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A pair of identical twin heifers at the Bramley Research Station

TWIN CALVES AND INFERTILITY

How Freemartins Occur

By F. C. WILKINSON, B.V.Sc., Veterinary Surgeon

FARMERS whose cows have given birth to twin calves, frequently write to the Department to inquire whether such twins can be expected to breed—in other words, whether they should be retained as potential herd replacements or whether they should be sold as vealers or fattened for the butcher.

Some farmers apparently believe that all twins—irrespective of their sexes—are likely to be sterile. Others think that all female twins are sterile, irrespective of whether they are born as a pair of heifer calves or as the female half of a bull-heifer pair.

In actual fact, where twins are both of the same sex—two heifers or two bull calves—they should be perfectly normal.

It is only when twins consist of a bull and a heifer calf that there is a risk of the female being unable to breed. In such cases, the bull calf should develop normally and could be used as a herd sire if necessary. The heifer calf of such a pair *could* be quite normal too, but in nine out of ten cases it would be what is known as a freemartin and would be unable to breed.

In general appearances, a freemartin tends to resemble a steer, or male

castrated early in life. As it develops to the yearling stage it fails to come into season and there is usually a lack of the normal udder and teat development. Such freemartins fatten readily and should be sold to the butcher as soon as profitable.

Incidentally, this freemartin condition of infertility is observed only in cattle and does not apply in the case of sheep, pigs, dogs or horses.

WHY AND HOW

Some knowledge of the mechanics of reproduction in cattle is necessary to understand why twins of like sexes are normally fertile and why twins of mixed sexes may or may not produce freemartins.

The normal pattern of reproduction in cattle is that the "cow comes into season" at about 21-day intervals. During this period an egg cell or ovum which has reached full development in the ovaries

or egg-producing organs is expelled and passes down the oviduct or egg tube into the uterus or womb.

If the egg is fertilised by a male sperm at this stage it becomes the embryo which ultimately develops into a calf. During its period in the womb, the developing embryo is enclosed in a sac called the placenta. This sac is expelled during or after the birth of the calf and is usually referred to as the "afterbirth."

The placental sac contains fluid which protects the unborn calf from injury, and the sac itself serves as the connecting link between the mother and the developing foetus. It contains blood vessels and is attached to the calf by the navel cord and to the mother by cotyledons or attachments to the lining of the womb.

IDENTICAL TWINS

On somewhat rare occasions, the fertilised egg on reaching the womb divides into two parts, each of which develops into a calf. These two calves are contained in the one placenta or afterbirth and being evolved from separate portions of the same egg they are always of the same sex and are identical, or almost identical, in appearance and in general make-up.

These identical twins, whether they be two males or two females, should breed quite normally.

NON-IDENTICAL TWINS

In the great majority of cases, the cow sheds only one egg at each heat period. Other animals, such as pigs, dogs and cats, shed a number of eggs and eventually give birth to litters of young.

On occasions, however, a cow may expel two or more eggs from the ovaries at the same time and as a very large number of male sperms are introduced at each mating, each of these eggs stands a good chance of being fertilised and the result will be twin, triplet or even quadruplet calves.

In animals which normally have multiple births, each embryo develops separately from the others in its own placenta or afterbirth.

In the case of twin calves, however, the two afterbirths often unite in the womb and consequently the two calves are nourished and developed by a common bloodstream.

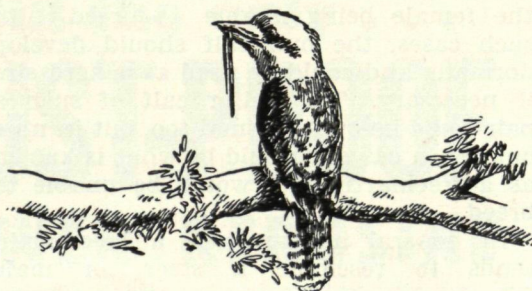
Where the calves are both of the same sex—two males or two females—this linking-up of the bloodstream has no ill-effects and the twins should be sexually normal with their breeding ability unaffected.

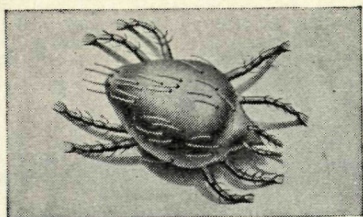
Where they are of different sexes, the sharing of the same bloodstream has the effect of preventing the full development of the female's breeding organs. It is believed that the male secretes a chemical substance which reaches the female embryo via the connected bloodstream in the placenta. This substance suppresses the development of the female reproductive system, especially the ovaries, which fail to grow into egg-producing organs. The female twin therefore becomes a free-martin.

The female does not apparently secrete any chemical potent enough to affect the bull calf which develops normally and is capable of breeding.

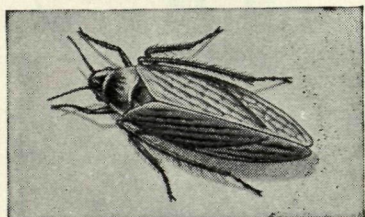
If the linking-up of the afterbirths does not take place and each twin develops independently of the other (as in normal multiple-birth procedure) both twins will be sexually normal, even though they may be of different sexes. In the case of cattle this is a comparatively rare occurrence and only about one twin heifer in every ten bull-heifer pairs is able to breed successfully.

Examination of the afterbirths immediately after the birth of bull-heifer twins will often furnish a guide to the breeding potential of the heifer. If the two membranes are entirely separate there is every chance that she will be sexually normal. If they are joined together she will almost certainly be a freemartin.

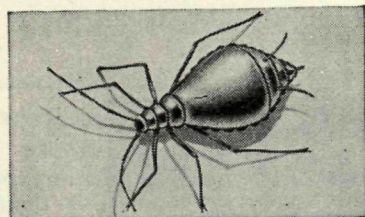




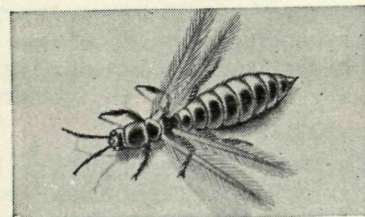
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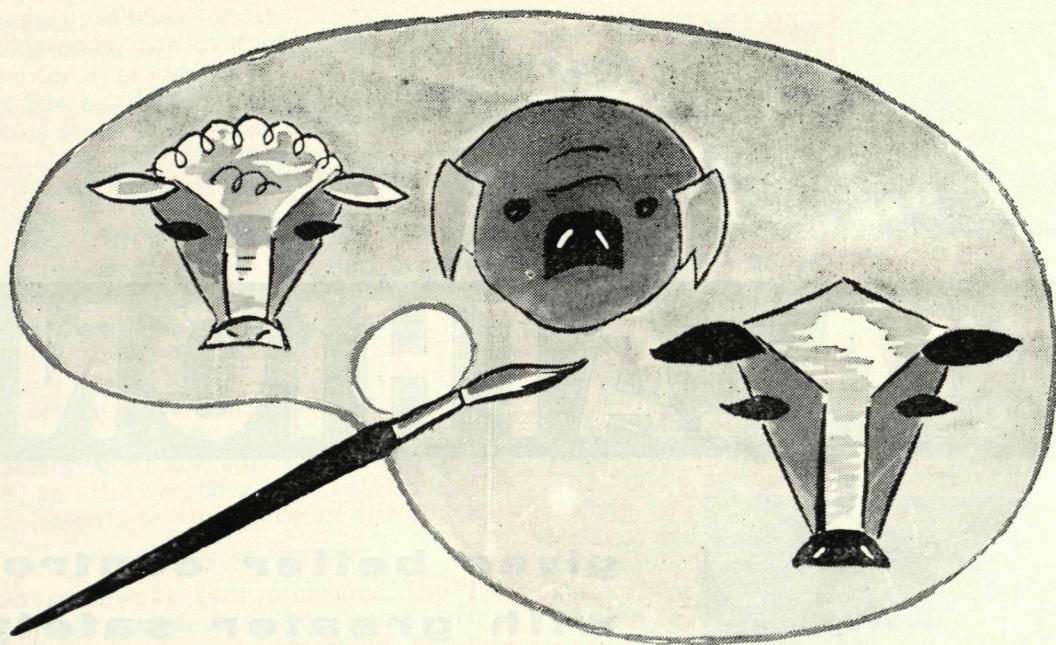
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