

Antibacterial Properties of a FiteBac® Germicidal Hand Gel Formulation

Purpose: To assess residual antibacterial activity of an expired **FiteBac® Germicidal Hand Gel** formulation when challenged with *Staphylococcus aureus*.

Study Materials:

1. **FiteBac® Germicidal Hand Gel** (*FiteBac SkinCare, LLC*) - lot# 105800, formulated 12/2011
2. Spectronic 200 Spectrophotometer
3. Commercial *Staphylococcus aureus* ATCC#6538
4. Neutralizing solution (containing lecithin and polysorbate 80)
5. ChromAgar *Staphylococcus aureus* selective medium
6. Non-antimicrobial liquid soap hand wash
7. Sterile latex gloves

Experimental Design (Modified ASTM E2755):

Volunteer's hands were screened for eczema, dermatitis, allergies, or other observable skin disorders prior to the initiation of this study. A bacterial suspension of stock *Staphylococcus aureus* ATCC #6538 was prepared by aerobically culturing bacteria in 10 mL of trypticase soy broth and incubated at 37C for 24 hours. Bacterial concentrations were subsequently determined using a Spectronic 200 spectrophotometer and diluted to a 5.0×10^6 cfu/mL working concentration. Prior to application of the test germicidal hand gel, 0.2 mL (1×10^6 cfu) of the bacterial working stock was pipetted into volunteer's hands and rubbed onto hands for complete coverage. Following 15 minutes of exposure, volunteers donned sterile gloves and 30 mL of neutralizing solution was poured into each glove. Gloved hands were massaged for 1 min and contaminated glove juice suspension was pipetted out and collected in a sterile 15 mL conical tube. This was diluted (1/10 and 1/100) and 0.1 mL of both diluted and undiluted solutions were cultured on CHROMagar *S. aureus* selective media and incubated at 37C for 24-48 hours. These initial samples served as positive controls. Hands were then washed with non-antimicrobial soap, air dried, and then a pea-sized amount of **FiteBac Germicidal Hand Gel** was applied onto the hands. Four (4) hours after the hand gel was applied 0.2 mL of the bacterial working stock was reapplied to the hands. Test samples were collected and cultured in the same manner as the positive controls. For all plates, test and control colony counts were calculated and analyzed.

Note: The expired **FiteBac Germicidal Hand Gel** was kept at room temperature both before and after its expiration date of December 2013.

Results:

No skin aberrations were found on any of the participating volunteers. Compared to the baseline (control) samples, on average we saw a 1.32 log reduction of *S. aureus* when expired **FiteBac** was applied to the hands (**Table 1**).

Table 1. Bacterial reduction

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Average
Log reduction	1.7	1.18	1.13	0.78	1.46	1.87	1.25	1.22	1.29	1.32

Conclusion:

In this study the residual germicidal efficacy of an expired **FiteBac Germicidal Hand Gel** hand gel (expired 12/2013) was examined. When challenged with 1×10^6 colony forming units of *S. aureus*, an average reduction of approximately 90% (1.32 log reduction) was observed. These findings suggest that the **FiteBac Germicidal Hand Gel** preparation retained its antimicrobial properties for an extended time period.