**[Summary of Dry Cow Therapy](http://vetstudentresearch.blogspot.com/2015/06/summary-of-dry-cow-therapy.html)**

The dry period of cattle is sometimes referred to as ‘DCT’ - **Dry Cow Therapy**. It is one of the most crucial points in a cow’s cycle as it can reduce mastitis infections, provide a regeneration time and also lead to successful calving and a healthy calf.

Dry periods in cattle are an essential part of the **cow’s lactation cycle**; it allows the **lining of the udder** to be repaired and restored, so that when lactation starts again, milk production is optimal. A dry period of **at least 40 days** is needed to get **optimal milk production** after calving and throughout the following lactation cycle. If it is less than 40 days, milk production will be reduced.

The dry period has **3 stages:**

1) **Involution** – after daily milking stops, milk secretions change and **finally dry up**. The lining of the udder **regresses** (reduces in activity and gets smaller) and the **teat canal becomes plugged** with keratin. This period lasts around **2 weeks**.

2) **Steady State**– after involution the udder stops changing and **there is no active secretion** of any product. The length of this period **depends on the length of the total dry period** as the length of stages 1 and 2 are fixed – it is during this steady state that the **recovery occurs** which allows maximal future production of milk. Shortening this period to <2 weeks will **reduce milk production**.

3) **Colostrum Production** – and start of lactation. The machinery of lactation is switched **on** and the udder starts to **enlarge** and the **lining becomes active**. This period lasts around **2 weeks**.

In light of these stages it is easy to see why the recommended time frame for drying off is 6-8 weeks before calving… Stage 1 takes **2 weeks** to complete and stage 3 also takes **2 weeks**, this means that **4 weeks**are taken up by stages 1 and 3; the most crucial period, the steady state, has to be at least **2 weeks**long as it is necessary for regeneration – this gives an overall total of **at least 6 weeks** of time that the dry period should last for.

**Tackling Infection**

As well as being essential for the recovery of the **mammary gland**, the dry period offers opportunity to tackle **udder infection**. The recovery process, alone, will **eliminate some infections**, but it is much more effective when combined with **antibiotic treatment**. In fact, the dry period can actually be the **best time** to treat udder infections due to two main reasons:

1) **Higher doses**of antibiotics can be used than in lactating cows.

2) Antibiotics **remain in the udder for longer**compared to milking cows, which lose a lot of antibiotic at each milking.

Antibiotics given to dry cows are different than those used to treat mastitis in milking cows – they have a **high concentration of antibiotics in a slow-release base**. This means that the cure rate for DCT is much **higher** than for milking cow therapy, especially for cases caused by *S. aureus.*

An advantage of dry cow antibiotics which is often appreciated is that clearing infections, even mild ones – can aid recovery of damaged mammary tissue and aid the speedy formation of the keratin plug in the teat canal.

**Preventing New Infection:**

DCT is not just about tackling **existing infection**. A second aim is in preventing **new infections** during the dry period. Even though the cow is not being milked, the **udder can still get infected** during the dry period. However, each of the 3 stages has **different risks associated** with it for mastitis.

During the **steady state** the risk is **low**, but **after drying off**and **immediately before calving** the risks can **increase dramatically**.



In addition to treat existing infections, DCT has to **prevent new ones**. This is simple in the **early dry period** as the high-concentrations of antibiotic which treat infections will also prevent new ones. However, in the period just **before calving**, antibiotic concentrations will be lower and the risk of infection will be **higher**.

To make matters more complicated, the infections that dry cow therapy has to **prevent** tend to be **different** from those is has to **treat** (i.e. an existing infection may be caused by *E.coli* but a new infection may be caused by a different pathogen, e.g. *S.aureus.*). ***S. aureus*** is the most important bacteria to kill as this is the organism which causes most **persistent infections**. In contrast, dry cow infection, especially in the late dry period, tends to be caused by **environmental organisms** such as ***E. coli****and****S. uberis***. Dry cow antibiotics tend not to be equally effective against **all 3 bacteria**, so choice of antibiotic should always be made based on the bacteria causing the problem.

**Which Antibiotic to Use?**

There are a range of products available from the vet. The best antibiotic to use will vary from farm-to-farm and often cow-to-cow and year-to-year. There is no simple answer. The key factors to look at are:

1) **Length of action** – if the average **dry period** of the cow is fairly long then **long acting action** may be beneficial, but if the dry period is short, withdrawal periods the duration of effect allowed in these cows.

2) **Environmental vs Contagious mastitis** – if the problem is the former, then preventing infections is key so use an **antibiotic with activity** against *S. uberis and E. coli* (as these are the main environmental pathogens causing mastitis); however in the case of the latter, then the cow will benefit more from sacrificing **activity against environmental pathogens** by choosing an antibiotic specifically designed to kill ***S. aureus***.

**Antibiotic Alternatives**

It should be noted that the following treatments are most successfully used in addition to antibiotic treatments and only used instead-of when the cow has extremely good SCC, immune system response and general health well-being.

The formation of the **natural keratin plug** during the dry period is key component of the cow’s **natural protection against udder infection**. However, not all cows will form a plug that is effective throughout the dry period…

**Artificial internal teat sealants** have been developed which can overcome the absence of the keratin plug. If used alone in **uninfected cows**, these sealants will reduce the risk of new infections during the dry period – they are at least as good as antibiotics in doing this. In infected cows than can be **combined with antibiotics** and will significantly reduce the risk of new infections in the later dry period, particularly in cows which are dry for longer than the active period of the antibiotic.

An alternative to internal sealants are **persistent external teat dips**, which protect against new infection by covering the teat end with disinfectant. However, as yet, we do not have products which persist long enough, most require new application every **5-7 days** (which in most systems is either unachievable or not worth the labour)

**Preparation of the Cow**

Cows should be producing less than **15L of milk** **per day** when dried off. This figure should be achieved by **gradual reduction**in feed intake, not by reducing water availability. Once the figure has been reached the cow can be **abruptly** dried off – do not skip milkings, the cow should be milked out to full potential and then not milked again.

**Dry Cow Treatment Procedure**

If done badly, dry cow treatment can result in udder infections and mastitis. These infections often cause extensive udder damage and can be extremely difficult to treat. Attention to detail and strict hygiene precautions are essential to prevent such infections. This is especially important if an internal teat sealant is going to be used without antibiotics.

All staff carrying out dry cow treatment should be familiar with the procedure and know how essential it is to follow it:

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| 1) After milking for the last time, separate the cow off and dry her off after that milking has finished2) Starting with the teats on the far side of the udder - clean the teat ends with separate teat wipes. Focus on the teat end not the udder3) Move onto the teats on the near side of the udder and clean those4) Then starting with the teats on the near side of the udder, infuse each quarter with antibiotic.a. Insert the antibiotic tube just into the teat canal (<6 mm)b. Insert the whole of each tube into teatc. Massage the treatment up into each quarter5) Immediately following treatment, dip all teats in an effective teat dip |