

The



Dry Cow Blueprint

5th Edition 2020



**Genetics
Nutrition**

F1 is the intellectual property of TBA & Lakeland Scottish

Introduction

Trevor Birchall and Jerry Trowbridge have attended many study tours to Dairy Farms in the USA, Canada and Europe together since 1999. We also continuously trawl the current research and scientific presentations and conferences to examine the management techniques used by the most efficient of the high producing herds, we have concluded that in the UK we need to continually update our approach if we are to have large herds of cows giving a lot of high quality milk whilst maintain health, welfare and longevity.

There is much to look at if these objectives are to be achieved, and this booklet will concentrate on the dry cow element of the system which is probably the first part of the system which every farmer needs to get right.

We also recommend that you check the F1 Dairy Blueprint and the Birth to Calving Blueprint for a more complete picture.

All of the Blueprints are constantly updated and in 2020 we have adjusted the framework to include some new techniques that are recommended from the latest innovative scientific research.

The Dry Cow

Management Priorities

Management of the dry cow is recognised as being the key driver to the success or failure of the subsequent lactation. It should be viewed as a time when the foundations for the next 9 or 10 months of production need to be laid down.

Getting this right will have a significant effect on production, health and fertility

Put simply “It’s a full service and an MOT ready for the next year’s work”!

The key task at the far off stage is to maintain cow condition at around 3.

This is not as easy as it sounds, since the cow’s intake of energy is usually much greater than it needs to be at the start of the dry period.

Dry cow intakes should therefore be limited to what supplies their energy requirements for maintenance and those of the growing foetus.

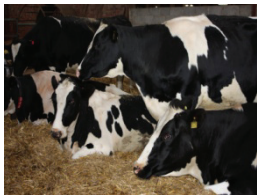
Dry cow diets featuring large intakes of straw or lower energy whole crop are excellent. They are both bulky (helping to keep the rumen big) and low in potassium (the main predisposing cause of milk fever).

During this period the foetus is getting bigger and the rumen is being squashed into a smaller space.

There is a key requirement to keep the rumen as big as possible at this stage. This helps to promote a rapid increase in appetite (lift) and also helps to avoid the chance of a displaced abomasum at the start of the lactation. We recommend a minimum intake of 6000 grams of NDF and 1200 grams of Metabolisable protein throughout the whole dry period.

As the dry cow nears her calving date, her requirement for energy starts to rapidly increase just as her intake starts to decrease. This is one key reason for having a separate close up (or transition) group.





There is much debate about what feed regime makes the best system for dry cows.

There are three systems currently being used:

- **Single dry cow group.**

Dry cow intakes vary from drying off right up to calving, when it drops off rapidly. As a result this system gives poor control of cow condition.

- **Short dry period.**

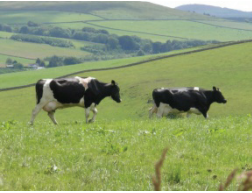
Modern dairy cows can produce high yields even into late lactation. Some farmers believe that there is an advantage to continue milking the cow until 4 weeks before calving. There is still much debate about this system, since it is widely believed that lactations are more productive following a typical 7 to 8 week dry period.

- **The split feeding system.**

Currently, over three quarters of North American dairy farmers use this system. The F1 Blueprint recommends the same management principles be applied here in the UK. The system broadly consists of a 5 week “Far Off” group and a 3 week “Close Up” group. This allows for much better control of health, condition and calving success.

Far Off Dry Cows

These cows should have been dried off in the correct condition score of between 3 and 3.5.



Condition of cows that missed service and have an extended lactation is best adjusted in a late lactation conditioning group and not after they are dried off. Most UK dairy farms are un-able to accommodate this approach but the principle of managing cows for condition in late lactation should be a management goal.

The main objective is to make sure that the rumen space is kept as large as possible by feeding plenty of low energy bulky forages in order to prevent the animal from getting fat and losing rumen fill capacity.

At this far off stage calcium can still be fed. The DCAD approach only applies in the close up period.

Good clean wheat straw chopped to about 4 cm (muzzle width) and fed along with silage, whole crop and or maize silage should form the bulk of the ration. The target dry matter of the ration should be around 45% this will give good intakes of bulk and keep the rumen big.

Nutritionists should note that the total energy requirement of the far off dry cow is only around 8 to 9 MJ/Kg DM, hence the need for low energy bulky forage.

Dr Jim Drackley (professor of Animal Sciences university of Illinois.) recommends limited energy intakes to the animal’s theoretical requirement at this stage. He recommends a high straw intake strategy for far off dry cows and only moves to a more nutrient dense diet when the cow enters the close up phase. This gives much better post calving responses.



Key Products

• F 1 Dry Cow Build Up Mineral

This mineral supplement contains all of the trace elements needed to prepare the cow, calf and colostrum for calving. It is a very highly specified mineral which features the full recommended dose of Availa protected trace elements, Selplex, Biotin, and plenty of Vitamin E alongside a balanced major element formulation.

The mineral has been spiced for use in TMR mixes but it has also been prepared for free access where it has to be trough fed.

Optomega Plus Recommended at 120 Grams

See below

• F 1 Absolute Dry Cow Mineral Buckets

Typically fed at 1 bucket per 10 cows every 10 days.

Carefully balanced to provide enough mineral supplementation to dry cows where trough feeding is not available.

• Extra Magnesium Chloride.

(50 grams to 150 grams) In situations where the diet is high in Potassium, Magnesium chloride will help to counter the effects of clinical and sub-clinical Milk Fever.

Note autumn grass, molasses and pot ale syrup are usually high in Potassium.

• F 1 Yeast

To maintain a healthy rumen microbe population.

• Limestone Flour

Contrary to belief, we know that at the end of lactation many cows have had some time when calcium has been under supplied. This has the effect of reducing the cow's reserves from its bone and cartilage structure. The result is an open sponge structure to the bone and a much greater chance of milk fever. Inclusion in the far off group diet is very useful because it helps to build a reserve. Limestone flour is calcium carbonate and as such does not affect the DCAD in the far off stage!

There is no point in using limestone flour or any other calcium source if you are feeding calcium binders in the close up stage like X-Zelit®. **We would only advise X-Zelit® in the close up group.**

• Extra Calcium Chloride

(50 grams to 150 grams) Very popular in some parts of Europe and North America, this mineral will supply calcium at a very low DCAD value making it a great choice for Close Up dry cows that will need calcium at calving to promote muscle movement and colostrum production with the huge bonus of reducing the Milk Fever threat. Calcium Chloride is first choice for Close Up cows when Limestone flour should not be fed (unless a calcium binder is used (see above)). Seek nutritional advice to balance the DCAD levels in the Close Up diet.



Close Up Calving

Management Priorities

This close up period is critical in determining the success of both calving itself and the coming lactation. The main priorities of nutrition are to avoid the symptoms of both clinical and sub-clinical milk fever and to ensure liver function is at peak efficiency.

We should also not lose sight of the fundamental need to encourage maximum appetite and rumen fill pre and post calving in order to minimise negative energy balance and its consequences post calving. This should be encouraged by managing a smooth transition and using appetite aids like yeast, flavours, and (salt post calving).

There are two schools of thought on the prevention of milk fever. The DCAD approach and the non DCAD approach.

If you cannot control the DCAD elements of the diet by housing the close up cows on a calculated ration, they have to be fed on grass.

The potassium and sodium levels in grass frequently predispose milk fever. The use of 500 grams of X-Zelit® in this situation is probably the best option. (See below).

1. The DCAD approach outlined below, effectively ensures that the calcium reserve needed at calving is fit for purpose and that the Cation-Anion (DCAD) challenge is addressed by the use of magnesium chloride and other anionic agents.

2. Dietary cation-anion difference, or DCAD, is a measure you should be using in both dry and lactating cows. In close-up dry cows, a negative DCAD can help prevent metabolic problems and in lactating cows, a positive DCAD can help increase milk production and milk components. The most common equation to determine DCAD is based on the dietary concentration of the cation minerals sodium (Na) and potassium (K), and the anion minerals chloride (Cl) and sulphur (S). The DCAD formula is as follows:

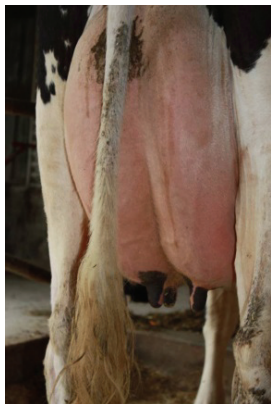
3. This is the complicated bit but to be honest we just let the software do all the sums and get on with life!

DCAD mEq (milli-equivalents)/100g (grams) dietary DM = $[(\%Na \times 43.5 + \%K \times 25.6) - (\%Cl \times 28.2 + \%S \times 62.5)]$ (Mineral % are on a dry matter (DM) basis).

4. Target DCAD for close up dry cows should be around minus 80.

5. Target DCAD for lactating cows should be around 350 to 400.

The practice of keeping close up dry cows outside on tightly grazed (exercise) paddocks is not the best way of preparing the cow for her next lactation. The variables of grass quality, intake, mineral composition and weather mean that we cannot control the diet. In this situation the X-zelit® approach is more practical



Housing these cows on a straw based diet is a far more effective way of allowing the cow to calve down where help can be given more easily if needed and start the lactation without a check.

We recommend a minimum space of 10 square metres per cow though more is preferable.

Stress reduction is hugely important so good housing environment with at least 30 inches (850cm) trough space per animal is recommended. Some experts suggest 1 metre is better.

The focus of recent nutrition research places much emphasis on maximising rumen space right up to calving. This is now known to have a very significant effect on post calving appetite and as such links in with the argument that high post calving intakes reduce the issues of condition loss and negative energy balance and gives a very positive response to fertility and improved pregnancy rates.

So, you can now see why the F1 dry cow products have to be designed to manage the critical close up and fresh cow periods so effectively.

The key tasks are as follows:

- Maintain a physically large rumen by feeding a lot of clean straw. This will help to avoid displaced abomasums after calving by allowing the unravelling squashed rumen to fill the space left in the body cavity by the calf more rapidly.
- Restrict high in potassium forages to 3 or 4 kilograms of dry matter.
- Feed a target of 1200 grams of metabolisable protein dry matter.
- Where the post calving diet is a TMR, feed 3 or 4 kilograms (DM) / (9 to 12 Kg fresh weight) of this, but make sure the production minerals and any limestone are not included unless you are following an X-Zelit® regime or you can compensate the positive DCAD of the production diet.
- Feeding yeast helps with microbe population efficiency and transition from the dry cow diet to the production diet. We should not underestimate the advantage it provides in this role!
- As the time for calving approaches intake levels drop to around 1% of body weight, just at a time when the cows requirements for energy are at the peak for the foetus and the act of calving itself. Some of the “close up” calving supplements now include valuable energy precursors in order to alleviate the problems brought about by naturally low energy intakes at this time.



Note: protected fats are not recommended at this stage of the cow's cycle.

Improvements in intake at this stage can have very beneficial effects.

Penn State University has found that including higher levels of clean high quality fibre from both forages and concentrates can greatly assist this objective. Work to a target of 6 Kg minimum NDF. This figure is also the target for the fresh calved cow because it will reflect the optimum intake and appetite that the cow needs to achieve if she is to follow a high yield lactation curve.

The University of British Columbia has concluded that a 1 kilo reduction in dry matter intake at this stage can double the risk of sub-clinical ketosis, and cows were three times more likely to have hung cleansings. One key and pretty obvious piece of advice is that to maximise intakes, the close up dry cows should be presented with fresh food at the trough and this means feeding more than once per day!

CLEAN WATER

Current research shows that cows that are stressed are much more likely to succumb to disease challenges. This includes metabolic diseases as well as infectious diseases. Water intakes tend to drop in the few days before calving and this has been shown to put more stress on the cow.

Stress free hydration at this stage is very beneficial because it reduces the opportunity for infection. Clean water is essential for these cows.

The minimum temperature of drinking water should not be less than 4°C because this will result in low intakes and reduced appetite at a time when the cow needs to achieve her target nutrient demand. Conversely the maximum temperature recommendations vary from 20°C to 12°C these are less critical but indicate that the cow prefers cool clean water.

Work is being done to see what can be used to stimulate extra water intake during this period. We already know that products like Credence © can be used to sterilise the water supply but this on its own is not effective enough, clean troughs are essential and pretty obvious when you think about it.



Key Products

F 1 Yeast. Recommended @ 25 to 50 grams

Recently voted as a most trusted brand in a national market survey (2015) it is a highly concentrated dose of a live yeast supplement for optimum rumen conditioning both before and after calving. F1 thermally stable yeast is carefully prepared to ensure that the active yeast is presented to the cow undamaged by the carrier mixing process and has maximum effect in the rumen.

F1 yeast has been proven to increase production and buffer rumen Ph. There are many extra benefits shown to result from the use of F1 yeast. Improvements in fertility, feet, milk quality and condition can all be associated with the use of this product. Using F 1 Yeast as a changeover agent is a great technique for stabilising rumen microbe populations as the diet changes from the dry cow diet to the fresh calved diet. This is without doubt one of the key ways to increase post calving appetite.

The 2020 version includes an activator which enlivens the yeast and further improves the benefits resulting from its use.

FiMLAC Dry Cow Rolls. Recommended 2Kg Massey Feeds (North) Harpers (South)

This compound dry cow roll has been formulated to include the features of Transpher 20 in a 2kg dose of rolls. It is a semi DCAD formulation which will need little DCAD help with Magnesium Chloride unless the forages are high risk.

Reashure Recommended at 60 grams

A great strategy for **reducing the risk of ketosis** and improving post calving milk yields.

Rumen protected choline fed at 60 grams per cow per day for 21 days close up and 21 days post calving if possible (but not essential). Delivering 15 grams active choline (the full dose)!

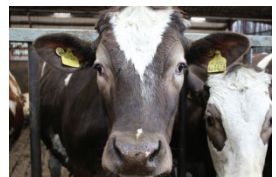
Choline facilitates the export of fat from the liver to the mammary gland where it is used to make milk. This function of choline also occurs right through the whole lactation. It also supports the metabolism of NEFA to energy for use by the cow to maintain body condition.

Put simply, it enables the cow to process NEFA positively (for energy and milk), rather than negatively (ketone bodies and fat) which would result in ketosis and/or fatty liver.

Rumen protection is critical to ensure that the choline is not being degraded by the rumen and the cow receives the dose that she requires.

Reashure is a highly effective rumen protected choline. It's cutting edge rumen protection technology ensures that the cow gets exactly what she needs further down the digestive tract.

Most Rumen protected choline products are fat embedded or encapsulated. The inclusion in dry cow compounds generally has a major effect in reducing the protection due to the heat involved at the cubing orbits in the feed mill.





Many supplements do not contain the full recommended dose of Choline at 15 grams (Pure Choline). At Lakeland-Scottish Feeds & Services we have decided to promote this product because the trial data and farmer experience is so positive and the 31 peer reviewed published trials give 99% reliability!

Optomega Plus Recommended at 120 Grams

Optomega Plus is a powdered supplement based on totally natural fish oil, rich in essential fatty acids EPA (Eicosapentaenoic Acid) & DHA (Docosahexaenoic Acid).

Feeding these essential oils **from the point of ovulation** and throughout her conception helps to ensure a successful pregnancy. Optomega Plus is a rich source of both EPA and DHA which are the two essential fatty acids that can only be supplied by nutrition. These two essential fatty acids have been shown to regulate and suppress the PGF_{2a} hormone (Prostaglandin F₂). This has direct implication in improving the conception rate.

EPA and DHA lower inflammation of membrane tissues throughout the cow's body. All benefits are derived from this prime function.

Optomega Plus is beneficial to your milk's omega 6:3 ratio, meaning that the quality of your milk will improve. Having a higher proportion of omega 3 in your milk implies that the milk is healthier for human consumption.

Optomega Plus is supplied in foil-lined bags to ensure freshness and we use specially selected carriers so that Optomega Plus remains free-flowing and easy to use.

F 1 Elevator Recommended. 250 to 300ml

This product is a blend of Glycerol and Mono-Propylene Glycol with a unique flavour added. It will provide a significant dose of energy just when the cow needs it. F 1 Elevator also has a major effect on optimising appetite during this critical part of the dairy cow cycle.

This is probably the most underestimated yet effective products we have ever brought to market.

F 1 Dry Cow Build Up Mineral. Recommended 150 grams

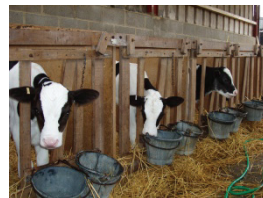
This mineral supplement contains all of the trace elements needed to prepare the cow, calf and colostrum for calving. It is a very highly specified mineral which features the full recommended dose of **Availa**® protected trace elements including Availa Selenium, biotin, and plenty of vitamin E alongside a balanced major element formulation.

• X-Zelit® Granular or Compound Pellets (with or without minerals) Recommended 500 grams Granular 2.5 Kg without minerals 3.0 Kg with minerals

This product has some remarkable abilities to eliminate milk fever and increase appetite. Based on Sodium Aluminium Silicate, this synthetic Zeolite clay binds calcium very efficiently indeed. This action effectively activates the cow's hormone system so that she is ready to absorb calcium efficiently from the moment of calving.



This should reduce the incidence of milk fever and in a big Danish trial over 22 herds reduced milk fever incidence by 86%. Grass fed dry cows should be buffer fed in any case and this is a great situation for this type of approach. (Use when the choice is not to feed supplemental calcium). X-Zelit® **(Not for use with DCAD systems)**



F 1 Fresh Start. Recommended 1Kg

Re-hydration therapy for fresh calved cows. (see below)

Magnesium Chloride & Calcium Chloride. Recommended Zero to 150 grams variable rate each. Seek advice.

For use where there is a severe potassium challenge as a DCAD agent. Magnesium chloride can be used alongside Calcium Chloride to greater effect in many Close Up diets.

Calving

Management Priorities.

The point of calving is obviously the major event in the cow's cycle. We recommend that the cow is quietly separated from her group into her own clean calving box, with plenty of straw. Some units work successfully with large group calving pens but hygiene routines have to be rigorous if environmental disease challenges are to be kept within reasonable limits.

It is important to allow the cow some quiet time to find her most comfortable position. (Usually backed up against a wall!)

She will require a large expenditure of energy for her labour and to expel the calf and the afterbirth.

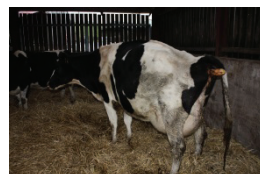
It is useful to have all of the necessary aids ready to hand in case they are needed. Also a post calving drench preparation is recommended in order to re-inflate the rumen and avoid a displaced abomasum.

Increasing the capacity of the rumen by up to 40 litres at this stage has some very impressive long-term benefits. Effectively, a large intake of fluid will create a big appetite right from the start of her lactation. This reduces negative energy balance (NEB), and gives a more rapid uplift of milk yield and a significant fertility response later on in the lactation. **F 1 Fresh Start** is ideal for this purpose.

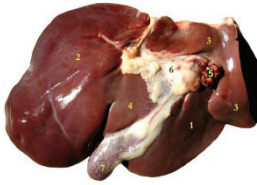


Key products

- The F 1 Blueprint recommends **F 1 Fresh Start** as a voluntary drink of around 20 to 40 litres or as a drench of around 35 litres. This mix of electrolytes, calcium, pro-biotics and ready energy will help to get the cow back on her feet, licking the calf and get her ready for her first big meal.



Liver Function



The liver is a fantastic organ; it has a fundamental role in processing the following nutrients:

Fats, Sugars, Starches, Fibres, and Proteins.

So it's pretty vital then! The liver's main role is transforming energy from these nutrients into a form where it can be moved around the body to all the sites where it is needed.

It is also responsible for the synthesis of non-essential amino acids, and getting rid of excess ammonia by detoxifying into urea.

• F 1 Elevator

This product is used in the close up diet to trigger liver function, it is a blend of Glycerol and Mono-Propylene Glycol with a unique flavour added. It will provide a significant dose of energy just when the cow needs it. F 1 Elevator also has a major effect on optimising appetite during this critical part of the dairy cow cycle.

Feeding elevator is recommended only as a top dress product added (usually via a watering can). The reason for this is that by exposing the digestive system to a significant dose of this very highly available energy source, the liver will be stimulated into a more vigorous response than the normal TMR would provide.

In simple terms "It is a kind of kick start"! This technique helps to improve the effectiveness with which the liver functions in general and the net result is a general improvement in energy metabolism.

ReaShure Feed at 60 grams

We recommend that you continue to feed this to cows in the recovery pen and up to 21 days post calving if possible,

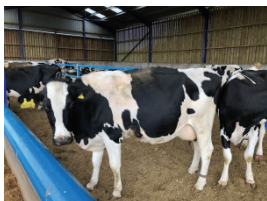
It is extremely cost effective and has a great effect in lifting milk yield by ensuring the transfer of fat (Lipids) to the mammary gland at the start of the lactation.

Rumen protected choline fed at 60 grams per cow per day for 21 days close up and 21 days post calving if possible (but not essential). Delivering 15 grams active choline (the full dose)!

Put simply, it enables the cow to process NEFA positively (for energy and milk), rather than negatively (ketone bodies and fat) which would result in ketosis and/or fatty liver.

Rumen protection is critical to ensure that the choline is not being degraded by the rumen and the cow receives the dose that she requires.

Reashure is a highly effective rumen protected choline. It's cutting edge rumen protection technology ensures that the cow gets exactly what she needs further down the digestive tract.



Support & Backup Services

TBA Ltd is a specialist company in the dairy and livestock industry established in 1995. Now based near Blandford Forum in Dorset to service the South and West of England, TBA Ltd is managed by **Trevor Birchall**

LSFS Ltd was set up in 1997 by ex ABN consultant **Jerry Trowbridge**. Based at Penrith in Cumbria the company services a wide area of Scotland and the North of England.

We are now able to cover the whole of the UK due to recent expansion and the addition of some extra independent Technical F1 Farming agencies.

Both companies have succeeded in staying at the forefront of ruminant nutrition by readily adapting up to date research into products and services designed to keep their customers ahead of the rest. They both offer all of the feedstuffs and associated products you could need

Both Trevor and Jerry have been actively working in the ruminant feed industry for over 35 to 40 years.

How do you make this F1 Blueprint work for you?

TBA and LSFS (Lakeland-Scottish Feeds & Services) offer the full range of nutritional support services. We use the most up to date version of Ultramix, the best nutrition software available.

We suggest that you meet with one of our qualified nutritionists before you start on the blueprint. We will help you to assess the best ways of making the group strategies work properly on your farm.

We can balance the rations you will need according to the types of forages that you are using.

Finally, if needed, we will set up regular visits to help you make sure that it all works according to plan.

Contact Trevor on 01300 345711 or via www.tbagri.co.uk

Contact Jerry on 07711 034141 or e mail to jerry@lakelandscottish.co.uk

