

Effect of Hand Washing on Surface Bacteria

The purpose of this exercise is for students to understand the value of proper hand washing using a very simple, semi-quantitative procedure.

First Period

Students should work in groups of four, if possible. Each group should obtain eight (8) tryptic soy agar (TSA) plates.

Three different hand soaps in pump bottles will be provided for the entire laboratory to use. Be sure to note the composition these soaps. As much as is practical, each student group should choose a different hand soap to use.

Four students in each group will be involved in washing his/her hands with the selected soap. Before hand washing, each of these students should use one hand to gently make a five-finger impression on one of their TSA plates. This plate should be labeled appropriately and marked “before” to indicate it is an impression made prior to hand washing.

Using the hand soap provided in pump bottles, one student in the group should wash his/her hands for 10 seconds using three pumps of soap. A second student, using the same amount of soap, should wash his/her hands for 30 seconds. The third student should wash his/her hands for 1 minute and the fourth should wash for 3 minutes. As closely as possible, adhere to the following procedure:

- Using continuously running warm water
- Apply soap vigorously across all hand surfaces
- Rinse thoroughly and dry well with paper towels
- Use a paper towel to turn off the faucet and do not touch anything before the next step

Immediately after washing and drying, make another five-finger impression on a TSA plate using the same hand/fingers employed previously. This plate should be labeled appropriately and marked “after” to indicate it is an impression made following hand washing.

Incubate both the “before” and “after” plates at 37°C for 48 hours.

Second Period

Remove and examine the TSA plates upon which the finger impressions were made.

Use the following scale to record the results:

- *, more growth on “after” fingerprints than “before” fingerprints
- , no significant difference in growth between “after” and “before” fingerprints
- +, slightly less growth on “after” fingerprints than “before” fingerprints
- ++, moderately less growth on “after” fingerprints than “before” fingerprints
- +++, significantly less growth on “after” fingerprints than “before” fingerprints
- ++++, no growth on “after” fingerprints, but growth evident on “before” fingerprints

Share these results with the rest of the class using the attached worksheet.

