

# Effects of Sanitation and Surface Type on Bacterial Populations in a University Swine Barn



A.J. Staggs\*, M.B. Muckey, and C.K. Jones

Department of Animal Sciences and Industry, Kansas State University, Manhattan

## Introduction

- Data from the human and pet food manufacturing industries suggests that surface type must be considered during sanitation practices due to unique challenges each presents for decontamination.
- Recent data from our laboratory suggest that concrete, metal, plastic, and rubber surfaces in swine feed mills are contaminated by viruses and bacteria at differing rates, and sanitation practices may need to be tailored to each surface for maximum efficacy.
- These types of surfaces are also common in swine barns, where sanitizing is commonly completed between groups of pigs to prevent horizontal transmission of bacterial and viral diseases.
- However, the current swine farm sanitation practices do not consider surface type, and there is little knowledge if swine barn sanitation has varying efficacy on different types of surfaces.

## Objective

To measure the effectiveness of sanitation practices on the quantity and type of bacterial population based on differences in surface type.

## Materials and Methods

- This experiment occurred in two finishing barns, West Finishing and Marketing rooms, at the Kansas State University Swine Teaching and Research Center in Manhattan.
- After pigs were removed from the room, a 103 cm<sup>2</sup> portion of 53 different locations were swabbed using pre-moistened environmental swabs in 5 mL of neutralizing broth (World Bioproducts LLC., Mundelein, IL) as described by Bowman et al., 2015.
- Normal powerwashing followed, including sanitation with a commercial cleaner-disinfectant (Synergize, Preserve International, Reno, NV) with active ingredients of 26.0% alkyl dimethyl benzyl ammonium chloride and 7.0% glutaraldehyde.
- After surfaces were dry and prior to a new group of pigs entering the room, the same surfaces were again swabbed using procedures described above.
- Swabs were analyzed for bacterial isolation and identification by the Iowa State University Diagnostic Laboratory in Ames. Total bacterial population was scored 0 to 4 with 0 representing no bacterial presence and 4 representing heavy growth.
- Data were analyzed using the main effects of time (prior to or after powerwashing), surface type, location, animal food contact, barn, or feed contact surfaces.
- Data were considered significant if  $P < 0.05$ .

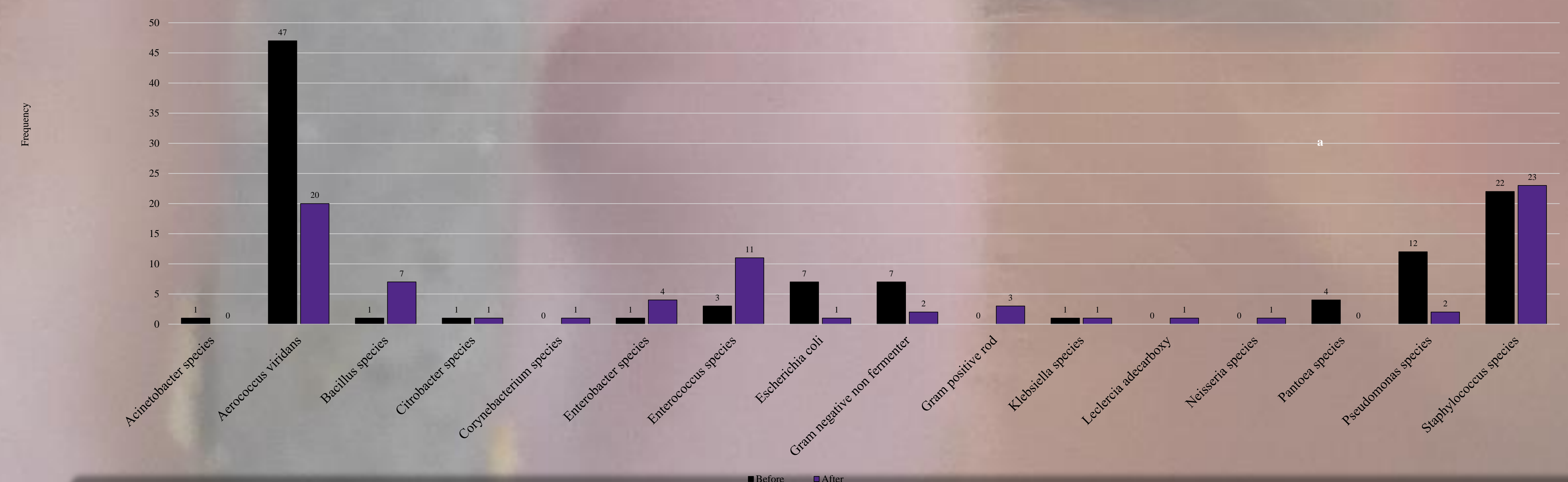
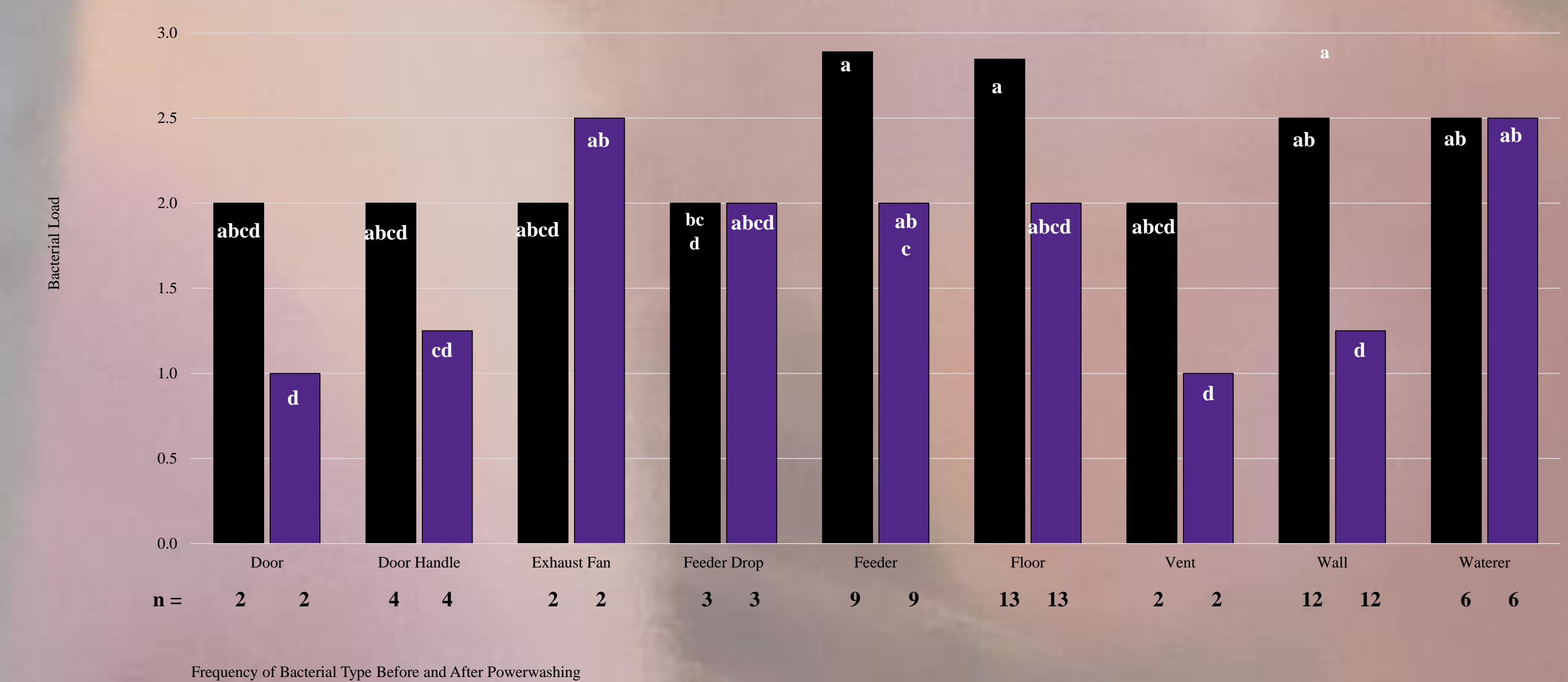
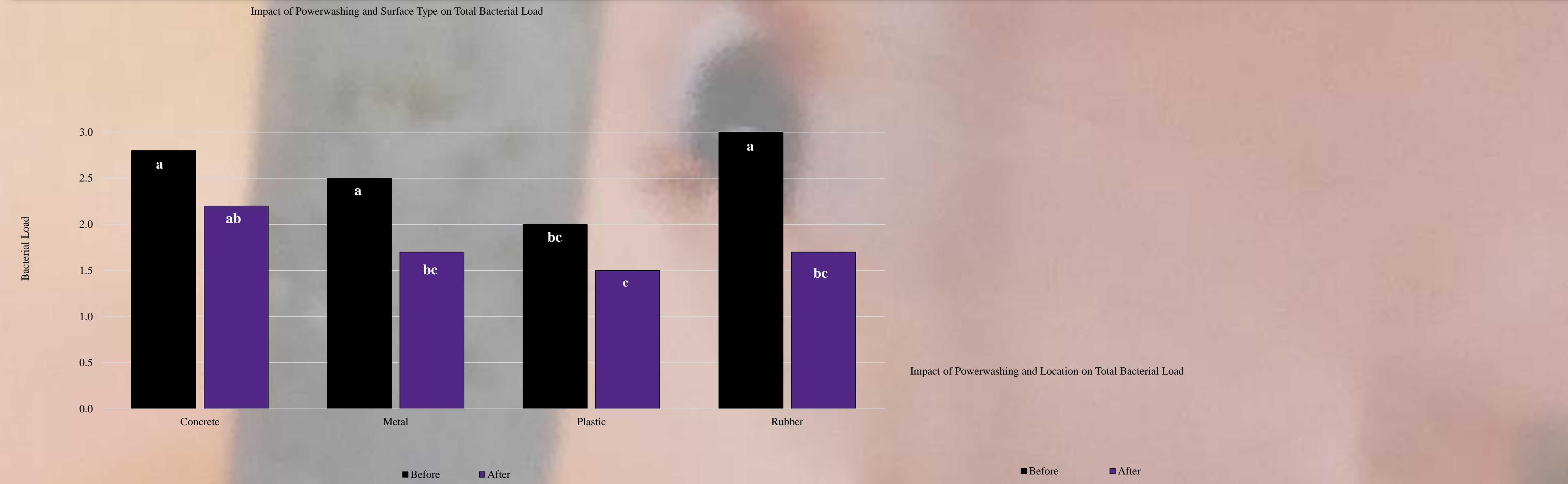
Marketing Barn



West Finishing Barn



## Results



## Conclusions

- Powerwashing reduced bacterial populations on all surfaces, but was most challenging on concrete.
- Feeders and floors had the greatest initial bacterial population, and exhaust fans and waterers had the greatest bacterial load after powerwashing.
- The greatest bacterial populations before and after powerwashing were primarily *Aerococcus viridans* and *Pseudomonas* species. However, other populations shifted. For example, powerwashing reduced *E. coli* populations, but increased the population of *Enterococcus* species.
- When powerwashing swine barns, producers should pay particular attention to feeders, floors, and concrete surfaces, which have a high contamination rate or are more difficult to clean.