Strain 19 in Western Australia

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Since the inauguration of its brucellosis control campaign in 1946, the West Australian Department of Agriculture has inoculated nearly 72,000 dairy heifers with Strain 19 vaccine and established a remarkable degree of control throughout the dairying districts. As the success of the control measures is largely dependent upon the vaccination of each year’s crop of heifers, the work is now being intensified and members of the field staff are again busy in the dairying areas.

Brucellosis, or contagious abortion as it is commonly called, is widely distributed throughout most of the world’s dairying areas and this State is no exception to the general rule. As a source of loss to the dairying industry the disease is second only in importance to mastitis. It is responsible for the loss of large numbers of calves every year and also for considerable reduction in milk yields. In addition, sterility resulting from metritis or inflammation of the uterus (womb) frequently occurs as a sequel to the disease.

DESCRIPTION

Brucellosis results from infection of the pregnant uterus with a microorganism known as Brucella abortus which sets up an inflammation causing the death and premature expulsion of the calf. The majority of such abortions occurs between the fifth and seventh months but the calf may be lost as early as the third or as late as the eighth month of pregnancy.

The disease is spread by the fluids which are discharged at the time the calf is lost, by the aborted calf and afterbirth, and by the discharges passed out by infected cows for several weeks after abortion and sometimes after normal calving. Such substances contain enormous numbers of the Brucella organisms which contaminate the pastures and are liable to be ingested by other cattle while grazing, thus spreading the infection.

In the past, so called “abortion storms” were fairly common. They were usually caused by the introduction of infected heifers or cows, purchased as replacements, into clean herds which, owing to their isolation or good fortune, had not previously been exposed to infection and were consequently highly susceptible.

When brucellosis is introduced into a susceptible herd it frequently runs an acute course during which a large number of abortions may take place in rapid succession, but after a season or two it gradually subsides and a stage is reached where few abortions occur and these are largely confined to heifers and young cows.

As the result of continued exposure to infection, the majority of the older cows in the herd eventually develop a
Cattle being inoculated with Strain 19 vaccine at an inoculation centre near Donnybrook.

—Photo by courtesy of the South-Western Times, Bunbury.
natural immunity or resistance to the disease which enables them to carry their calves to full term. They may, however, remain carriers and continue to spread infection. Heifers which have not previously been exposed to infection are highly susceptible unless protected by inoculation with Strain 19 vaccine, and the abortion rate in these animals may be very high.

BRUCELLOSIS AND PUBLIC HEALTH

Apart from the economic losses caused by the presence of brucellosis in dairy herds, the disease has an important bearing on human health. The infection is transmissible to man causing the disease known as undulant fever which may be contracted by consuming milk from infected cows.

Horses are also susceptible to infection with Brucella abortus and the organisms are often found in the abscesses which form in such conditions as fistulous withers and poll evil. These are large swellings which develop in the region of the withers and poll, and which finally rupture and discharge pus for prolonged periods. Conversely, horses suffering from fistulous withers could be responsible for brucellosis infection in cattle if allowed to run in the same paddocks.

CONTROL MEASURES

Like many other diseases affecting livestock, brucellosis may be controlled by vaccination. For this purpose a live vaccine, prepared from a strain of Brucella abortus of low virulence, is employed. This product is known as Strain 19 vaccine.

When injected into heifers it does not cause permanent infection or subsequent abortions and it cannot be transmitted from one animal to another. It does, however, stimulate the formation of antibodies in the blood and tissues of the vaccinated animal, conferring upon it an immunity or protection which enables it to resist infection if subsequently exposed.

Although this immunity is not absolute and may be broken by exposure to a massive infection, it is of a high order and is usually sufficient to protect the animal for at least three pregnancies if not for life.

Many extensive tests have been carried out in the U.S.A. and in other dairying countries throughout the world and in every case the use of Strain 19 has been followed by a sensational drop in the abortion rate.

THE TEST AND SLAUGHTER METHOD

In some countries attempts were made to control the disease by subjecting all cattle above the age of six months to a blood test known as the agglutination test. Any which gave a positive reaction to this test were removed from the herd and slaughtered. Testing was repeated at intervals of 30 days until all the animals in the herd showed negative reactions on two consecutive occasions. Thereafter the herd was declared brucellosis-free and subjected only to annual tests.

In the U.S.A. the test and slaughter method has been successfully employed but at enormous cost. The scheme is still operating in some American States in conjunction with Strain 19 vaccination.

While the advantages to be derived from the complete eradication of the disease are obvious, being reflected in an increase in the number of calves produced, greater breeding efficiency and increased milk production, the test and slaughter method is a very costly procedure and there are few countries in which it could be adopted as a general method of control. In Western Australia where the disease is widely distributed throughout the dairying districts and where the incidence of infection in many herds was high, the test and slaughter method was neither practical nor economically possible.
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VACCINATE THE HEIFERS

Vaccination by Strain 19 offers a practical method of control and its greatest advantages would be obtained when each year's crop of young heifers are vaccinated, preferably between the ages of nine and twelve months.

The vaccination of heifers is recommended both in clean and infected herds. The advantages to be obtained in the case of the infected herd are obvious and need not be emphasised. In the clean herd the procedure is equally sound and the vaccinated animals would be in a condition to resist the disease should infection be inadvertently introduced. The use of Strain 19 in a clean herd cannot result in the introduction of the disease and the fears which are sometimes expressed by stock-owners in this connection are groundless.

Whatever method of control is adopted it is important that hygienic precautions should continue to be taken. Any cows which are bought should be isolated until they cease to discharge and the aborted foetus should be destroyed by burning or should be buried deeply.

ARRANGEMENTS FOR VACCINATION

The Department of Agriculture undertakes the vaccination of heifers throughout the dairying areas and is prepared to make officers available to carry out this work. A fee of 2s. a head is charged for all cattle treated in order to defray the cost of the vaccine, and the ear-tags used for identification purposes. In order that the scheme will be successful, the fullest co-operation on the part of dairy farmers is necessary and it is requested that, wherever possible, vaccination centres should be established to which heifers from surrounding properties can be brought for vaccination.

The provision of a well-constructed crush will greatly facilitate the work of Department officers and will considerably increase the number of heifers it will be possible to vaccinate within a stated period. A crush from 15 to 30 feet long, four feet six inches high, and 20 inches wide with a forcing-pen at the entrance and an exit gate for the release of cattle after treatment will meet requirements. The rails should be about eight inches apart and, whatever type of crush is employed, it should be strongly constructed in order that the cattle may be adequately restrained during treatment.

In most dairying districts the local branches of the Farmers' Union have undertaken to make arrangements for the vaccination of heifers in their areas. They usually acquaint the officers of the Department of Agriculture with the numbers of heifers to be treated and co-ordinate the arrangements for grouping them in some central spot for treatment.

EFFECTS OF VACCINATION

Following vaccination, a swelling develops at the site of the inoculation. This gradually subsides but a period of several months may elapse before it finally disappears. The animal may become rather tucked-up in appearance for a few days and there is often a falling-off in appetite. In the case of cows, there is usually a sharp decline in milk yield which sets in within 48 hours of vaccination and persists for about a week before a return to full production occurs.

Cattle vaccinated with Strain 19 develop a positive reaction to the agglutination test which cannot be differentiated from the reaction resulting from a natural infection. In the case of calves, these reactions subside fairly rapidly and all but about five per cent. of them become negative within 12 months. In adult cattle, however, the reaction persists for a much longer period. Under our conditions, the persistence of a positive blood reaction is only likely to be of importance in the case of cattle which are intended for export to other States and countries and are required to be accompanied by a negative agglutination test certificate.

Further particulars concerning brucellosis and Strain 19 are available in Leaflets Nos. 832 and 875 which are available free from the Department of Agriculture.
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