Appendix 7 - Vaccines to control Bovine Respiratory Disease

Beef CRC discovered and commercialised two vaccines (Bovilis MH™ and Pestigard™) to control Bovine Respiratory Disease (BRD). BRD is the single most costly disease affecting feedlot cattle, with losses estimated at $60 million annually. It is estimated to cause 50-90% of illness and death in Australian feedlots. It is a complex disease involving many contributing factors, and usually occurs within four weeks of induction to the feedlot. The bacteria Mannheimia haemolytica (MH) is a major cause of BRD in Australia. Pestivirus can also cause respiratory disease, especially when animals are managed intensively (e.g. in feedlots) or are under severe stress, when Pestivirus infection results in immune suppression, potentially allowing other viruses and bacteria to infect the animal, thereby producing more severe respiratory disease.

In addition to Bovine Respiratory Disease, Pestivirus is an insidious cause of production and reproductive losses in beef and dairy herds in Australia. Infection is widespread, with about 70% of Australian cattle herds having evidence of infection. In herds recently infected with Pestivirus, production losses of between 25 and 40% have been recorded due to reduced reproductive losses, mortalities and ill thrift. If Pestivirus stays in the herd, annual production losses between 5 and 10% commonly occur. The CRC vaccines are used in two ways. To manage Bovine Respiratory Disease, both vaccines are used as part of a feedlot 'pre-boosting' strategy. PestigardTM is additionally used in breeding herds to control reproductive losses due to Pestivirus.

Success of the vaccines can be measured through product sales. However a far greater impact would be recognised if productivity improvements arising from reduced animal morbidity or mortality rates due to use of the vaccines could be directly measured in industry herds. Feedback from the feedlot sector and the commercialisation companies suggests that vaccinated animals have significant health benefits in feedlot environments, including:

- A decrease in death loss of 68.38%;
- A decrease in respiratory death loss of 82.18%;
- A decrease in morbidity of 37.61%; and
- A decrease in respiratory morbidity of 39.77%.

Additional to these benefits is the economic impact of the health benefits on the profitability of feedlot operations and the animal welfare improvements that can be achieved. Through its health benefits the vaccines:

- Increase average daily gain of cattle
- Reduce time to market (through better growth)
- Improve feed efficiency (conversion), reducing feed costs
- Reduce antibiotic use (reduced health costs)

Pre-registration uses of both products occurred between 2000 and 2004. By the end of 2004, one of the products had annual dose sales of 62,000 units. Both products were registered for use in 2005-06. By 2009, ~1.3 million doses of the first product were sold annually, with ~80% used on entry to the feedlot as a preventative. This volume represents ~65% of annual feedlot cattle. From 2009, there has been a stronger focus for a 2-dose program (1 on-farm and 1 at feedlot entry) to increase the performance of the vaccine in feedlot cattle. This has been initiated by the feedlots, which are aiming to further improve their animal welfare and feedlot performance. The gross value of sales for the first product is estimated at $3.2 million.

Between July 2008 and June 2010, total sale revenue of the second product was $10,473,533. Sale volumes before July 2008 are not available. An independent study (Insight Economics, 2006[1]) reported that sales of both vaccines through to June 2006 totalled 2.75 million doses and ~$6 million in value, with supplies mainly to cattle being backgrounded for feedlot entry. An attribution rate to Beef CRC of 50% was applied by that study to the net cost savings delivered from use of these products.

As indicated in the case studies in the attached articles, most cattle entering Australian feedlots (>1 million per annum) are now routinely vaccinated with these vaccines. In addition, the Pestigard™ vaccine is now being used in commercial beef herds across Australia to improve the reproductive performance of breeding cattle (see BPP case studies related to Pestivirus).

[1] Insight Economics (2006) Economic impact of the CRC Programme. Available online at: http://www.crca.asn.au/content/economic-impact-study-crc-programme)