



# Managing the dry cow from start to finish

A successful dry period is the foundation to the entire subsequent lactation. There are significant consequences on animal productivity, animal health, farm labour, farm finances and stress if the dry cow period is poorly managed. The period can be broken up into three sub periods. The first is the initial “drying off” process this is followed by a consistent mid dry period which leads into the transition period (3 weeks before and after calving). In this article we intend to introduce some of the management practices which are required in each of these three periods to result in a successful dry period.

## The cow at dry off

Ideally cows are targeted for drying off based on one of three criteria,

1. Days in milk (or predicted calving date). The target in Ireland is to achieve 305 days of lactation, as we have primarily seasonal calving systems targeting a 365-day calving interval, leaving a 60 day dry period.
2. Parity. Primiparous cows may require a minimum period of 10 weeks with many farmers in Ireland opting for 12 weeks.
3. Body condition. Cows in poor body condition <2.75 should be treated like heifers and given an additional 2-4 weeks of dry off period. In most cases silage in Ireland will improve body condition during a longer dry period, but where feed space is restricted, or silage quality and housing conditions are poor, cows will need to be supplemented with concentrates. Fat cows should be milked to the 305-day mark to minimise additional condition score gain.

Cow should be pulled down off-of their milk two weeks before intended dry off by reducing the concentrate level in the milking parlour or introducing high fibre low energy forage. Once the appropriate dry cow treatment has been administered cows' energy intake should be restricted for a further 4-7 days by offering low DMD silage or hay, or a combination of silage and straw 50:50, while ensuring an adequate supply of clean water always exists.

## The mid dry cow period

Once cows are dried off, they can be grouped according to body condition, or predicted calving date if body condition is adequate. Providing cows with a consistent routine, group and a well-balanced diet will minimise stress, and prevent excessive body condition score gain. The first step in determining the correct nutritional programme is to analyse the nutrient profile of the grass silage. See table 1. for further information. The three metabolic targets of a successful dry cow diet are to minimise excessive body condition score gain, prime the cow for calcium mobilisation after calving and to ensure a good antioxidant status resulting in adequate colostrum quality and cow immunity at calving.

**Managing the dry cow from start to finish Table 1 Recommended nutritional programme depending on silage quality, BCS at drying off and the length of the dry period**

Silage Quality	BCS < 2.5 at dry off	BCS 2.75 at dry off	BCS > 3.0 at dry off
Dry Period Length	12-14 weeks dry	8-10 weeks dry	weeks dry
>72 % DMDS	ilage + 1 kg conc.S	ilage ad-lib	Restrict silage/dilute*
68-72 % DMDS	ilage + 2 kg conc.	Silage + 1 kg conc.	Silage ad-lib
64-68 % DMDS	ilage + 3 kg conc.S	ilage + 2 kg conc.S	ilage + 1 kg conc.

(Conc. is an abbreviation for concentrate or meal)

\*Good quality silage must be restricted to cows if BCS is > 3 at dry off. It can be diluted with a lower energy feed such as straw but needs to be balanced for protein.

To ensure cows are not gaining excessive condition an outside opinion is an invaluable resource. The BCS monitoring process should begin prior to dry off with a target to calve 90% of cows in the correct BCS (3.0-3.25). A slightly higher target of up to 3.50 for in-calf heifers entering the herd is considered appropriate. A single unit of Body Condition (1 BCS) is equivalent to approximately 50 kgs liveweight gain or loss.

Table 1 outlines a simplified overview of dietary management when allocating grass silage assuming an overall crude protein content of 13%.

To prime the cow for calcium mobilisation in the immediate periparturient period (48 hours before and after calving), the dry cow diet must remain low in calcium (below 30g of absorbable calcium per day) and contain adequate magnesium. Most Irish silage will provide an excess to calcium requirement, so quite often the process of calcium mobilisation requires additional aid from vitamin D, additional magnesium, and a moderated dietary cation-anion balance. Vitamin D3 should be at least 200,000 IU/kg pre calving mineral premix.



An animals' store of vitamin D3 is sufficient for about 3 months, however winter forages are low in D3 and body reserves deplete very quickly. Vitamin D3 is required for calcium absorption in the small intestine but must first be converted to 25-Hydroxy vit D3 in the liver, and this conversion is reliant on sufficient Magnesium.

25-Hydroxy vit D3 is then converted to 1-25-dehydroxy vit D3 in the kidneys and this reaction is reliant on parathyroid hormone.

Magnesium absorption can be compromised in two ways, firstly a lack of Mg intake (cows require 40g/day during the dry period) and secondly an increase in potassium content of the rumen. High potassium (>1.8% in silage) in the rumen reduces the transport of Mg across the rumen wall and into the circulatory system.

High potassium also has an alkalisng effect on the cow's blood, which dulls the effectiveness of parathyroid hormone. Frequently an additional 10-20g of magnesium is allocated in the close-up period, and with higher incidences of hypocalcaemia, anionic salts such as Magnesium Chloride can be offered to have an acidifying effect on the cow's blood.

The cow's antioxidant status and immune function can be enhanced by choosing a high quality pre calving mineral and feeding it twice per day for the 8-week period leading up to calving.

- Vitamin E is an important antioxidant and is crucial for health and immunity. Aim for at least 10,000 IU/kg of premix
- Selenium acts as an antioxidant and helps boost cow and calf immunity. Organic selenium yeast helps prepare the mammary glands for next lactation and reduces the incidence of mastitis in the following lactation.
- Copper and Zinc are associated with the antioxidant status of the cow and as a result is involved with the function of the immune system. A good quality dry cow mineral will contain increased levels of chelated copper and zinc.
- Iodine cannot be stored by the cow, and it must be supplemented daily.
- Biotin and Zinc build up hardness and health of the hoof reducing the incidence of lameness in early lactation. Biotin also aids good liver function is critical in preventing the onset of ketosis

### The Transition Period

In the final 3 weeks before calving and the first 3 weeks after calving, a cow in the correct BCS may avoid many of the potential diseases listed in table 2., however there are some management strategies that may elevate some potential fallouts. Cows in excessive condition are prone to a mvriad of disease following the impacts of excessive BCS loss.

The process can begin three weeks before calving and is traditionally thought to be underpinned in many circumstances by a reduction in voluntary intake as a response to fat mobilization.

This exacerbates the reduction of fatty tissue creating increased blood ketone levels, ketosis ensues and a cascading effect on secondary illness follows including impaired calcium mobilization (with potential fallouts) and suppressed immunity (with potential fallouts).

The management of cow stressors will help minimise this; Ideally cows should be grouped and moved to a "close up" (1 week before and after calving) calving facility one week in advance of calving and should remain with a majority of now familiar cows in the fresh calved group for several days. The lying space in "close up" accommodation needs to be 10m<sup>2</sup> per cow.

**Table 2 Protentional diseases linked with BCS**

Over fat cows BCS 3.5 +	Thin cows BCS <2.75
Increased Ketosis	Increased Incidence of Lameness
Increased Fatty Liver	Increased milk fever
Increased Retained Foetal Membranes	Increased Uterine Tract Infection
Increased dystocial	mmune system suppression
Increased milk fever	

Cows need 24hr access to several water points in this accommodation. Feed needs to be allocated fresh daily and cows should never be in a rush to the feed barrier in this group (feeding space allowance of 2.5 ft per cow). Cows should be capable of reaching 3 ft for feed, so the feed barrier height should not restrict this.

Immediately post calving cows should be offered 20 litres of warm water, and an oral calcium supplement in herds prone to milk fever.

Along with this, 2 kg of dairy nuts may be allocated to cows for 4-5 days pre-calving to introduce some calcium supplement and to prepare the rumen for the increased starch content of the lactating cow diet. In some cases, the lactating cow TMR can be allocated to the entire close-up group to increase the energy density of the diet and ready the rumen for the subsequent lactating cow diet.

The ideal outcome of the fresh cow is a healthy cow a healthy licked calf and cleanings dropped within 12 hours