

THE BENEFITS OF VACCINATING MAIDEN HEIFERS ONCE AGAINST BOVINE VIBRIOSIS IN NORTHERN AUSTRALIA.

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Bovine vibriosis, caused by *Campylobacter fetus* subspecies *venerealis*, is widespread throughout the Northern Territory (NT) (Jayawardhana 1998) although the prevalence and impact of the disease are not known. The most common management practice to control it is the vaccination of bulls but, because NT cattle properties are extensive, not all bulls get mustered and vaccinated. Also bull control is difficult especially in the wet season when fences frequently get washed down. As a result females may come into contact with infected bulls.

A field test was conducted to determine whether there was an economic benefit from giving maiden heifers a single injection of a vibriosis vaccine just prior to joining. The vaccine instructions state that heifers that are older than 18 months of age only require one injection of the vaccine to gain immunity from vibriosis for 2 years. Younger heifers require 2 vaccinations administered 6 to 8 weeks apart. Since most heifers are joined for the first time at two years of age in the NT, giving one injection of a vaccine is a practical treatment, whereas a vaccine that requires 2 injections several weeks apart is not practical due to high mustering costs when heifers are run in large paddocks.

The experiment was conducted at Newry station (16° 00' S, 129° 25' E) which is situated approximately 440 km west of Katherine NT. On 31 October 2004 a large mob of maiden Brahman heifers was weighed and pregnancy tested (manual palpation per rectum) and 700 non-pregnant heifers were selected to be joined as part of this experiment. 300 heifers were randomly selected to receive a vibriosis vaccination while the remaining 400 were not vaccinated. The vaccinated group (VIB) and the control group (CON) all grazed together in the same paddock and bulls of mixed ages were introduced to the heifers in late December and remained with them continuously thereafter. Several fences were washed down over the wet season and other bulls gained access to the paddocks. Some of the heifers also entered other paddocks. The heifers were weighed and their stage of pregnancy determined on 8 April 2005 and then again on 6 September 2005. The numbers of heifers able to be mustered on each of these dates are shown in Table 1.

Table 1. Average weight and fertility of heifers in each treatment group - Pregnancy rates with different superscript letters are significantly different (P<0.01, Pearson's Maximum Likelihood test)

Treatment	Ave wt (kg) 31/10/04	% preg. 8/4/05	Ave wt (kg) 8/4/05	No. animals 8/4/05	% preg 6/9/05	Ave wt (kg) 6/9/05	No. animals 6/9/05
VIB	238	53 ^A	323	252	78 ^A	347	276
CON	234	42 ^B	322	343	72 ^A	345	385

Conception rates in both treatment groups were low in April, probably due to the low joining weights of heifers. However, the conception rate was significantly higher (+11%) in the VIB group than in the CON group (Table 1). These results are similar to the findings of Allen (1972) who reported a 24% increase in conception rates in heifers vaccinated against vibriosis in north Queensland (although heifers received 2 vaccinations in that study). In September, the conception rate was only 6% higher (not significant) in the VIB group. However, the higher proportion of late conceptions in the CON group is not desirable, as these heifers will calve and lactate in the dry season. This would reduce their chances of re-conception and increase the likelihood that they and/or their calf would die before weaning. Their progeny are also likely to take an extra year to reach turn-off weight. If the maiden heifers had been control mated and the bulls removed, these late conceptions would not have occurred at all.

There were significant benefits from vaccinating heifers for vibriosis in this herd. If an extra calf is valued at \$100 then the 6% increase in conception rates associated with vaccination results in a return on investment of about 210% (the cost of the vaccine was \$2.86 per heifer). However the actual benefit is much greater, as the benefits of an increased proportion of conceptions early in the joining period are substantial (although harder to quantify). It is likely that similar benefits would be achieved on most properties across northern Australia as the conditions and management on this property are typical of the region.

ALLAN, P.J. (1972). *Aust. Vet. J.* **48**: 72-3.

JAYAWARDHANA, G. (1998). N.T Dept of Primary Industries Fisheries and Mines, Agnote No. 745.

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