

Issue 36

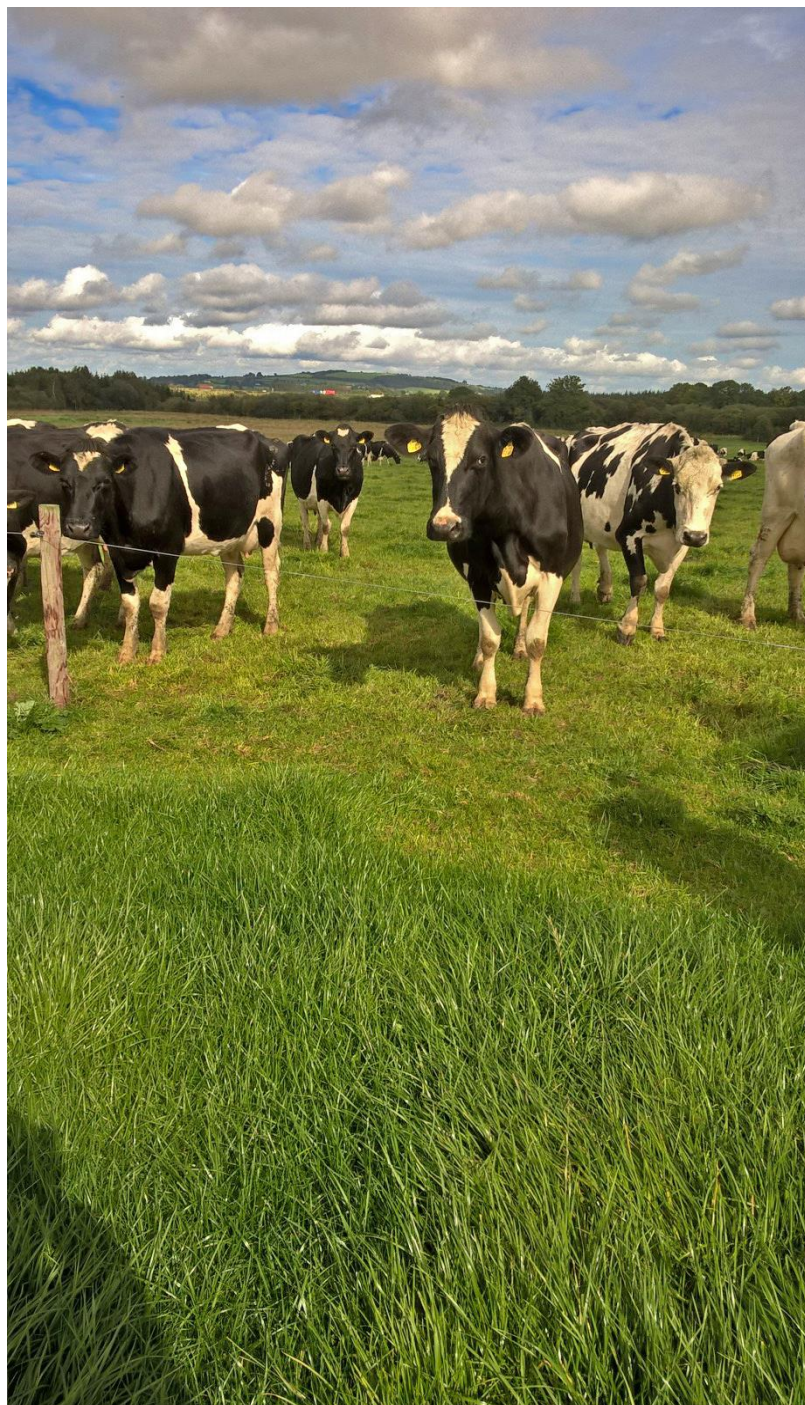
May 2020

Milk Manager NEWS



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Market Update

UK Wholesale Dairy Commodity Market

- Fonterra's latest on-line GDT auction (21st April) resulted in a large decrease of 4.2% in the weighted average price across all products, reaching US \$2,836/t. Surprisingly, the previous auction was up 1.2% on the 7th April, which was the first rise since 21st January. Butter, skim milk powder (SMP) and whole milk powder (WMP) dropped 3.6%, 4.9% and 3.9% respectively and only lactose and cheddar increased in price. Full results are available at <https://www.globaldairytrade.info/en/product-results/>
- UK wholesale dairy commodity prices have been extremely volatile throughout the month of April. Loss of sales into the food service sector, coupled with variable retail demand has made it very difficult for processors to balance supply and demand. The increase in milk volumes due to the seasonal peak has increased challenges in getting all milk processed or into the liquid retail market.

Commodity	Apr 2020 £/T	Mar 2020 £/T	% Difference Monthly	Apr 2019 £/T	% Diff 2020- 2019
Bulk Cream	£900	£1,280	-30	£1,500	-40
Butter	£2,390	£2,920	-18	£3,460	-31
SMP	£1,720	£1,990	-13	£1,650	5
Mild Cheddar	£2,880	£2,910	-1	£2,830	2

Source: AHDB Dairy - based on trade agreed from 1st to 24th April 2020. Note these prices are indicative of values achieved over the reporting period for spot trade (excludes contracted prices)

- Cream prices have varied greatly throughout April, with prices fluctuating by as much as £500/T. Varying demand from the continent and unpredictable retail demand for milk saw prices start off at nearly £1,200/t at the beginning of the month, with spot prices market dropping as low as £700/t.
- Increasing stocks of butter on the back of rising production levels has seen the butter price fluctuate by £765/T throughout April. While there has been a spike in retail sales of butter, this nowhere makes up for the loss in the food service sector.

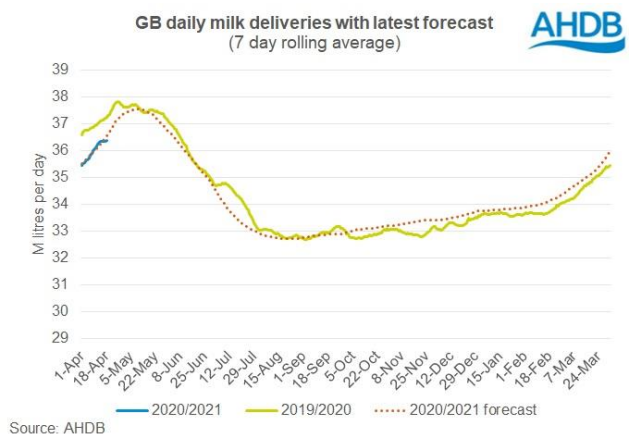
- The market is also falling for SMP and so buyers are not keen to commit to sales. Demand is fairly low as buyers are thought to be well covered for both SMP and butter. The EU Commission looks set to open private storage aid at the end of April for butter, SMP and cheese, and this may have prevented prices from falling further.
- Cheddar showed the smallest movement in price throughout April as retail demand has remained strong during the lockdown and exports are still happening, although future export demand is very much unknown.
- On the back of falling butter and SMP prices, AMPE dropped 18% for April, with the butter and SMP components back 2.61ppl and 2.42ppl respectively. MCVE only dropped 0.87ppl due to cheddar prices having been much more stable over the last month.

	Apr 2020	Mar 2020	12 months previously	Net Amount less 2.4ppl Average Haulage – Apr 2020
AMPE	23.33ppl	28.49ppl	27.83ppl	20.93ppl
MCVE	30.11ppl	30.80ppl	30.56ppl	27.71ppl

Source: AHDB Dairy

UK Milk Deliveries

- For the week ending 18th April, GB milk deliveries were up 0.5% on the previous week but were 3.2% below the same week last year (equivalent to 1.22 million litres). According to AHDB Dairy, on farm milk disposals over this period have been taken into account and the daily average production for the week was 36.35 million litres.



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- The UK's total milk production for March was down 2.4% to 1.297 billion litres according to DEFRA.
- It is estimated that about one million litres of milk has been dumped on GB dairy farms up to 18th April and the same volume of skim milk has been disposed of by processors as there were not the facilities available to dry it. Some of this will have ended up in anaerobic digestors.
- The European Commission is opening private storage aid for dairy (butter, cheese and SMP) and meat products, meaning that these will be temporarily withdrawn from the market for a minimum of two to three months and a maximum of five to six months. This was one of the requests by NFU when they recently called for government action to support the dairy industry through the COVID-19 crisis. In addition, the request for relaxing competition law was met, which will improve the flow of milk through the supply chain and identify spare processing capacity so that as much milk as possible can find a home.

Monthly Price Movements for May 2020

Commodity Produced	Company Contract	Price Change from Apr 2020	Standard Litre Price May 2020
Liquid & Cheese	Arla Farmers UK	-0.87ppl liquid -0.9ppl manufacturing	28.74ppl liquid 29.89ppl manufacture
Cheese, Liquid & Brokered Milk	First Milk	No change	26.75ppl liquid 27.63ppl manufacture
Cheese	Fresh Milk Company (Lactalis)	No change	26.50ppl liquid 27.61ppl manufacture
Liquid & Manufacture	Grahams	No change	24.50ppl
Liquid & Manufacture	Müller Direct	No change	26.25ppl (includes 1ppl direct premium)
Liquid & Manufacture	Müller (Co-op)	+0.43ppl	29.82ppl
Liquid & Manufacture	Müller (Tesco)	+0.33ppl	31.51ppl
Liquid, Powder & Brokered	Yew Tree Dairies	-2ppl	23.5ppl Standard A litre price (to be paid on only 54% deliveries)

Other News

- There is a huge amount of uncertainty in dairy markets across the globe. Although there has been an increase in retail sales of dairy products in the UK, this is small in comparison to the sudden drop in demand through the food service sector. This could not come at a worse time as milk supplies are increasing with the spring flush, there uncertain global economic outlook and dairy commodity markets are falling. Therefore, there is unlikely to be any good news on the milk price front for at least another couple of months.
- Graham's Dairy has given 12 months' notice to six of their producers who supply a combined total of around 12 million litres. Selection criteria was based on location, milk quality, forecasting accuracy and attitude towards Graham's Dairy.
- Yew Tree's price drop of 2ppl on their A litre standard price from 1st May will only apply to 54% of their producer's original volume, matching their current demand from the liquid milk sector. The remaining 46% will be paid at a price based on market returns for SMP and skim milk concentrate (SMC). Yew Trees' liquid

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milk business is heavily reliant on the food service sector and their drying facilities have been running at full capacity but it is hoped that their 2nd dryer will be up and running by the end of April to help increase capacity. Some of the excess liquid milk can be processed through the company's two evaporators to produce SMC, although market returns are currently very poor. B litres (volume produced over the original A litre volume) will continue to be priced at the FCStoneMilkprices.comUKMFE price.

- Many milk buyers have changed their pricing structure, by introducing A/B pricing or requesting either that farmers supply no more than forecasted (if so, they risk a penalty) or reduce volumes (Müller by 3%). Some examples of changes to payments are listed below:

1. Freshways dropped their price by 2ppl to 24ppl from 29th March and recently announced (17th April) they would only pay their producers 30% of the money owed to them for March deliveries, with the balance to be paid by the end of April.
2. Pensworth Dairies has reduced its May price by 2ppl to 22.5ppl (23ppl to those involved in their animal welfare standards scheme) and have also introduced A/B pricing. Their A price (of 22.5ppl) is based on 70% of milk supplied and the B price is based on average market returns in May for SMC (processed by Yew Tree).
3. Medina reduced its milk price by 2ppl in April and a further 3ppl in May, bringing its liquid standard litre price down to 20.75ppl.
4. After a 2ppl drop in their April milk price, Meadow Foods have announced a further 2ppl drop to their Cumbrian farm suppliers, taking their A litre price down to 22ppl.
5. Blackmore Vale Dairy in Dorset put forward three emergency measures which they have asked their producers to agree to:
 - Reduce milk supply volumes.
 - The current 28 days notice on milk price changes will now be 7 days notice due to the market moving so quickly from 15th April, based on a standard liquid price of 24ppl.
 - Up to three days milk supply each month will not be collected or paid for (three days would be the worst-case scenario). All these measures would apply for April, May, June and July, to be reviewed in early July.

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Straights Update

Straights prices for delivery in artic loads as of early May are as follows (varies depending on location):

£/T for 29t loads delivery + £8/t haulage to central belt	May 20	Jun 20	Jul 20 - Oct 20	Nov 20 - Apr 21
Proteins				
Hipro Soya	316	313	306	311
Rapeseed Meal	POA	POA	Aug-Oct 217	Nov-Jan 221 Feb-Apr 224
Maize Distillers Meal	244	245	POA	-
Starch				
Wheat	158	159	Jul 160 Aug-Oct 163	Nov-Jan 169
Barley	136	137	Jul 138 Aug-Oct 128	Nov-Jan 138
Maize	181	182	182	171
Fibre				
Imported Sugar Beet Pulp	191	193	195	-
Soya Hulls	180	164	164	170

Source: Straights Direct and Cefetra on 4th May. Barley and wheat prices are based on delivery to central belt (for North-East, deduct £5/t for wheat), courtesy of Julian Bell, Senior Rural Business Consultant, SAC Consulting. Prices do not include seller's margin.

Global News

- Global markets tell a tale of two halves; grains (milling wheat) and vegetable oils for human consumption have seen strong demand as consumer and state buyers stock up on key staples, while those for industrial uses linked to oil (US maize for ethanol) and more discretionary uses (barley for brewing, whisky) have seen weaker demand. The US is also expecting a large rise in maize production as area and yield potential rises strongly from the poorer harvest in 2019.
- Brazil has had a bumper crop of soyabeans (over 120mT) and combined with weak currency, has led to more farmer selling. Brazil's export figures for March were a record breaking 13.5mT and it looks like April is set to be bigger still, at 14.5mT by the end of the month.
- Soya prices rocketed during the month of March as COVID-19 caused logistical problems in countries that locked down early. Reduced

availability coupled with increased demand, with many countries increasing their imports for animal feed supplies saw prices increase by about £80-£100/t although this was relatively short-lived. In the short to mid-term, there will likely be pressure on soya prices easing back. As US soya exports remain sluggish, US stocks could be near record levels by harvest time in September.

- Despite the collapse in the price of crude oil the effect on rapeseed prices has been partly offset by dry weather conditions in Europe. Ukraine is a major exporter of rapeseed to the EU and it is estimated that their production will be down 14% compared to last year. Global vegetable oil consumption is expected to be down by 500,000T compared to 2019 due to lower demand for food and biodiesel.

UK and Scottish News

- In Scotland, wheat prices are now trading at a discount to much of England as our winter wheat crop area has not been as severely affected by the wet autumn while distilling use of wheat has been cut. Malting barley use has been affected by the closure of whisky distilleries and falling beer sales as pubs and the hospitality sector look set to remain closed for perhaps months to come. The outlook for cereal prices in Scotland this harvest is very dependent on (i) how quickly the whisky sector returns to normal production and (ii) the yield and quality of the Scottish spring barley crop and (iii) the wider UK and global cereal market conditions. As things stand, prices for feed barley and feed wheat come harvest look like they will stay under downward pressure unless crop production problems emerge in the UK or globally, and/or the world economy makes a steady recovery from COVID-19 restrictions.
- The UK wheat crop for 2020 harvest is expected to be down significantly on the back of difficult planting conditions from wet weather over the autumn and winter period. Whilst 2019 harvest was 16.3mT, there are very few estimates over 10mT for the 2020 harvest.
- More malting barley is likely to be diverting into feed usage in the UK, and with the demand for animal feed now falling, there is even more importance on the ability to export surplus stocks and this is where haulage will be a

challenge. It looks like there will be another large crop of barley in the UK this coming harvest, meaning that with the end of year deadline for Brexit negotiations, there will be added pressure for exports early in the season.

- It looks like maize could very well be cost-effective in livestock rations this coming winter, with a much-reduced wheat crop and less demand for maize for ethanol production. It could also displace some of the feed barley demand and so old crop barley may face continuing downward pressure on price, with little incentive to carry over old crop barley into the coming harvest season.

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Dealing with the Financial Effects of COVID-19

It goes without saying that COVID-19 has brought with it a huge amount of uncertainty to all parts of the economy and society in general. For the dairy industry, there was initial optimism from images of milk flying off the shelves in the supermarket. This was soon tempered by the realisation that these higher sales were not compensating for the drop in demand from the service industry. At the farm-gate, this has had a variety of consequences ranging from price drops, requests for reduced production to, in some cases, payment deferrals.

It may seem that the factors causing this are out with your control, but what can you do to prepare for or react to these changes? In the short-term, work out how much cash you actually need. This should include drawings, loan and HP repayments and any tax burden. Be sure to include pensions and investments in your drawings. Speak to your accountant to get an idea of any likely tax bill. If you don't already, get to know your cost of production. If your likely future profit is not high enough to cover your cash need the options are:

- Reduce cash need
- Reduce costs
- Introduce funds

Reducing cash need

Look at all non-essential capital expenditure, on and off farm. Discuss capital repayment holidays with HP companies. Make sure you are getting the best rates on any borrowings.

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Reduce costs

This is what farmers are constantly told to do. However, after a few years of relative stability, it is worth looking at again. The sale of unprofitable animals will reduce costs and production. Start asking the hard questions. Is she a good cow if she has recurring mastitis and took five straws to get in calf? Remember, no shows this summer.

It should be noted that some units culling or selling off extra animals have not seen a reduction in milk output. Is your unit as efficient as it can be? It is worth looking at reducing milking cow numbers especially if stocking rates are high. Chances are that milk output will be unaffected, but your variable costs will be less.

Look at all the options. If more family labour or relief help is available due to lockdown, would you be able to reduce costs by furloughing staff? Cut costs not corners. Factor in long-term effects of any changes you make. Reducing vaccinations, routine vet visits, concentrates to high yielders or minerals may lead to higher costs in the future.

Introduce funds

Do you have any equipment that is not used on a regular basis and a contractor could do the job instead? This could be sold to raise funds. If you are lucky enough to have funds outside the business, consider if this is the time to introduce them. If you have exhausted all of these options, you may need to increase your borrowings.

Increasing borrowing

If you need to approach the bank to increase your borrowing capacity, consider the following:

- Calculate how much you are likely to need using a forward budget. This will demonstrate to the bank that you have thought about what you are doing. In general, creating a forward budget will give you an idea of any potential need to increase borrowing before money runs out. This should be a dynamic document that can be changed as costs and prices change and should be reviewed on a monthly basis or at least quarterly as a minimum.
- Include a future plan of where you are taking the business and show what you are doing to cut costs or make changes. Asking for money to keep things ticking over might not lead to a positive response from your bank.

- Include industry benchmarks to show your technical ability. Use the Farm Advisory Service or AHDB website to find these:

<https://www.fas.scot/rural-business/business-tools/whole-farm-benchmarks-tool/>

<https://dairy.ahdb.org.uk/optimal-dairy-systems/key-performance-indicators/#.XqvyQqhKiUk>

- Consider a Carbon Audit. These are increasingly being used by banks as a measure of efficiency and are funded by the Scottish Government <https://www.fas.scot/carbon-audits/>
- Act early! Banks are running at full capacity at the moment so keep an eye on the long-term view so that there is time to arrange any extra borrowing.

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Home Improvements for High Herd Health

With spring underway, albeit an unusual one, and cattle out to grass, many farmers will take the opportunity to evaluate and improve livestock accommodation on the farm.

When assessing accommodation for the milking herd, two factors for consideration should be paramount; cow welfare and performance, and with that in mind some key things to consider are:

Evaluating feed access

It may seem common-sense but cows that cannot get adequate access to feed will eat less and less often, resulting in decreased productivity and potentially more welfare concerns. Cows that have to push and force access to the feed passage will be more prone to lameness, reduced feed intake and body condition loss. As a general rule of thumb, a 700 kg cow needs a minimum feed space of 70cm.

Evaluating water access

Water access is just as important for the dairy herd. However, as cattle are more likely to drink throughout the day, competition for space is less of an issue compared to feed, with the exception of a peak post-milking. High yielding cows can drink up to 200 litres per day and possibly even more. With

that in mind it is crucial that both water and the troughs it feeds into are clean and maintained regularly.

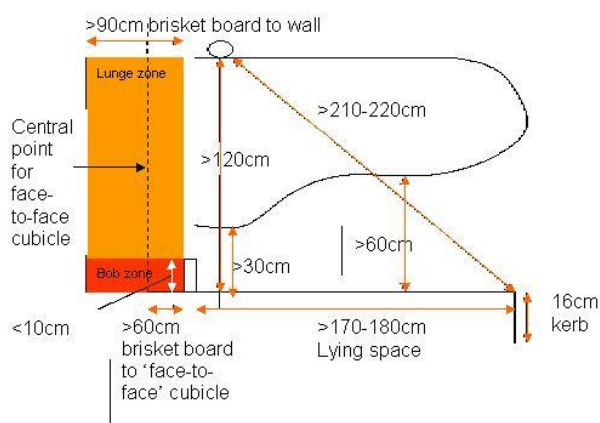
Evaluating cubicle size and access

Cubicles are a common feature for the majority of dairy herds, allowing farmers to maximise capacity, comfort and ease of management. There should be at least 5% more cubicles than cows in the milking herd. This facilitates cow flow within the shed and allows flexibility within the hierarchy of the herd. Where the number of cubicles is inadequate, you will typically find the following:

- Increased lameness.
- Lesions within the claw and on the sole of the hoof.
- Reduced lying time.
- Additional dunging of bedding, feed passages and open spaces within the shed.
- Increased metabolic and muscular stress.
- Increased cow aggression.

Cubicle dimensions are really important to cow health and inappropriately sized cubicles can lead to most of the above-mentioned issues. The standard recommendation for milking cows would see a minimum cubicle length of 2.5m and width of 1.18m.

Recommended cubicle dimensions for typical Holstein-Friesian cows



Source: NADIS

Evaluating ventilation

Ventilation has seen a lot of discussion through the Farm Advisory Service (FAS) in the last year (<https://www.fas.scot/building-ventilation/>), but it is worth repeating as it is a significant contributing factor in evaluating livestock accommodation. Poor ventilation can have knock-on effects on ration and

water quality, the longevity of bedding and the overall health of cows on an individual and herd basis, with particular reference to respiratory and metabolic health.

When considering the ventilation of a shed there are three overarching factors to think about:

1. Fresh air – the availability of free, free flowing air that is free from particles, excess moisture and harmful micro-organisms is crucial to herd health. At the same time good air quality will extend the utility of sawdust, sand or similar bedding products.
2. Moisture – saturation can be an issue across livestock housing units, with excess moisture and heat from cattle creating the perfect breeding environment for a host of potentially harmful bacteria, therefore contaminating clean water supplies.
3. Draughts – while air movement within the shed is important, draughts should be excluded. If the cow has to increase her metabolism to maintain body heat in cold weather she will lose body condition and become more susceptible to disease as immunity falls.

Carrying out a smoke bomb test will allow you to identify air flow issues within a shed, highlighting pockets where air is stagnant, so that informed decisions around building layout changes can be implemented. Smoke bomb tests should be done at animal height, giving a more representative indication of conditions at their level. In sheds with good air flow the smoke should rise quickly to the outlets, dissipating as it rises. Where smoke lingers, or even settles, this is generally indicative of a problem.

Evaluating slurry capacity

Moving into summer, it's easy to forget the issues with slurry storage in past months. Long periods of heavy rain exposed weaknesses in waste management capacity of some farms. A general increase in hygiene around the steading, in particular the removal of slurry, will reduce the spread of disease, as well as waste and contamination of feed rations, water and bedding material.

As more and more farms come under increased pressure from direct and indirect challenges of adverse weather conditions, as well as scrutiny to improve welfare, productivity and environmental standards, the summer months may be an ideal

time to reassess the farm's waste management plan.

At the end of the day every farm is different and will come with its own strengths and weaknesses. For many businesses, the farm steading is inherited and has limited scope for large-scale improvement, but small incremental changes over time can have a profound impact on herd health and welfare.

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Options to Reduce Milk Output

COVID-19 has significantly impacted on dairy markets with a huge drop in demand for milk and dairy products in the food service industry, despite a small increase in the retail sector. The introduction of A/B pricing systems and Müller requiring a 3% volume reduction until at least the end of May means that many farmers are having to look at options to reduce milk output and there are several areas to consider:

Reducing milking frequency

If going from 3x to 2x milking, the expected drop in milk volume is around 10%. For herds focusing on high solids output, moving to once a day milking might be an option and could reduce volumes anywhere between 15-30% in the first six weeks, but will very much depend on stage of lactation. Are there low yielding cows in late lactation that could be kept in a separate group and milked just once a day? Beware that there could be a rise in cell counts and potentially mastitis rates as well with a longer interval between milkings, so more opportunity for infection. Attention to detail in parlour routine and teat preparation becomes even more important to maintain udder health and milk hygiene quality. Ensure adequate bedding and perhaps more frequent bedding and use a powdered disinfectant, if not already. Also consider cow cleanliness and how clean the passageways are.

Reducing concentrates

While this might seem like an obvious strategy, reducing concentrate feed is risky, especially for high yielders and cows not in-calf. Will cows lower their peak yield accordingly or are they programmed to produce milk at the expense of body condition, even if concentrates are reduced? For high yielding cows, the risk is that energy in milk

output will still greatly exceed energy consumed, leading to an increase in body condition loss, metabolic diseases and fertility issues, with veterinary intervention required. The effect on fertility will also be felt in the long-term through lower milk output in 12 months' time.

Focus on where concentrates can be reduced for lower yielding cows and those well in-calf. Can you get some cows out to graze? Any cows giving below 30 litres should be able to have their energy requirements met through good grazing management and parlour cake in the first half of the grazing season.

For robot systems look at targeting mid to late lactation cows. Is it possible to restrict the number of milkings by increasing the time in between eligible milkings? Any alterations should be made on an individual cow basis, taking yield, stage of lactation and body condition score into consideration. Feed management of the trough could be altered by increasing energy density, so that later lactation cows are less driven to visit the robot. For example, this could be achieved by feeding less than seven litres under the herd average in the trough.

Drying off cows early

Are there cows in the herd that could be dried off early? Those overconditioned (BCS 3.5 or more) and cows over say 350 days in milk could be dried off early to reduce volumes and also save on concentrate feeds. It is important not to radically alter body condition throughout the dry period if possible. If some weight loss is required, this should be done in the early part of the dry period, with the aim of achieving the target condition score of 2.5-3 at four to six weeks before calving. For fat cows that are dried off early, a "slimming diet" may be required. Take advice from your nutritionist. Any cows producing less than say 15 litres (depending on breed and level of milk production of the herd) should be considered as they are unlikely to be covering their keeping cost. If cows are dried off early and put out to pasture, use a teat sealant and fly control measures to prevent summer mastitis.

Culling opportunities

Are there less efficient cows in the herd that can be culled? Consider culling repeat breeders, lame cows, chronically high cell count cows and those with repeat cases of mastitis (three repeats in the

same quarter or more than five cases across all quarters in the same lactation). Beware that this strategy may not necessarily reduce overall milk output if the remaining cows in the herd benefit from extra feed and lying space, especially if facilities were overstocked beforehand.

Feeding whole milk to calves

Depending on your milk contract, you could consider feeding whole milk from the bulk tank to calves and even keep them on milk for longer. However, this will not significantly reduce bulk tank volume but could have huge implications for calf health. Whole milk varies in quality depending on the stage of lactation of the cow and this is one of the risks when feeding whole milk – inconsistent quality leading to digestive upsets. Also, whole milk should not be fed if there is Johnes disease present in the herd or other infectious diseases such as *Mycoplasma bovis* or *Salmonella dublin*. The risk for disease transfer to calves is high. While pasteurisation can reduce the risk, it will not eliminate it.

If you must reduce milk output, take advice from your vet, consultant and/or nutritionist regarding the best strategy for your herd and management system.

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Increasing Genetic Progress in Scottish Dairy Herds

Genetic progress can be affected by a number of factors including selection accuracy of the parents, selection intensity, genetic variation and generation interval. Technologies such as genomics have gone a long way to improving genetic gain by reducing the generation interval down to the age of reproductive maturity plus gestation. Advanced reproductive technologies such as MOET (multiple ovulation embryo transfer) have been responsible for increasing selection intensity as up to five embryos can be produced from a single flush, thus improving genetic progress. A project funded via KTIF (Knowledge Transfer and Innovation Fund) known as the Fast Breeder project, which finished on the 31st of March 2020, aimed to increase genetic progress amongst dairy cows using advanced reproductive technologies. The Fast Breeder project involved three block-calving grazing herds in the south west of Scotland and aimed to increase milk production by increasing the

rate of genetic progression using the advanced reproductive technology of juvenile in vitro embryo transfer (JIVET). It also looked at how financially viable the practice would be.

JIVET aims to shorten the generation interval by collecting oocysts before the animal has reached reproductive maturity. In theory the generation interval from the dam's side could be as short as nine months of age, the length of gestation, if carried out on a newborn calf. Using genomic selection of sires in conjunction with JIVET over 25 years could see a genetic improvement of milk yield by as much as 22%.

JIVET involves using gonadotrophins to stimulate the ovaries of calves between the ages of two to three months and using laparoscopy to recover the oocytes. The oocysts are then fertilised in vitro and grown to the morula/blastocyst stage before potential implantation into a donor cow. Using this method, studies have found that from one ovulation between eight to ten pregnancies can be created, which therefore increases selection intensity and genetic progress.

The success of the procedure is dependent on factors such as the type of hormone used to stimulate ovulation, calf nutrition and selection accuracy of donor calves. Over the years many studies have been carried out looking at which hormones produce the best quality oocysts as well as the most numerous. The consensus now is that gonadotrophic hormones are best. The nutrition of the calf, particularly the quality of the milk it is being fed can affect the number and quality of the oocysts produced. In particular Galli *et al.*, (2003) found that beef suckler calves were better oocyst donors than Holstein-Friesian calves due to differences in milk composition from suckler milk compared to milk replacers. Therefore, dairy calf nutrition will play a massive role in the success of the procedure. Due to the age of the calves at the time the procedure is carried out, it will not have been possible to evaluate the milk production characteristics of that individual, therefore the use of genomic selection will play a big role. Again, it will take a number of years before milk characteristics of the embryos can be assessed by traditional methods such as progeny testing.

In the future a combination of genomic selection and advanced reproductive technologies such as JIVET could vastly increase the rate of genetic gain

in Scottish dairy herds thus equipping farmers to produce milk more efficiently. Results of this project will be published in a future issue.

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Milk Urea – A Practical Guide

Milk urea can be a useful tool to assess protein nutrition in the dairy herd. It is a fairly crude measure but can give an indication of whether there is excess rumen degradable protein (RDP) in the ration in relation to fermentable metabolisable energy (FME) in the rumen. This is often the case when cows are turned out onto lush spring grass, where protein levels can be in excess of 25% (and the target for the milking ration should be around 16-17% protein on a dry matter basis).

Urea is formed when excess RDP is broken down to ammonia in the rumen. Ammonia is absorbed across the rumen wall and transported to the liver where it is detoxified into less toxic urea. Most of the urea is excreted in urine and some ends up in milk.

The target range of urea in milk is between 0.015 to 0.03%. High milk urea has been linked to reduced fertility and is thought to lower the pH of the uterine environment leading to reduced conception rates and embryo loss.

It is rare to see very high milk urea levels in housed herds as generally protein levels in milking rations have reduced over the last few years, due to the cost of buying in protein and the drive to improve efficiency and reduce nitrogen excretion to the environment. Where high milk urea can arise is where high protein multi-cut silage is being fed as the only source of forage. Over 80% of the protein in grass silage is rumen degradable and if there is insufficient energy to capture this, it can lead to high milk urea. This type of forage works best when fed alongside wholecrop cereals or maize silage to limit the supply of RDP and add more effective/structural fibre to the TMR.

High milk urea can also be seen on cows grazing very high clover swards. Even at grass, the provision of buffer feeding will help limit milk urea levels in grazed herds and for herds that rely on only grass and cake, a 14% protein cake in the early part of the summer will suffice.

There are instances where milk urea is low, and this is not always necessarily a bad thing. It could mean that the ration is very well balanced with little excess RDP. There could also be more than FME available to help capture any excess RDP, with little ammonia being produced in the rumen.

From a practical point of view, low milk urea could point to issues with feed intake. A drop in milk urea could indicate that feed intake has reduced. Perhaps there are more cows being milked and feed space at the feed fence has dropped? Or has there been a change in silage quality, reducing dry matter intake? Recommended milk urea levels are detailed in the table below, along with suggestions for altering levels to achieve the target range.

Levels of milk urea, causes and recommended actions

Milk Urea Range %	Milk Urea Range mg/L	Cause	Result	Action
LOW < 0.015	<150	Lack of RDP and/or excess FME	Stiff muck Poor rumen function Poor FCE Lower milk yield	Increase RDP e.g. 50-100g urea or more rapemeal/ grass silage
MED-IUM 0.15-0.03	150 – 300	Good balance of RDP and FME	Good milking performance	None
HIGH > 0.03	> 300	Excess RDP and/or inadequate FME	Loose muck Reduced fertility Dirtier cows – higher SCC?	Reduce RDP, feed more DUP sources (soya, protected proteins) Increase starch from cereals

Monitor milk urea levels and act if they consistently exceed 0.03% of 300mg/L. In early lactation feeding excessive protein can lead to increased loss of body condition. This is easily corrected by lowering RDP from protein sources and/or feeding more starchy cereals (if safe to do so) or digestible fibre sources such as sugar beet pulp or soya hulls. There is an energy cost for the liver to convert ammonia to urea and this is the likely reason that overfeeding protein and high urea can lead to a loss

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in yield. Conversely, if milk urea is low and milk yields are below expectation, feeding extra protein will likely result in a milk yield response.

Milk urea can vary considerably between cows and with stage of lactation and so individual cow values are not very useful. Therefore, interpretation of milk urea should be done at the group level, with a minimum of eight cows and in conjunction with information on nutrition and feeding management practices.

The liver is crucial in the conversion of ruminal ammonia produced from excess RDP to urea. However, if cows in early lactation are experiencing fatty liver, the detoxification of ammonia to urea is compromised. If milk urea levels are low when cows are on high protein diets, then consideration must be given to how well the liver is functioning and whether there could be a build-up of ammonia in the system. This is why it is so crucial to provide sufficient FME to early lactation cows at grass to minimise urea production, otherwise there could be further strain/demand on liver function at a time when it may already be compromised.

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Useful Resources

With the cancellation of all face-to-face events for the foreseeable future, useful sources of information are listed below:

Farm Advisory Service information for dairy
<https://www.fas.scot/livestock/dairy-cattle/>

AHDB Dairy
<https://dairy.ahdb.org.uk/>

AHDB Dairy Webinars
https://www.youtube.com/playlist?list=PLbxhW7-AcqGWbM_qhrkza5VHAARM57LCq

Hoards Dairyman Webinars
<https://hoards.com/flex-309-webinars.html>

Cornell University Pro-Dairy Programme Webinars
<https://prodairy.cals.cornell.edu/webinars/>

AHDB Forage for Knowledge
<https://ahdb.org.uk/knowledge-library/grass>

GrassCheck NI from AFBI
<https://www.agresearch.org/grasscheck>

Agrecalc (Carbon Footprint Tool) by SAC Consulting
<https://app.agrecalc.com/>

For any further enquiries regarding the information in this newsletter please contact:



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