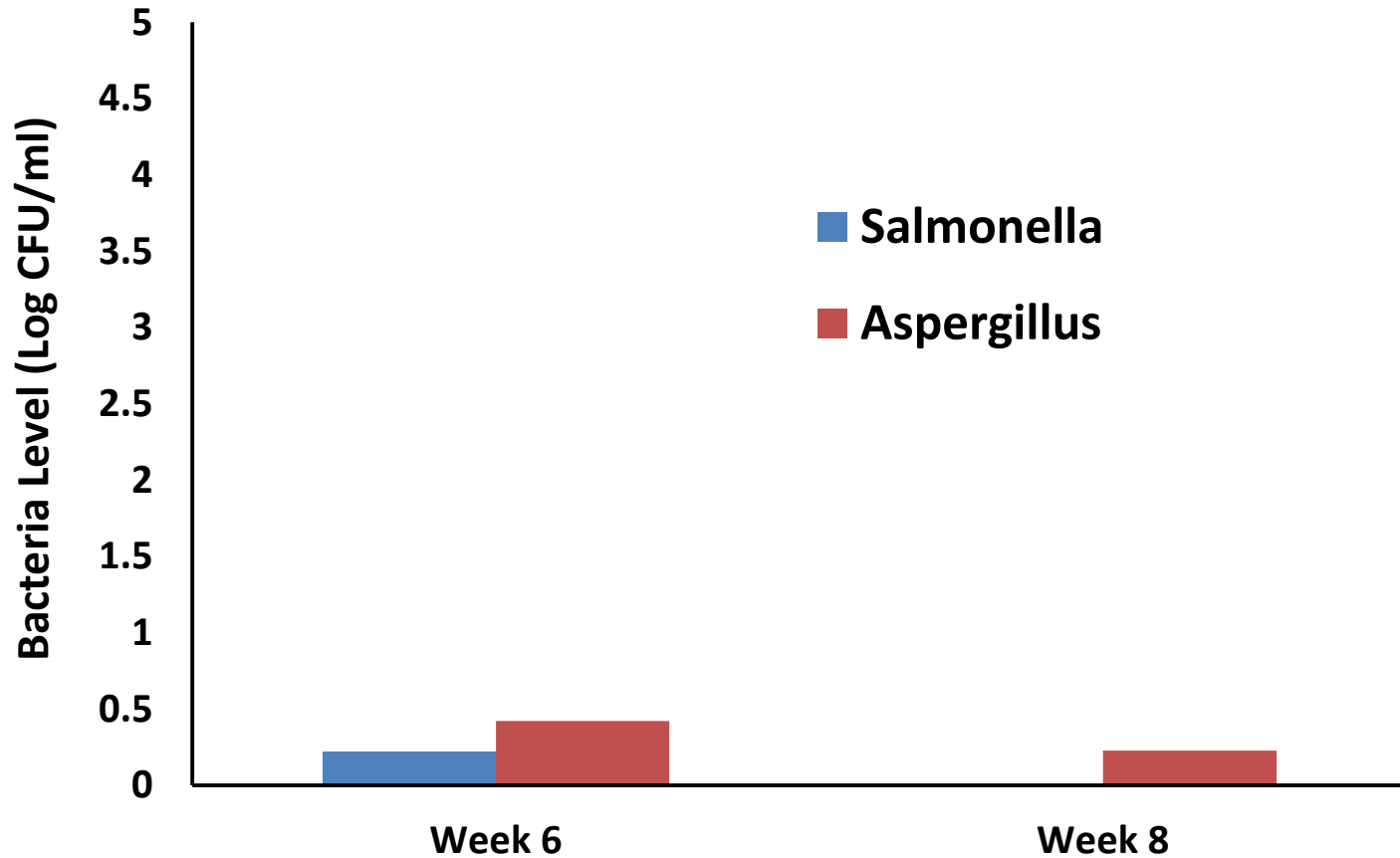
- Feeders out for 9 weeks
- Sampled weekly for
 - General bacteria
 - *Aspergillus*, *Salmonella*, *Mycoplasma*
- Sampled ground debris weeks 6 & 8
 - *Aspergillus*, *Salmonella*



General Bacteria Levels Over Time



Pathogenic Bacteria Levels in Debris on Ground



Cleaning Interval - Summary

- **General bacteria levels peak by week 4**
- **Pathogenic bacteria present by week 3**
- **Pathogens detected in ground debris**
- **Cleaning interval of 1-2 per month**

Effectiveness of Cleaning Methods

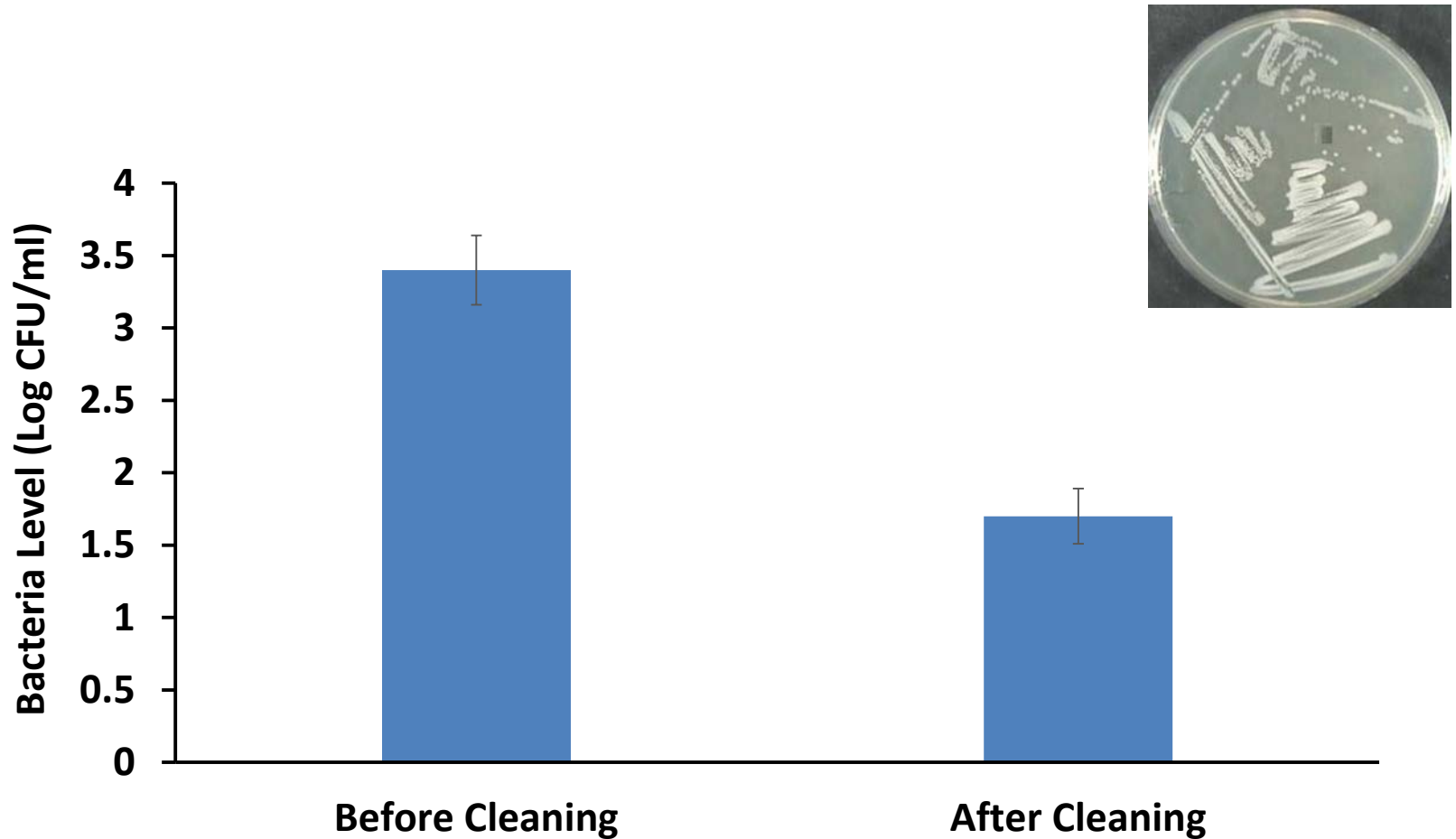
1. 10 % Bleach wipes – short term

- Feeders out for 6 weeks
- 1-2 wipes to remove debris
- Final wipe to sanitize
- Sampled for bacteria before and after cleaning



Effectiveness of Cleaning Methods

1. 10 % Bleach wipes – short term



Effectiveness of Cleaning Methods

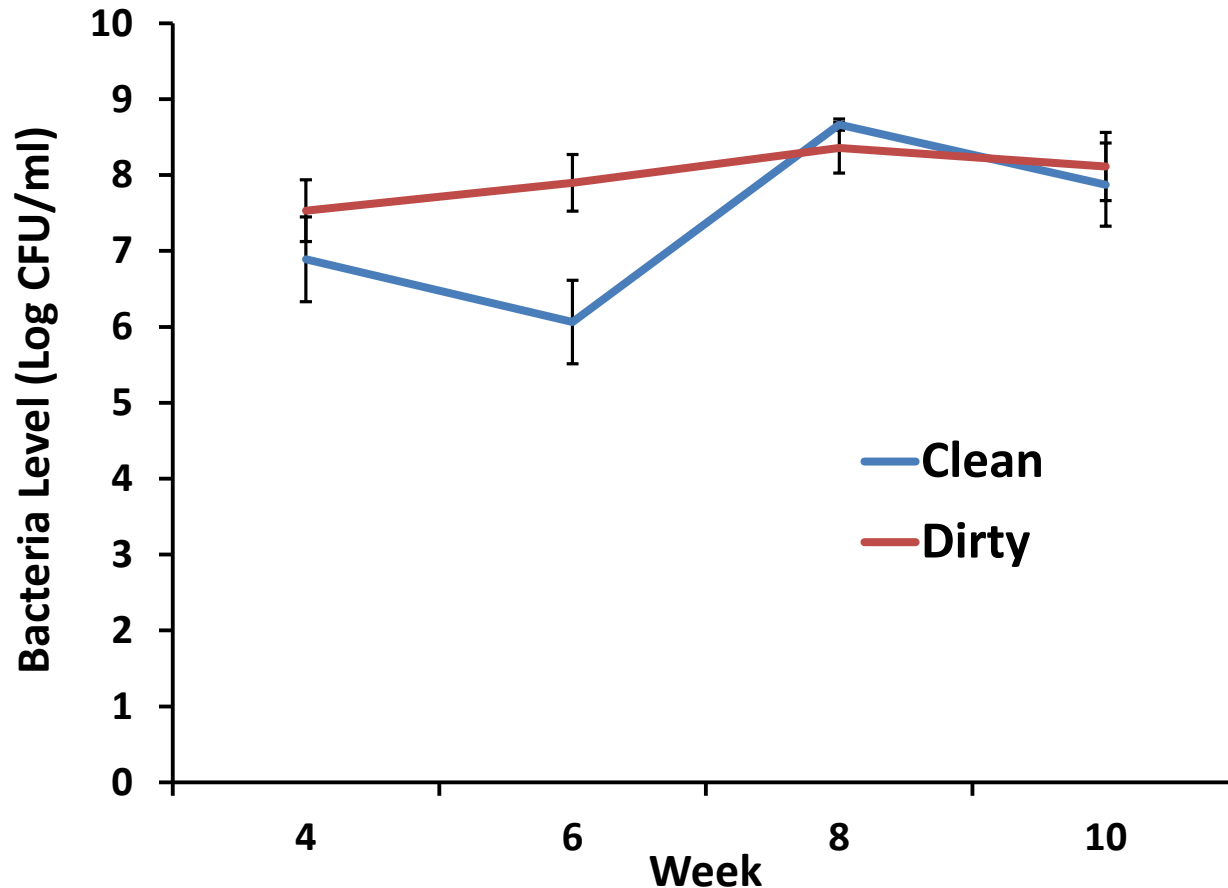
1. 10 % Bleach wipes – long term

- Compared bacteria on feeders cleaned with bleach wipes to those not cleaned
- Cleaned every 2 weeks for 10 weeks
- Sampled for bacteria weeks in between cleaning



Effectiveness of Cleaning Methods

1. 10 % Bleach wipes – long term



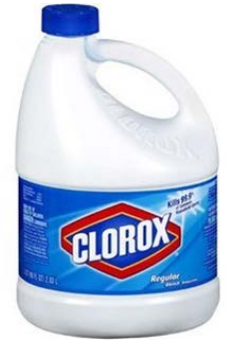
Effectiveness of Bleach Wipes – Conclusions

- **Effective at removing bacteria**
- **Effectiveness diminished over time**
- **Likely due to build up of debris**

Effectiveness of Cleaning Methods

2. Comparison of 3 common methods

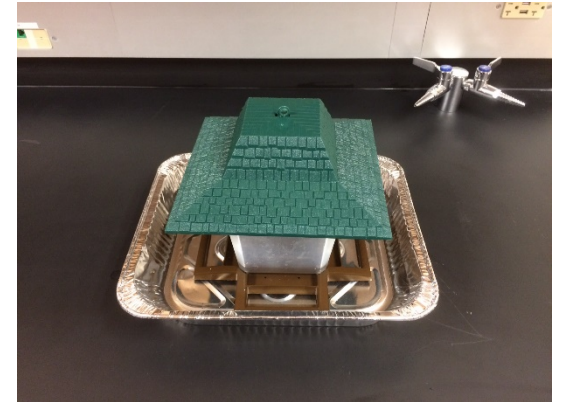
- 1. Soap & Water
- 2. 10% Bleach Soak
- 3. Soap & water plus bleach soak
- Effectiveness in removing *Salmonella* from feeders
- Tested with and without seed & feces debris





Procedures for 3 Methods:

- Feeders inoculated with *Salmonella enterica* and allowed to air dry
 - Exp 1 new feeders
 - Exp 2 feeders used for 6 weeks
- Sampled for bacteria before and after cleaning



Three Cleaning Methods

Soap & Water



10% Bleach Soak



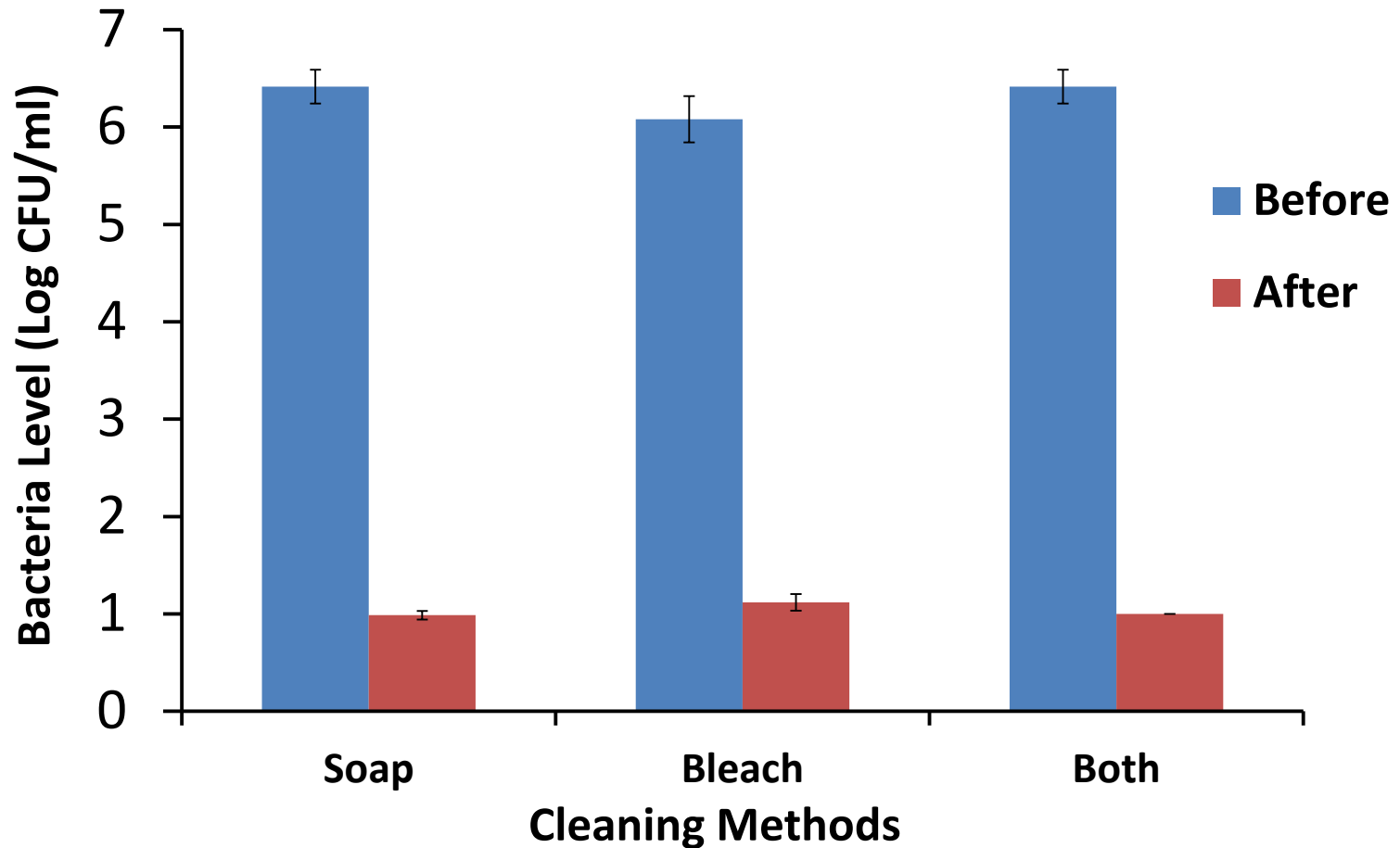
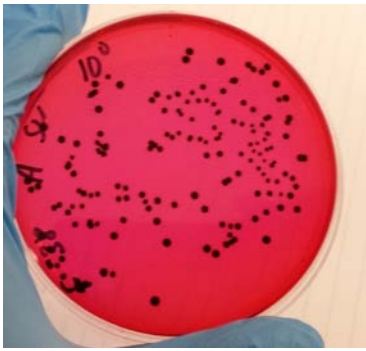
Soap & Water plus Bleach

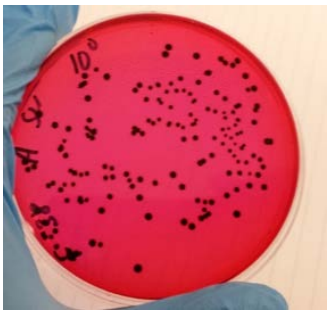


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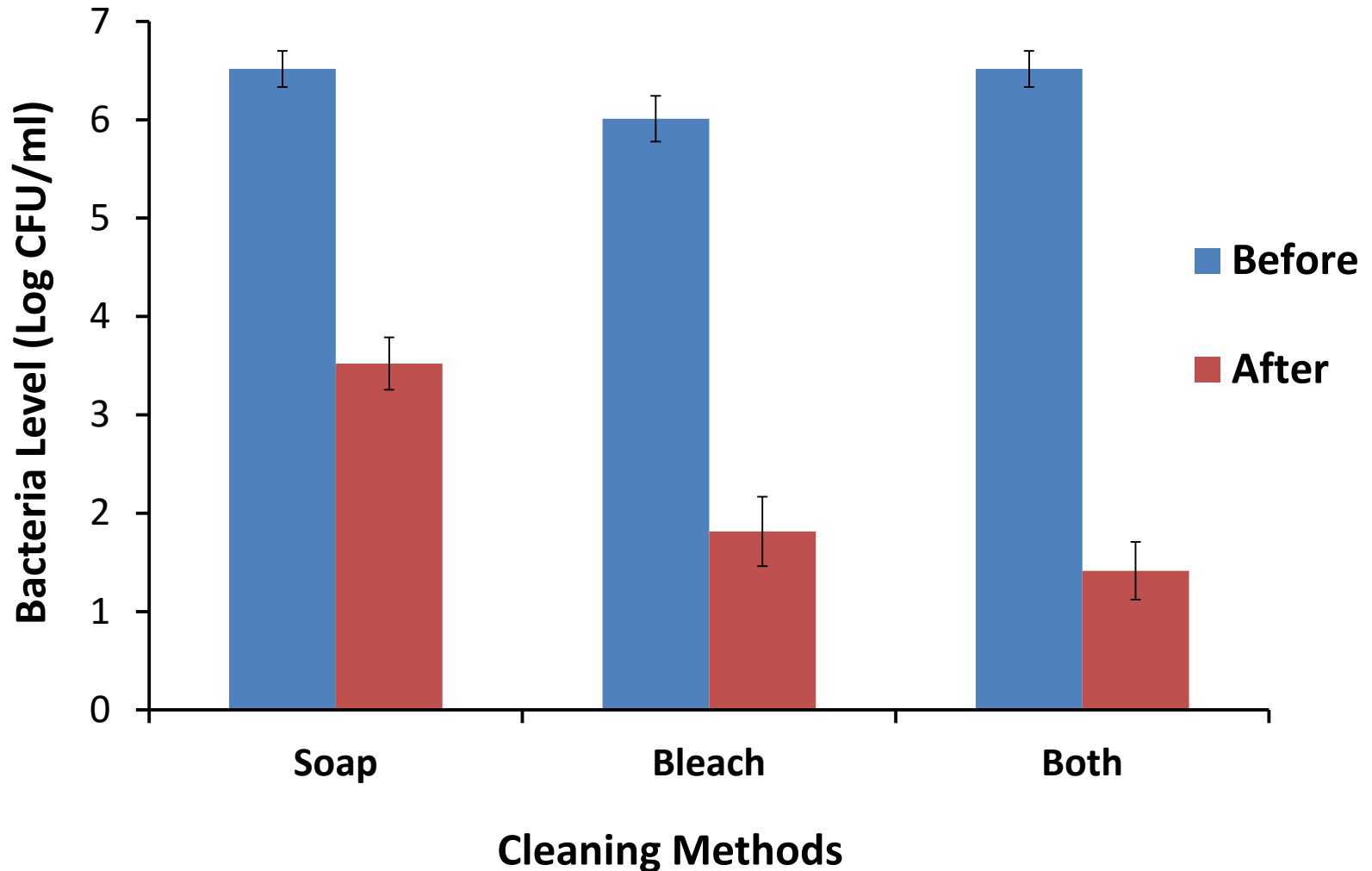


Results - Reduction of *Salmonella* No Debris





Results - Reduction of *Salmonella* With Debris



Methods with and without Debris

Conclusions

- **All treatments were effective without debris**
- **Presence of debris reduced effectiveness**
- **Soap and water was least effective with debris**
- **Thorough debris removal critical part of cleaning**

Final Cleaning Recommendations

- **Feeders should be cleaned 1-2/month**
- **Minimal Debris - Use soap & water or 10 min soak in 10 % bleach**
- **Heavy Debris or Sick Birds - Combination of soap & water plus 10 min soak in 10 % bleach**
- **Debris below the feeder should be removed**

Final Cleaning Recommendations

Human Health Concerns

- **DO NOT clean in kitchen!**
- **DO NOT use dishwasher**
- **Wash your hands thoroughly after cleaning feeders**



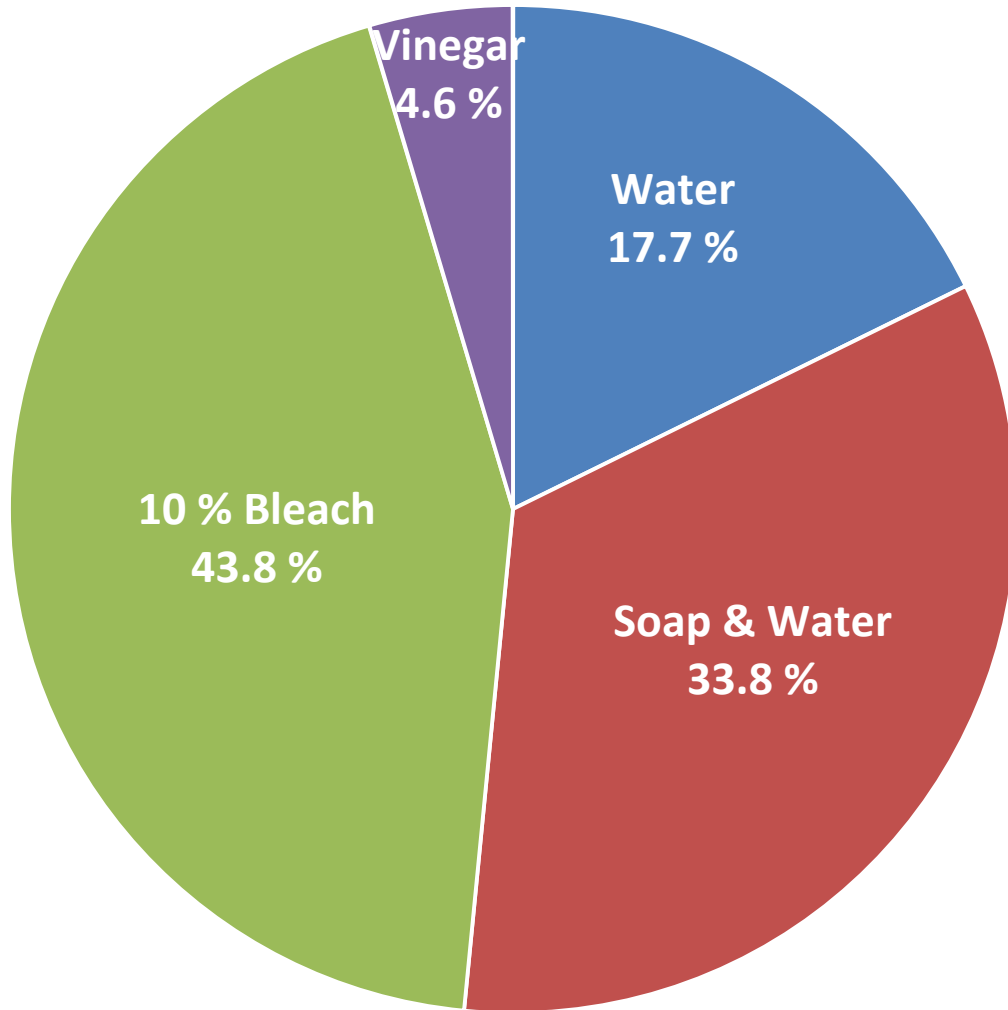
<http://blog.audubonguides.com/>

Feeder Hygiene Survey

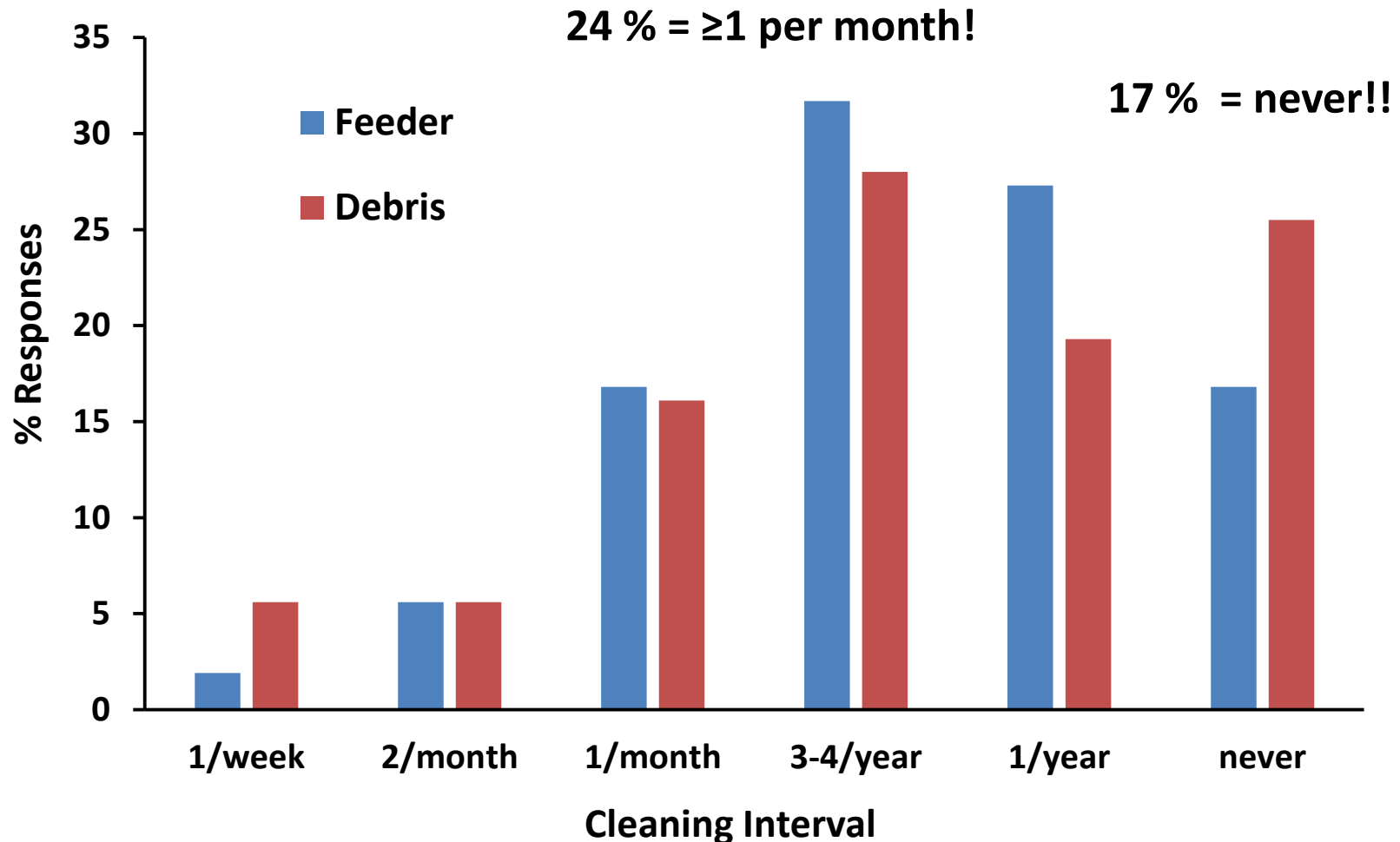
- **Online survey of birdwatchers (170 respondents)**
- **Members of bird watching listservs in PA, NJ, & NY**
- **Questions about bird feeder cleaning methods**



What products are feeders cleaned with?



How often do you clean your feeder and debris on ground below?



Actual Hygiene Methods - Summary

- **Most using effective cleaning products**
- ***Need to clean up debris too**
- **** Not cleaning often enough!**

Future Research Directions

- **What is most effective cleaning interval?**
 - In practice over feeding season
- **Does feeder type or material influence bacterial growth?**



Future Research Directions



- Efficacy of non-toxic alternatives to bleach
- Does bleach residue deter feeding by birds?



Final Conclusions

- **Some effective cleaning methods**
 - more research needed
- **Feeders design important**
 - should be easy to clean
- **Continual public education needed**



Acknowledgments

Collaborator

- Daniel Aruscavage

Students

- Makayla Boyd
- Chelsea Bressler
- Lisamarie Feliciano

- Many volunteers

Funding

