

Coagulase negative Staphs: friend or foe?

CNS are all the Staphs that can cause mastitis apart from *Staph. aureus*. They are considered as minor mastitis pathogens.

We are learning more and more about these bacteria. Prof. Sarne de Vliegheer from Ghent is carrying out major research on CNS bacteria and at a recent meeting in Slovenia I found out a lot more about this fascinating group of bacteria.

You find more CNS bacteria in herds with lower cell counts. CNS have been isolated from about 15% of cows with clinical mastitis. However, is this actually due to a CNS infection or is it an *E. coli* case where the toxin has caused the problem and the *E. coli* gone – or is it due to CNS? Nobody knows! There are 50 different CNS species and 10 are found from cows with mastitis.

Different strains live in the environment, in the udder, on the teats and on milkers' hands. The species are difficult to diagnose as most diagnostics have been developed for human use and we now know that these tests are not accurate for bovine or goats and you need molecular diagnostics.

You can divide CNS into contagious and environmental strains. You tend to get farm-specific CNS bugs and different flora on different farms. Some CNS show a protective effect against some clinical mastitis. CNS can produce bacteriocins and these can have protective effects against other bacteria.

In heifers, those with CNS infections gave an extra 2 litres of milk per day, and nobody can explain why! Is it due to less clinical mastitis, a slightly raised cell count having a protective effect or from a genetic

effect? We will have to wait for more research.

Quarters contaminated with CNS pre-calving had less mastitis from the major mastitis pathogens in early lactation. The lower the cell count, the greater the significance of CNS, but just how important they are is questionable.

A herd will not have a high cell count due to CNS infections, high cell counts will always be due to *major* mastitis pathogens. Never treat cows with CNS infections. It's not worth it and there is no economic benefit.

PETER EDMONDSON provides his annual round-up of developments in the treatment and management of mastitis with a look at CNS along with a summary of what is happening elsewhere



Antibiotic resistance to CNS is quite high but this has no significance to the cow but might have significance to human health if these bacteria are passed on. CNS are generally good bugs to have: they should be considered as friends and not foes.

Treatment of mastitis

The overall treatment success to clinical and subclinical mastitis is generally very poor and certainly nothing to write home about. There is no problem with treating *E. coli* mastitis as the bug itself does little harm; the problems are caused by the toxins. The two mastitis bacteria which cause us grief are *Staph. aureus* and *Strep. uberis*.

It's worth considering where these bugs reside in the udder. **Table 1** shows that *Staph. aureus* resides deep in the udder tissue and so will be difficult to remove, compared to the likes of *Strep. agalactiae* which are in the milk and are very easy to remove.

Much has been talked about the use of combination therapy to try and

Table 2. Comparison between INTRAMAMMARY and SYSTEMIC antibiotics for mastitis

	Pros	Cons
Intramammary	High levels of antibiotic in udder Low antibiotic use Easy to administer No pain	Poor antibiotic distribution Risk of infection from poor infusion technique
Systemic	Good distribution	High doses of antibiotic required Low levels of antibiotic in udder Expensive Can be painful

Table 3. Clinical mastitis bacteriological cure rate (%)

	No Antibiotics	Antibiotics in chronic infection	Antibiotics in new infections
<i>Staph. aureus</i>	10 - 20	0 - 30	30 - 70
<i>Strep. uberis</i>	20 - 30	< 60	60 - 80

maximise cure rates. For *Staph. aureus* this makes sense as the bacteria are deep in the udder tissue and intramammary antibiotics don't penetrate very well with these infections.

However, cure rates are still very poor for a variety of reasons, including the fact that they form micro abscesses and there is quite a lot of penicillin resistance.

There are pros and cons from combination therapy and these are shown in **Table 2**.

Table 3 shows that with *Staph. aureus* the cure rates in chronic infections are about the same as when you don't use any antibiotics at all! What is very clear from this data is that if you treat early then the cure rates will be maximised.

However, prevention is far better than cure and more and more farms are taking a very proactive approach to mastitis control. We now have herds with mastitis rates of well under 20 cases per 100 cows per year.

In the Nordic countries and in the larger US herds they now culture all cows before any treatment starts. If the cows have *E. coli* infections and show no systemic signs then the cow will be treated with NSAIDs and oxytocin.

During a recent trip to Zimbabwe, I found that the majority of herds do not use any intramammary antibiotics during lactation as they are often not available.

They rather rely on frequent milking up to six times a day and the use of uddermin. They find that this treatment works remarkably well and there are few repeat cases. The majority of clinical mastitis is due to *E. coli* and some from *Staph. aureus*.

When we have cowside testing to identify the pathogens we can then use the same approach and only use antibiotics for Gram-positive cases of clinical mastitis.

This is already available using PCR technology but it's just not cost effective at present, but this will all come in the future and this should help reduce the use of antibiotics and allow us to target our treatments according to the pathogen, just like in human medicine.

Mastitis course in November

THE annual Mastitis Control and Quality Milk Production Seminar tutored by Peter Edmondson and Roger Blowey will be held this year from 3rd to 5th November in the usual location: The Hatherley Manor in Gloucestershire.

This seminar is intended to provide an in-depth understanding of the basic principles of mastitis control and quality milk production. It is designed for the dairy practitioner who wishes to be, or is already involved in mastitis work.

For details, download the brochure from www.sheptonvet.com.

Table 1. Location of different mastitis bacteria.

	Milk and in ducts	Deep in udder tissue	Cow
<i>Staph. aureus</i>	+	+++	-
<i>Strep. uberis</i>	+++	+	-
<i>Strep. dysgalactiae</i> and <i>agalactiae</i>	+++	+	-
CNS (Coagulase negative Staphs.)	+++	-	-
<i>E. coli</i>	+	-	+++ (toxic cases)

Peter Edmondson, MVB, DipECBHM, CertCHP, FRCVS, graduated from Dublin in 1980 and is a practitioner with the Shepton Veterinary Group in Somerset, specialising in mastitis control and milk quality. He provides referral visits throughout the UK and works closely with many dairy and pharmaceutical companies around the world. He also runs, with Roger Blowey, the mastitis control seminars for vets which are now in their 21st year.