Brucellosis in Cattle

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Brucellosis infection in cattle causes infertility, and the birth of dead calves (abortion). The disease once introduced into a herd can spread rapidly, resulting in very few calves being born alive, thus reducing expansion of the herd and profitability. The disease can also be transmitted from infected cattle to man causing a serious painful disease known as undulant fever.

A PROGRAMME arranged for the eradication of brucellosis has prevented the disease from becoming widespread in Papua New Guinea. It is now confined mainly to herds which have recently been imported from Australia where brucellosis is present in all states except Tasmania. As brucellosis has not been completely eradicated, everybody involved in the cattle industry should be aware of the disease and the problems it poses.

What Causes Brucellosis?

Brucellosis is caused by one of the brucella group of bacteria. The most common means of cattle becoming infected is by ingesting bacteria with food or water. Very occasionally infection occurs through cuts or when an infected bull services a cow.

How does Infection Occur?

The infection is almost always introduced to a herd by an infected cow which may calve normally or abort. The brucella bacteria present in the membranes and the fluid discharged during calving contaminate the surrounding grass. Other cattle will eat the infected grass and so the disease is passed on through the herd. An infected cow may also pass brucella bacteria in her milk, so infecting the calf.

Steers are rarely affected and are not known to spread the disease.

Infection can also spread from a neighbouring infected farm by contact of cattle through the boundary fence, by animals straying on to the land, by contamination of drinking places, or through dogs and vermin transferring unburied afterbirth and other infected material. People contaminated by infected discharges on their hands or clothes can introduce infection. A vehicle used to carry infected cows may become contaminated and be a source of infection.

What Happens in an Infected Herd?

When a clean herd becomes infected, there are initially many abortions. Brucella bacteria picked up by pregnant cows invade the uterus where they cause damage to the membranes of the calf, resulting in the death of the foetal calf, which is then aborted. Most abortions occur between the fifth and eighth month of pregnancy, when the calf is one or two feet long and hairless, but fairly well formed. Following abortion, the uterus is infected for a varying period of time, and there is a visible discharge of liquid containing blood and pus. The cow is infertile during this period, but as infection is overcome, the discharge ceases and the cow will conceive. The infected cow which has aborted then develops a resistance to the disease and rarely aborts at subsequent pregnancies. These resistant cows frequently remain infected, however, and contaminate the pasture at their next calving.

In calves, sexually immature cattle and mature cows which are not pregnant, the infection causes a fever which is usually not apparent, then the brucella die. However, in a small percentage of cattle the brucella remain alive in the genital organs, lymph glands and udder. When these cows, which are carrier animals, become pregnant the brucella bacteria again invade the blood stream, are carried to the uterus and can cause abortion.

Plate I.—A sample is taken from the stomach of an aborted calf. The fluid will be tested to see whether brucellosis was the cause of the abortion

How is the Disease Diagnosed?

The brucella bacteria may be present in the blood or milk of the cow, on the skin of the aborted calf, and in the fluid discharged during calving. To diagnose the disease, a bacteriological culture is made from any of these sources and from the culture the brucella bacteria can be identified if present.

For large-scale diagnostic work, blood tests are the most practical. They have proved successful in routine testing and in repeated testing during an eradication programme.

What is the Routine Testing Programme to Detect Brucellosis?

Blood tests are carried out on all breeding cattle herds at least every four years. In the case of herds offering breeding stock for sale or importing cattle, testing is required every two years. All breeding cattle slaughtered at abattoirs or slaughter-houses are blood-tested.

What Happens when Brucellosis is Detected?

Brucellosis is a notifiable disease, and cattle owners who suspect the presence of the disease are legally obliged to report the matter immediately to an officer of the Department of Agriculture, Stock and Fisheries, who will arrange an investigation. For this, blood samples are taken from all cattle in the herd and if brucellosis is confirmed, the herd is placed in quarantine, so restricting the movement of infected animals. The cattle which show evidence of brucellosis are slaughtered, for which the Government pays compensation.

The only movement of infected cattle allowed is to slaughter. A permit may be obtained to move steers over twelve months old, if they give negative results to blood tests.

Blood tests are carried out on the herd in quarantine at monthly intervals until three consecutive herd tests are all negative. After a

further three negative tests at three monthly intervals, the herd is released from quarantine. During the eradication programme, the owner is encouraged to adopt management procedures to prevent further spread of the disease within the herd, for example, placing pregnant cows in a separate herd away from cows with calves.

What are the Restrictions on Movement of Cattle?

At any time, a permit is required to move cattle from one property to another. Such a permit will be issued only if:

1. There have been two tests of the whole herd separated by at least 12 months, both of which have given negative results.
2. The last complete herd test was within 24 months.
3. There have been no positive brucella tests within 24 months.
4. There have been no imported stock introduced within 12 months.
5. There have been no stock introduced from an infected herd within 24 months.

In all other cases, testing of the whole herd or stock to be moved must be undertaken, and all cattle must show a negative test before a permit will be issued.

How are Imported Cattle Tested?

All imported cattle must pass stringent brucellosis tests before importation is permitted. Further tests are undertaken on arrival in Papua New Guinea, and at six and twelve months after importation.

Unfortunately heifers and cows which are not in calf can be infected with brucella bacteria but give negative blood tests before and after importation. To help detect these carriers, all cattle intended for importation are required to be given one injection of killed 45/20 strain at the time of the first blood test. Carrier cattle which react to the injection and show a positive blood test at the next test 42 days later are not allowed to be imported.

Despite these elaborate precautions, brucellosis still might be introduced in imported cattle. Farmers are advised to keep imported cows separate from other breeding cattle for twelve months or at least until after they have calved.

Brucellosis eradication has commenced in all Australian states, and as progress is made there, the risk of introducing the disease in imported cattle will be reduced.

Why is Vaccination not Allowed?

Vaccination can be used to decrease the effect of the disease in an infected herd. However, although vaccination prevents most abortions, it does not prevent infection. So the cows can carry the disease without any visible symptoms—and in the long run, this is worse than abortions which do, at least, let the owner know at once that the infection is present. Furthermore, when an animal is vaccinated, the interpretation of the blood test is complicated. Vaccination is therefore not merely discouraged, it is absolutely prohibited.

With strict veterinary supervision, the Administration has used the killed 45/20 strain of vaccine in Papua New Guinea as a diagnostic aid to help detect carrier animals on infected properties in the same way as it is used for cattle prior to importation.

Is it Worth the Trouble?

If brucellosis can be completely eradicated, the cattle industry will be able to expand without the deleterious effects of a disease causing abortion and infertility. Furthermore, the human population will not be exposed to the risk of undulant fever. Although there have been no cases recorded of undulant fever in Papua New Guinea, it is common in Australia amongst abattoir and dairy farm workers and the possibility of its occurrence here cannot be ignored.

Thanks to the co-operation of cattle owners, the disease has been reduced to a low incidence, but there is no room for complacency, and owners must be continually aware of the possibility of brucellosis infection in their cattle. Constant vigilance is needed if the disease is to be eradicated, and re-introduction prevented.