

1 **EDITORIAL**

2 **Diagnosing postpartum endometritis in cattle**

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9 Postpartum endometritis is a common cause of infertility in dairy cattle (Fig 1). Most  
10 veterinarians can confidently examine the female reproductive tract to discriminate  
11 between a cow with endometritis and a normal cow. However, veterinarians are less  
12 confident when asked what defines a case of endometritis, how to diagnose the  
13 disease, when after calving to make the diagnosis, and how sure they are that their  
14 method of diagnosis is accurate? These challenges are highlighted in a study by  
15 Kusaka and co-authors, comparing three methods for diagnosing postpartum  
16 endometritis, which is summarized on page XXX of this week's issue of the Veterinary  
17 Record.<sup>1</sup> The key finding was that between two and six weeks after calving there was  
18 little agreement amongst the three methods used to diagnose endometritis, but there  
19 was good agreement amongst the methods seven weeks after calving, when  
20 identifying the mainly normal cows.

21 Endometritis is an important disease for veterinarians to be able to diagnose because  
22 the disease causes infertility in individual cows, and reduces herd fertility.<sup>2-4</sup>  
23 Endometritis increases the average interval from calving to first insemination by nearly  
24 a week compared with normal cows, delays conception by about four weeks, and  
25 nearly doubles culling for failure to conceive. This reduced fertility, even after the

26 successful treatment of endometritis, is not only a consequence of the inflammation in  
27 the uterus and oviduct during the disease, but also caused by abnormal oestrous  
28 cycles and damaged oocytes. <sup>5</sup>

29 The normal postpartum period includes prompt involution of the uterus and  
30 regeneration of damaged endometrium, resumption of ovarian cyclical activity and the  
31 ovulation of competent oocytes, and control of the pathogenic bacteria that are found  
32 ubiquitously in the uterus of postpartum cattle. <sup>6</sup> These concurrent processes take  
33 about three to four weeks, after which a normal cow usually has uterine horns < 3 cm  
34 diameter and a cervix < 5 cm diameter, with no pus detectable in the reproductive  
35 tract, and regular oestrous cycles. However, in about 15 to 20% of dairy cows there is  
36 pus in the reproductive tract and/or an enlarged cervix, which are signs of clinical  
37 endometritis. <sup>2; 3 7</sup>

38 The definitions of postpartum uterine disease are usually based on those proposed in  
39 2006. <sup>8</sup> Briefly, clinical endometritis is defined by the presence of pus in the uterus  
40 three weeks or more after calving, usually with a purulent uterine discharge detectable  
41 in the vagina, and/or a cervix > 7.5 cm diameter. The severity of endometritis can be  
42 scored based on the abundance and appearance of pus in the vaginal mucus: score  
43 0 is normal, clear or translucent mucus; score 1 endometritis is mucus containing  
44 flecks of pus, which is usually an white or off-white colour; score 2 endometritis is  
45 mucus containing < 50% pus; and, score 3 endometritis is mucus containing > 50%  
46 pus. <sup>4; 8; 9</sup> The prognostic value of scoring the severity of endometritis is that animals  
47 with higher scores have lower treatment success rates and, even after successful  
48 treatment, they have lower conception rates. Subclinical endometritis is diagnosed  
49 when the uterine discharge is normal but the proportion of neutrophils in endometrial

50 cytobrush samples exceed specified thresholds, which depend on the time after  
51 calving, as outlined in the present study. <sup>1</sup>

52 The methods used to diagnose endometritis usually rely on detecting the presence of  
53 pus in the reproductive tract by inspection of the contents of the vagina, using a  
54 gloved-hand, Metricheck device or vaginoscope, or by using transrectal  
55 ultrasonography of the uterus (Fig 2). <sup>8; 10</sup> The study by Kusaka and co-authors  
56 compared the diagnosis of endometritis using a Metricheck device, transrectal  
57 ultrasonography, and counting the number of neutrophils in endometrial cytobrush  
58 samples. Despite each of these methods detecting an aspect of pus in the  
59 reproductive tract, there is often disagreement between operators; <sup>11</sup> and, as reported  
60 in the present study and by others, there is disagreement between diagnostic  
61 methods. <sup>1; 4; 9; 10; 12</sup> One explanation for this disagreement is probably the subjective  
62 nature of the diagnosis and scoring of endometritis. Furthermore, it is often possible  
63 to detect neutrophils in cytobrush samples when there is insufficient pus in the uterus  
64 for a positive diagnosis by inspecting the contents of the vagina or ultrasonography of  
65 the uterus. Similarly, it is sometimes possible to detect pus resulting from vaginitis or  
66 cervicitis independently of endometritis. <sup>13</sup> Indeed, in the study by Kusaka and co-  
67 authors, 43% of cases of endometritis diagnosed by ultrasound three weeks after  
68 calving did not have pus in the vagina detectable using the Metricheck device. <sup>1</sup>

69 Another challenge that the paper in the Veterinary Record helps to address is when to  
70 diagnose endometritis. The timing of diagnosis for endometritis has to allow three to  
71 four weeks after parturition for recovery of the uterus in normal cows, and yet provide  
72 sufficient time for treatment of diseased cows before insemination, which usually starts  
73 from seven weeks after parturition. There is also a practical consideration about

74 integrating the timing of diagnosis into routine fertility visits for dairy farms. The  
75 reduction in the proportion of cows with endometritis slowed after three to four weeks  
76 after calving in the study by Kusaka, <sup>1</sup> which supports the widely applied clinical  
77 practice of examining cows for endometritis about four weeks after parturition. Thus,  
78 when visiting farms that have fortnightly routine fertility visits, veterinarians should  
79 examine cows for endometritis between three and five weeks after parturition.

80 Additional conclusions that can be drawn from the study in the Veterinary Record, <sup>1</sup>  
81 are to be clear about the definitions of endometritis, and to score the severity of  
82 disease - if you can measure it, you can manage it. Furthermore, multiple lines of  
83 evidence provide for a more robust diagnosis, and veterinarians should use more than  
84 one diagnostic method. <sup>1; 8; 9</sup> First, herd records should be used to identify cows at risk  
85 of endometritis, such as cows with a history of retained foetal membranes, dystocia or  
86 twins. Second, the reproductive tract should be examined for the presence of pus  
87 using a hand, Metricheck or vaginoscope. Finally, transrectal ultrasonography should  
88 be used to identify pus in the uterus and whether there is an enlarged cervix.

89 Veterinarians are always going to be faced with the tensions between taking time to  
90 make an accurate diagnosis of endometritis and the need for efficient routine fertility  
91 visits to dairy herds. What helps is having a strategy to monitor postpartum dairy cows  
92 (see Box: **What you need to know**). Accurately detecting the presence of pus in the  
93 reproductive tract is important in postpartum cows, whether that pus may have come  
94 from disease or damage to the uterus, cervix or vagina. The future may bring more  
95 accurate diagnostics; for example, a cow-side test for neutrophils in the uterus would  
96 be handy. However, for now, there remains room for improvement in the veterinary  
97 diagnosis of postpartum endometritis in cows.

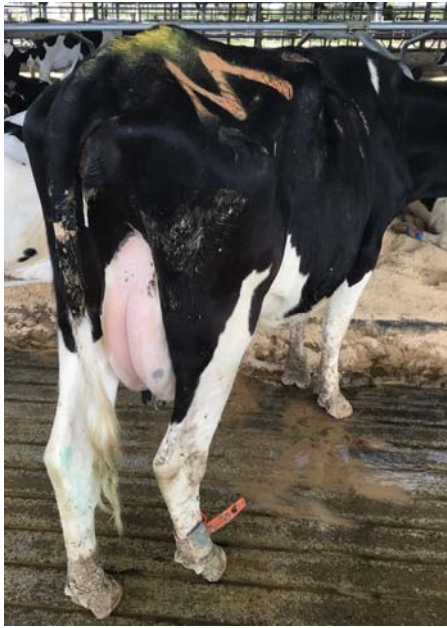
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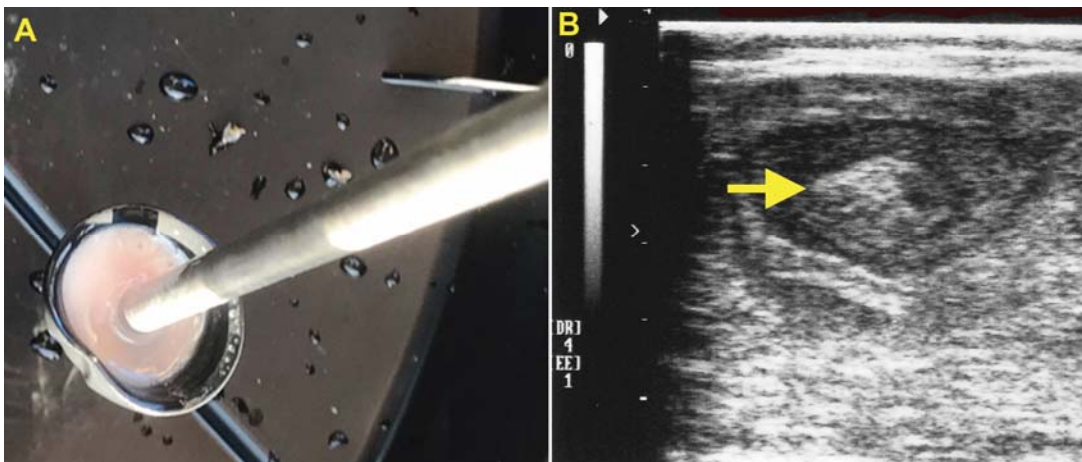
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### **WHAT YOU NEED TO KNOW**

- Accurate diagnosis of postpartum endometritis is important to justify treatment with antibiotics or hormones, and because these cows are less fertile than normal cows.
- Be clear about your definitions of endometritis and score the severity of disease.
- Aim to examine cows for endometritis between three and five weeks post partum – long enough for normal cows to recover after calving but soon enough to treat diseased cows before the insemination period.
- Use more than one diagnostic method. Use herd records to identify risk factors for endometritis; examine the genital tract for pus using a hand, Metricheck or vaginoscope; and, use ultrasonography to identify pus in the uterus and/or a cervix > 7.5 cm diameter.
- Be realistic about the accuracy of endometritis diagnosis. Re-examine cows two weeks later when the diagnosis is unclear or when cows are treated for disease.



**FIG1.** Postpartum endometritis in a dairy cow.



**FIG 2. Diagnosis of endometritis.** Common techniques for detecting the presence of pus in the reproductive tract about 4 weeks after calving include (A) using the Metricheck device to collect mucus from the vagina, and (B) using transrectal ultrasonography of the uterine horns (arrow indicates pus in the uterine lumen).