

# Animal health advice for producers in the *Hunter*

## FACTSHEET



### BOVINE EPHEMERAL FEVER (BEF) VACCINATION CONSIDERATIONS

We are often asked to provide advice regarding BEF vaccination of cattle. In particular, producers ponder if they should vaccinate cattle following a season with strong BEF transmission as we had in March to May of 2020.

There is the belief that virus transmission will be complete within the herd and that all cattle will be infected and then immune for life.

However, the Local Land Services/DPI mosquito/midge borne disease surveillance data (National Arbovirus Monitoring Program) paints a different picture and can help answer this question. As can a consideration of the action of the vaccine and duration of immunity of natural infection.

Another common question is “is it necessary to continue to provide BEF booster injections year after year”? Producers wonder if they vaccinate their herd, will the vaccine prevent cattle from generating longer lasting natural immunity, if they are then naturally infected. All great questions. Please read on for answers to these and many more.

#### ***When is the best time to vaccinate?***

Late winter /spring is the ideal time to consider your cattle vaccination plans for Bovine Ephemeral Fever Virus. Initial vaccination requires two injections from two weeks to six months apart. It is recommended to provide the initial primer dose in late winter (August - September) and the second vaccination in early summer (Nov-Dec), so that stock are protected when the virus arrives in our region. This is often in late summer, but sometimes can catch us by surprise with an early season start.

The benefit of this approach is that if the BEF season looks like it will arrive early then the second vaccine or annual booster can be quickly administered and within 7-10 days cattle should have solid immunity.

Annual boosters should ideally be given 8-10 weeks before virus transmission.

Please also be aware that vaccine availability (vaccines are available from your private veterinarian) can be in short supply when the season is imminent. Speak with your private vet early to secure supply.

#### ***In an unvaccinated herd, what level of BEF infection and antibody protection can I expect throughout my herd after seasonal transmission?***

Hunter LLS, in partnership with DPI, monitors five sentinel herds on a monthly basis to assess the seasonal distribution of several economically important mosquito and midge borne arboviruses; Bluetongue, Akabane and Bovine Ephemeral Fever Virus. These viruses are transmitted only when vectors are in sufficient density. The main vector of BEF virus in Australia is generally considered to be the mosquito *Culex annulirostris*. *C. annulirostris* has different ecological thresholds from the main vector of both Bluetongue and Akabane the midge; *Culicoides brevitarsis*. BEF generally has a wider distribution than Akabane and Bluetongue virus.

Ten very young beasts (not previously exposed to arboviruses) are blood sampled monthly from October to July, to identify virus distribution and infection prevalence as an indication of wider herd/regional exposure. Reports from this program are available at [www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/national-arbovirus-monitoring-program/](http://www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/national-arbovirus-monitoring-program/)

In addition to this data, sampling of 20 adult dairy cows, undertaken winter 2020, from a Lower Hunter herd that had recorded BEF infection in three of the last five years, found 14 animals were BEF positive and 6 BEF negative. This result surprised us as well considering this herd, reported many down and affected cattle in April/May of 2020 (diagram 5) and BEF was seasonal transmitted in 2016, 2018 and 2020.

This data highlights that natural infection throughout a herd is unlikely to be complete, even in the face of multiple infection opportunities over several years, and if you are relying on 100% natural infection to provide antibody protection in the absence of vaccination, then please think again.



Diagram 1

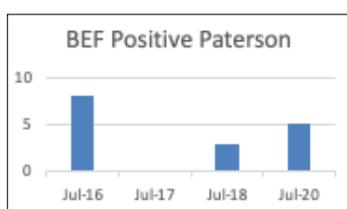


Diagram 2

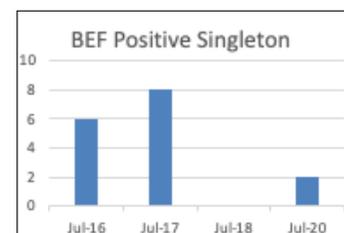


Diagram 3

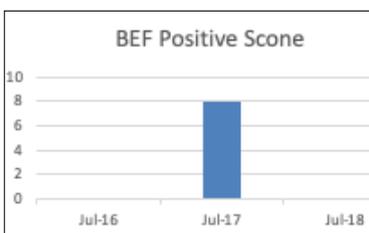


Diagram 4

Diagram 1-4, graphs antibody results of ten animals sampled in each of the four sentinel herds; Taree, Paterson, Singleton and Scone during 2016, 2017, 2018 and 2020. Due to the drought BEF did not circulate in 2019 in the Hunter. Infection rates across the ten sampled animals did not achieve anywhere near 100%.

Postscript: Results of the 20/21 BEF Season sampling has shown that BEF DID NOT circulate in NSW in summer/autumn of 2020. This may influence your BEF vaccination decisions for spring of 2021

## BEF distribution can be very patchy in a region.

The other interesting finding is the variability in BEF transmission between district herds in the Hunter. In some years (2017), Upper Hunter herds had relatively solid infection rates (8/10) animals infected but Paterson did not record any infection and only minor levels of infection (3/10 animals) were recorded at Taree. This highlights the vagaries of mosquito distribution carrying the virus. Sometimes it tracks down the coast and then inland, but other years it appears inland first and heads across to the Upper Hunter as well as tracking down the coast as in 2020.

There is also the theory – backed by many years of regional experience – that the Hunter has a microclimate

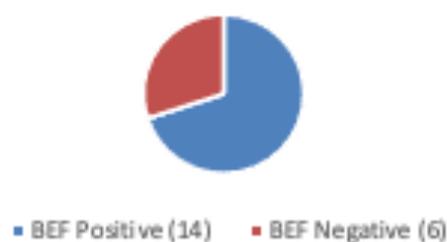
that may be able to support overwintering of the virus and mosquitos. This is borne out by surveillance data that showed that BEF was detected at Wingham in December 2016, prior to anywhere else in the state. There have been other isolated examples of this in the previous 20 years, elsewhere in the Hunter.

Practically this means when buying cattle from other areas of the Hunter one cannot assume they will have had the same BEF exposure or protection as your own herd.

Diagram 5: Results from BEF sampling of 20 mature dairy cattle in September 2020 shows that cumulative infection levels reached 70% positive with 30% still negative. This compares with results of 50% of young heifers achieving infection in one year.

This highlights cumulative infection and antibody protection generated through various age cohorts. Still does not cause 100% of the herd to be immune to BEF.

## Paterson Dairy Herd Sept 2020



## Can I mix, store and then use the vaccine on additional days.

No. Mix and use on the same day as per label directions. When mixed the diluent inactivates the BEF virus. Antibody protection and challenge studies show that delayed use reduces antibody levels and hence protection.

## Will BEF Vaccination prevent my cattle from achieving long lasting antibody protection from natural infection?

The vaccine does not produce sterilising immunity and vaccinated cattle that receive natural exposure to the virus will have the same solid long-lasting immunity as cattle that survive natural exposure.

## Is natural infection life long?

Natural infection is generally regarded as long lasting, but probably not lifelong. As cattle age, particularly as they enter the geriatric age bracket (10 years plus), they become less efficient at mounting an immune response to natural challenge. Thus, if you are relying on immunity from natural infection to protect your older cattle (ie older breeders, milkers, bulls) they might benefit from BEF vaccination to boost antibody protection.

## Should I vaccinate my herd against BEF? Which animals are a priority?

The decision to vaccinate stock against Bovine Ephemeral Fever (BEF) virus often comes down to a consideration of both animal welfare and potential production losses from the fever and lameness, and the resulting condition, pregnancy and lactation losses. Occasional cattle deaths either due to primary BEF infection or secondary effects from the virus and sustained recumbency can also occur. The extra workload created by having to nurse down cattle is a major consideration for dairy and beef herds and absentee cattle owners. In the latter, it becomes a welfare issue not to vaccinate stock. During BEF season stock must be inspected daily for any down cattle that may require water, shade and veterinary attention.

In summary, we suggest developing a program that suits your situation (dairy, beef, absentee or off farm worker) and approach to risk.



## The BEF Vaccination Hierarchy

The general recommendation is to consider a vaccination hierarchy. Vaccinate the most important stock and work your way through the groups as your resources and situation dictates. Many producers routinely vaccinate all cattle over six months of age others have a more selective approach.

As a priority vaccinate;

- Bulls, non-immune pregnant and lactating cows, well-conditioned cattle and cattle introduced from non BEF endemic areas.
- Breeders and milkers in the first and second year of production, ie maiden heifers and first and second calvers.
- Very old cows ie older than 10 years.
- Calves over six months of age are the final group for consideration. Generally, this age bracket copes the best with the disease. If you opt not to vaccinate this group please ensure you have a plan to manage any affected cases that require assistance.

Please also make yourself aware of the district's history of BEF infection as a transmission hiatus of a couple of years' can dramatically change the situation. As discussed, elsewhere in this edition, BEF is not always a minimal disease and at times can cause considerable illness and death in some animals as outlined in the BEF emphysema cases found in 2020 in the Hunter.

Please see earlier article on how to treat down and lame cattle suffering from BEF [www.lls.nsw.gov.au/\\_\\_\\_data/assets/pdf\\_file/0017/1214711/animal-newsletter-autumn-2020.pdf](http://www.lls.nsw.gov.au/___data/assets/pdf_file/0017/1214711/animal-newsletter-autumn-2020.pdf)

### HERE'S HOW TO CONTACT YOUR DISTRICT VET:

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### FOR MORE INFORMATION ABOUT HUNTER LOCAL LAND SERVICES:



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