

From: Marc Edwards [<mailto:edwardsm@vt.edu>] Sent: Friday, January 6, 2017 6:02 PM
To: Shawn McElmurry <s.mcelmurry@wayne.edu>; apruden@vt.edu
Subject:

Shawn,

POU end of faucet filters are very commonplace and many of them are carbon block. The best estimate I have is that they are installed in about ¼ of US homes. They are sold in virtually every big box hardware store and wal-mart in the country. Have been for decades.

All of them have some effectiveness for cyst and microbial, the only question is whether they meet certification or not.

5 log increase in bacteria in such filters after stagnation regrowth are commonplace.

I can also tell you over the years, that it is not uncommon to get a million cfu/mL in parts of a system with low chlorine residual and a galvanized iron pipes. No distribution system monitoring sites would ever use a site with a galvanized iron service for that very reason.

Was there any other specific references or insights that you wanted? Marc

From: Shawn McElmurry [<mailto:s.mcelmurry@wayne.edu>]
Sent: Friday, January 6, 2017 8:51 PM To: Marc Edwards <edwardsm@vt.edu> Cc: apruden@vt.edu
Subject: RE:

Hey Marc, thanks for the email follow up and taking the time earlier to discuss. I will read the attachment you sent along very closely. Thank you.

With regard to other references, I can't remember exactly but I thought you said something like all studies show no evidence of pathogens coming through PoU filters. I may have paraphrased this incorrectly. I also remember you suggesting that Enterobacter is the type of bacteria amplified and this isn't a health risk. I guess any references you can point me toward regarding these issues would be helpful to me.

Safe travels.

Thanks, Shawn

From: Marc Edwards

<edwardsm@vt.edu>

Date: January 8, 2017 at 11:43:12 AM EST

To: 'Shawn McElmurry'

<s.mcelmurry@wayne.edu>, "'Wells, Eden (DHHS)'"

<WellsE3@michigan.gov>, "'Pruden-Bagchi, Amy'"

<apruden@vt.edu>, 'Mona'

<monahannaattisha@gmail.com>, "'Deltoral, Miguel'"

<deltoral.miguel@epa.gov>, "'Kaplan, Robert'"

<kaplan.robert@epa.gov>

Subject: Your request for references about enterobacteria as "normal" part of regrowth

Shawn,

What I said in the phone call, is that I am not aware of any credible research, that indicates microbial regrowth occurring on POU carbon filters will produce pathogens that pose a significant human health risk via ingestion.

After your teams presentation in Flint a few weeks back, I fielded about a dozen phone calls from Flint residents, who said they heard that your team has found health "issues" and "drawbacks" associated with use of the filters. That was also the message you repeated to me in our phone conversation Friday. You further stated that your team is preparing publications on the on the possible microbial health risks to residents, arising from using the lead filters, and is preparing guidance on how they can supposedly reduce those risks.

Central to your argument, is that your team is the first to ever look at enterobacteria in potable water, and your belief that finding these bacteria growing on filters represents a health risk that your team is obligated to publicize. In the call I said growth of such bacteria is not unusual in normal potable water systems, and below you requested that I provide you with some references.

Here is a representative paper in which we report normal microbial regrowth in several water distribution systems. While it was a side issue because we are focused on actual pathogens, if you look at SI (Table S7) you will see Gamma Proteobacteria (Enterobacteria is a member) are amongst the most abundant in the normal microbiome of premise plumbing from several systems. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0141087>

Here is our paper on Gamma Proteobacteria regrowth in ultrapure water storage, which has filter sterilization as a final step. <http://pubs.rsc.org/en/Content/ArticleLanding/2015/EW/c5ew00134j#!divAbstract>

We have also tracked Enterobacteria re-growth in our hot and cold

plumbing rigs in Blacksburg and elsewhere.

Here are two review papers discussing Gamma Proteobacteria as the dominant component of the normal microbiome regrowth in bottled water.

Leclerc, H., and M. S. Da Costa. 1998. Microbiology of natural mineral waters, p. 223-273. In D. A.

G. Senior and P. R. Ashurst (ed.), Technology of bottled water. Sheffield Academic Press, Ltd., Sheffield, England.

Leclerc, H., and A. Moreau. 2002. Microbiological safety of natural mineral water. FEMS Microbiol. Rev. 26:207-222.

Here is the same, confirmed in a more recent U.S. molecular study for Desani and Aquafina bottled water. http://scholar.colorado.edu/cgi/viewcontent.cgi?article=1866&context=honr_theses

None of these researchers, felt that these data, merited publicly raising health “issues” about “drawbacks” associated with consumption of either potable or bottled water.

In the call you also speculated that there is a problem with fecal contamination in the Flint system, due to main breaks or other deficiencies, If the Flint water system is currently unusually fecal contaminated and compromised, as you speculated in our call Friday, then the Flint water is dangerous with or without the filters. If you actually discover fecal bacteria, the accepted response is to increase chlorine and/or issue boil water orders. Your public statements and materials imply the filters are amplifying the (speculated) problem with fecal pathogens, does not make sense to me.

Your public statements from a few weeks ago have already significantly impacted public perception regarding safety of filter use in Flint, and it is practically impossible at this point, for anyone to walk those statements back. If you keep making statements like those in our phone call Friday, I can guarantee that some Flint residents will stop using the lead filters completely. I would not be surprised if some people already have.

The residents also have received a message from your team, that you think the filter bacteria might be causing their rashes and respiratory problems. I reviewed your materials, and I do not see where you said that, so unless that is what you actually believe, maybe you can make it more clear in your public presentations, that the residents rashes and breathing problems have nothing to do with regrowth on the filters.

I am cc'ing Bob, Miguel, and the State folks on this, because after our call, I feel that this issue should be a priority discussion item for our data summit-- it will certainly be a key point at the town hall because the residents have now been primed by your team to voice your concerns. At a minimum, everyone should be made aware of exactly what your past and future public statements on this subject will be, so that they can be better prepared.