Accepted Manuscript

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PII: S1438-4639(17)30356-5
DOI: http://dx.doi.org/10.1016/j.ijheh.2017.08.005
Reference: IJHEH 13118

To appear in:

Received date: 5-6-2017
Revised date: 11-8-2017
Accepted date: 13-8-2017

Please cite this article as: {http://dx.doi.org/

<AT>Growth of *Legionella anisa* in a model drinking water system to evaluate different shower outlets and the impact of cast iron rust

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<ABS-HEAD>Abstract

<ABS-P>*Legionella* continues to be a problem in water systems. This study investigated the influence of different shower mixer faucets, and the influence of the presence of cast iron rust from a drinking water system on the growth of *Legionella.* The research is conducted using a model of a household containing four drinking water systems. All four systems, which contained standard plumbing components including copper pipes and a water heater, were filled with unchlorinated drinking water. Furthermore, all systems had three different shower faucets: (A) a stainless-steel faucet, (B) a brass-ceramic faucet, and (C) a brass thermostatic faucet. System 1 was solely filled with drinking water. System 2 was filled with drinking water, and cast iron rust. System 3 was contaminated with *Legionella*, and system 4 was contaminated with a *Legionella*, and cast iron rust. During a period of 34 months, 450 cold water samples were taken from 15 sample points of the four drinking water systems, and tested for *Legionella* according to the Dutch Standard (NEN 6265). In system 4, with added cast iron rust, the stainless-steel mixer faucet (A) had the highest concentration of *Legionella* at >4.3log10CFU/l (>20,000 CFU/l) and was positive in 46.4% of samples. In contrast, the stainless-steel mixer faucet (A) of system 3 without cast iron rust showed 14.3% positive samples with a maximum concentration of 3.9log10CFU/l (7,600 CFU/l) *Legionella*. Additionally, both contaminated systems (3 and 4), with the brass thermostatic faucet (C), tested positive for *Legionella.* System 3 in 85.7% of the samples, with a maximum concentration of 4.38log10CFU/l (24,200 CFU/l), and system 4 in 64.3% of the samples with a maximum concentration of 4.13log10CFU/l (13.400 CFU/l). These results suggest that both the type of faucet used in a drinking water system and the presence or absence of cast iron rust influence the growth of *Legionella*.
<KWD>Keywords: Faucet; *Legionella* spp.; Stainless steel; drinking water; thermostatic.

INTRODUCTION