

BOVINE NEONATAL PANCYTOPENIA: A NEW DISEASE OF CALVES



Bovine Neonatal Pancytopenia (BNP), a newly recognised disease of calves, is caused by antibodies in the cow's first-milk (colostrum) which damage the calf's bone marrow when it suckles. The harmful alloantibodies are induced in the cow after vaccination with a particular vaccine (Pregsure BVD).

It was scientists at the University of Edinburgh and SRUC who were the first to describe this unexplained haemorrhagic disease of calves, with profound depletion of white blood cells and platelets. Our subsequent research enabled recognition of BNP as a truly novel disease and characterised the clinical, haematological and pathological findings.

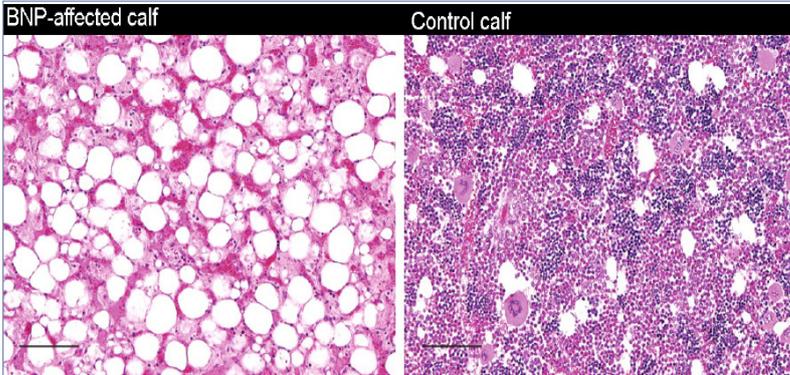
While the numbers of cases of BNP on each farm is usually small, most affected calves die, with some farms losing up to 5% of their calves. Between 2009 and 2010 more than 4,500 cases were confirmed across Europe, and the disease has also been seen in New Zealand. Our recent studies have suggested many more calves may be affected by a milder form of the condition.

EASTER BUSH RESEARCH CONSORTIUM

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 counterparts from Scotland's Rural College (SRUC) and the Moredun Research Institute. In collaboration teams from all EBRC organisations identified BNP as a new disease entity, elucidated the cause and developed strategies to reduce the incidence. The outcome was that the vaccine associated with emergence of BNP was withdrawn from sale.



WITHDRAWAL OF BVD VACCINE AND INCREASING MONITORING



In BNP the calf's bone marrow is damaged (left), compared to a normal calf (right)

Early observations suggested a role for colostrum in the development of BNP and research at the University of Edinburgh and SRUC demonstrated that the disease could be prevented by colostrum substitution. These findings were subsequently confirmed by an experimental feeding trial conducted in collaboration with 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 Defra epidemiological study, with input from the University of Edinburgh. On-going work at Roslin has offered insight into the exact nature of the problem with this particular vaccine, and provided a means to test future vaccines to ensure that they don't cause similar problems.

The immediate impact of this research was the acknowledgment by Pfizer Animal Health (now Zoetis) of the connection between BNP and vaccination of cows with Pregsure. This 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, even with increased awareness of the disease, the number of cases diagnosed at post-mortem by SRUC fell by 42% from 2012 to 2013, suggesting that the withdrawal of Pregsure vaccine will gradually reduce cases of BNP.

PREVENTION THROUGH COMMUNICATION

Rapid transfer of information about the clinical features of the disease to vets and farmers allowed prompt recognition and investigation of cases, which helped investigations into the cause. Results contributed to the Defra BNP working group which generated a case definition for the disease that was used in further large-scale epidemiological studies.

Our finding that BNP can be prevented by colostrum substitution was rapidly disseminated to the veterinary profession and farming community which helped to prevent many further cases of the disease.



CONTACT

The Roslin Institute
The University of Edinburgh
Easter Bush Campus
Midlothian, EH25 9RG
T: 0131 651 9100
E: info@roslin.ed.ac.uk
www.roslin.ed.ac.uk

If you require this document in an alternative format, such as large print, please contact info@roslin.ed.ac.uk



THE UNIVERSITY of EDINBURGH