

AGFACTS AGFACTS AGFACTS

www.dpi.nsw.gov.au



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Diseases causing reproductive losses in breeding cattle

Agfact A0.9.68, rev. first edn, January 2005

Belinda Walker

Veterinary Officer, Gunnedah

INTRODUCTION

Most cattle producers probably do not realise the extent of economic loss that can occur through reproductive failure in their cattle. Although we have eradicated brucellosis, which used to be a major cause of reproductive loss, other reproductive diseases are still common. There are also many non-infectious factors that contribute to infertility and reproductive loss.

Low calving rates may be due to infertility (failure of cows to conceive) or to early embryonic losses, abortion and stillbirth. This

Agfact will focus on calf losses rather than the failure to become pregnant.

Just what constitutes low calving percentage will vary in different areas, largely because of variations in access to adequate nutrition. In the outback, where distance makes supplementary feeding impractical, a calving rate of 70 per cent may be acceptable, but in more reliable environments with good nutrition the same figure should ring alarm bells! More than 90 or 95 per cent live calves should be achievable with good management and nutrition.

Testing bulls for vibriosis and trichomoniasis involves taking a sample from the prepuce.



NON-INFECTIOUS CAUSES OF ABORTION

Abortions can be caused by a number of factors, including hormonal abnormalities, toxic insults and nutritional deficiency during pregnancy. Of those abortions investigated in NSW Department of Primary Industries laboratories, some are due to non-infectious factors, such as dystocia (difficult birth) (6%) and genetic diseases (about 1%). However, many are due to infectious causes, which can be avoided.

INFECTIOUS CAUSES OF ABORTION

Vibriosis

Bovine campylobacteriosis (vibriosis) is a venereal disease that causes abortion and infertility in cattle. Its prevalence in New South Wales appears to be increasing. In most infected herds, the abortions recur sporadically. The disease is spread by infected bulls at mating.

Vibriosis can be diagnosed by examination of an aborted foetus, or by testing samples from the vaginal mucus of cows and heifers for the presence of antibodies to the disease. Scrapings or washings from the prepuce of a bull can also be cultured to detect the presence of the organism.

Vibriosis can be controlled by regular vaccination of just the bulls. Commercial vaccine is available in small quantities (for example, 2 or 20 mL vials) for this purpose. Reaction to the vaccine leaves a lump on the bull, which may account for the reluctance of some studs to vaccinate their bulls. This is short-sighted, as in this case a vaccination reaction is an indication that the bull's immune system has responded well, and the bull is effectively immunised against vibriosis.

For more information, see Agfact A2.9.7 *Vibriosis of cattle*.

Leptospirosis

Leptospirosis is a highly infectious bacterial disease of cattle that can also cause debilitating effects in humans. Two different serotypes are common in Australian cattle: *Leptospira pomona* and *Leptospira hardjobovis*.

These bacteria survive for long periods in wet conditions and are shed by infected animals in urine and in uterine fluids. When previously unexposed cows are infected, they may abort,

retain foetal membranes, or have reduced milk production. Abortions usually occur in cows that are more than 5 months pregnant (that is, late term abortions).

Leptospirosis can be diagnosed when a foetus is submitted for laboratory examination. The diagnosis may also be made by blood-testing a sample of cows in the herd (up to 10 cattle). The sample should include the aborting cow(s), dry empty cows and normal pregnant cows for comparison.

Leptospirosis can also cause severe illness in humans. Infected urine poses a high risk to dairy farmers, and exposure through handling aborted foetal material and fluids is also possible. Vaccination against leptospirosis is therefore recommended to protect humans as well as cattle.

For more information see *Leptospirosis in cattle herds*.

Pestivirus (bovine viral diarrhoea virus, mucosal disease)

Pestivirus is an extremely common virus in cattle herds and can cause a range of disease syndromes, including reproductive failure, abortion, and birth of abnormal (often small) calves with brain damage. Cows first exposed to the virus and infected during early pregnancy may give birth to weak or apparently normal calves that act as carriers and then later develop the clinical signs of mucosal disease.

In infected herds there are usually some carriers that maintain the infection. As a result, most heifers become immune before they become pregnant, in which case no reproductive

Submission of an aborted foetus to the laboratory is the most reliable way of diagnosing the cause of reproductive loss.



problems occur. However, major reproductive loss can occur if a previously uninfected herd (or a segregated part of a herd, such as replacement heifers) becomes exposed during the mating period, or soon after.

To avoid this, immunity can be achieved by exposing heifers to carrier animals in the rest of the herd before mating. Some producers retain known carriers in the herd specifically for this purpose (while they remain healthy).

A pestivirus vaccine has recently become available and is a more reliable way to achieve immunity. In herds experiencing problems, all breeders should be vaccinated before the start of the breeding program.

For more information, see Agfact A0.9.62, *Bovine pestivirus infection*.

Neosporosis

A protozoan parasite known as *Neospora caninum* has only recently become recognised as an important cause of foetal death, mummification and abortion in cattle, particularly in coastal New South Wales. Antibodies to this parasite appear to be widespread in dairy herds. The disease is difficult to diagnose unless an aborted foetus is available for examination, which is perhaps why its importance has been underestimated in the past, and why it is diagnosed less often in beef cattle than in dairy herds.

Neospora-infected cows are thought to remain infected for life, and repeatedly transmit infection to the foetus. However, many infected foetuses are not aborted, but are carried to full term and are normal at birth, although rare cases may have paralysis. Infected female calves, in turn, have a higher risk of repeated abortion than uninfected calves, and will transmit the disease to their calves in subsequent pregnancies. Thus the disease is maintained in the herd.

Dogs can also become infected with *Neospora*, and shed oocysts (eggs) in their faeces, so domestic dogs, feral dogs and dingoes may spread the parasite to cattle. Control of neosporosis is aimed at minimising contamination of feed and pasture by dog faeces and culling repeat aborters.

For more information, see the Agnote *Neospora caninum infection in cattle*.

Trichomoniasis

Another protozoan parasite known as *Tritrichomonas foetus* causes uterine infection and abortions, which may be accompanied by discharge of pus. This is a venereal disease, with bulls maintaining the infection in the folds of the prepuce, and transmitting it to cows at mating. The disease is thought to be rare in New South Wales, but is common in Northern Australia. In New South Wales it is a notifiable disease: infected herds must be quarantined and stock owners must implement an eradication strategy.

Trichomoniasis is diagnosed by culturing samples from the infected bull's prepuce or from the uterine discharge of infected cows. The disease can usually be eradicated by culling infected bulls and ensuring that cows have at least 3 months' sexual rest.

For more information see the Agfact A0.9.64 *Trichomoniasis*.

Akabane, Aino and Palyam viruses

Akabane, Aino and Palyam viruses are examples of arboviruses, meaning that they are spread by insects. These viruses can cause birth deformities such as 'dummy' calves (from damage to the brain; known as **hydranencephaly**) and 'curly' calves (from damage to the spinal cord causing twisted limbs; known as **arthrogryposis**). However, this occurs only if animals with no immunity are exposed to the virus when they are pregnant. Insects regularly spread these viruses along the New South Wales North Coast and the Hunter Valley, and most cows in these areas develop immunity before their first pregnancy. In this situation, calf abnormalities are rare.

However, the geographical range of the insect vectors varies, depending on the season. When the insects spread into areas where they are not often found, the incidence of abnormal calves can be much higher, especially in heifers, as they are less likely to have been exposed before. Some adult cows in such areas may still be immune from prior exposure, depending on their age.

Devastating losses can also occur when pregnant cattle from outside the 'endemic' region are introduced before or during the period of virus transmission (usually mid-summer to early autumn). Introduction of pregnant cattle to New South Wales coastal regions, especially in summer and autumn, should be avoided.

NSW DPI is involved in a National Arbovirus Monitoring Program (NAMP, <http://www.namp.com.au>), whereby insects are trapped and animals sampled at selected surveillance sites, in an attempt to detect and monitor the spread of arboviruses.

Septic abortion

There are many species of bacteria that can cause sporadic abortions in cattle. They enter the placenta, and sometimes the foetus, through the cow's reproductive tract or her bloodstream. The bacterium *Listeria ivanovii* sometimes causes abortions in cattle that have been fed silage.

Many of these infections can be prevented by:

- providing a hygienic environment for handling cattle (for example, clean dairies and cattle yards)
- avoiding the feeding of mouldy hay or silage
- keeping water supplies clean and free of rotten vegetation.

Fever

Any illness that causes a high fever in the pregnant cow has the potential to cause abortion. This does not have to be a disease that affects the reproductive tract. Examples include bovine ephemeral fever (3 day sickness), salmonellosis (usually septic abortion), abscesses, and pasteurellosis and other respiratory diseases.

HOW TO DIAGNOSE THE CAUSE OF REPRODUCTIVE LOSS

To effectively control reproductive losses, the precise cause of the problem must be determined. Several diseases can cause similar signs, and a thorough veterinary investigation will be required to pinpoint the cause. Sometimes more than one disease may be present in the herd at the same time.

Calving pattern

To find out whether you have a problem it is essential to keep a record of your herd's reproductive performance. If you use a restricted mating season, then analysis of the calving pattern can help narrow down the possible causes. If herd fertility is normal, the majority of calves (65 to 70 per cent) should be born within the first 6 weeks of the start of calving. If this calving peak does not occur, and births are

spread over a much longer period, a venereal disease such as vibriosis or trichomoniasis is a likely cause.

Pattern of abortions/empty cows

Late abortions are more likely to be seen with neosporosis or leptospirosis. Earlier losses (often recognised only when cows are pregnancy-tested as empty) may be more likely to be due to pestivirus or vibriosis. Sporadic abortions may indicate that the herd is partly immune to the disease, and that the disease has been present for some time. An 'abortion storm' is more likely to indicate neosporosis, or the recent introduction of pestivirus to a previously unexposed herd. None of these observations is diagnostic, but they form an essential part of any effective investigation.

Blood tests

Blood tests can be very useful to indicate whether a herd has been exposed to a particular disease. However, although a positive result confirms previous exposure to the disease, it does not necessarily mean that that particular agent is responsible for the problems seen. It is important to have the results of any blood tests interpreted by your veterinary surgeon in the context of other information available. Good records will be an asset in this situation.

For example, a cow may test positive for pestivirus, but if she was exposed before becoming pregnant she is likely to be immune to the disease, and it is unlikely to be the agent responsible for her abortion. A comparison of test results from cows that have calved normally with results of those that have aborted is more likely to yield meaningful results than looking at the test results of the affected animal only. For example, if the affected cows have high levels of antibody and the normal pregnant cows are negative for antibodies, then it is likely that you have found the culprit! If all cows are positive, and only some have aborted, then you need to look elsewhere for the cause.

Submission of foetus and placenta

Post-mortem examination of dead or aborted calves is the only means of identifying with certainty the cause of your herd's reproductive problem. It is important to recognise the importance of submitting aborted foetuses and placentas for laboratory examination, even if they have started to decompose or have been partly dismembered by scavengers. Culture of

foetal stomach contents and examination of the foetal brain for parasites can yield results, even in specimens that are past their prime! About two-thirds of cases of abortion in cattle can be diagnosed if the foetus and placenta are submitted to a laboratory.

Always wear protective gloves when picking up a foetus or placenta (to avoid the possibility of catching leptospirosis and Q fever); place it in plastic bags and refrigerate it. Then contact your private veterinarian or a veterinarian at the Rural Lands Protection Boards or NSW Department of Primary Industries, who will provide further information and help.

PROTECTING YOUR HERD IN FUTURE

1. Invest in obtaining a differential diagnosis from a veterinarian.
2. Make use of the information gained by defining any necessary preventive measures or by adopting a vaccination program.
3. Work with your veterinarian to evaluate control measures by pregnancy testing annually to monitor reproductive performance.
4. Cull empty cows.
5. Maintain records so that you can monitor your herd's progress towards more calves and more dollars!

Acknowledgment

This Agfact replaces an earlier version, Agfact A0.9.58, *Are your cattle aborting?*, written by Peter Windsor.

© The State of New South Wales 2005
NSW Department of Primary Industries
ISSN 0725-7759

Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing (1 January 2005). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the New South Wales Department of Primary Industries or the user's independent adviser.