A live oral Lawsonia intracellularis vaccine does not result in protective immunity comparable to that of a virulent strain

Lawsonia intracellularis is the cause of proliferative enteropathy, an economically important enteric disease in pigs that causes weight loss and failure to thrive. The disease is controllable with antibiotics and an attenuated live oral vaccine (Enterisol®) is used for prophylaxis. Still these interventions have not resulted in eradication of the bacteria, which is abundantly present in most pig herds in many countries, including Denmark. In the experimental study we present here, weaned pigs received the oral L. intracellularis vaccine or a virulent field strain (Re-I pigs). The latter resulting in subclinical disease. Both groups were treated with antibiotics from day 21 to 26 and challenged at day 49 with the virulent strain. A control group (CC) only received challenge. We here report on clinical outcome, L. intracellularis infection of the intestines and immunological responses. While Re-I pigs had a serological response to L. intracellularis from day 18, no specific IgG or IgA was measurable in serum from vaccinated animals until around day 55, i.e. after challenge. Specific secretory IgA measured in faeces was at a low level and short-lasting (day 67-70) in both groups. Excretion of bacteria was measured in faeces by qPCR after primary inoculation (Re-I). After challenge Re-I pigs did not excrete bacteria, but vaccinated animals had a high excretion at a level comparable to the CC group. Acute phase response measured in serum as an indication of the general disease status of the animals was high in both Vac and Re-I groups after primary inoculation/vaccination compared to the CC group. After challenge, however Vac and CC levels were high and Re-I levels low, indicating that Re-I pigs were protected from disease whereas vaccinated pigs were not. These results show that the vaccination does not confer protective immunity comparable to that of a virulent strain.