What is environmental mastitis?
Environmental mastitis is mastitis caused by bacteria which spread primarily outside of the milking parlour. This doesn't mean that they don't spread during milking. Just like with contagious bacteria, infected cows can contaminate the cluster and spread infection to other cows during milking. However, unlike contagious bacteria, preventing cow-to-cow spread during milking will not eliminate environmental mastitis. This is because parlour management does not tackle spread from the environment to the cow. To control environmental mastitis, an added focus on environmental hygiene as well as parlour management is needed. Parlour management, alongside dry cow antibiotics, has been effective in reducing contagious mastitis but our control of environmental mastitis has been much less effective, so that environmental mastitis now accounts for more than 50% of mastitis cases in UK cattle. All farms need to include environmental management in their mastitis control plan.

The two most important bacteria in this group are E. coli and Strep uberis. Of the two bacteria, Strep uberis is the one that spreads more easily during milking, while E. coli is the one that is most commonly associated with severe toxic mastitis. However, some strains of E. coli can also be spread very well during milking and the majority of mastitis caused by E. coli is mild in nature.

Where does environmental mastitis come from?
A contaminated environment! E. coli comes from the gut, so anywhere where cow faeces can come into contact with the udder, will provide a potential source of coliform mastitis. Bedding is the most important source, particularly organic bedding where the bacteria can grow and multiply. However areas around feeding or water troughs are also risk areas as slurry around these can get splashed onto the udder. Outside of the udder, Strep uberis is also found in the intestines but, compared to E. coli, it is much more commonly found elsewhere on the cow, particularly the skin. Strep uberis has a fantastic ability to develop outside of the cow, particularly in straw. Both E. coli and Strep uberis, particularly the latter, can also cause environmental mastitis in cows on pasture as they can survive for months in contaminated wet mud.

Non-organic bedding, such as sand, doesn't support the growth of either E. coli or Strep uberis, so the use of such beds can reduce the risk of mastitis. However, these beds need to be kept clean as there is more than enough organic material in a single faecal pat to support exuberant bacterial growth.

The peak time for infection with new environmental mastitis-causing bacteria is the dry period. Infection during the dry period is often inapparent until the cow develops mastitis after calving. In order to control environmental mastitis, we have to focus on environmental management throughout the cow’s lactation cycle. Preventing environmental contamination in the dry cow is just as, if not more than, important as it is in the milking cow.

Fig 1: Good clean housing reduces the risk of environmental mastitis.

Fig 2: Good clean pasture also reduces the risk of environmental mastitis.

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How do you control environmental mastitis?

a) Hygienic environment

**Indoors:**
- Avoid keeping cows in damp filthy conditions.
- Adequate, clean, dry bedding is essential - replace daily.
- Cubicle comfort and design - Are the cows using cubicles properly, and not defaecating in them.
- Avoid overcrowding, particularly in straw yards.

**Pasture:**
- Avoid overgrazing and overstocking.
- Ensure shade areas (around trees) are large enough to not become too contaminated.
- In wet conditions, ensure cows are in well drained paddocks.
- Pay particular attention to management around troughs and feeding areas.

**Calving:**
- Cows should calve in a clean and dry environment.
- Indoors - ensure plenty of fresh bedding for every cow.
- Outdoors - choose calving paddocks carefully, don't overstock.

b) Dry cow therapy

Dry cow therapy will reduce the risk of new environmental infections, particularly in cows with a history of mastitis or high cell counts (see bulletin 8). However, the protection against infection provided by dry cow antibiotics at the end of the dry period is not as good as it is at the beginning, especially in cows with a dry period of &gt;6 to 10 weeks (depending on the dry cow used). Using internal teat sealant is the best way of preventing infections of environmental mastitis. They can be used alone in cows with low cell counts that don't need an antibiotic, and together with antibiotics in cows that have high cell counts and are therefore at risk of being infected at drying off. Internal teat sealants prevent new infections from the time of insertion, until the cow is milked for the first time.

c) Vaccination

In herds with a significant mastitis problem due to E. coli, the use of a J5 vaccine has been shown to reduce the incidence and, particularly, the severity of the disease. Such vaccines are used widely in the US, but less so in the UK. A combination vaccine which is effective against mastitis due to E. coli and staphylococci is currently available in the UK and may be beneficial on some farms. However such vaccines are only one component of a mastitis control package, do not control Strep uberis and are no substitute for good environmental management.

d) Good milking routine

Although environmental bacteria spread outside the parlour, good milking management will reduce environmental mastitis. For example, ensuring teats are clean before milking, foremilking to detect early mastitis cases, keeping teats in good condition, and reducing impacts by good cup removal technique will all reduce the level of environmental mastitis, particularly that caused by Strep uberis. So having environmental mastitis does not mean that you need to pay less attention to your milking regime.

One important change to the milking routing which can reduce the spread of environmental mastitis, is adding pre-milking teat dipping to the protocol (See bulletin 7). There are several commercial dips available on the market but you must ensure that you use a dip designed for pre-dipping and allow 30 seconds contact time before you dry the teats.

e) Good recording of cases

Proper mastitis records with good bacteriology are essential to tackling an environmental mastitis problem.
Always take a milk sample from cows with mastitis before treating them for the first time, freeze it and when you have a problem you have a selection of samples available to test. Without good information, individualised targeted control programmes cannot be developed for your farm.