

## PESTIVIRUS

*Pestivirus [also known as Bovine Viral Diarrhoea Virus (BVDV) and Mucosal Disease], is a viral infection of cattle well recognised as a significant disease in both beef and dairy herds in Australia.*

Pestivirus has 3 main categories of economic loss;

- 1) Fertility losses –Reproductive losses at all stages of pregnancy in females and bull infertility.
- 2) Productivity losses -Bovine Respiratory Disease –Pneumonia and weight loss in feedlot cattle
- 3) Persistently infected (PI) calves - 50 % of PI calves die by the age of 2 years.

### **Fertility Losses**

**Research indicates 70-90% of Australian beef herds show evidence of Pestivirus infection.**




Initial exposure to the virus around the time of joining or artificial insemination may reduce conception rates. Some properties have seen conception rates as poor as 30 % due to Pestivirus infection. Most of the reproductive losses due to Pestivirus infection occur when heifers or cows are first exposed to the virus when they are pregnant..

When the cow is infected during pregnancy, the virus crosses the placenta and infects the developing foetus. Depending on the stage of pregnancy this infection of the foetus may result in early foetal loss (presenting as return to service or poor pregnancy testing results) or, abortion or stillbirth [later stage infections]. If the

developing foetus survives to the end of pregnancy, the calf may be born with severe birth defects, or may die soon after birth or may be ‘persistently infected’ with the virus [PI calf].

PI calves are created by foetal infection at a stage of pregnancy [usually <90days] when the calf’s developing immune system does not recognize the virus as foreign. These calves develop no antibodies to Pestivirus; basically have the virus in-built in their bodies and shed the virus for as long as they live.

Another large cause of infertility involves bulls becoming transiently infected with Pestivirus at the time of joining. The resultant immuno-suppression causes decreased semen quality that can have disastrous effects on conception patterns. The effects of the disease vary depending on the stage of gestation:

Conception	First trimester	Second trimester	Thlrd trimester
<ul style="list-style-type: none"> <li>Prevents fertilisation</li> <li>Early embryonic death</li> </ul>	<ul style="list-style-type: none"> <li>Formation of PI calves</li> <li>Early embryonic death and resorption</li> </ul>	<ul style="list-style-type: none"> <li>Abortion</li> <li>Later delivery of non viable or abnormal calves at full term</li> <li>CNS effects</li> <li>Eye defects</li> </ul>	<ul style="list-style-type: none"> <li>Smaller calves at full term</li> </ul>
<ul style="list-style-type: none"> <li>Reduces conception rates</li> <li>Delays conception</li> <li>Returns to service 21 days or longer</li> </ul>		<ul style="list-style-type: none"> <li>Reduction in calf numbers</li> </ul>	<ul style="list-style-type: none"> <li>Varying birthweights</li> </ul>
	 <p>Normal foetus (top) Non viable BVDV infected foetus (below)</p>	 <p>Aborted foetus      BVDV infected brain</p>	

A combination of tighter herd management, modern breeding practices, better diagnosis techniques and the marketing of the Pestiguard vaccine has highlighted Bovine Pestivirus as a major viral disease infecting Australian Cattle.

### ***Bovine Respiratory Disease (BRD)***

In stressful environments such as high-stocking rates, transportation, feedlots and yarding, Pestivirus transmission can take as little as one hour. Direct contact of previously unexposed cattle with a PI animal can have devastating effects on animal health and productivity. Once cattle become infected with Pestivirus they become susceptible to a wide range of secondary infections with other viruses and bacteria. This is because infection with Pestivirus suppresses the immune system, making cattle much more likely to catch other infections. Examples include:

- Bovine Respiratory Disease (BRD)
- Pneumonia
- Footrot and lameness
- Diarrhoea and intestinal infections
- Bovine papular stomatitis or wart infections
- Pinkeye infection

Feedlot performance is diminished greatly by Pestivirus infection through reduced feed consumption, low average daily weight gains, sickness and in some cases death of stock.

### ***Persistently infected (PI) calves***

The principal way Pestivirus is transmitted within cattle herds is by direct contact with persistently infected (PI) animals. The majority of PI animals can be recognized as 'poor doers', or sick animals that die before 2 years of age from Mucosal disease. These animals are often 'immunological cripples', developing severe, non-responsive forms of common diseases such as ringworm and dermatophilus infection. However, some PI animals appear 'normal', survive longer than 2 years, and act as long term carriers of Pestivirus. Essentially these are 'hidden transmitters' continuing to infect animals in the herd, showing no obvious signs of illness and are difficult to recognise and diagnose.

### ***Control programs – Holbrook Veterinary Centre recommendations:***

*Use of Pestiguard vaccine and natural exposure to PI animals forms the basis of control programs.*

The core aim is to ensure cattle are not first exposed to Pestivirus when they are pregnant, maximizing immunity in females prior to joining will minimize reproductive losses.

Control programs will also reduce losses from transient Pestivirus infections. Vaccination of bulls prior to joining and steers pre feedlot entry will maximize immunity at these crucial times and decrease potential economic losses.

**In commercial enterprises** we recommend that all heifers are vaccinated twice prior to joining, bulls are vaccinated annually prior to joining and that cattle sold to feedlots are vaccinated prior to leaving the property. At this point in time our recommendation is not to annually vaccinate commercial cows as the reliance is on natural exposure through contact with PI animals to maintain immunity.

**In seedstock enterprises** and in herds performing artificial breeding frequently, we recommend that all females [heifers and cows] and bulls are annually vaccinated prior to joining and that cattle sold to feedlots are vaccinated prior to leaving the property.

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