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September 2023

News in brief

2023 weather not favouring farmers

It has been a very variable growing season this year, with a cold and dry spring, followed by a June heatwave then a washout July and August. Not ideal for crops, and that is seen in the fields.

Forage quality has been very variable, and the last week busy with a scramble to bring in grass while the weather stays drier. The Scottish Farmer reported this week that beef and sheep carcase weights are down on the year, with slaughterhouse throughput up to compensate for reduced weights and maintain output tonnage.

Cereals too are looking short, following the cold, dry start to the year and changeable summer, and cereal quality so far is very varied. Early suggestions are that straw supply will be low, and overall quality poorer and more varied than usual, not helped by a reduction in pig and poultry numbers affecting feed demand.

In policy news, just this week Scotland's Rural College published a series of reports presenting evidence and analysis to support rural and agricultural development policies for Scotland. The twelve reports, and summaries, can be read here: https://www.gov.scot/publications/evidence-support-development-new-rural-support-scheme-scotland-summary-written-outputs/

With a chunk of income coming in in the next few weeks, it is a good time of year to take stock ahead of purchasing winter supplies. This month's input costs article looks at low emissions heating options and funding sources, for those looking to reduce energy bills in the long term. Next month's management matters article will take a deep dive into budgeting for the year ahead.

Next month:

- Financial budgeting
- Feed update

Contents

This month's editor:
Anna Sellars

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Photo identification needed to buy AN

Under the amended Home Office Control of Poisons and Explosives Precursors Regulations 2023, from the 1st of October 2023, farmers, crofters and land managers will be required to provide photographic identification to purchase ammonium nitrate (AN) fertiliser with a nitrogen content of 16% or more. This applies to compounds, blends, and N:P:K fertilisers containing AN above the 16% threshold. Blends containing straight AN with a base concentration of 34.5% will be over the threshold even if the resultant blend is declared at less than 16% N.

In seeking to tighten the controls for poisons and chemicals which can be used to make explosives known as 'explosive precursors', the UK Government has updated the Poisons Act 1972 to include new chemicals to the list of reportable and regulated substances. As a consequence, businesses supplying what are deemed to be explosives precursors to professional users and other businesses must verify the legitimacy of the individual or business, hence the requirement for photographic ID. Examples of photographic identification can include: passport, driving licence, trade identification card, business ID card.

Other Statutory information that will be required to purchase fertilisers with an AN content of 16% or greater will be:

- The name and address of the purchaser (individual or named representative of a business);
- A statement of the nature of the business customer's trade, business or profession, or of the public function that the individual/company performs, and;
- If VAT registered, the business customer's VAT registration number.

While under the 2023 Regulations, the required information does not need to be physically presented in person. As all the information must be recorded and retained for 18 months and available for a police inspection, retailers may require photographic ID to be provided in person to ensure authenticity of the purchaser rather than a photograph of the ID being attached to an email. For further information of the forthcoming legislative changes, please see online at GOV.UK

The Wildlife Management and Muirburn Bill

With the shooting season underway, the Wildlife Management and Muirburn Bill currently at stage one of its journey through the Scottish Parliament is seeking to implement recommendations for increased grouse moor management and trap regulation, as set out in the in December 2019. While sustainable grouse moor management provides conservation benefits, particularly for ground-nesting birds, birds of prey, rare moorland plants and pollinators the Bill aims to address illegal targeting of birds of prey and ensure that the management of grouse moors and related activities are carried out in an environmentally sustainable way.

Under the current proposals, if the Bill is passed, stricter rules will be introduced for muirburn, a licence will be required to shoot red grouse and the use, purchase and possession of glue traps will be banned, and new licensing and training requirements will be introduced for certain types of wildlife traps.

As part of the ongoing consultation process, the Scottish Government is currently seeking the public's views on whether there should be an outright ban on the use of snare traps, or if any exemptions should be considered. Equally, opinion is being sought on extending the investigative powers of the SSPCA which would involve giving inspectors more authority to search, examine and seize any evidence relating to incidences of illegal hunting and other offences. For further information, please see online at: Protecting Scotland's wildlife - gov.scot (www.gov.scot). The consultation period ends on the 3rd October 2023.

Animal health and welfare support now open for claims

If you have undertaken the Animal Health and Welfare activities included in Preparing for Sustainable Farming (PSF) Support, you can now make a claim at www.ruralpayments.org. Any farming or crofting business that has an active Business Reference Number, is Rural Payments and Services online registered, and has a flock/herd number can undertake up to two interventions in each scheme year of the Programme. Each intervention will attract a standard payment of £250, with the first claim an additional £250 to cover personal development. The online claim platform has now been updated to allow claims for AHW claims to be submitted in addition to carbon audit and soil analysis support.

Further details of the funding available under Preparing is available on the Rural Payments Website

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Tentative firming of markets

Whilst the wheat Futures market has recently reflected escalations in the Black Sea region conflict, notably the drone attacks in the Danube and Odessa regions and the consequential risk to sea freight, latterly the focus has turned to US weather and its potential impact on global prices. The markets have managed to firm over the last fortnight on the back of these dry weather concerns particularly relating to US spring crops and speculation of lower Australian and Canadian production has also provided some buying impetus to the market. London feed wheat Nov 23 Futures stood at £190.85 on 24th August, up 2.11% since the 16th of August.

The EU markets followed the trend trading slightly higher week on week. EU wheat exports have got off to a slow start this season, down 20% at just over 4Mt as demand for EU supplies remains limited. Russian crop estimates continue to rise and so therefore does the export potential, which may be pertinent as there is increased talk of an Indian / Russian trade deal due to a weather-related lower crop on the Indian sub-continent.

The EU wheat harvest tonnage output has been cut to 124.73Mt which is 5Mt lower than previous estimates due to weather issues, especially in France. Germany has some sprouting problems in fields still to be cut due to the ongoing wet weather and they normally export a lot of bread making wheat to the UK. These two countries along with Canada accounted for nearly 70% of UK imports last season and consequently could bolster milling premiums for UK growers that do manage to meet specification.

Scotland's harvest progress

A frustrating and difficult harvest so far; any milling wheat is reported as very variable with 12% protein and sub 10% protein common in Group 1 & 2 varieties respectively and Hagberg's struggling where crops have been lodged. Distilling wheats need high starch levels relative to protein so good grain specific weight is desirable, some may struggle at 72kg/hl. The spring barley crop is proving troublesome too, with secondary tiller growth resulting in uneven ripening and desiccation will be delayed into September for some as a result.

So far there has been mixed feedback for any spring barley harvested; screenings are ranging from 5-20%, skinning is in evidence and there are concerns over grain germination capacity.

However, maltsters are reluctant to change their specifications for quality before the bulk of the spring barley harvest is in the shed and can be assessed. In summary premiums are very strong and look overvalued amid low demand and at these levels the market is quickly finding the flexibility to fill in any supply side issues, the EU for example, sourcing 6 -row varieties from France into northern Europe. For UK growers it'll be essential, going forward, to ascertain quality before marketing, both to optimise premiums on the upside and protect against claims on the downside.

UK oilseed rape yields are being reported as below the 5-year average (3.3t/ha) at between 2.7-3t/ha. Europe appears to have fared better both on yield and oil content and prices have drifted lower as a result, longer term values will build in the output achieved from Australia and Canada's harvests. The EU supply side will however remain underpinned by high opening stocks and substantial imports continuing from Ukraine.

Food & Agriculture Organisation

Over the next decade, the FAO report that cereal production is expected to increase by 12%. Almost half of this production increase will come from maize, while wheat (and rice) account for about 20% (each) and other coarse grains account for the remaining 10%. More than half of the increase in wheat will come from India, Russia, and Canada. The United States, China, and Brazil will account for more than half of the increase in maize production. For other coarse grains including barley and oats, the major increase in production will be in India, Sub-Saharan Africa, Ethiopia, and Canada. World cereal trade is projected to increase by 15% by 2031. Wheat will contribute about 40% to this increase while maize, rice and other coarse grains account for 30%, 16% and 8%, respectively. Russia will remain the largest wheat exporter, accounting for 22% of global exports by 2031. The United States will remain the leading exporter of maize, followed by Brazil, Argentina and Ukraine.

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Indicative grain prices week ending 30th June 2023 (Sources: Frontier,SAC,ODA,ADM,AHDB)

£ per tonne	Basis	As available '23	Nov '23	Mar'24
Wheat	Ex farm Scotland	173	190	199
Feed barley	Ex farm Scotland	155	172	182
Malt. dist. barley	Ex farm Scotland	230	255	
Oilseed rape	Delivered Dundee	360	368	378

Beef price levelling out?

Throughout June and July, deadweight beef prices in Scotland have fallen significantly from a peak of 525p/kg at the beginning of June. Beef prices have continued to fall throughout August, as a result of larger supplies, lower import prices and poor consumer demand due to school holidays with consumers holidaying abroad. 469p/kg/dwt is now being quoted in Scotland for R4L steers.

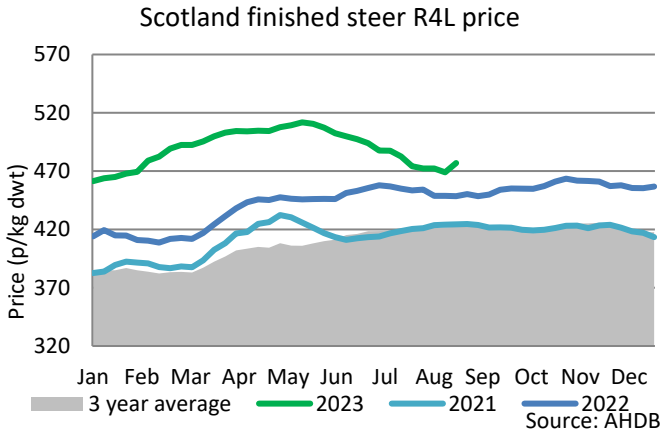
It is anticipated that once the schools return in September prices will increase. Going forward cattle numbers will continue to tighten, due to the peak young bull selling period now over and supplies of spring 2021 born cattle dwindling. Lower cattle availability will offer support to price, as processors look to increase prices in order to secure cattle.

Despite a fall in in finished price, trade for store cattle has remained fairly steady, with July weather hampering combines rolling out sheds, store cattle were keenly bid for. However good weather in recent weeks, has seen store trade dip slightly, as harvest keeps buyers away from the ring.

Store trade

Demand continues to be high for shorter keep stores whilst smaller stores are noticeably cheaper. English buyers continue to support Scottish store sales, with availability south of the border and TB risks meaning finishers are coming North. This is encouraging to keep the market healthy as we head towards the big autumn calf sales, where some finishers could well be cautious, off the back of the falling beef price and with several finishers having made a loss on store cattle bought at their highest levels back in the Spring.

Although variable costs such as feed and fertiliser have started to return to a reasonable level, margins remain tight across many farms as labour and veterinary costs remain high with bank interest rates increasing.



Cull cows supply vs demand

Cull cow values have seen a sharp fall in the first half of August. With no BBQ weather and consumers abroad, retail demand for manufacturing beef has not been there. With numbers available for slaughter reported to be trending seasonally higher (there are still farmers looking to sell older, less productive animals), it is unlikely that prices will rise in the coming weeks, and with milk prices looking to drop, cull cow numbers could quickly rise. For those with spring calvers, scanning early to get empty cows offloaded before any potential dip in trade pre housing when seasonally higher numbers of cows are expected would be advised.

Looking forward

Going forward farm businesses will need to plan ahead and budget, however difficult this might be due to market volatility.

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Scotland prime cattle prices (p/kg dwt) (Source: drawn from AHDB and IAAS data)

Week Ending	R4L Steers (p/kg dwt)			-U4L Steers			Young Bulls -U3L		Cull cows	
		Change on week	Diff over North Eng.		Change on week	Diff over North Eng.		Diff over North Eng.	R4L	-O3L
05-Aug-23	**472.3**	-1.9	1.7	**469.6**	-4.6	-6.6	462.0	2.6	385.2	346.5
12-Aug-23	**472.2**	-0.1	1.0	**471.2**	1.6	1.6	460.9	1.6	377.6	334.4
19-Aug-23	**469.0**	-3.2	1.8	**466.2**	-5.0	-4.6	462.9	4.8	378.1	332.0

Sheep

On the ground

With a warm and wet summer, there is plentiful grass across the countryside. This availability of grass is driving people to the store lamb rings, maintaining prices at similar levels to last year. However, the wait for the BPS loan payments and the effects of the high interest rates on borrowing money/market finance can be seen in breeding sheep and tup sales.

With the drive for cash flow, some are selling store lambs earlier than normal, these may have been third or fourth draw lambs in previous years, with a lack of bloom to them, which is creating a firm bottom end of lambs at sale.

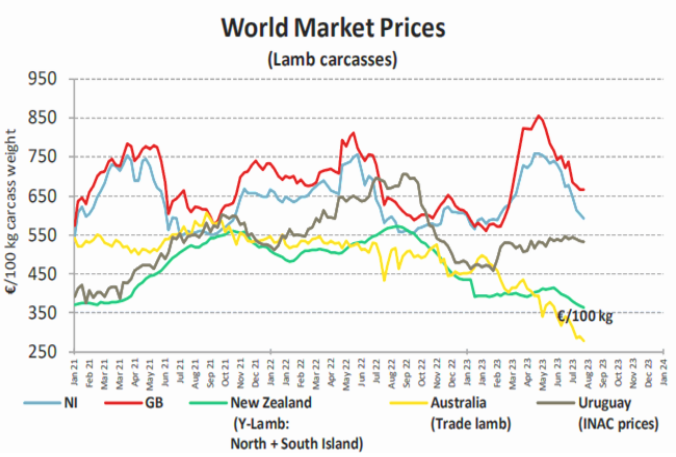
The cull trade has dropped gradually since May, with weaning progressing well in the late lambing flocks, there are more leaner type upland and hill ewes coming forward, which has dented the high averages we have seen over the last number of months. This high supply of ewes will continue now through to October, which will continue to supress the trade.

Global trade

French lamb remains at the top of the pricing table with a premium (week ending 12th August) at €8.00/kg DW, compared to a very similar €8.02/kg DW for the same period last year. The Spanish product is at a reduced premium of €6.74/kg DW for the same week (was €6.77/kg DW the same period in 2022).

Looking at the other end of the table is the Australian lamb which for the week ending 12th August was trading at an incredibly low rate of €2.80/kg DW, compared to €5.09/kg DW in the same period last year!

The Australian flock has undergone flock expansion in recent years, and a large stock of lambs is now coming forward following a period of poor weather meaning a greater supply of lambs, at the same time as a drop in demand from the Chinese market.



Source: European Commission

Looking at the price differentiation between exporting countries in the above graphic illustrates how attractive in price the Australian and New Zealand lamb is, which will result in more volume being exported to the EU and the UK. Which could result in the volume exported from the UK to the EU being distorted, and our price decreasing.

Positivity!

At a time when more lamb may be coming to the EU from other sources, it is worth highlighting that the EU flock is declining, they have suffered an extraordinary hot and droughted summer, which has affected production negatively and some Spanish flocks have had losses from the sheep pox virus, all of which is speeding up the decline of the European flock. Consumption of sheep meat is not forecast to decline like other red meats, due to being favoured culturally and for religion. The European Commission have estimated that imports of sheep meat will increase by 12% this year, mainly from the UK and New Zealand.

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Week ending	GB deadweight (p/kg) 16.5 – 21.5kg				Scottish auction (p/kg)				Ewes (£/hd)	
									Scottish	Eng&Wal
	R3L	Change on week	Diff over R2	Diff over R3H	Med.	Change on week	Diff over stan.	Diff over heavy	All	All
05-Aug-23	**575.0**	-7.0	-1.0	2.6	**255.60**	-5.8	12.0	0.1	79.60	85.76
12-Aug-23	**574.5**	-0.5	-2.9	-0.6	**269.50**	13.9	10.9	3.4	79.90	88.90
19-Aug-23	**583.1**	8.6	0.6	2.3	**260.70**	-8.8	16.0	-0.8	77.80	86.28

Deadweight prices may be provisional. Auction price reporting week is slightly different to the deadweight week. Source: AHDB and IAAS
Standard weight 32.1 - 39.0kg; Medium weight 39.1 - 45.5kg; Heavy 45.6 - 52.0kg

Improving fertility with semen testing

Performance of suckler herds has never been more important as increased input costs continue to put pressure on businesses and squeeze margins. Improving on-farm efficiencies such as herd fertility strongly correlates with reduced production costs per kg of beef sold. Improving performance within a beef herd relies on optimal fertility.

Many farmers have taken advantage of the attractive cull cow price over the past 18 months, opting to cull poor and underperforming animals in order to improve efficiency. However, how many farmers have semen tested stock bulls to identify underperforming and sub fertile bulls? Sub fertility can affect up to 25% of bulls, with there being no guarantee that a bull will retain fertility from one breeding season to the next.

Therefore, it is vital that you are know bulls are capable of doing their job. For those herds who are rotating bulls, the severity of bull infertility could well be masked, as you may not be aware there is an issue and can still be losing performance.

Bull infertility is costly, resulting in reduced calf output through having less calves to sell and lighter calves at weaning due to calves being born later (bull fertility is key to maintaining a tight calving period). When the cost of heifer replacements is considered then the potential cost of one bull's reduced fertility could run into thousands of pounds. This can easily be increased if there is more than one sub-fertile bull in the herd. To ensure suckler cow fertility is not comprised semen testing is an essential part of maximising herd performance and calves reared.

Funding for testing

In a 3-year trial run by SRUC Vet Iain McCormick, it has been found that on average, 1 in 5 bulls fail a fertility test irrespective of age or breed, with young bulls failing as much as older stock bulls. Routine annual testing of bulls is something which more herds are carrying out. There is funding available for assessment of bull fertility and bull pre-breeding examinations as part of the Scottish Government's *'Preparing for Sustainable Farming'* under the animal health and welfare interventions aimed at better production efficiency.

For more information see: https://www.ruralpayments.org/topics/all-schemes/preparing-for-sustainable-farming--psf-/ and consult your vet if you are interested in bull fertility testing.

With the autumn bull sales only weeks away, now is the time to semen test stock bulls, so problems can be picked up on and a new stock bull bought ahead of the next breeding season. For those bulls still running with cows, semen test when bulls are taken out, as pregnancy scanning reports a historic event, and so will not prevent the problem of empty cows, if bull fertility is the problem.

Bull selection

Buying a stock bull is an important decision. Breeding decisions made at these autumn bull sales will impact the herds productivity and efficiency for the future. A bull bought in 2023 will not have calves on the ground until 2025 with these calves not finished until 2026 at the earliest. If heifer calves are retained for breeding, their calves won't be on the ground until 2027 at the earliest. Breeding decisions made today have a major impact on the future of a herd, therefore it is important that farmers look to the future. Take time to evaluate what bulls at the upcoming autumn sale offer your herd, to ensure the investment will have a positive impact. Remember a bull bought to breed heifer replacements, will have his genetics in the herd for potentially the next 10 years.

The use of EBVs can help when choosing a stock bull to identify how the bull's offspring should perform productively. EBVs are not comparable across different breeds, the figures allow comparison of genetic traits of bulls within a breed type. All breeds have different values as their average. The importance of EBVs will depend on whether the bull is being selected as a terminal or maternal sire.

These figures should be used alongside visual assessment of the bull considering conformation, locomotion, scrotal size and shape. Scrotal size is linked to fertility. Bulls with increased scrotal size are likely to produce males with increased sperm quantity and quality with earlier puberty in heifers being strongly linked to the scrotal circumference of their sire.

The BCVA Bull Pre-Breeding Examination Certification Guidelines for age and minimum scrotal size are:

Age in Months	12-15	15-18	18-21	21-24	>24
Minimum SC cm	30	31	32	33	34

Source: The Society of Theriogenology SC standards

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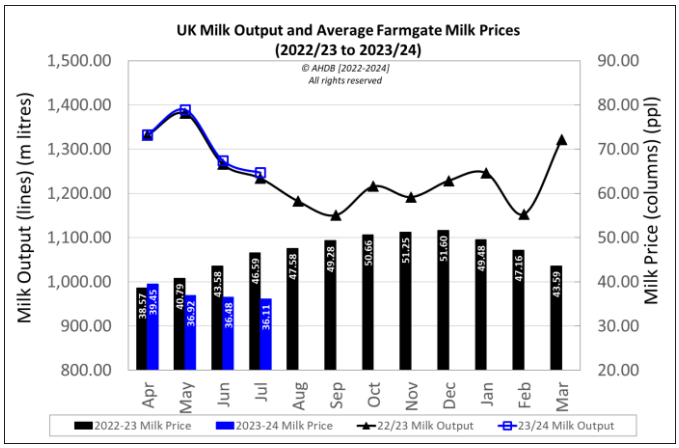
Negative sentiment in dairy markets continue…..

- *Milk volumes are still in the seasonal decline, but production is still slightly ahead of last year.*
- *Most processors are holding their milk price for September despite further drops in wholesale prices and the GDT auction.*

Milk production data

The latest milk production data shows that UK milk output for July 2023 was 1,247m litres, 2.2% less than the previous month and just 1% less than July 2022 volume. As of the week ending 19th August, daily milk deliveries were 32.09m litres, 0.3% below the previous week but 1.7% (or +0.53m litres a day) more than the same week in 2022.



Grass growth

Grass growth rates are still well above the 4-year average at 58.9kg DM/ha as of 21st August (GrassCheckGB). Average grass crude protein content across dairy, beef and sheep farms was 18.5%, with an ME of 10.5MJ/kg DM. Based on this, a 650kg spring-calving dairy cow consuming 13.5kg DM of grass will produce just M+12.6 litres from grass alone (3 litres less than in July). As always, this is just a guide and milk from grass will very much depend on your own grass quality and availability. It is worth getting fresh grass analysed to ensure grazing cows are not underfed energy at this time of year.

Farmgate prices: September 2023

Milk Prices for July & August 2023 Scotland	Standard Ltr ppl	
First Milk Manufacturing *(4.2% BF & 3.4% Protein)*	Sep	36.85
Müller - Müller Direct - Scotland [1, 2]	Sep	36.75
Grahams[1] *	Aug	36.00
Arla Farmers Manufacturing (4.2% BF & 3.4% Protein)	Sep	35.21
Lactalis / Fresh Milk Co.[1]	Sep	35.50
Yew Tree Dairy[1,3] *	Aug	36.00

1 *Liquid standard litre – annual av. milk price based on supplying 1m litres at 4.0% butterfat, 3.3% protein, bactoscan = 30, SCC = 200 unless stated otherwise.*

2 *Includes 1.00ppl Müller Direct Premium + additional 0.25ppl haulage charge for Scottish suppliers.*

3 *Liquid standard litre price for A volume litres.*

* *Aug price – Sep price not announced at time of writing 29 Aug 23.*

The Defra average UK milk price for July 2023 was 36.11ppl – down 0.37ppl from June and 23% lower than July 2022. Milk prices are more stable, with more processors holding their August price for September, with fewer price reductions announced across the UK.

Dairy commodities & market indicators

Trade in dairy commodity products has continued to be quiet over the summer holiday period, with prices of all products slightly back on last month on the back of subdued demand, lower wholesale prices in the EU and a further fall in the latest GDT auction. Both market indicators AMPE and MCVE fell for July 2023, reflecting decreases in the commodity prices and are on average 5ppl less than six months ago.

UK dairy commodity prices (£/tonne)	Aug 2023	Jul 2023	Feb 2023
Butter	3,680	3,790	3,920
SMP	1,850	1,900	2,200
Bulk Cream	1,623	1,644	1,508
Mild Cheddar	3,330	3,470	3,680
UK milk price equivalents (ppl)	**Aug 2023**	**Jul 2023**	**Feb 2023**
AMPE	28.61	29.66	33.47
MCVE	34.14	35.87	39.47

The latest GDT auction (15th August) crashed 7.4% from the previous event to an average of £$2,875/t (average price $3,289/t as of 18th July). Only cheddar returned a positive price movement, up 5.8% to $4,127/t, while whole milk powder, skim milk powder and butter fell 10.9%, 5.2% and 3% respectively.

Looking forward

Over the next 6 months, variable costs are thought to be slightly lower than previously, but volatility will remain with the biggest impacts likely to come from any extreme weather events, developments in the Ukraine war and changes to oil output which could impact on energy costs. External factors will have more impact on our dairy markets than domestic production or events, with the European market heavily influencing the UK market and EU milk production up 0.8% in the first six months of this year.

According to the Dairy Group, the prediction for the rest of the 2023/24 milk year is that continuing high costs will mean negative cash flows for many and only the top 25% of producers are likely to make a profit. Farmers are feeling the pressure, not only from the low milk price in relation to the cost of production but from trouble sourcing labour and investment costs to conform to new slurry storage regulations. A recent survey of 590 dairy farmers by the NFU, revealed that 20% were unsure if their business would continue past 2025 and 9% said they would likely stop by 2025.

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Sector Focus: Buffalo farming

European water buffalo (*Bubalus bubalis subsp. river*) currently provide 11% of the world's milk supply and this volume is growing. While famous for mozzarella production in Italy, given their preference for wet climates and grass diets, they are no stranger to the UK, being kept for both milk and meat production.

Like cattle but not like cattle!

Like cattle, water buffalo are ruminant herbivore mammals. Although they perform well on high input intensive systems as seen in Italy; they can also thrive on low input, low-quality, fibrous forage, converting grass efficiently to milk and muscle. Water buffalo can digest rougher forages than cattle linked to having a higher rumen pH together with a larger population of rumen bacteria, particularly the cellulolytic bacteria.

Breeding

Water buffalo cannot be crossed with other cattle or bison. While rotating bulls is the normal practice in UK, AI is also used. After a gestation period of ~310 days, buffalo will calve themselves and many herds have a 95-100 calving percentage. Buffalo are naturally fertile and will conceive within the 1st or second cycle with the bull. Cows can live up to 25-30 years reaching 500-750 kg lwt. Buffalo heifers mature early and like beef and dairy cows can be bulled successfully at ~13-14 months (buffalo ~280kgs LW) to calve down at 2 years old.

Health

Buffalo need to be health monitored for all the things cattle are, such as BVD, TB, Johnes, IBR, Leptospirosis, Neospora etc. In general, buffalo are a more disease-resistant, worm resistant species requiring very little intervention. Unlike dairy cows, they have very few feet issues.

Diets and grazing management

In the UK, while there are farms that have complex concentrate diets and produce high yields >12 litres/day and good growth rates >1.5kg/day; these results have also been achieved on grass-based systems in established herds with good genetics. From a grazing perspective, generally, water buffalo can be reared on any grass system, including strip and rotational grazing and they respect and move well with an electric fence.

Keeping cool

While the high melanin concentration in the skin of water buffalo provides them with increased protection against ultraviolet radiation; they have a less efficient evaporative cooling system than cattle due to their poor sweating ability. However, as their black skin is rich in blood vessels, it conducts and radiates heat efficiently making them cool off faster than cattle in the shade. Practical experience has shown that wallowing areas are not essential, but the buffalo will appreciate it if you can provide them mud scrapes and a water pool, especially on a hot day!

Housing

Buffalo are intelligent animals; they communicate via grunts and snorts but normally they are very quiet grazers and shed occupiers. While their inbuilt cooling system means that they do not need to have their backs shaved when housed for the winter, clipping tails helps to reduce the risk of mastitis.

Milking & milk composition

Buffalo can be milked by robots, rotary, herringbone, or tandem parlours, but establishing suitable milking routines requires time and expertise as they differ from those used with cows. The lactation period is ~270 days. While highest yields are generally achieved during the 3rd lactation; buffalos have greater longevity than dairy cows with buffalo herds often having cows with 15 consecutive lactations.

Upside: Buffalo milk can be 25% milk solids linked to the very high fat content (~ twice that of a dairy cow's milk) and the fat-to-protein ratio is about 2:1, with a higher casein-to-protein ratio.

Downside: average yield ~10 litres/day. The high calcium content of casein facilitates cheese making which is the dominate product from UK farms followed by ice cream and bottled milk. The raw milk can be worth from 75p/litre to over a £1/litre depending on contract and supply.

Calves and buffalo beef

Calf birth weights range from 35–45kg. While water buffalo have their iconic horns, many farmers for health and safety reasons dehorn calves at birth. Following 7 days colostrum/early milk, calves move onto a milk replacer (normally sheep milk) for 10 weeks - supplemented with hay and concentrates.

Beef calves are normally weaned from 6 months. Animals for beef can be finished at similar ages to cattle with both sexes' fat at 20-30 months and at weights from 500–750kg depending on DLWG. In Italy, some finish at 14 months but at lower weights. Buffalo has a similar KO percentage to cattle at around 50% and are sold at prices in line or higher with the top cattle trade, the carcases go to retail or private sales. In Scotland there is only one abattoir that can kill buffalo.

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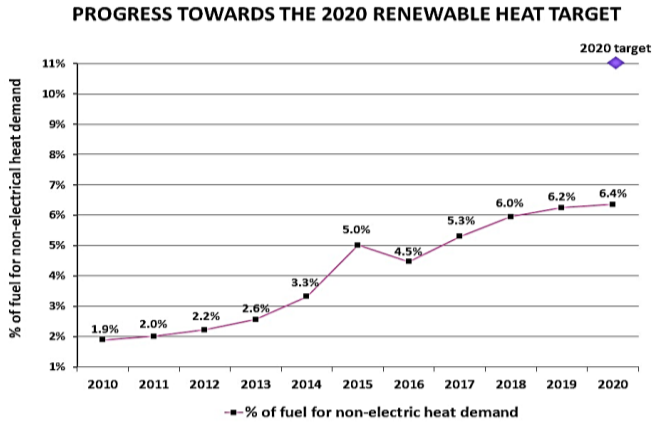
Turning up the heat

Scotland has made significant progress over recent years to increase its renewable output, with renewable electricity generation equivalent to approximately 97% of Scotland's gross electricity consumption. However, decarbonising our heat sector has been more of a challenge, with key targets missed. See below graph from Scottish Renewables.



Providing more sustainable options to meet our heat demand is essential to meet our climate change targets. It is estimated that 20% of Scotland's carbon emissions are as a result of heating buildings.

The Scottish Government is implementing policies and proposals to help accelerate this. Scotland's Energy Strategy and Just Transition Plan aims that by 2030, Scotland's main energy using sectors, including heat in buildings, transport, industry and agriculture, will be using energy more efficiently and be largely decarbonised. New buildings will not be able to have gas boilers from April 2024 and a current consultation on Energy Performance Certificate (EPC) reform is seeking views ahead of the introduction of new legislation. You can find more on this consultation at: https://consult.gov.scot/energy-and-climate-change-directorate/energy-performance-certificate-reform-consultation/

These will all have consequences for both business and domestic properties, including agriculture. Heat demand on farms and crofts can be high for numerous reasons, including heating animal sheds, drying grain or cleaning.

Low emission heating options

Only around 11% of Scottish households currently have a renewable or low emission heating system. What technology is right for you will depend on your heat demand, existing infrastructure and buildings. Firstly, improving energy efficiency and insulation on buildings will help to minimise heat loss and make best use of heat generation, however this will have additional costs.

Heat pumps

Heat pumps are a popular option. Heat pumps still require electricity to operate, but less than would be required for direct electric heating. If you're using electricity from your own renewables, then these running costs can drop dramatically.

Heat pumps are very efficient, providing approximately 3 units of heat for every unit of electricity, with ground and water source being more efficient than air source. However, heat pumps are more expensive than conventional boilers. They can be retrofitted to existing buildings and can also contribute to cooling requirements.

They produce heat at lower temperatures, therefore you need larger radiators in properties, and they wont meet your total heat demand for all processes e.g. grain drying, but can help meet part of it.

What about hydrogen?

Green hydrogen created from renewable electricity is another potential way of storing large amounts of energy. At present, it is more efficient to use the electricity used to create hydrogen to heat our homes directly, or power heat pumps. Hydrogen for heating is not currently expected to be central in decarbonising our heat demand. However, trials are being undertaken to assess the potential for mixing hydrogen into the existing gas grid and the use of hydrogen boilers in homes for space and water heating are being developed.

What support is available?

Heat and Energy Efficiency Scotland is a new agency being developed to coordinate heat decarbonisation in Scotland. It aims to reduce Scotland's contribution to climate change by 2045 by making Scotland's homes and buildings cleaner, greener and easier to heat.

Different types of support may be available depending on if it is a domestic or business property. Business Energy Scotland offers interest free loans, plus cashback grants for various renewable heat (including biomass, solar thermal and heat pumps) and energy efficiency measures. Home Energy Scotland has a grant of £7,500 to cover the cost of heat pump technology, with additional money for homes that qualify for rural uplift.

There are potential changes on the horizon to be aware of and plan ahead for. Assessing your heat demand and sustainable options to meet this can benefit your business, by helping to improve the overall farm carbon footprint and efficiency.

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Decision-grade data from nature tech

What is nature tech?

Nature tech are digital technologies and tools that help us protect and restore our natural environment. Nature tech promises to help investments in nature-based solutions projects be easier to justify, by providing better clarity about their impact over time and by helping make them even more cost-effective.

Satellite rainforest monitoring and remote sensing drones are trusted technologies. Whilst remote and satellite sensing can help with some aspects of measuring, reporting and verifying of the state of nature, biodiversity is location-specific. So the state of environmental and ecosystem assets must be assessed in up-close, local context.

Nature tech is a cost-effective way of doing this. But inexpensive sensors of the type likely to be deployed on farms to count numbers of animal species, like audio recorders and digital measuring devices such as camera traps and mobile apps can lack credibility as comparable, trustable data sources. This is because there are no consistent or standardised processes for authenticating, calibrating, and validating them, or for guaranteeing their cybersecurity. This is compounded when each device manufacturer has differing methods and bespoke measurement units.

What is decision-grade data?

Nature-based solutions projects arising from the restoration of natural assets are now increasingly recognised as environmental opportunities which can attract public payments and private investment. The finance sector has called for decision-grade, asset level data about nature projects in order to facilitate their investment decisions and reporting to investors.

Why might farms need decision grade data?

Without high quality trustable digital data, public and private sector investors in nature uplift projects could demand more expensive or time-intensive manual survey methods to demonstrate improvement. This can make projects financially non-viable for farmers and land managers.

Are farms already collecting it?

Lauriston Farm in Edinburgh is. SRUC researchers have made this 22 minute documentary with the team, providing a case study which explains why it is useful to invest in data collection to establish baselines, and prove changes through time. In it, the Lauriston Farm team and their investor Federated Hermes Ltd., discuss how they are collecting decision grade data to prove the social, economic and environmental impacts of their regenerative agriculture and community engagement practices. Some data collection is being done with nature tech.

How do I get started with nature tech?

1. Decide to develop a nature improvement project.
2. Plan what you'd need to measure to show improvement, and ask what data funders and investors want to see.
3. Investigate if nature tech could do the measurements more cheaply and trustably than manual methods.
4. if it can, buy the tech, then set it up, calibrate it and deploy it securely and trustably.

Find out more at https://decisiongradeiot.com.

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Key economic data

General Indicators	
Base interest rate	5.25% (4.5% 31 May 23)
ECB interest rate	3.75% (3.0% Mar 23)
UK (CPI) inflation rate	6.8% (target 2%)
UK GDP growth rate	0.2% (Q2 2023)
FTSE 100	7,474.66 (31 Aug 2023)

Price indices for June 2023 (Defra 2015 = 100)			
Output Prices		**Input Prices**	
Wheat	123.83	Seeds (all)	106.87
Barley	131.35	Energy	161.23
Oats	134.41	Fertiliser	162.58
Potatoes	149.36	Agro chemicals (all)	126.39
Cattle and Calves	141.21	Feedstuffs	141.95
Pigs	139.78	Machinery R&M	117.57
Sheep and Lambs	136.00	Building R&M	140.72
Milk	126.06	Veterinary services	105.78

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