

a focus on BVD & Johne's



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INTRODUCTION

Animal disease has a severe effect on productivity and profitability of cattle and impacts adversely on animal welfare.

Control and prevention of disease will improve productivity. Improving the health status of herds provides sources of disease free stock which creates export opportunities and raises the profile of the Welsh Beef industry.

This booklet will focus on two diseases that are costly to, and should be tackled by, the industry.

BVD – Bovine Viral Diarrhoea Johne's Disease

These diseases are spread by apparently healthy but infected carrier animals and when introduced to a herd tend to cause disease independent of husbandry.

In Wales many herds are already controlling Johne's Disease and HCC have provided financial incentives for producers to tackle the disease.

BVD is recognised throughout Europe as one of the most important viral diseases of cattle. Major benefits in calf survival have followed the eradication of the infection from the Scandinavian countries.

HCC data shows that 3.6% of calves born alive die before weaning (range 0 to 20%) and 1.1% die post weaning. The main reasons cited are diarrhoea and pneumonia. BVD infection is important in calf health as it leads to a suppression of disease resistance allowing calf pneumonia and calf diarrhoea problems to be more severe resulting in greater losses.

The aim of this booklet is to raise awareness of these two diseases across the whole of the Welsh beef and dairy sectors and encourage testing for the diseases through a health scheme approach.

Wales has over 20% of the breeding cattle of Great Britain and it is vital that Welsh producers tackle these diseases. The end result will be more viable farm enterprises and higher numbers of calves available on the Welsh market.

A BVD – THE DISEASE

Question: Which herd or animals are BVD carriers?



Answer: Unless you test you do not know

The disease can impact at all stages of the breeding cycle, from the introduction of the bull to the herd until the resulting calf crop is finished – see *Figure 1*. The economic impact of a BVD breakdown on a herd can be devastating.

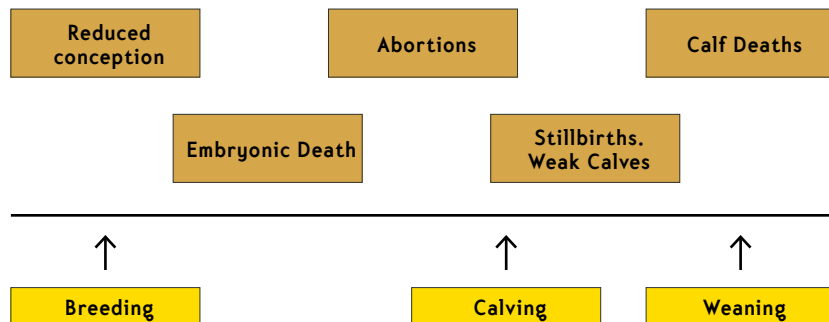


Figure 1-Effect of BVD during the Breeding Cycle

A BVD outbreak in a herd can result in:

Infertility	<i>barren cows or slow to go to bull resulting in longer calving intervals</i>
Abortion	<i>at any stage of pregnancy</i>
Calf deaths	<i>at any stage from birth onwards</i>
Deformed calves	<i>may have to be culled</i>
Weak calves	<i>survival is compromised</i>
Immune system suppression	<i>lowered disease resistance leads to more severe pneumonia and diarrhoea outbreaks</i>
Mucosal disease	<i>always fatal despite treatment</i>

a) BVD – Method of Spread

The disease can easily spread through contact with infected animals or contact with equipment or clothing that has been in contact with infected animals. This can be through purchased carrier stock, contact with neighbours' cattle across fences or contact at market or shows. Visitors who have come directly from other cattle and shared equipment can all result in the introduction of the BVD virus to your herd.

As the virus is easily spread biosecurity has to be given utmost priority.



b) What is a PI?

The source of infection to other animals in the herd is the apparently healthy, persistently infected (PI) BVD virus carrier. Most PI animals die young and before breeding age but some survive till adulthood (Figure 2-adult PI). Every day of their life PI animals, whatever their age, are a source of virus and a risk to all animals in the herd and a major risk to pregnant animals. Vaccination has no effect on the PI animal. The PI results from a cow being infected with virus for the first time in the first third of pregnancy. Some infections at this time will result in the death of the developing calf but those that survive will remain infected with the virus for as long as they live. The PI heifer that survives to breeding age will produce PI offspring. Adult PI animals are almost always infertile if they are bulls and often subfertile if females.

Figure 2 – Adult PI



Calves of same age, one is persistently infected with BVD

c) BVD related birth defects

Infection late in the first third and into the second third of pregnancy can result in the death of the calf and abortion. It may lead to abnormalities of development (Figure 3), the commonest of which affect the brain and often result in calves that have difficulty in maintaining normal posture and stand with legs wide apart to compensate. Infection later in pregnancy may well result in no detectable damage to the calf although BVD infection at this time has been suggested as a cause of stillbirths and weak or under-sized calves.



Figure 3 BVD can affect calf development



BVD virus is most important when it infects susceptible breeding cattle during early pregnancy causing foetal death/abortion, and weak/premature calves.

d) Categories of Stock Infected

1. Bulls

A purchased bull may be a PI. A bull that is not a PI but becomes infected for the first time will shed the BVD virus in his semen for a short time and may remain infertile for up to four months. Although he recovers his legacy will be barren cows and extended calving periods.

2. Cows and heifers

Purchased females may be PI animals themselves or they may be carrying a PI calf.

3. Set-on calves and calves purchased at foot

Purchased calves can introduce BVD virus to a herd. Unless bought-in foster calves come from an accredited source they are a potential threat. If it is a PI it will spread virus in the herd.

4. Weaned calves

A weaned PI calf that is purchased by a finishing unit will also be spreading virus which will present a challenge to the immune system of other feeding cattle on the unit and this may lead to severe outbreaks of pneumonia. Furthermore the PI may die from mucosal disease before they finish.

If BVD is suspected in a herd the procedure to tackle it is outlined in Appendix 1.

e) Controlling the Risk

There are three important points that should be discussed with your vet.

- 1) Find out if BVD is active in the herd by blood sampling the calf crop.
- 2) Are biosecurity measures sufficient to prevent purchase of PI and to prevent contact with risk factors?
- 3) Is the use of BVD vaccine on the herd advisable?

Several formal programmes have been developed to help you in this.

1. BVD accredited free programme

The CHeCS (Cattle Health Certification Standards) BVD accreditation programme is the gold standard for BVD control combining blood testing with best practice biosecurity.

There must be a minimum of a three metre gap at any farm boundary to prevent animal contact with neighbouring cattle.

To gain accredited status herds need to have 2 clear tests at a year interval. The test includes blood sampling 5 cattle (ideally 9 months of age and older) per management group. Blood samples are taken by your local vet and sent to the health scheme provider for analysis and results are copied to your vet and yourself.

Vaccination is optional but strongly recommended. Accredited herds can use vaccine.

Animals purchased directly from BVD accredited free herds offer the lowest possible risk of introducing BVD to your herd.

2. BVD Vaccinated Monitored Free

This status is suitable for herds that may struggle to meet the biosecurity rules of 3m gap fencing. The testing procedures are the same but all stock must be protected with a BVD vaccine which is recommended for use in breeding animals. The vaccine used will require 2 doses at 3 to 4 weeks interval in the first year with a single booster each year thereafter. The vaccine must be used strictly in accordance with the vaccine manufacturer's instructions.

3. BVD Virus Free and Vaccinated

Unlike the previous categories this does not apply to the herd, but is an individual animal status. It is suited to businesses that buy heifers or cows to bull and then sell them on in-calf or with calf at foot. To prevent trading in virus positive animals all animals to be sold are tested for virus and are also vaccinated.

This process should be completed at least two weeks before sale. The exception is where pregnant animals are sold in which case vaccination should be completed before they are served. As always the vaccine must be used in strict accordance with the manufacturer's instructions.

These animals offer a higher risk than categories 1 or 2, but are still considered to be safe.

On many farms, the approach in (1) or (2) above will be cheaper as only a small number of animals need testing whereas with (3) all animals have to be tested for virus.

It is important that whatever your cattle production system you discuss options for BVD control with your vet and incorporate BVD prevention into your health plan.

B JOHNE'S – THE DISEASE

Johne's disease is an important source of financial loss to the British beef and dairy industries.



It is caused by a bacterium, *Mycobacterium avium subspecies paratuberculosis* (*Map*) that is closely related to the organism causing bovine tuberculosis. There is no practical course of treatment and once animals begin to show signs of the disease they will usually continue to deteriorate until they die or are culled on welfare grounds.

Although most infection is believed to occur early in life the signs of disease are usually seen in adult cattle with a high level of wastage at 3 to 5 years of age, removing animals from the herd when they are at their most productive. In the year before the signs of the disease are obvious productivity is often below potential with milk yield and fertility being adversely affected.

The characteristic sign of Johne's Disease is severe watery diarrhoea and extreme weight loss. Animals with Johne's disease are shown above.

Johne's Disease can affect other ruminants including sheep. In sheep diarrhoea is not such an obvious feature and wasting leading to early culling is the most common way Johne's Disease affects a sheep flock. Rabbits are also frequently infected. The role that other species play in infecting a cattle herd or maintaining infection in the herd is not known, but these species are a much poorer source of infection to cattle than are other infected cattle.

a) Johne's – Method of Spread

Cattle that are infected with Johne's Disease can shed *Map* in their faeces from an early age. As the animals mature and the disease advances large amounts of *Map* are shed in the faeces and lead to infection in any young calves in their vicinity. It is paramount that cows and the calving environment are clean at calving time to reduce the risk of infection of the recently born calf.

While the main route of spread is through the faeces with infected material being ingested by susceptible calves, infection can also be spread in the milk and in colostrum. Infection can even occur before the calf is born and research has shown that almost half of pregnant animals in the later stages of the disease will produce calves that are infected at birth. Adults are considered to be more resistant to becoming infected but adult infection has been shown to occur and this is considered a risk in herds with a high infection rate and high exposure to faecal material.

The disease may be present in a herd without ever being recognised and this may be related to the degree of stress the animals are under. Carrier animals that have been introduced to a herd may take several years to develop the disease and it may be several more years before infection in home bred cattle becomes apparent.



Faeces of infected animals contaminating surface drinking water

b) How do you know if your herd is infected?

If the disease has never been identified in your herd and you are not selling breeding stock then all that is required is for you to discuss with your vet how to monitor for the disease. Instead of screening the whole adult herd through blood tests it would be beneficial, and much cheaper, to screen any adults that you have decided to cull on production reasons. This will allow you to examine the high risk animals. For example, a sample could be taken at pregnancy diagnosis time if the vet is on the farm.

If you are selling breeding stock then consideration should be given to entering the herd accreditation programme to offer assurance to your customers.

c) What do you do if you have infection in the herd?

For both beef and dairy herds some form of regular whole herd testing is recommended. In the beef herd this takes the form of annual testing of the breeding herd usually in the second half of pregnancy. Animals that test positive are separated from test negatives until their calf is weaned or they begin to lose condition and at that point they are slaughtered. The offspring of test positives should not be retained for breeding. They can be added to a finishing group but should not be kept with animals being retained for breeding. A similar approach is adopted in the dairy herd with separation of test positive taking place during the dry period and test positives cows being culled when either their production falls or as soon as possible where the maximum pressure is being placed on the disease.

d) Testing for Johne's Disease

Unlike other diseases, such as BVD, testing for Johne's disease is problematic. While animals may be infected from early in life they only test positive later as the disease begins to develop. This means that infected animals will test negative for several years before they test positive. It is not possible to screen a herd and remove all infected animals in one go and it takes many years to reduce the number of infected animals in the herd and achieve a degree of control. In some herds where little control can be exerted over the environment (see below) progress towards freedom from the disease may not be achieved, although a financial benefit will be gained by removing test positive animals before they develop the disease. This can represent a saving of £500 to £1000 per animal, easily demonstrating that the programme provides a positive cost benefit for the infected herd.

e) Management Factors

A testing programme is only one part of the control of this disease. The emphasis must be on reducing the amount of faecal contamination that young calves in particular are exposed to. Calving in a contaminated shed, a scarcity of bedding, dirty water troughs and bowls are all sources of risk. Cleanliness at calving time cannot be over-stated. The control measures that are required will vary from herd to herd and the best approach is to consult with your vet to ensure the most effective and practical measures appropriate for your herd can be implemented.

f) Biosecurity

The disease is usually introduced to the herd by the purchase of apparently healthy infected stock. This risk is minimised by sourcing replacement stock from herds free of the disease (see accreditation below) or employing suitable test and quarantine when this is not possible. The disease can also be introduced



Do not feed waste milk to calves

by using colostrum from dairy herds as a top up for suckled calves that may have received insufficient colostrum

from their dam. Other potential factors include other ruminants and rabbits. Co-grazing with sheep, although beneficial for grassland management, is not recommended if Johne's is recognised as a problem on the farm. Sheep can be infected with Johne's. Rabbit numbers should be controlled and cattle are best provided with mains water rather than allowed to drink from streams and rivers that have passed through other cattle farms.

g) Accreditation Programme

The gold standard Johne's Disease programme is the CHeCS accreditation programme. Here herds are tested annually and once a herd has had at least two clear herd tests accreditation can be achieved. Animals purchased from the herds that are accredited free of Johne's disease are at lowest risk of developing the disease.

C DIFFERENCE BETWEEN HEALTH PLANS & HEALTH SCHEMES

Health plans have become an integral part of stock management and allow the scheduled delivery of veterinary care to stock on a farm.



The best health plans use the farm's production data to identify problems that need to be addressed and then put in place a management programme using that information. They further allow the most cost-effective use of routine treatments. To get the best out of a health plan it should be regularly reviewed and updated. For the beef cow herd a review should be carried out at weaning to evaluate performance and again at the time the bull stud is examined, when in addition to checking the bulls, calving performance can be reviewed.

Health schemes are a planned approach to the control of several infectious diseases (Johne's

Disease, BVD, IBR and Lepto). They provide disease control blueprints to help with disease eradication. But more importantly, they provide herd accreditation programmes that confirm the health status of a herd and allows the sale of animals with a disease free accredited status. They are based on sound biosecurity to keep the disease out (see opposite) and a testing system to demonstrate that the disease is not present in the herd. There are several providers of health schemes nationally, but all should be members of the Cattle Health Certifications Standards (CHeCS) and the CHeCS logo should appear on all herd certificates for them to be accepted as proof of accreditation.

D BIOSECURITY

Several infectious diseases are spread through contact with apparently healthy carrier animals.

Animals in the early stages of infection can also appear healthy only to develop obvious signs after a day or two, by which time they have introduced infection. Purchased breeding stock should be from accredited sources wherever possible and kept in isolation from other stock for one month. During that time the animals can be tested for any disease that is appropriate and be brought onto the herd vaccination programme. Control at farm boundaries where contact can occur over fences with neighbouring stock is also important. BVD and Johne's can also spread on equipment, personnel and food.

Table 1 Risk Assessment Guidelines for BVD and Johne's Disease.

Common replacement policies	Level of risk that each policy holds for each disease	
	<u>BVD</u>	<u>Johne's Disease</u>
Purchase virgin bulling heifers from accredited herds	Very Low	Very low
Purchase virgin bulling heifers from herds of unknown status	Moderate	Moderate
Purchase in-calf heifers from herds of unknown status	Moderate to high	Moderate
Purchase of cows with calves at foot	Moderate to high	Moderate
Purchase young bulls that have not mated from accredited herds	Very Low	Very low
Purchase, hire or share bulls that have been used in other herds	Moderate	Moderate
Buy calf to set-on (Calf finished and not retained for breeding)	High	Very low

Tables 1 (with green being low risk and red being higher risk) and 2 detail risk guidelines.

Table 2 Risk Assessment Guidelines for Beef Cow Herd- boundaries, equipment etc.

Factor	Risk	Diseases	Action
Farm boundaries	Nose to nose contact with other cattle	BVD	3 metre boundary or keep breeding stock away from farm boundary. Consider vaccination for BVD.
Equipment and personnel	Spread of infection after contact with cattle on other farms	BVD, Johne's Disease	Have separate protective clothing for high risk visitors. Cleansing and disinfection before equipment or visitors contact cattle
Streams running through farm	Spread of infection from farms upstream	Johne's Disease	Fence off running water for breeding stock.

E OTHER DISEASES

Although this booklet has focused on two main cattle diseases which can be monitored through health schemes other diseases of cattle are prevalent.

Three of those, Leptospirosis, IBR and Neosporosis can be tackled via health schemes. For information on cattle diseases please visit the HCC website www.hccmpw.org.uk, alternatively please contact your veterinary surgeon.



F CONCLUSION

Tackling BVD and Johne's will reduce many production problems in Welsh herds and increase financial efficiency. At the same time more product will be available to the Welsh market. Many producers do not think they have a problem. To ascertain if this is true blood sampling needs to be undertaken.

Key factors to understand are;

BVD

- Persistently infected animals (PIs) are main source of BVD infection.
- PIs not always obvious to the eye.
- Risk of buying in infection is high.
- The disease can affect the production from bulling time until slaughter.

JOHNE'S

- Reduced profitability through lowered production, wasting and death.
- Mainly infected as calves.
- Attention to detail at calving time reduces spread of infection.
- Disease is common-place.

The diseases can be combated by following the guidelines provided and through testing and implementing appropriate biosecurity programmes.

As a first step discuss your herd situation with your veterinary surgeon.

APPENDIX

BVD - Infection in a Herd **YOU CANNOT AFFORD AN OUTBREAK** **OF BVD IN YOUR HERD.**

If you already have an outbreak:

RECOMMENDED PROCEDURE

- Vaccinate all breeding stock - do not forget bulls
- Test all calves over one month old for BVD virus
- Test all mature stock that are not the mother of a tested calf
- Test all bulls
- Vet takes blood samples and sends to lab. Vet discusses results with client
- Screen mothers of PI calves for BVD virus
- Isolate PI animals immediately - do not allow contact with other stock.
- Confirm PI animals by second blood test after 3 weeks
- Remove PI animals from herd – cull or remove for slaughter
- Test all remaining calves when they reach at least one month old
- Screen all calves born for the 12 months following removal of the last PI animal
- Keep a high standard of biosecurity – discuss with your vet