Experimental infections with rifampicin-resistant Clostridium perfringens strains in broiler chickens using isolator facilities

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Experimental infection studies were carried out on the ability of three Clostridium perfringens type A rifampicin-resistant strains to colonize the intestinal tract of broiler chickens kept in isolators from 1-day-old. Various doses of C. perfringens were given orally at 22 days, 9 days or at 1 day old. At 22 days none of the strains, given in doses of approximately $10^{10}$ colony-forming units, caused mortality or clinical necrotic enteritis. None was able to colonize the intestine permanently and all were eliminated within 9 days. One strain given to groups of 9-day-old birds was recovered only from those receiving high doses, but for no longer than 13 days. In chicks infected at 1-day-old there was transient colonization up to 15 days, and the most persistent colonization was in a group given a fresh broth culture of unwashed cells, including extracellular products. Test strains were rapidly replaced by naturally occurring strains of C. perfringens in all groups but they persisted for considerably longer in chickens inoculated at 1-day-old or at 9 days than those at 22 days, indicating a possible resistance to colonization with increasing age. The findings emphasize the difficulties of establishing a reproducible model for infection with C. perfringens in broiler chickens.