CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

J1919

Project Title

Mom, Do I Have to Rinse/Scrub the Plates Before I Put Them in the Dishwasher?

Abstract

Objectives/Goals

To determine if a pre-rinse or scrub step will help the ability of a dishwasher to clean dishes. Glo Germ(TM) was used as a bacterial surrogate to represent a biofilm that could possibly form if dirty plates were left in the sink over the weekend. Three different automatic dishwashing detergents were evaluated. The effect of using no automatic dishwashing detergent was also determined.

Methods/Materials

Constant levels of Glo Germ(TM) were introduced and evenly distributed onto the surfaces of plates. Photographs were taken before and after each dishwashing cycle after illuminating the plates with UV light. Photographs were then analyzed using Image J software. Fluorescence was measured and compared. Testing was also performed after using a 5 second pre-rinse step and a scrub step.

Results

Differences were seen when evaluating the different automatic dishwashing products. Miele, Cascade, and Finish reduced Glo Germ(TM) by 76%, 67%, and 7%, respectively, when no pre-rinse or scrub steps were evaluated. The use of no detergent performed better than Finish and produced a 35% reduction. With the exception of Finish and no detergent, the use of a pre-rinse step did not help in Glo Germ(TM) removal. The use of a scrub step helped all products (including no detergent) remove Glo Germ(TM).

Conclusions/Discussion

Test results indicate that differences exist between different cleaning products. Miele and Cascade appeared to produce the most favorable results. Pre-rinsing plates did not have an effect when evaluating all of the products. Scrubbing plates helps in Glo Germ(TM) removal and conserves water.

Summary Statement

Determined if pre-rinsing or scrubbing helps the abilities of three different dishwashing detergents to remove surrogate biofilms from plates.

Help Received

My teacher, Cathy Engle, and my parents provided support and guidance in performing this project.