

# BOVINE NEONATAL PANCYTOPENIA (BNP): IDENTIFYING A NEW DISEASE



Some farms may lose up to five per cent of calves to BNP

Scientists at the University's Roslin Institute and Royal (Dick) School of Veterinary Studies teamed up with researchers from the Easter Bush Research Consortium (EBRC) to identify and explore the causes of a new disease, Bovine Neonatal Pancytopenia, or BNP, which affects calves. First to describe this unexplained haemorrhagic disease, the team characterised the clinical, haematological and pathological findings that have led to a greater insight into the disease, and the creation of strategies to reduce its incidence.

## A truly novel disease

While the numbers of cases of BNP on each farm is usually small, most affected calves die, with some farms losing up to five per cent of their calves. Between 2009 and 2010 more than 4,500 cases were confirmed across Europe, and the disease has also been seen in New Zealand. Recent studies by the research team have suggested many more calves may be affected by a milder form of the condition.

The consortium discovered that the cause of BNP is antibodies in the cow's first-milk (colostrum) which damage the calf's bone marrow when it suckles. These harmful alloantibodies are induced in the cow after vaccination with a particular vaccine (Pregsure BVD).



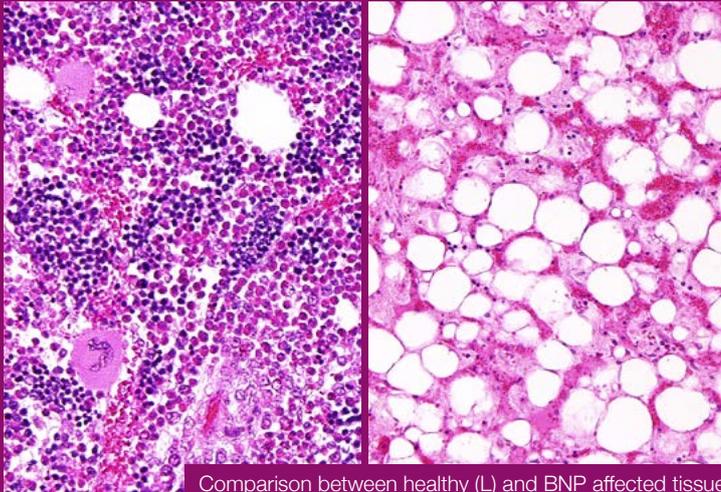
## A SUCCESSFUL COLLABORATION

The Easter Bush Research Consortium (EBRC) brings animal sciences researchers from the University of Edinburgh's Roslin Institute and Royal (Dick) School of Veterinary Studies together with their counterparts from Scotland's Rural College (SRUC) and the Moredun Research Institute.

Scientists who have common and complementary interests in research work closely together to develop effective disease controls and treatments, improved food safety, improved animal welfare and sustainable management of farm animals.



Working towards better farming practices



Comparison between healthy (L) and BNP affected tissue

▶ As early observations suggested a role for colostrum in the development of BNP, the team demonstrated that the disease could be prevented by colostrum substitution. These findings were confirmed by an experimental feeding trial conducted in collaboration with researchers from the Moredun Research Institute.

Subsequent studies demonstrated that the harmful alloantibodies produced by vaccinated cows react with the proteins from the cell line used to manufacture Pregsure vaccine. An association between BNP and Pregsure was also confirmed by a Department for Environment, Food & Rural Affairs (Defra) epidemiological study, with input from the Edinburgh research team. Ongoing work at Roslin offers insight into the exact nature of the problem with this particular vaccine, and provides a means to test future vaccines to ensure that they don't cause similar problems.

The immediate impact of this research has been the acknowledgment by Pfizer Animal Health (now Zoetis) of the connection between BNP and vaccination of cows with Pregsure. This has led to the precautionary withdrawal of the vaccine from Europe in 2010 and the retraction of market authorisation by the European Medicines Authority. Despite this, cases of BNP continue to be seen in calves born to dams that have been historically vaccinated. However, with increased awareness of the disease, the number of cases diagnosed post-mortem by SRUC fell by 42 per cent from 2012 to 2013, suggesting that the withdrawal of Pregsure vaccine will gradually reduce cases of BNP.



The research teams' results contributed to the Defra BNP working group, which generated the case definition for the disease used in further large-scale epidemiological studies.

Rapid transfer of information about the clinical features of the disease to vets and farmers was vital in enabling prompt recognition and investigation of cases, which helped investigations into the cause. The finding that BNP can be prevented by colostrum substitution was rapidly disseminated to the veterinary profession and farming community, helping to prevent many further cases of the disease.



Instances of BNP have decreased significantly

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