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Disinfection effectiveness of slightly acidic electrolyzed water in swine barns

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Slightly acidic electrolyzed water (SAEW, pH 5.0-6.5) is considered to be an environmental friendly disinfectant for deactivating pathogenic microorganisms. A study was conducted to evaluate the effectiveness of SAEW in deactivating microorganisms that are adhered to the facility and aerosolized in the air in swine barns. Three farrowing rooms of 40×8×4 m (length × width × height), each housing approximately 30 sows and 120 piglets, were used in the study. SAEW was produced using a non-membrane generator to electrolyze NaCl and HCl

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solutions. A lab experiment was first performed to determine the lowest concentration of SAEW solution for deactivating the microorganisms. SAEW was applied with two different methods: i) flushing the selected surfaces of wall, rail and floor; ii) spraying to the air. In flushing, the surfaces were exposed to SAEW for 5 minutes. A rate of 100 ml m⁻³ and duration of 20 minutes were used for spraying. It was found that SAEW with an available chlorine concentration (ACC) of 300 mg l⁻¹ can inhibit isolated microbes completely. The usage of SAEW resulted in significant ($P < 0.05$) reduction of microbes on the wall, rail, and floor surfaces after flushing. Spraying SAEW at ACC of 300 mg l⁻¹ reduced the airborne microorganisms by 59% 30 minutes after spraying, and kept the population of microbes at a lower level for at least eight hours after spraying. It was concluded that SAEW can be an effective disinfectant for preventing or reducing diseases in swine barns.