

# Early detection of uterine infection in the modern dairy cow

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Uterine infection in the modern dairy cow is a common condition affecting a large number of cows and is estimated to cost in excess of £1.4 billion per annum. The detection of infection and effective treatment is therefore of great importance. Early detection and cure allows cows to get back in calf more quickly and produce higher yields. Results from studies show the prevalence rate of clinical endometritis to be 17% and cows with clinical endometritis took 27% longer to become pregnant. There is a significant cost incurred by these individual animals, and therefore identification coupled with effective treatment has a large cost benefit.

## Common around calving

Infection of the uterus occurs most commonly around calving when infectious agents such as bacteria and viruses can enter the open uterus, although the infection can enter at other times such as during DIY AI and during service by an infected bull.

Infection is very common at or around calving but the uterine environment and the hormonal and immunological influence on the uterus results in the majority of these infections self-curing within a few days.

However, higher proportions of persistent infection occur dependent on the type of bacteria or virus involved and the health of the calving cow. If there is any concurrent problem such as retained placenta, milk fever, ketosis or the birth of twins at calving the stressful influence of these can increase the persistent nature of the infection and prevent its self-cure.

Many uterine infections can be detected by the herdsman during his daily routine whilst observing the cows. The white purulent discharge produced by these infections can be seen on the tail and rump of the cow or by the presence of purulent discharge on the cubicle beds. These can be detected early and treated. However, many of the infections cannot be detected from



**White purulent discharge on the tail of the cow.**

observation as there is no obvious discharge. Diagnosis of the low grade and non-discharging cases requires an examination to detect the presence of infection.

Early detection and timely treatment of the uterine infection during routine herd fertility management programs reduces the prevalence in the herd and the impact of the disease in the individual animal.

Cows which are 2-4 weeks calved are examined during these visits where use of ultrasonography can aid diagnosis.

The infected cases can be detected and treated, effecting an early cure of the uterine infection before it becomes chronic and rendering the cow permanently infertile or requiring more extensive treatment.

Uterine infection is defined depending on the time since calving and the state of the cervix.

## Metritis

Clinically metritic animals may not be systemically ill but have an abnormally enlarged uterus, detected by ultrasound (Fig. 1), and a purulent uterine discharge detectable in the vagina, within 21 days post-partum. The cervix is usually open at this stage and vaginal discharge is usually obvious in most cases and detected or suspected by the herdsman. The metritic cow can often be off colour with signs of systemic disease ranging from lower-than-expected milk yield to marked malaise with an elevated body temperature (pyrexia).

Animals with this form of disease, termed puerperal metritis, have an abnormally enlarged uterus and a fetid watery red-



**Discharge seen on the cubicle bed behind the cow.**

brown uterine discharge within 21 days of calving. Diagnosis by manual examination to detect the vaginal purulent material can be made in many cases but ultrasound examination is required to definitively diagnose and to observe the extent of uterine infection.

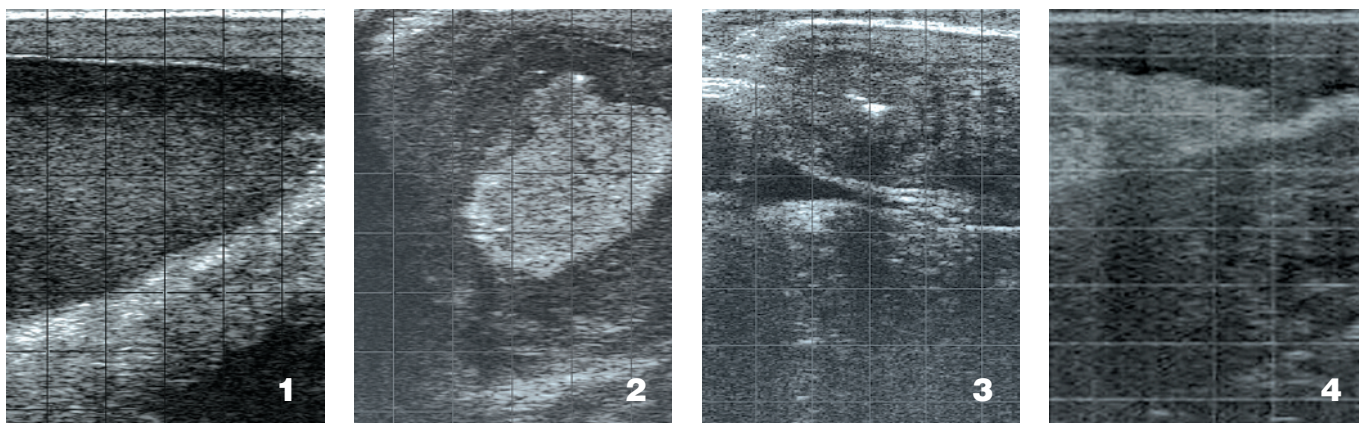
Metritis commonly affects around 20% of animals but some herds can have periods of up to 50% infection rates. Subsequently 15-20% of cases have clinical disease with malaise beyond three weeks (clinical endometritis) and up to 30% have chronic infection without clinical signs (subclinical endometritis). Therefore treatment of metritis at this stage is required to prevent escalation of any malaise of the cow and reduce the number of cases developing into endometritis which prolongs uterine infection, further reducing fertility.

Ultrasonography is of great benefit in diagnosing metritis in the small percentage of metritic cows that do not show an obvious vaginal discharge. The presence of

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## Discharge found during a manual vaginal examination.





**Figs. 1 and 2 show metritic infection with a large amount of material. The echogenic appearance of the material is 1: low and 2: high. Figs. 3 and 4 show pockets of echogenic purulent material within the uterus. Fig. 4 shows a large pocket (Easi-Scan ultrasound, BCF Technology).**

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an observable discharge depends on the shape of the reproductive tract, the openness of the cervix and the amount of purulent material in the uterus.

When ultrasound is used the image displays considerable amount of echogenic material within the uterus. There is a big variability of the echogenicity of the material and amount seen (Figs 1 and 2).

## Endometritis

Endometritis is an infection of the endometrium, the inner layer of the uterus. It is diagnosed in cattle that have calved three weeks and over. It is very common, with an incidence rate of around 17% delaying return to oestrus or preventing conception. Delay to oestrus is caused by the interference to the production of the prostaglandin hormone which is produced from the endometrium.

Prevention of conception occurs by either the infection killing the sperm or interfering with its transportation up the uterus or by preventing implantation of the embryo.

The degree and severity of the infection is extremely variable. In some cases the infection produces a mucopurulent discharge which can be seen discharging

from the vulva. In the majority of cases there is no vulva discharge; diagnosis requires vaginal and rectal examination to determine both its occurrence and severity. Many cases have only a small amount of infection requiring very careful and detailed ultrasound examination to visualise the pockets of infection (Fig. 3).

These pockets of infection can be very small occupying only a very small area of the uterus, all other parts looking normal and empty. The methodical ultrasound examination ensuring complete visualisation of the uterus allows these to be detected. In many cases, due to the quantity, the uterine mucopurulent content can be identified quickly and easily by visualising the echogenic material within its lumen (Fig. 4).

In a small number of cases no ultrasound or gross signs are present.

Treatment of this condition is usually by an intrauterine antibiotic lavage, often requiring more than one infusion. If a corpus luteum is present (Fig. 5) then prostaglandin can be administered to induce cycling of the cow. Endometritis, by its involvement of the uterine lumen, can prevent oestrus cycling of the cow.

Once prostaglandin has been administered and oestrus is induced the oestrogen environment of the uterus helps the cow's own immune system to self-clear the

infection and infusion of intra-uterine antibiotic preparations when the cow comes into oestrus can also help cure the infection.

Some cases prove refractory to treatment requiring modified intrauterine infusions and multiple infusions.

## Pyometra

Infection of the uterus more than 21 days post-calving in the presence of a closed cervix. Consequently there is no vaginal discharge and no clinical evidence on vaginal examination – the cervix is tightly closed and does not allow the mucopurulent uterine content to pass. The cow does not cycle as the infection of the endometrium prevents prostaglandin release. Diagnosis can only be made by ultrasound examination which identifies the mucopurulent uterine infection (Fig. 6).

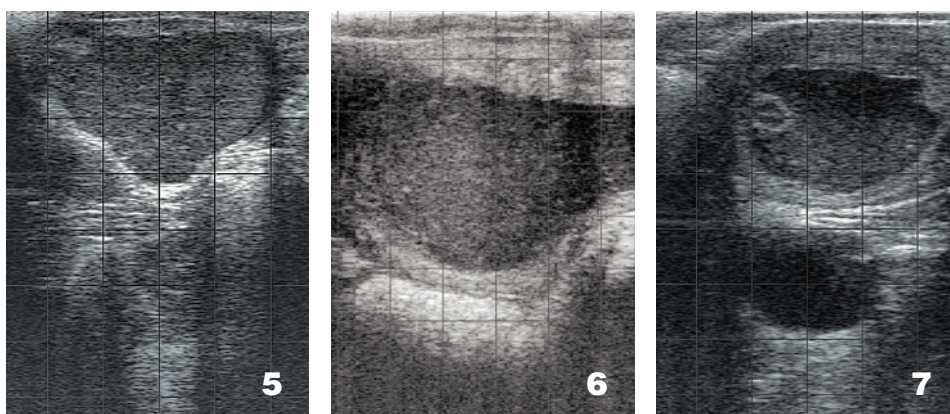
There is a large amount of uterine fluid in these cases which, if diagnosis is attempted by palpation alone, can be mistaken for a pregnancy. The image reveals the echogenicity of the fluid and the absence of any foetal membranes or placenta.

During pregnancy fluid is present in the uterus and can feel similar to endometritis and pyometra by palpation. If there is a pregnancy complication it cannot be

detected by palpation as the fluid and embryo are present but defective.

The ultrasound examination can differentiate problems by identifying the viability of the embryo with the presence of a heartbeat, the exact size of the embryo and the echogenicity of both the embryo and the fluid around it (Fig. 7). Palpation has been the traditional method of rectal diagnosis of uterine conditions but misdiagnosis can occur. Only ultrasound can definitively diagnose the condition and its severity allowing the best choice of treatments leading to an effective early cure. ■

**Figs 5, 6 and 7. Left, Corpus luteum; centre, pyometra; and, right, pregnancy complication (Easi-Scan ultrasound, BCF Technology).**



References are available from the author on request