Assessment of the impact of a biofilm-embedded bacteria-based vaccine against Staphylococcus in suckler flock ewes on lambs development and mammary gland score

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Objectives

To evaluate the effect of a vaccine against staphylococcal mastitis in suckler flock ewes by assessing lambs growth and mammary gland score in vaccinated and non-vaccinated ewes. The used vaccine (VIMCO©, Hipra) included an antigen based on a bacterin of Staphylococcus aureus strain, expressing the exopolysaccharide poly-N-acetylglucosamine (PNAG), which is involved in biofilm formation by these bacteria. It was hypothesized that the vaccine would reduce incidence of subclinical mastitis and thereby improve suckler lambs growth.

Material and methods

200 pregnant Ile-de-France ewes were divided in two similar groups based on their parity and age. One group underwent vaccination against mastitis by 2 intramuscular vaccine (VIMCO©) injections at 5 and 2 weeks before lambing (Vacc), the second group served as non-vaccinated control (non Vacc). Their suckling lambs were weighed at birth, at 48 hours of age and at weaning, allowing to calculate daily weight gain (DWG) and age at weaning. Cases of clinically detectable mastitis were recorded. At weaning, each ewe underwent mammary gland inspection. A mammary gland score taking into account retromammary lymph nodes, left-right gland asymmetry and presence or absence of nodules was established for each ewe.
Data were analysed by ANOVA in order to assess the effect of vaccination on lambs weight at 48h of age, weight at weaning, DWG at weaning, clinical mastitis incidence and mammary gland score. A p-value below 0.05 was considered as significant. Data from ewes whose lambs died or needed continuous bottle feeding were withdrawn from analysis, leading to 96 non-vaccinated ewes aged of 3.77±1.78 years with 158 lambs and to 93 vaccinated ewes aged of 3.76±1.66 years with 146 lambs.

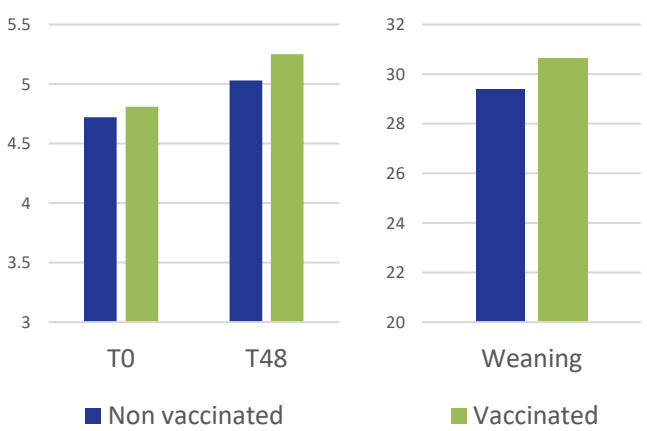

Fig 1. Weights of lambs from vaccinated and non vaccinated ewes at birth, at 48 hours of age and at weaning

Results

While age at birth did not differ between groups (Non Vacc: 4.72±0.95 kg *versus* Vacc: 4.81±0.77 kg, p=0.95), age at 48h after birth was significantly higher in lambs raised by vaccinated ewes (Non Vacc: 5.03±0.95 kg *versus* Vacc: 5.25±0.89 kg, p < 0.05). At weaning around 74 days of life, weight and DWG were significantly higher in lambs suckling vaccinated ewes (weight: Non Vacc: 29.39±4.78 kg *versus* Vacc: 30.63±4.39 kg, p <0.05; DWG : Non Vacc: 0.34±0.06 kg/day *versus* Vacc: 0.35±0.05 kg/day, p <0.05). Mortality of newborn lambs equalled 4.5 % and did not differ between groups. Regarding udder evaluation of vaccinated and non-vaccinated ewes, the mammary gland score did not differ between groups (Non Vacc: 1.19±0.73 *versus* Vacc: 1.18±0.81, p = 0.89). Intramammary small-sized nodules were detected in 14% of non-vaccinated ewes and in 15% of vaccinated ewes whereas minor udder asymmetry occurred in 40% of non-vaccinated and in 38% of vaccinated ewes. Clinical mastitis occurred in 1 non-vaccinated and 2 vaccinated ewes.

Conclusions

The low prevalence of clinical mastitis in the flock made not possible to asses the impact on detectable signs of mastitis. However, suckler lambs' growth increased by 4% as demonstrated by increased DWG and weight at weaning in lambs raised by vaccinated ewes