

Vaccinating for Calf Scours

Aim

To better understand veterinary prescribing patterns and NZ dairy farmer attitudes and behaviour towards use of vaccines to prevent scours in young calves caused by rotavirus, coronavirus and *E. coli*.

Introduction

There are several cattle vaccines available in NZ for the prevention of calf scours. The vaccines work by boosting the cow's antibody production prior to calving so that her colostrum is 'fortified' with antibodies to gastrointestinal pathogens (rotavirus, coronavirus and *E. coli*). Since the bovine placenta does not allow for the transfer of antibodies, calves are born immunologically naive, and hence require passive immunity via colostrum antibodies for protection from environmental pathogens.

The key to a successful scour vaccination program is the careful management of newborn calves and colostrum from the cow's first milking. Calves should ingest at least 2 litres of first milking ('gold') colostrum within the first 6 to 12 hours of life, whilst the gastrointestinal tract remains 'leaky' thus allowing optimal systemic absorption of immunoglobulins. Timely and effective administration of gold colostrum for all calves requires:

- Picking up newborn calves twice a day, and feeding 2 litres of 'gold' colostrum on arrival at calf rearing facilities
- Keeping colostrum from the first milking separate from the 'pooled' colostrum and using only this 'gold' colostrum for administration to the newborn calves

Despite wide acceptance within the NZ cattle vet industry that scour vaccines, along with appropriate farm management, are effective and provide significant protection to young calves, there has been limited uptake by dairy farmers (refer Figure 1).

Vaccination programs used by vets and farmers for calf scours in New Zealand

Gold Program	Silver Program	Bronze Program	Risky
Full program	Adequate program	Half-herd program	Poor program
Vaccinate mixed aged (MA) cows and R2 heifers	Vaccinate MA cows only	Identify vaccinated animals	Half of herd vaccinated without recording cow ID
Calves are fed gold colostrum with maximum immunity, as all cows and heifers are vaccinated	Calves are fed gold colostrum with maximum immunity, from mixed age cows, provided heifer colostrum is kept separate	Calves are fed gold colostrum provided vaccinated cows are identified and colostrum from these cows is managed separately	Calves are fed lower quality colostrum, as colostrum from vaccinated cows is mixed with colostrum from unvaccinated cows
Optimal protection and simple to manage	Manageable on most NZ dairy farms	Difficult to manage unvaccinated cow and vaccinated cow colostrum pools separately	Not recommended as antibody concentration for newborn calves is unknown or diluted by unvaccinated cows

Vaccination Programs for Calf Scours

Only 18% of New Zealand dairy cows and heifers are vaccinated each year to fortify colostrum with extra rotavirus, coronavirus and *E. coli* antibodies.¹

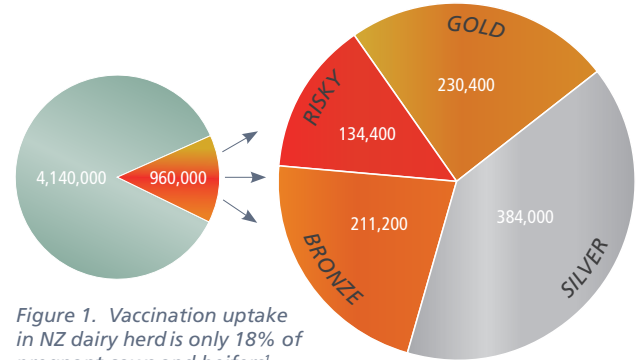


Figure 1. Vaccination uptake in NZ dairy herd is only 18% of pregnant cows and heifers¹

Figure 2. Estimated prevalence of vaccination programs in NZ

Vaccination Program	Dairy cows & heifers	% vaccinated
Gold Program	230,400	24
Silver Program	384,000	40
Bronze Program	211,200	22
Risky	134,400	14
Animals vaccinated	960,000	100%

Table 1. Estimated scour vaccination prevalence in NZ

In practice there are several different vaccination programs used, as illustrated. Each program has benefits, although some also carry a level of risk which requires a risk-benefit assessment by the prescribing veterinarian and the farmer responsible for the cattle.

Farmer Survey

Recent market research² verified reasons for the limited uptake of scour vaccination programs by NZ dairy farmers. Table 3 outlines reasons cited by farmers for vaccinating, or not vaccinating cows.

Reasons for not vaccinating	Reasons for vaccinating
'Never' had serious calf scours outbreak (in recent seasons)	Previous calf scours outbreak
Cost outweighs benefits (or perceived benefits)	Peace of mind 'insurance policy'
Current system is lower risk for calf scours	Pride in calf rearing, calf health
Low milk price last two seasons so cashflow tight	Principal calf-rearer on the farm demands vaccination
Previous experience of adverse event following vaccination (e.g. lumps, anaphylaxis)	Reduces strain on facilities and staff at busy time of the year
Unable or unwilling to sufficiently change farm management regarding calf pick-up, administering colostrum to calves and/or colostrum management (especially separating first milking from pooled colostrum)	Prior experience of disappointing heifer weights due to poor start Premium / requirement for selling calves off-farm

Table 3. Farmer cited reasons for vaccinating against calf scours

Farmers provided reasons for their current scour vaccination programs from the following (with multiple reasons possible):

1. Veterinary advice
2. Price sensitivity to full program
3. Lack of understanding of the risk being taken
4. Level of risk aversion
5. Perceived efficacy of 'lower' placed program

Other interesting insights from the market research include farmer's own observations that, in general, once they invest in a scour vaccination program they are much more focussed on their management to ensure best results from this program. Administering 'gold' colostrum to all calves on arrival to the calf rearing facilities becomes mandatory. Management of calf pick-up frequency is more variable, but there is heightened awareness of the importance of newborn calves receiving 'gold' colostrum (during the first 12 hours where practical).

Veterinary Opportunities

These new data highlight some considerations for veterinarians:

1. How does your clinic compare to the national calf scour vaccination penetration of 18%?
For example; 9,000 vaccine doses for a veterinary practice servicing 50,000 dairy cows
2. Veterinary advice is an important source of information regarding program selection
3. How can the veterinarians at your clinic influence farmer perceptions to increase uptake of vaccination (and improve colostrum management)?
4. Many herds, calf mobs and farmers would potentially benefit from advancing to better vaccination programs

Summary

In NZ dairy herds, the powerful tool of scour vaccination is currently underutilised. The opportunity exists for the veterinary industry to more widely promote and prescribe successful vaccination programs.

In general, colostrum transfer to calves improves in vaccinated herds. This is likely because farmers are better informed about risk factors for calf scours, and have heightened awareness for implementing key success factors in minimising scours.

Higher uptake of scour vaccination in New Zealand will have positive impacts for the health of young dairy calves, reduce viral load within the calf rearing facilities, reduce the incidence of disease and thus any antimicrobial treatments, and improve well-being of farm staff.

References

¹NZ Animal Health Market and AgriHealth NZ data on file

²AgriHealth NZ, 2016 Market Survey, data on file