Do not turn shrunk or hungry cattle out onto lush legume or small grain pastures without

first filling them up on hay. Bloat is still possible on these forages even after a frost.

Bloat risk is lower when legumes begin to flower than with earlier plant growth. Use of

forages containing condensed tannins can assist in bloat prevention. Cattle should be

slowly adapted from forage-based diets to grain-based diets over a period of at least

three weeks. Manage the nutritional programs of chronic bloaters carefully.

Poloxalene can be provided in a salt-molasses block or as a top dressing to feed

according to label recommendations. If a poloxalene block is provided, make sure cattle

consume the blocks at least three days before placing them on a pasture with a

significant bloat risk. Remove other sources of salt, and place poloxalene blocks (30

pounds per four to five animals) where they will be easily accessible to the cattle.

Feeding monensin can reduce the risk of both feedlot and pasture bloat. Monensin is

reported to be more effective than lasalocid in controlling bloat, while poloxalene is

more effective than monensin for bloat prevention.

Discuss bloat treatment options with a veterinarian. Poloxalene may be administered

through a stomach tube to help break up the stable foam and allow the animal to

eructate (belch). Do not drench a bloated animal because of the danger of inhalation

and subsequent pneumonia or death. Feed coarsely chopped roughage as 10 to 15

percent of the ration in a finishing diet. A bloat needle (six to seven inches long) or a

trocar can be used in extreme cases to puncture the rumen wall on the left side of the

animal to relieve pressure inside the rumen. This treatment option should be considered

a last resort as severe infections may result. Although there is no label claim, research indicates that monensin reduces the incidence and severity of frothy bloat.

 **The most obvious preventative measure is to not have cattle on grain in the first place**. This is because grain is not a natural diet for cattle, and often causes more issues and illnesses than grass or hay does. This is often one faultless preventative measure that a lot of producers can (and do) fall back on.

 2

**Feeding grain often cannot be avoided, though, so gradually increasing the grain ration over time is the best way to prevent acidosis while still feeding cattle grain**.

 3

**Always include roughage with the grain diet you are giving your cattle**. This helps with ease of digestion in the rumen, and also prevents the microbes in the rumen from digesting this high-concentrate ration too fast.

* Roughage should not be finely chopped, as this will often defeat the purpose of preventing acidosis. Coarsely-chopped (or not chopped at all!) roughage is best.

 4

**Often Nature-caused interruptions like storms, hot- or cold-spells, and extreme weather, or change in schedules such as being handled or hauled to a new farm or ranch can cause cattle to reduce their feed intake or stop eating all together until the danger has passed**. Then they over-eat to compensate for the loss of diet they missed during this interruption. Often during extremely hot spells cattle won't eat during the day, then eat their hearts out at night when it's cooler.

**The Importance of Cows Rumen pH and Rumen Buffering**

Dairy Cow Health and Longevity - Many of the health problems with modern dairy cows are primarily triggered by, associated with or are directly caused by acidosis. These cow health issues include lameness, mastitis, high somatic cell counts (SCC), left side displaced abomasum (LDA), impaired liver function, loss of body condition,  negative energy balance, infertility, milk yield below potential and high culling rates. The problem isn't high yields, it is our reluctance to adequately balance high yielding diets to meet the requirements for herd health.

Most cows at some point in their lactation suffer from acidosis

**Sub Acute Rumen Acidosis (SARA) in dairy cows**

Acidosis is caused by cows eating high levels of concentrates, starch and high D-value forages. As rumen pH falls, Streptococcus bovis increases causing the pH to fall further. At low pH levels lactobacillus produce high levels of lactic acid producing a highly acidic environment. Often extremely high levels of E. coli are also present along with scours. Liver abscesses may also result. As rumen pH falls from 6.4 pH to 5.6 pH fibre digestion will fall by around a third from 55% down to 35%. This can equate to around 2.5 - 3 litres of milk per day.

Using a rumen buffer to increase rumen pH from 5.6 pH to 6.5 pH will improve feed efficiency and can be worth an additional 3 litres of milk per cow

Acidosis has consequences for performance, health, fertility and feed efficiency so it is essential to protect the rumen. Ideally the rumen should be kept within the range of 6.4 - 7.0 pH which is optimum for rumen microorganisms to thrive.

First and foremost acidosis can only be controlled by well designed diets with emphasis on efficient rumen function. Good quality high D-Value forage is essential. Over feeding of fast fermentable starch and excessive concentrate to forage ratios should be avoided. Equally all diets must contain sufficient floaty, scratchy, mature long fibre in order to form a rumen mat and to stimulate cudding and rumen mixing. Providing straw as the long fibre is only really effective where the straw is cleanly chopped to between 1" and 2" long to avoid sorting and rejection by the cow.

Rapid diet changes involving sudden increases in concentrates must also be avoided especially post calving. This is all fine in theory, but in practice cows are usually group fed with a single total mixed ration (TMR), and cows do usually have to be moved directly from dry cow diets to high energy peak lactation diets involving sudden diet changes at a critical time often with long lasting consequences.

There are also limitations with forages, wet acid silages, high starch forage maize, and grazed grass. The three main causes of ruminal acidosis are excessive intake of rapidly fermentable carbohydrates, inadequate ruminal buffering and inadequate ruminal adaption to a highly fermentable diet. You may have previously thought that acidosis only occurs when cows are fed winter rations but it is also a problem on grazed grass.

**Grazing Cows and Rumen Acidosis**

A study carried out by University College Dublin in 2006 showed 53% of cows had a rumen pH <5.8, which is too low for optimal feed digestion and intake, whilst 11% had a rumen pH <5.5, which meant they had SARA. These were cows 80 to 150 days in milk being fed grazed grass. Remember, high D value grass can have sugar percentages in the range of 20% to 40%, which is similar to feeding a total diet with 63% cereal! Ideally, the rumen environment needs to be kept in the optimal pH range of 6.5 to 7.0.

Yes, cows do suffer from acidosis at grass. Ever considered why cows scour at turnout and lose body condition through the grazing season? Rumen pH on grazed grass can be as low as 5.4 pH.

Good diet formulation is essential. But even if we do everything right it isn't enough!

There are considerable benefits to be gained from feeding an effective Live Yeast Supplement together with a Rumen Buffer

**Feeding Cows for Improved Rumen Efficiency**

More than anything else performance of high yielding dairy cows depends on the rumen functioning efficiently. Feeding systems that maximise microbial growth and production will maintain high milk yields, safeguard herd health and maximise profitability. Rumen microbes are essential to digest the forage, which makes up a large part of the cows diet. These rumen microbes produce volatile fatty acids and microbial protein and in doing so can provide up to 75% of the energy and up to 60% of the amino acids required by the high yielding cow. For the rumen to work efficiently and effectively the rumen microbes need a steady supply of fermentable energy and degradable protein and most importantly they need a stable rumen pH between 6.0 and 7.0 pH. Within this pH range the rumen is at its most efficient.

The rumen microbes ferment starches and sugars to form organic acids, propionate and other volatile fatty acids (VFA). This is not a problem if the rumen stays above 6.0 pH. If on the other hand these acids build up in the rumen then the pH of the rumen drops. The fall in pH has two effects. Firstly, the rumen stops moving, becoming atonic. This depresses appetite and production. Secondly, the change in acidity changes the rumen flora, with lactic acid-producing bacteria taking over. They produce more acid, making the acidosis worse. The increased acid is then absorbed through the rumen wall, causing metabolic acidosis.

When acidosis occurs the rumen microbes use additional energy to get rid of excess hydrogen ions. This in turn results in fewer less active microbes being available to ferment the cows diet.

High yielding cows often experience a few hours of high rumen acidity during the day. If this situation is corrected, milk production can be increased.

**Feed for optimum Rumen pH to Improve Digestive Efficiency & Health**

SARA is a very common and much under rated metabolic disorder which has a significant effect on milk production and herd health. SARA occurs when the pH of the cow's rumen drops below 5.8. The cow's dry matter intake declines, fibre digestibility and rumen microbial protein production is reduced, butterfat % declines, and milk production suffers. Too often SARA which affects most dairy herds goes unrecognised and ignored by nutritionists, consultants and farmers. SARA represents a massive economic cost to the industry.

Sub acute rumen acidosis or SARA reduces dry matter intakes, fibre digestion, milk yields and butterfat production. Dairy herds experiencing SARA will have a decreased efficiency of milk production, impaired cow health and high rates of involuntary culling. **If acidosis occurs in one cow, it usually indicates that many other cows in the herd are suffering from sub-clinical acidosis.** Solutions have to be for the whole herd not the individual animal. Many diseases have been linked to acidosis. For some, such as liver abscesses, the evidence is very strong.

All too often farmers and nutritionists assume that there is no acidosis problem unless intakes severely decline, butterfat (%) declines, and laminitis is apparent.
This is not the case.

Diagnosing sub clinical acidosis in the field is a challenge. The following signs can be useful in identifying SARA, but can vary and may be caused by other factors:

* Moving dry cows to a high concentrate TMR after calving without a transition diet
* Increasing concentrate intake after calving faster than 0.75kg per day
* High concentrate : forage ratio
* Cows fed more than 4.5kg of concentrate per feed
* Overall concentrate feed rates higher than 0.38kg/litre
* Low levels of scratchy structural forage fibre greater than 1" long in the diet
* Less than half of the cows chewing their cuds
* Average cudding rate less than 60 chews per cud
* Starch levels greater than 15% or combined sugar and starch greater than 23% in the diet
* Dung appears loose, foamy and bubbly and inconsistent across the herd
* Dung will often contain fibrin casts, undigested grains and fibres
* Poor rumen fill and individual cows off feed for no apparent reason
* Cows dropping their cud
* Excessive loss of body condition score in early lactation and negative energy balance
* Dirty, rough coated cows
* Tail swishing / twitching resulting in dirty backs
* Hyper ventilation or rapid breathing
* Individual cows with low butterfat % and high milk protein %
* Cows selectively consume coarse long forage (straw or hay)
* Excessive intakes of free access salt or minerals
* Cows eating soil, licking urine or chewing stones
* Digestive / metabolic disorders such as displaced abomasums, ketosis, sick cows, general ill health
* High cell counts, mastitis, reduced immune response, poor fertility
* Increased Lameness, haemorrhages or red discolouration in the hoof, laminitis, poor quality hoof horn, solar ulcers, white line disease especially first lactation heifers and fresh cows
* Hoof surfaces have horizontal ridges or lines
* Cows under performing, reduced milk yields or reduced butterfats

Efficient Rumen Function = Healthy Cows = High Feed Efficiency
= High Yields = Profitability

**Transition Cow Management and Acidosis**

Early lactation is where acidosis is most common, most severe and most damaging to cow health, and this is where acidosis can have the most profound effect on future fertility and milk output. 30 years ago when most cows were fed parlour cake and silage, few farmers would ever consider feeding a new calved cow more than 10kgs of concentrates the day after calving. Now with modern total mixed rations (TMR) it is common practice on many farms to move cows from a low energy high forage diet to the high yield group TMR with little thought to the dire consequences for the cow.

The transition cow undergoes massive physiological changes to the rumen, intestines and liver during the 3 - 6 weeks pre and post calving. The diet that we feed to the cow following digestion all has to be absorbed through the rumen and intestinal wall and processed by the liver. The rumen wall is covered in papillae which provide the massive surface area necessary to absorb sufficient nutrients to meet the requirements of the high yielding cow. These papillae regress on high forage diets during the dry period. Sudden introduction of excess starchy concentrates post calving usually results in acidosis as a result of excess acid production and can slough off the rumen papillae reducing the surface area for absorption of nutrients. The result is reduced dry matter intake, often resulting in more severe acidosis, metabolic disorders, ketosis, loss of body condition, infertility, reduced yields, lameness, mastitis high cell counts.

Acidosis is a disaster for the fresh calved cow

**Transition Cow Diets that Reduce Acidosis Risk**

Transition diets should be designed to introduce concentrates at least 3 - 4 weeks before calving and where possible to increase concentrates by no more than 0.75kg per day after calving.  Where possible a 3 week post calving group is very beneficial. Avoid high concentrate to forage ratios and avoid feeding excessive levels of  starch and sugars. Always feed sufficient long scratchy fibre in the diet. Where cows in early lactation are under performing with excessive weight loss as a result of SARA feeding more concentrates will make matters worse.

In all herds showing any acidosis there needs to be a full assessment of the diet
by an experienced nutritionist

Most cows at some point in early lactation suffer from a degree of sub-acute rumen acidosis. Acidosis has consequences for performance, health, fertility and feed efficiency so it is essential to protect the rumen. Work has shown that rumen buffers are more effective when fed with live yeast, which suggests that both should be included in the ration. It is very worth while to feed Biocell live yeast from 3-4 weeks pre-calving through lactation and feeding a rumen buffer from calving onwards. Rumen buffers and live yeast supplements have completely different modes of action but are complimentary.

Yeast metabolises lactate, lifts rumen pH and stimulates growth and activity of rumen microbes increasing rumen fermentation rates, removing lactic acid and improving feed efficiency. Rumen buffers directly neutralize acids in the rumen and buffer to provide a stable pH for rumen microbes to thrive.

**Live Yeast Supplements**

The combined cost of using a rumen buffer in addition to [yeast](http://www.rwn.org.uk/rwn_Cow_Yeast_Supplements.htm) as standard in dairy diets is less that of 0.5 litre of milk but the benefits are massive. Buffers are beneficial even at grass where the rumen can be as low as 5.4 pH. With this in mind there is good reason to include rumen buffers in all dairy diets. Live yeast and rumen buffers have different modes of action. Using the two in combination as routine in dairy diets is very worth while.

We now recommend using a Rumen Buffer as well as Biocell Yeast
in all our Dairy Diets

**Rumen Buffers**

Traditionally rumen buffers have been used in the main where a specific acidosis problem has been identified, often as a short term measure. It has now become widely recognized that the inclusion of rumen buffers as standard in TMR's particularly in early lactation and high yielding dairy diets have a valuable and cost effective role to play.

Chopped Straw - Whilst straw is not a rumen buffer it has been widely used to provide long scratch fibre and encourage cows to cud and to produce more saliva and saliva contains bicarbonate which acts as a buffer. Sufficient long scratch fibre should always be included in the diet in order to maintain an adequate rumen mat. However straw alone will not cope with sudden increases in concentrates after calving, with excessively high concentrate feed rates, or with very high starch diets.

With very high D-value forages which have insufficient structural fibre to form a rumen mat and to encourage cudding , chopped straw fed at up to 1kg is very beneficial. Straw is only really effective if is cleanly chopped to between 2cm and 6cm to prevent sorting. Shredded straw is much less effective than cleanly chopped straw. Weathered straw stored outside should be avoided as it can be a source of mycotoxins.

Where forages are relatively mature with low to average digestibility and with adequate chop length, adding straw simply makes acidosis worse. The reason for this is that low digestibility forages take longer to digest and are lower in energy value, consequently the rumen remains full for longer, dry matter intakes are lower and energy intakes are reduced. The cow under performs and loses body condition and is invariably then fed higher levels of starchier concentrates in order to maintain milk yields.

The resulting acidosis is due to the high concentrate to forage ratio rather than to a lack of structural fibre. Adding more indigestible straw simply further reduces intakes making the acidosis  even worse.

In these situations, replacing the straw with an effective rumen buffer increases the digestibility of the TMR, reverses the acidosis and lifts intakes allowing the high concentrate level to be eased back. 100 - 150 gms of an effective rumen buffer costs less than 1kg chopped straw, does not reduce the energy density of the diet and generally proves much more effective.

**Benefits of Ostrea over traditional Rumen Buffers**

Limestone Flour - Mistakenly ground limestone flour has often been recommended as a rumen buffer fed at 100gms - 200gms per cow on the grounds of price. Whilst limestone flour is an excellent source of calcium, well absorbed at the very low pH seen in the true stomach, it is in fact largely insoluble above about 5.5 pH. It is therefore totally unsuitable as a rumen buffer and should not be used as such. Inappropriate use of ground limestone flour can also interfere with a range of other nutrients including phosphorous, zinc, copper, iodine, selenium and manganese resulting in trace element deficiency which has on occasions resulted in problems with lameness, high somatic cell counts and mastitis. When using any buffer, diets need to be checked by a competent nutritionist who can advise on mineral, trace element interactions.

Sodium Bicarbonate - Traditionally Sodium bicarbonate (NaHCO3) has been used to buffer dairy diets. However results have been mixed. It is only effective with very low rumen pH or for neutralising low pH silages. Also sodium bicarbonate only works for a limited time and is unable to provide any long term stabilising effect.

Sodium bicarbonate is highly soluble and as with some other rumen buffers can result in very rapid rumen pH rises which can adversely affect the rumen environment. To be effective sodium bicarbonate requires a relatively high feed rate of up to 200gms - 250gms which can result in a higher cost per cow than other rumen buffers.

The high sodium level in sodium bicarbonate can however, restrict its use in many diets. since feeding 250gms of sodium bicarbonate is equivalent to feeding 170gms of salt.

Acid Buf - Acid Buf is a natural product, derived from calcified seaweed with a very fine particle size.  Acid Buf provides calcium, magnesium and a range of important trace minerals. It is normally fed at 100gms - 125gms / cow and has proven effective in reducing the acid load of wet, low pH silages as well as in raising rumen pH. Some care is needed since Acid Buf has the potential to give very rapid and large pH rises beyond the optimum range for rumen pH.

Proprietary Rumen Buffers - There are a number of proprietary rumen buffers available in the UK, produced by various mineral manufacturers. These usually contain a combination of buffer and neutralizing ingredients such as sodium bicarbonate, sodium carbonate, ground limestone, magnesium oxide, calcified seaweed  and sometimes a token amount of yeast. These are designed to have a spread of ingredients which may buffer over a long time period however since they carry additional manufacturing costs are generally more costly than individual straight buffers.




Ostrea Oyster Shell Flour - Ostrea Crushed Oyster Shell flour is a source of chalk derived from natural shell banks in the North Sea. The shells are dried and then ground to a powder. Sea-shell chalk is a rich source of calcium carbonate (96.1 %). The dry matter percentage is 99.5 %. Ostrea Oyster Shell Flour is held in high regard by dairy farmers in Holland, Belgium and France who have used the product as a rumen buffer for many years.

It is often claimed that Sodium Bicarbonate (NaHCO3) is better than Calcium Carbonate (CaCO3) for neutralising rumen acidosis.
**We consider this claim to be incorrect!**

So how does Ostrea actually work in the rumen of the cow? The main cause of acidosis is due to volatile fatty acids (VFA's) in the rumen. Research shows that 1 mol of calcium carbonate efficiently binds with 2 mols of VFA's. This is twice the capacity of sodium bicarbonate which only binds to 1 mol of VFA. Because the molecular weight of calcium carbonate is higher than that of sodium bicarbonate the amount of calcium carbonate required to obtain the neutralising effect in the rumen is less. Ostrea is capable of neutralising over 150% more acid than sodium bicarbonate.

Unlike sodium bicarbonate, sodium carbonate and many proprietary rumen buffers Ostrea Oyster Shell Flour does not supply excess sodium, which at high levels can lead to excessive water intakes, softened hooves and damage to the cows kidneys.

Ostrea contains similar levels of Calcium Carbonate to ground limestone. However ground limestone has poor availability above 5.5 pH and is therefore considered to be relatively ineffective as a rumen buffer. Ostrea is much more effective due to its high availability together with its large surface area and complex honeycomb matrix structure. Neutralising acids in the rumen is not the only benefit when feeding Ostrea. The calcium in Ostrea is highly available and fulfils the calcium requirements of the animal.

The calcium is absorbed by the animal over a period of time which contributes to overall animal health. In addition Ostrea contains a wide range of other highly available mineral and trace nutrients of benefit to the animal.

Digestion in the rumen is most efficient within a stable pH
range between 6.0 and 7.0

Ostrea has clear advantages over other rumen buffers commercially available to farmers in the UK. Many rumen buffers based on sodium bicarbonate, sodium carbonate or calcified seaweed, are capable of buffering the rumen pH to a level well above the optimum range for efficient fermentation. These buffers can also result in very rapid pH rises within the rumen fluid resulting in an alkaline shock which can adversely affect the rumen microbial population and rumen fermentation rates. Excessively high rumen pH value can reduce cudding and saliva production, and disrupt the whole rumen environment. Effective rumen function can rapidly decline to the detriment of production and health of the animals.

Ostrea Oyster Shell Flour on the other hand has a natural ability to minimise wide fluctuations in rumen pH and to maintain the rumen within the optimum range. In addition Ostrea has the important advantage of slow release, avoiding rapid fluctuations in rumen pH and resulting in a much more stable rumen pH over time.

In practice Ostrea cannot over buffer the cows rumen. If the rumen pH is OK, Ostrea will not lift the pH further but will instead dissolve at the very low pH in the abomasum allowing the minerals and trace elements in Ostrea to be absorbed.

The result of feeding Ostrea is increased rumen efficiency, higher dry matter intakes, increased output with improved feed efficiency together with better animal health.

In our experience feeding Ostrea as standard in dairy diets has resulted in improvements in both herd health and in feed efficiency far in excess of the
3.5 - 5.0 pence per cow per day cost of the product.

Feeding Ostrea to cows at grass increases rumen efficiency helping to reduce lameness, maintain body condition, improve fertility and lift milk yields.

**Benefits of Feeding Ostrea Oyster Shell Flour to Cows:**

**Specific qualities of Ostrea Oyster Shell Flour**

* Ostrea is a natural source of essential mineral and trace nutrients for animal husbandry
* Stabilises the rumen within the optimum pH range of between 6.0 and 7.0 pH
* Reduced risk of rumen acidosis results in improved performance and feed efficiency
* Improves the general health of high yielding cows
* Healthier hoofs and reduced lameness
* Rich in calcium with good absorption
* Improved Calcium : Phosphorous balance in feeding-stuffs

**Ostrea Oyster Shell Flour Dosage**

* Lactating cows (Fully Housed)    - 100g per day
* Lactating cows (Grazing)           -  80g per day
* Calves and Youngstock             -   50g per day
* Beef Cattle                             -   50g per day

**What Farmers think of Ostrea Rumen Buffer**

"Ostrea really did make a difference to my cows. Within 4 days the muck had improved and milk was up by more than a litre. After several weeks butterfats and milk yields were still improving and the cows were much more settled. A marvelous product and costs very little." Simon Taylor, Leicestershire 2012.

Contact [Richard Webster](http://www.rwn.org.uk/rwn_contactus.htm) for further information on using rumen buffers, feed efficiency, milk output, health and fertility and reducing feed costs with improved rumen efficiency.

RWN offers a full nutritional support package free of charge to customers along with the most extensive range of high quality feed inputs available