Brucellosis and its control with strain 19 vaccine

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BRUCELLOSIS AND ITS CONTROL
WITH
STRAIN 19 VACCINE

DAIRY farmers of a generation ago will not need to be reminded of the ravages of contagious abortion or of the need for the continued application of effective control measures. Fifteen or 20 years ago this disease which we now call Brucellosis was rife throughout the dairying districts of the State and it exacted a heavy toll. The “abortion storm” was a common occurrence and it was not unusual for 30 per cent., and sometimes considerably more, of the cows in a herd to lose their calves at about the sixth month of pregnancy.

This resulted in a heavy loss of milk production and it was a most serious matter not only to farmers in the butter-fat areas who desired to take full advantage of the flush season but also to the wholesmilk producer who had set his herd for summer calvings in order to maintain his “quota.”

HUMAN HEALTH

In addition to the loss of calves and greatly reduced production there was usually an infertility problem and a period of many months often elapsed before affected cows would again hold to service. The risk to human health had also to be considered since the infection of cattle is transmissible to man, producing the disease known as undulant fever which may become chronic and is often incurable. In quite a large proportion of affected cows the infection becomes localised in the udder and many human cases have been traced to the consumption of infected milk. In veterinary surgeons, dairy farmers and meat workers, undulant fever is regarded as an occupational hazard associated with the handling of infected cattle or their products and they are more liable to infection than other sections of the community.

THE DISEASE DESCRIBED

Brucellosis is caused by the microbe Brucella abortus and the infection is spread by the consumption of pastures contaminated by the discharges shed by infected cows for several weeks after abortion and often after normal calving, as well as by aborted foetuses and their membranes. There are other modes of transmission such as through wounds or abrasions on the skin or through the eye membranes by the agency of flies but these are of little practical importance and it may also be worth noting that the bull plays little if any part in the spread of the infection.

When a pregnant animal is exposed to infection, the organisms invade the developing foetus and the placental membranes in which it is contained; the uterus becomes inflamed and the foetus dies and is expelled resulting in abortion usually between the fifth and seventh months of gestation.

In the “empty” female the infection may not become established or persist for very long and the animal suffers no ill effects.

When brucellosis is first introduced into a susceptible herd it frequently runs an acute course during which a large number of abortions may occur in rapid succes-
sion but after a season or two—as the result of the development of a resistance or immunity from exposure to field infections—it gradually subsides and a stage is reached where few abortions occur and these are largely confined to heifers and young cows which have not been previously exposed. To this extent the disease is self-limiting.

CONTROL WAS DIFFICULT

Before the advent of Strain 19 vaccine, no practical means of control was available. Hygienic precautions which involved the destruction of aborted calves and their membranes and the isolation of cows until all discharges had ceased, were advocated but under the conditions of management on the average dairy farm, these precautions could not be applied rigidly enough and they usually ended in failure.

It is possible to eradicate the disease by the test-and-slaughter method. Blood samples are collected from every member of the herd and subjected to a diagnostic test and testing repeated at frequent intervals until every positive reactor has been eliminated by slaughter. This is a costly approach to the problem, particularly in herds where the incidence is high. Furthermore, it would result in the establishment of highly susceptible herds and should infection be re-introduced (which with the disease still prevalent in the cattle population would not be unlikely), the consequences could be most serious.

Complete eradication both on an area and State-wide basis which has been achieved or is being attempted in some other countries, must of course become the ultimate objective but this would not be feasible at the present time.

STRAIN 19

When Strain 19 vaccine became available in 1946 it became possible to launch a sustained and organised attack against the disease which embraced the immunisation of heifers throughout the dairy areas.

This product is a live vaccine prepared from a strain of Brucella abortus of low virulence, and while it does not produce abortion when injected into susceptible cattle, it stimulates the formation of antibodies in their tissues which enables them to resist infection if subsequently exposed to fully virulent field strains. This immunity is of quite a high order and endures throughout the life of the animal. It is not, however, absolute and could be broken down by exposure to massive infections.

A vaccination service is provided by the Department and has been available to dairy farmers at a nominal fee of 2s. per head since 1946. Approximately 75 per cent. of the heifers bred in the dairying areas are vaccinated annually as yearlings and the abortion rate has in consequence been reduced to almost negligible proportions. The associated infertility problem seems also to have been largely eliminated but the suppression of brucellosis has unmasked another and no less important cause of breeding failure in the form of vibriosis.

A WARNING

There is, however, no room for complacency. Dairy farmers of the present generation who have had no experience of brucellosis may question the need for vaccination, and others who have suffered no losses from abortion for many years may feel that it is unnecessary to continue with it as an annual routine.

It must, however, be emphasised that while Strain 19 vaccine is highly effective for the prevention of abortion, it does not necessarily prevent infection. It has been shown that whereas the abortion rate is reduced to 1/7th, the infection rate is reduced only to 1/3rd.

This means that about a third of the heifers vaccinated with Strain 19 could subsequently become infected and since these animals may excrete fully virulent Brucella organisms at the time of normal calving, any unvaccinated female animals grazing the same pastures would be exposed to a very serious risk of infection.

It will thus be apparent that should vaccination programs be curtailed or discontinued, the infection would steadily build up again and that within a few years we would find ourselves back in the pre-Strain 19 era with all of its attendant losses.

Dairy farmers would do well to remember that no effort has been spared in providing them with this vaccination service and that it is to their own advantage
as well as in the best interests of the dairying industry that it should continue to receive their support.

It has been the policy of the Department to provide as wide a coverage as possible and to carry out inoculations not only in the closely settled areas but also in the more remote districts no matter how small the number of heifers available for immunisation on individual properties or how far distant they may be and this service will be continued and where possible expanded in all of the dairying districts so long as the full support of local stock owners' organisations is assured.

Vaccinations for the current season are already in progress and owners with heifers for inoculation should submit an application to their District Stock Inspector either directly or through their local organisations.

Why bother year after year to bump over rough eroded tracks? Road formation by contract or road board graders is surprisingly cheap. Road formation is not effective unless spur drains are formed and maintained. This was once a reasonably good track. Now it is badly eroded and resulting in waste of good land.