

OBJECTIVES

Mastitis is an important animal disease causing decreased production and profits on dairy farms. J5 vaccines against gram negative pathogens have been used in the US for over 40 years. Since 2009 a polyvalent vaccine protecting against coliforms, *Staphylococcus aureus* and coagulase negative staphylococci (CNS) has been available in Europe (STARTVAC®, HIPRA). The objective of this study was to look at the efficacy of this vaccine under field conditions and to estimate the economic consequences of using this vaccine on dairy farms.

MATERIALS AND METHODS

This poster is based on the bachelor thesis written by Oostenbrug and Van Aaken in 2013 at Utrecht University, Faculty of Veterinary Medicine. To evaluate the efficacy of this vaccine a literature study with peer reviewed articles was performed. The data extracted from these papers is shown in the results section. For the economic analysis peer reviewed literature as well as case studies were used.

RESULTS

In the UK more than 3000 cows on 7 farms were divided into 3 groups and vaccinated according to the label regime, rolling regime and a group was left as negative controls. Vaccine efficacy for coliforms was measured during the first 120 days in milk (DIM). Although no difference in incidence of clinical and subclinical mastitis was observed, the severity of clinical mastitis cases was significantly reduced. Furthermore vaccinated cows produced significantly more milk with higher milk solids than negative controls¹ (Figure 1).

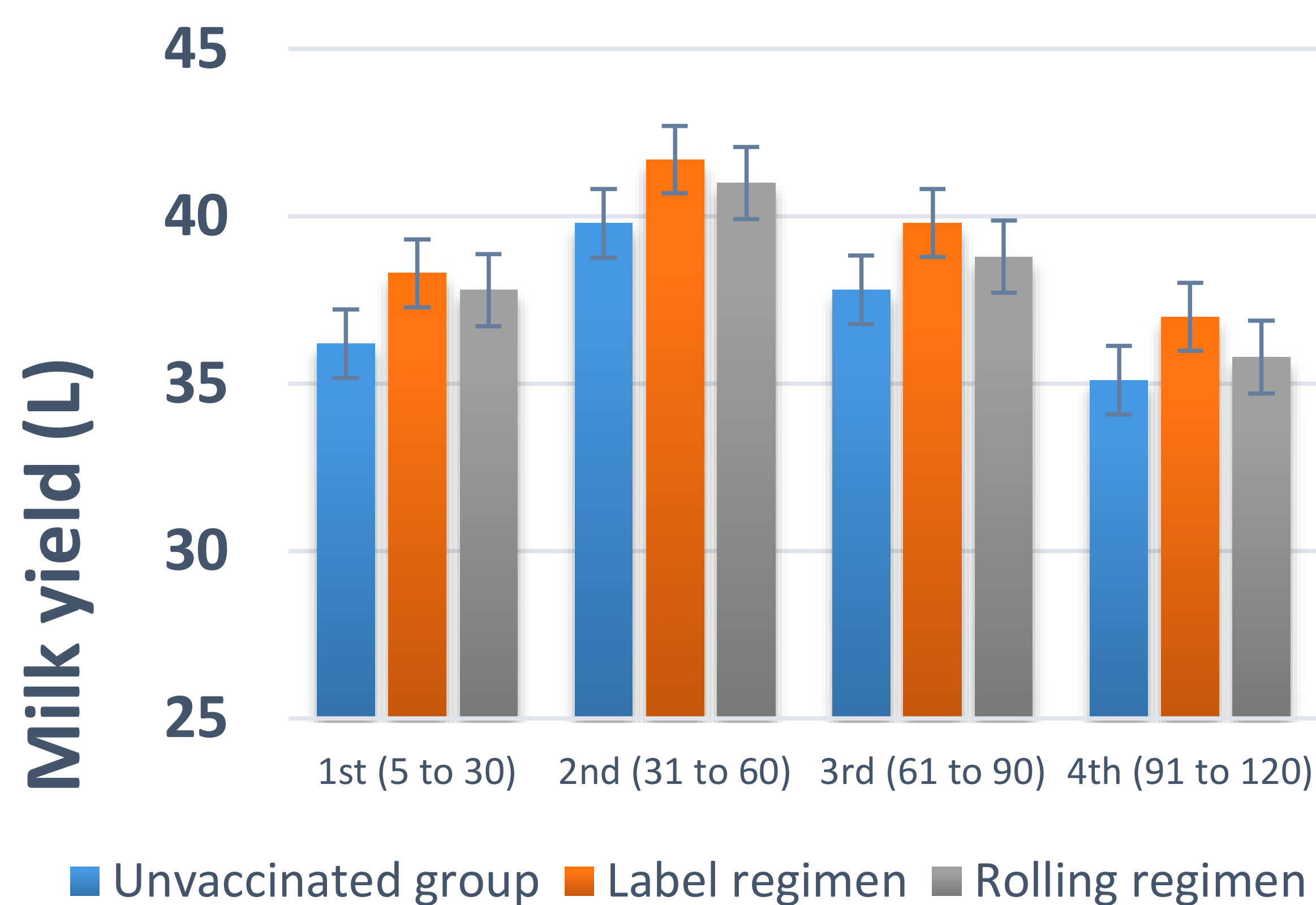


Figure 1. Milk yield is shown at four timepoints for all three groups in the first 120 DIM. Error bars denote SE. Edited from Bradley et al. 2015.

In Italy two herds with a total of 809 cows were either vaccinated according to the label regime or left as controls. Vaccinated cows had a lower incidence of new infections with *S. aureus* or CNS. Also the duration of infection by *S. aureus* or CNS was significantly lower than negative controls. The estimated reproduction ratio (R^0) for *S. aureus* was decreased by 45% and for CNS with 35% compared to negative controls. Estimated vaccine efficacy decreased with increasing lactation number. Significant differences between farms were observed². As a result of the calculation and assumptions made in regard to the 'STARTVAC®' vaccine, it can only give an annual cost of €40 per cow per year on a farm to be profitable (table 1).

Category	⁴ (Huijps, Lam, & Hogeveen, 2008)	⁵ (Lam et al., 2013)	⁶ STARTVAC® /TOPVAC® vaccine	¹ (Bradley et al., 2015)	
Milk production losses	Clinical mastitis	23	25	8	6*
	Subclinical mastitis	13	14	6	3*
Labour	4	4	4	4	
Treatment	15	15	15	15	
Culling	22	22	7	22	
Veterinary Services	1	1	1	1	
Vaccination	0	0	40	30	
Total	78	81	81	81	

Table 1. Estimation of the annual costs for mastitis per cow on a farm for different situations.

*Over the first 120 DIM.

In a UK study, vaccination with this vaccine resulted in a return on investment of 2.57:1 and gave an increase in milk production of 231L in the first 120 DIM¹. However this return on investment is based on a British situation and can therefore not be extrapolated to the Dutch situation. But milk production will most probably be the same and this gives the opportunity to make calculations for the Dutch situation. Using the same calculation method as mentioned before, vaccination may only cost € 30,- or less to be profitable. A study done in the US found that vaccination against mastitis could result in a profit of \$ 57 per cow lactation³. However in this study only the J5 component was evaluated.

CONCLUSIONS

This vaccine has proven being capable of reducing clinical signs of acute coliform mastitis and reducing the reproduction ratio for more chronic mastitis pathogens. Also increased milk production with higher milk solids and reduced culling rates due to mastitis have been observed. Although a decrease is seen, these reductions vary between farms. This indicates that a mastitis vaccine can be a helpful tool in reducing mastitis but is not the sole solution. Table 1 shows what economical results the effects mentioned above can have on the annual costs for mastitis per cow on a farm. Based on two different studies, vaccination may only cost €30,- or €40,- or less to be profitable. It should be stated that the €30,- estimation is based on the first 120 days of lactation. Since the average lactation is longer than 120 days, this could be an underestimate for the costs of vaccination. So it is likely that the cost of vaccination can increase and still be profitable.

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