Technical Bulletin

AgriHealth

Efficacy of Kolibin Neo as a booster vaccination for previously vaccinated New Zealand dairy cows

Background

Kolibin Neo is a vaccine for use in pregnant dairy cattle to provide passive immunity by colostral transfer to newborn calves. Kolibin Neo contains antigens for Bovine rotavirus (BRV), Bovine coronavirus (BCV) and *Escherichia coli.* The vaccine has been marketed in New Zealand since early 2016.

Study objective

To evaluate antibody titres following annual booster vaccination with Kolibin Neo in NZ dairy cows vaccinated during their previous pregnancy with Rotavec Corona or Scourguard 4(K), and compare antibody titres from cows booster vaccinated with Rotavec Corona and Scourguard 4(K).

Study design

The study was undertaken in one dairy herd in the Bay of Plenty region. The herd consisted of 650 cows, including 420 mixed-age cows. The annual vaccination policy for this herd was to vaccinate the rising 2 year old heifers with Rotavec Corona, and half of the mixed-age cows with Scourguard 4(K) based on known vaccination history. All vaccinations were recorded within herd-recording software each year.

40 mixed-age healthy cows were randomly selected from the groups of cows vaccinated in the previous season with Rotavec Corona or Scourguard 4(K). From these enrolled animals, 10 cows were allocated to each of four groups as shown in Table 1.

Group	2015 vaccination	2016 vaccination
RC - RC	Rotavec Corona	Rotavec Corona
RC - KN	Rotavec Corona	Kolibin Neo
SG - SG	Scourguard 4(K)	Scourguard 4(K)
SG - KN	Scourguard 4(K)	Kolibin Neo

Table 1: Study groups for vaccination comparison

Blood samples were taken from the coccygeal vein of each cow on day 0, and the allocated vaccine administered, intramuscularly by a veterinarian. Day 0 corresponded to approximately three weeks prior to the planned start of calving for the herd.

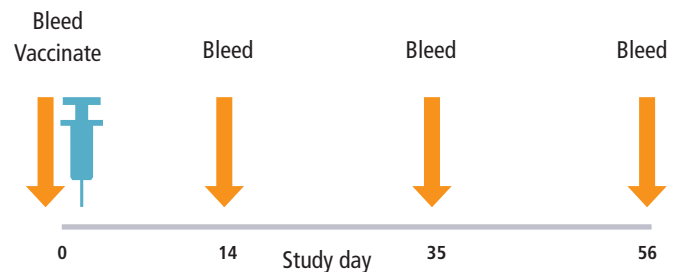Further blood samples were collected on days 14, 35 and 56 after vaccination, as shown in Figure 1.

Figure 1: Study design timing

Blood samples were tested using a haemagglutination inhibition method (coronavirus, *E.coli*) and virus neutralisation method (rotavirus) to determine the titre of antibody for each of the antigens.

For each sample and antigen, if the result was positive, the sample was diluted by half and retested. This was repeated until a negative result was obtained, and the result reported as the dilution at which the last positive test result was obtained.

The data was then converted to a linear scale of Log base$_2$ for comparison and analysis. Results were analysed using covariance in Genstat with the corresponding Day 0 log$_2$ value as a covariate for each cow.

Results

Enrolled animals did not develop lesions at injection sites, or have abnormalities observed during the study period.

Cows initially vaccinated with Rotavec Corona

The mean Day 0 log$_2$ values were not significantly different between treatment group RC - RC, and group RC - KB.

Means of log$_2$ values for each time point measured are adjusted for the day 0 log$_2$ value and presented in Figures 2, 3 and 4 below for BRV, BCV and *E.coli*.
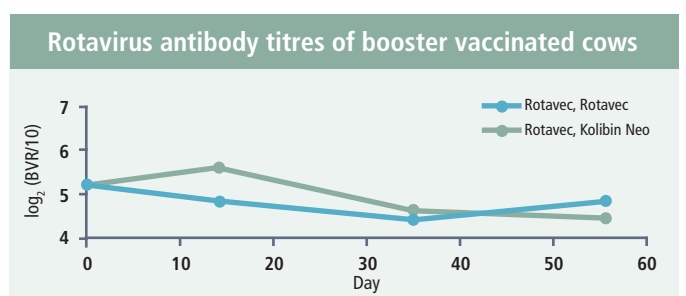

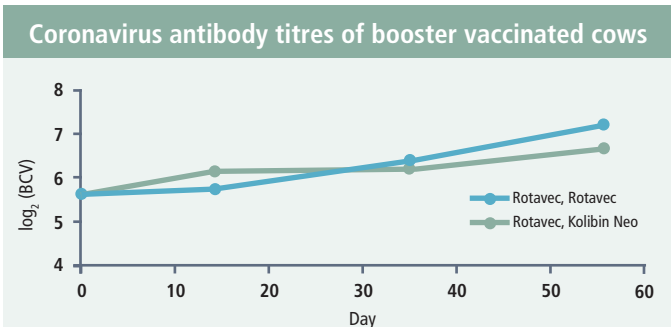*Figure 2: Antibody titre results (mean log$_2$) for Bovine rotavirus*

Coronavirus antibody titres of booster vaccinated cows

$\log_2$ (BCV)

Rotavec, Rotavec
Rotavec, Kolibin Neo

Day

Figure 3: Antibody titre results (mean $\log_2$) for Bovine coronavirus

E. coli antibody titres of booster vaccinated cows
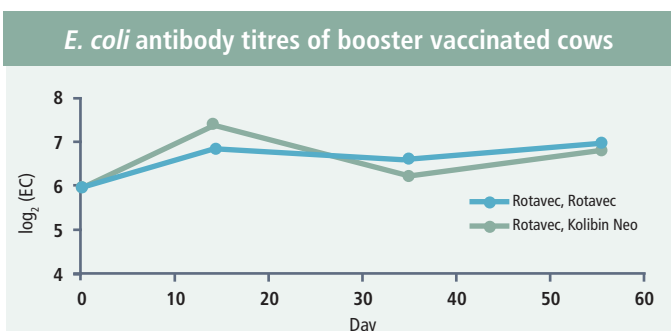
$\log_2$ (EC)

Rotavec, Rotavec
Rotavec, Kolibin Neo

Day

Figure 4: Antibody titre results (mean $\log_2$) for E. coli

There was no statistical difference between treatment groups SG - SG and SG - KB.

Cows initially vaccinated with Scourguard 4(K)

The mean Day 0 $\log_2$ values were not significantly different for the two treatment groups.

Means of $\log_2$ values for each time point measured are adjusted for the Day 0 $\log_2$ value and presented in Figures 5, 6 and 7 for BRV, BCV and *E.coli*.
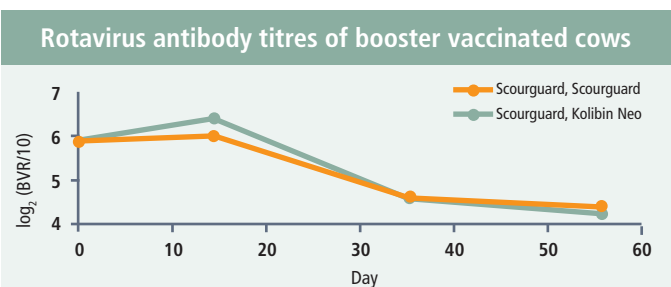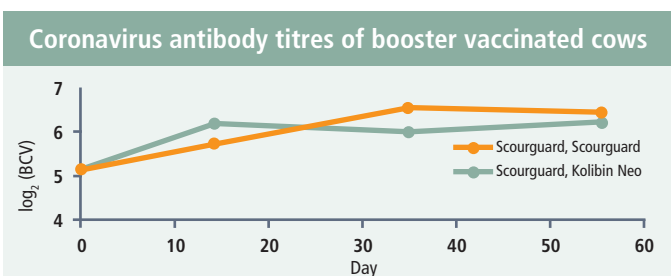
Rotavirus antibody titres of booster vaccinated cows

$\log_2$ (BVR/10)

Scourguard, Scourguard
Scourguard, Kolibin Neo

Day

Figure 5: Antibody titre results (mean $\log_2$) for Bovine rotavirus

Coronavirus antibody titres of booster vaccinated cows

$\log_2$ (BCV)

Scourguard, Scourguard
Scourguard, Kolibin Neo

Day

Figure 6: Antibody titre results (mean $\log_2$) for Bovine coronavirus

E. coli antibody titres of booster vaccinated cows

$\log_2$ (EC)

Scourguard, Scourguard
Scourguard, Kolibin Neo
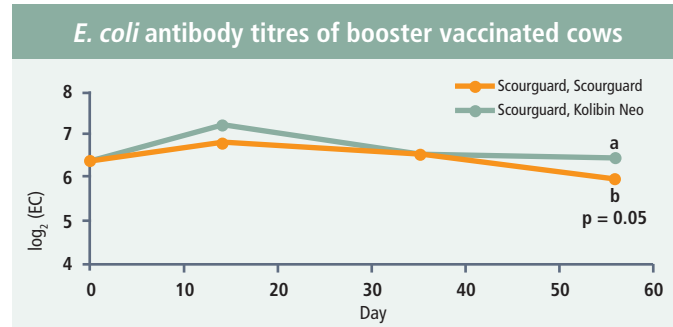
a
b
p = 0.05

Day

Figure 7: Antibody titre results (mean $\log_2$) for E. coli

The only significant difference observed was seen at Day 56 when the group mean antibody titre ($\log_2$) for *E.coli* with the Scourguard-Kolibin Neo group was higher than the Scourguard-Scourguard group (6.44 vs 5.78 respectively, p = 0.05). All other antibody titres for all 3 antigens were not statistically different between the two treatment groups.

Discussion

Serological response to vaccination was measured to determine whether there was any difference when Kolibin Neo is used as a booster vaccine in cows previously vaccinated with either Rotavec Corona or Scourgard 4(K). Statistical analysis showed that there was generally no difference in group mean titre for each of the three antigens in the vaccines, between animals annually boostered with the vaccine used previously in comparison with cows vaccinated 12 months later with Kolibin Neo.

There were no local or systemic reactions observed in any animals given any of the vaccines.

Conclusion

This Study showed an equivalent serological response in cows boosted with Kolibin Neo compared with cows boosted with Rotavec Corona or Scourguard 4(K).

Kolibin Neo has an ACVM approved label claim for annual booster vaccination of cows previously vaccinated with Rotavec Corona and Sourguard 4(K).

Kolibin Neo is safe and effective when administered as an annual booster to cows vaccinated in the previous season with Rotavec Corona or Scourguard 4(K).