

Vaccination Schedules to Raise Antibody Concentrations Against epsilon-Toxin of *Clostridium perfringens* in Ewes and their Triplet Lambs

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ABSTRACT: The objective of this experiment was to compare vaccination schedules for ewes and their lambs to raise antibody concentrations to ϵ -toxin of *Clostridium perfringens*, the causative agent of enterotoxemia. Half of 200 Finnsheep \times Dorset ewes were vaccinated with *C. perfringens* type D toxoid vaccine 3 wk before lambing. Serum samples were obtained from 20 ewes that were to be vaccinated and 20 ewes that would remain unvaccinated before treatment and at wk 2, 1, and 0 before the start of lambing. Antibody concentrations in sera of unvaccinated ewes remained at 2 IU/mL, but they peaked in vaccinated ewes at 15 IU/mL by wk 1 before lambing. Lambs from each of the first 13 and the first 14 sets of triplets from vaccinated and unvaccinated ewes, respectively, received one of three vaccination treatments: no vaccine (control), vaccination on d 1 and 21 of age, or vaccination on d 21 and 42 of age. Antibody concentrations declined in sera of vaccinated ewes from 8.5 IU/mL immediately after lambing to 3 IU/mL 12 wk later. Vaccination of lambs did not increase sera antibody concentration. However, prepartum vaccination of ewes significantly increased lamb antibody concentrations (19 IU/mL) compared with lambs reared by unvaccinated ewes (2 IU/mL). Vaccination of ewes resulted in lambs with higher antibody concentrations until wk 10 postpartum. Concentrations declined to .6 IU/mL in all lambs at 12 wk. Because concentrations of .2 IU/mL may be protective, these results indicate that vaccination of ewes before lambing imparts passive protection in lambs to 12 wk of age, whereas vaccination of young lambs provides no added protection.

The results of this experiment indicate that ewes should be vaccinated 3 to 4 wk prior to parturition and that there is no benefit of vaccinating lambs prior to 6 wk of age. Further studies are needed to recommend an adequate immunization schedule for lambs after weaning or whether fast growing lambs from vaccinated ewes need to be immunized.

