MAP OF AG

HORIZON 2024

An outlook for the agrifood sector

Building a world where industry and farms thrive together.
Map of Ag is the Agricultural Data Exchange that connects supply chains, enabling sustainable outcomes at scale.

Foreword

Over the past 12 months it feels like we've turned a corner.

There has been talk for many years about the power of data and the way it can revolutionise farming and food production. Yet the talk hasn't always been matched by the walk.

But now it seems the use of data, particularly when it comes to sustainable food production, is becoming a core activity throughout the food chain from the farm to the retailer shelf.

As the articles in this year's *Horizon* publication attest, much is being done at a practical and pragmatic level with data, from improving on-farm efficiency through to international marketing. It all proves that with better information at our fingertips, we can and will make better decisions.

But it isn't easy. Much of the data in our sector is messy and fragmented and the industry is going to need to be able to do these data-driven things at significant scale if we are to realise the opportunities and mitigate the risks of food production.

Within our own business, our *Pure Farming* data exchange platform is starting to come into its own: enabling us to integrate and tidy up data from disparate sources and then use it intelligently to deliver on-farm measurement and change towards environmental targets such as a reduction in the supply chain's Scope 3 emissions.

The story in these pages of the Statham family's cotton farm based in Australia is a fabulous example of data being used in all facets of the business - understanding the opportunity to produce more sustainably, developing technology that can scale, and backing it up with robust and defensible science that is hard to knock.

The Stathams are setting a standard for what is possible and in doing so moving their business from one of price taker, to price maker.

That's a fantastic achievement but it shouldn't be unique. Their example should be a beacon for others to follow. A demonstration that data should be the friend of the farmer, not something to fear.

It's why we are signing up to the new *Farm Data Principles* data certification scheme in the UK (you can read more about the scheme at the back of these pages) and have adopted the *Australia Farm Data Code*, to give farmers reassurance that in our business we are handling data transparently and respectfully.

We hope others will follow and help release the power of digital in our sector. Because the evidence of the past year suggests there is much to gain from independent, credible and trusted use of data throughout the supply chain.

Farmers need to know there are benefits from this. What follows in this year's *Horizon* should leave no-one in any doubt...

Richard Vecqueray
CEO, Map of Ag

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Accuracy essential to measure feed emissions

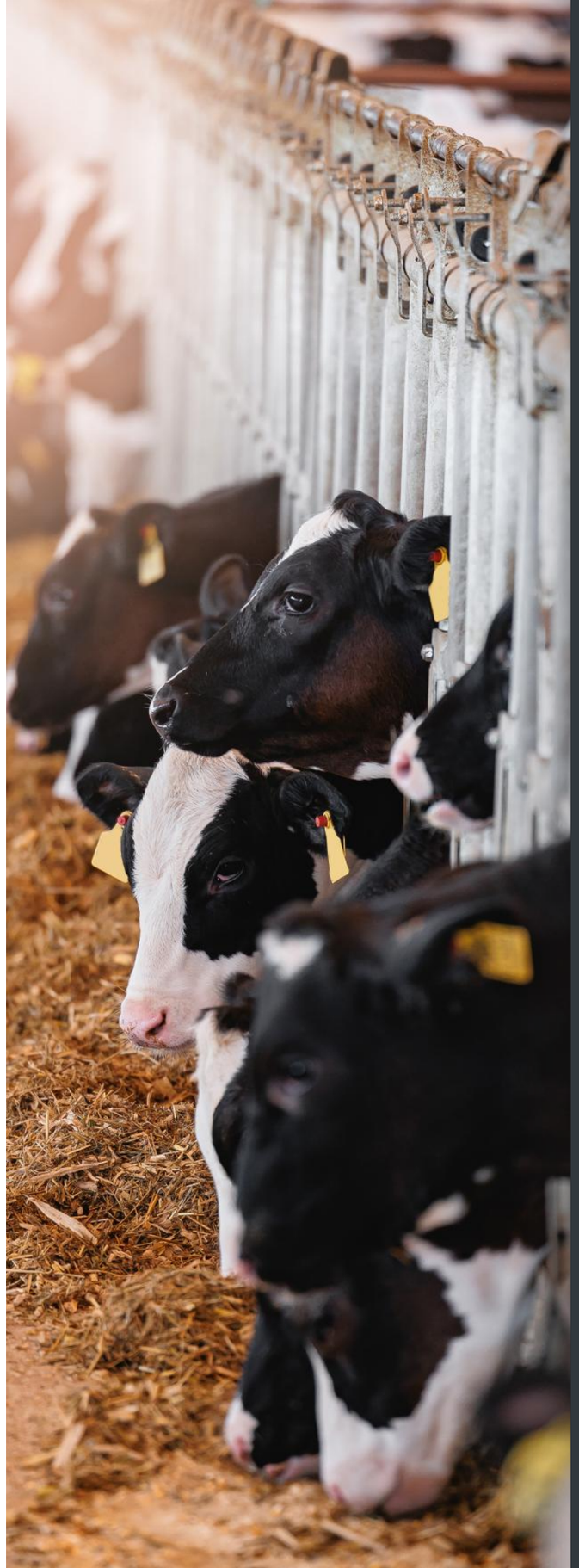
The use of long-established industry averages to calculate the embedded CO2 emissions of purchased feeds is no longer tenable, as *James Husband* explains

Everyone's talking about emissions these days and for good reason. With agriculture in the spotlight, farms are under increasing pressure to know the carbon footprint of what they produce.

Much of the focus has been on the belching of ruminants (enteric fermentation) and while this is important, data that we have been working on shows that as much as a third of a dairy farm's emissions relates to the feed that the farm buys in.

The range between systems is significant with low input grass-based units much lower at around 10%. But where a high input herd is using a lot of concentrate feed, the number could be 30% or more.

With retailers and processors having made very public commitments to reaching net zero, they need to know the carbon footprint of the milk they buy, referred to as Scope 3 emissions, because those emissions can represent 75-80% of their total. Scope 3s are, therefore, a big deal.



For some time the industry has relied on average or assumed figures, an approach which treats all feeds in a very generic way - an 18% protein cake is simply that, regardless of the make-up of the constituent parts that contribute to the protein content.

With such a low level of accuracy, some retailers and food businesses invoked blanket bans on the use of soya for example, because it was not possible to establish its provenance and whether its production was associated with land use change which has a very large impact on the embedded emissions number. And yet it is probably not fair to demonise soya in this way because its protein density per area of production is very high, which is a good thing.

All this has led to a need to reassess how the carbon footprint of feeds can be measured. Over the past three to four years we have been working with a number of clients to inject more rigour and robustness into the calculations. The findings have been quite eye-opening.

By plotting the CO2 emissions based on the old methodology of assumed averages and comparing this with the numbers we are now getting (see Figure 1) it's very clear that those industry averages are simply not good enough. The variability is huge with some concentrate feeds at a standard 18% protein inclusion having embedded emissions more than three times higher than others.

Our approach starts with understanding how much bought-in feed has been used by the farms. Where we have been granted permission by the farmer, we can use the feed orders and deliveries from their feed company to give us this information.

Then we need to know the embedded emissions number (expressed as CO2 equivalents) for all the feeds (concentrates, blends and straights). This is more complex. So we approach it in a number of ways. One is to rely on the embedded CO2 number provided by the feed company. Several of the larger ones have the resources to do this. Another is to be provided with the specification of the cake with the percent inclusion rates to which we apply numbers from the Global Feed LCA Institute (GFLI) database. Ideally we'd like to know the exact component analysis of the feed but some companies regard this as confidential intellectual property and are unwilling to share it.

In these circumstances, we apply algorithms based on our growing dataset to calculate the emissions based on more limited information such as the percent of soya or palm oil. And we can even back-engineer the analysis based on the statutory information on the feed label (which lists the constituent parts in descending order) knowing that the molasses inclusion rate is usually somewhere around 6%.

Good data, as ever, holds the key. Working with the farmers and their feed companies and building confidence in these important relationships is crucial.

Could things be improved? Yes, of course. A national and independent certification system for feeds would be a great way to enable feed companies to provide very accurate numbers without giving up IP. And on the farm, the use of feed data from farm software systems (for example Feedlync or Keenan's InTouch) would provide increasing granularity and accuracy, and could provide a much improved level of automation too. ■

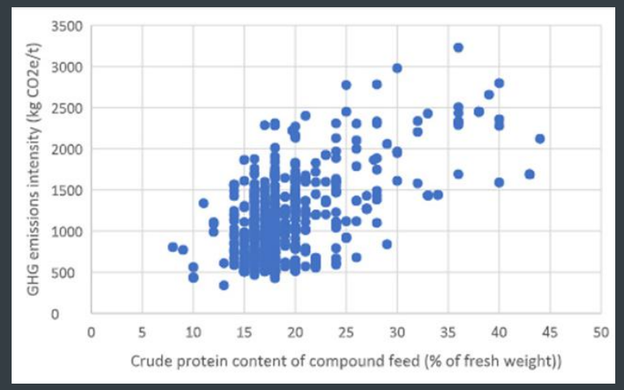


Figure 1: GHG emissions intensity of compound feeds - the detailed analysis shows the variability of individual feeds (blue dots) with similar or the same levels of crude protein content (Source: Map of Ag)

Fork in the road?

Farmers are going to earn a bigger share of GDP in the future argues *Forbes Elworthy*. But will this be because society rewards them for addressing climate change, or because climate chaos lifts real prices of farm produce?

If you turned the clock back two hundred years, you'd find farming earning over 10% of GDP in almost all societies. Today it is less than one percent in many places.

Thanks to successive leaps forward in technology which started with the Agricultural Revolution in the 18th century and were magnified by the Green Revolution of the 1970's and 80s, farming has become more and more adept at feeding the population for a lower and lower return.

But is this all about to change with the drive towards sustainability and the opportunities that offers the agricultural sector?

Industries are seldom changed by a single measure. Myriad factors including regulations, incentives, market pressures and evolving technologies interplay to create a recognisable shift.

So it will be with the greening of farming: food company net zero commitments; reporting of financed emissions in banking; methane and nitrous oxide abatement technologies; rediscovered ancient farming practices such as regenerative agriculture; improved data collection; regulatory change; and the direct impacts of climate change.

What might this mean for the macro-economics of farming?

Five interrelated factors are shaping the greening of the natural capital industries.

The first is that farming is already lean. It is also highly fragmented. Most of the 20m farmers in the developed countries are owner-operators (and far more again in the developing world). Despite being lean, few, if any, of these farmers have high profits or surpluses to re-invest in change.

Second is that 80% of the food industry's emissions are behind the farm gate. Even though farms and processing co-ops as private companies don't have to report on their emissions, most major food companies do report on and seek to reduce their "Scope 3s" - the emissions of their farmer suppliers.

Third is that a quarter of world food crosses a border before it is eaten. World farming has specialised so that cereals and dairy are grown in the temperate zones, while fruit, vegetables and rice are grown in the subtropics and tropics. Large firms such as Nestle, Unilever, Mars, General Mills, ADM, and Cargill have grown up to intermediate these flows. These firms are under pressure to decarbonise food and are turning for supply to the countries and farmers that can help them deliver this.

Fourth is that climate change is disrupting agricultural supply. Equilibrium prices of the most affected foodstuffs are rising because farmers simply can no longer rely on four good climatic years to balance the one bad one. Almost every second year we now experience floods or droughts. These headwinds impact especially annual crops. Vegetable crops are delicate and low to the ground, therefore sensitive to increased variability, especially excess moisture.

The fifth and last factor is more positive. Half the terrestrial surface of the planet is managed by farmers and foresters. The rest is far harder to change since it is desert, tundra and mountain, alongside the one percent of world land that is urbanised or under roads. To address climate change, society is turning to the owners and managers of land to do new things, to rebalance flows to and from the atmosphere.

How will these five factors interact? Can the new sources of income offset other challenges of agriculture? Agricultural economics now faces two possible routes.

The first is for national governments to address the issues head on. To include forestry and agriculture in strategies to rebalance emissions. In this context rewarding them with US$20 per tonne is not enough. We need to get the price of carbon right – in my view closer to US$100 per tonne.

How affordable is this? Well mankind needs to shift annual flows to the atmosphere down by at least 10bn tonnes of CO2. At $100 per tonne this is $1trn a year. Around one percent of global GDP. If half of this was devoted to the natural capital sector (increasing its revenues by around 50% in developed agri systems) then I'm confident the land sector should be able to deliver up at least 5bn tonnes a year of improvement. A great opportunity for farmers and foresters to repurpose land.

The second route is society continues to take only ginger steps toward decarbonisation; in effect, to hope there is a magic bullet out there that can solve climate change and/or hope the risks of a two, three, four, or five degree change in average global temperatures will be manageable.

If this "messy" route is followed, which seems likely, farmers are going to be rewarded anyway, but in a different way. As climate change knocks out production from marginal farming systems, food markets will tighten. Equilibrium prices of food, relative to other goods, could rise quite sharply.

Either way I am confident agriculture is going to earn more than one percent of developed country GDP. ■

Driven by data... and a great story

Australian farmers *David and Danielle Statham* of the Sundown Pastoral Company have leveraged passion, technology, and a great message to change the face of their cotton business, as David explains.

How do you become a price maker in a sector of price takers? That's the challenge we set on our 170,000 acre farm business in Queensland and New South Wales growing cotton alongside a number of other crops and fattening cattle.

I grew up in the steel industry in Newcastle on the east coast of Australia. The business was started by my father and the day I joined after leaving school he taught me a lesson I'd never forget: "Without a sale you're nothing and you won't need anyone else in the business".

In other words, marketing first, marketing second and marketing third. The other thing I learned was the importance of technology.

So what did we have in our farming business that would lend itself to a marketing and technology first approach? The answer was cotton. And the opportunity was sustainability.

Cotton is the second longest traded commodity, two or three years in advance. It is highly commoditised and as such dominated by large trading companies and thousands of price takers - farmers.

But we live in a changing world, one in which clothes manufacturers have become focused on sustainable sourcing, both from a brand positioning and regulatory point of view. The question was: how can we sell a certified sustainable product that could have traceability from the farm to the shirt on your back, so we could be a price maker and deal with those brands direct?

Danielle had a passion to trace our cotton that we grew which led her to finding and purchasing a patent for use on manmade fibres, on a solution developed in Europe that was being used to create a unique signature in paper money for security. FibreTrace, as she branded it, works by injecting a rare earth mineral into a viscose fibre which is itself embedded in the cotton. Each injection has a unique signature (radio wave) that can be picked up by a scanner on a finished garment. The provenance of the cotton can be tracked by scanning initially at the gin (the machine which separates cotton fibres from their seeds) and then at each stage along the supply chain - each scan drops a time stamp and geolocation into a blockchain.

So with the technology in place, all we needed was the story. And that was how Good Earth Cotton was born. Danielle, has been passionate about also wearing the fibre we grew, particularly if we could prove its sustainability credentials, since more than 60% of the environmental footprint of a garment sits with the farmer.

Data has played a massive role. We already had decades of precision farming records - soil tests, every pass, every application. We started measuring water use efficiency in 2004. At that time, we were producing 0.8 of a bale from one megalitre of water. Fast-forward to today and that same megalitre produces between 2.2 to 2.5 bales and with a 95% reduction in chemical use because of GMO. The fact is the cotton industry in Australia is a fantastic success story and consumers and brands need to hear it.

Moisture retention is what it's all about in a climate like ours. So we introduced a change to the rotation and cropping practice and cut passes for the crop from 12-13 a year to between three and four.

We created permanent beds in the paddocks growing cotton at 30-inch row widths on the shoulders of the beds and then post-harvest in May, planting wheat between the rows which we harvested in November followed by a year of stubble until replanting cotton the following November.

While our driver had been soil moisture, our soil testing started to demonstrate that we were building up soil carbon. We could see that farmers were now the answer to climate change if we could store more carbon and measure it.

That measurement has been crucial. We adopted an ISO-accredited methodology for carbon accounting (Carbon Friendly) that is aligned with the GHG protocol and that meant we now had the data to back the story and the technology to provide the provenance.

Then enter Downforce Technologies - also ISO accredited. What we needed next was a way to improve the accuracy of our measurement, at scale. We had, until 18 months ago, been doing traditional soil testing. But Downforce, with its satellite data and smart AI-driven algorithms has been able to measure the whole farm at 10 sqm resolution.

Not only has this added a level of robustness to our measurement but it's also provided an incredibly visual tool which, when we put it in front of manufacturing brands, they are blown away by. Now they can see five years' worth of history. It gives us the ability to communicate the message of what's happening on the farm very simply to someone on the other side of the world.

Since we've started measuring with Downforce to create a baseline, our job is to keep the soil carbon above that baseline. There's a real incentive to instigate management practices that encourage this because in our best year we managed to sequester 335kg CO2e per bale compared with the world average of emitting 260kg CO2e. But every year is different and mother nature presents its challenges. But the key message is knowing what is happening beneath your soil and measuring constantly.

The next challenge is to turn the whole business climate positive. That's why we are building a solar farm and installing a hydrogen/ammonia plant that will allow hydrogen to displace diesel and create anhydrous ammonia - green fertiliser.

We are also turning the cotton trash at the gin into biochar and using cattle manure that has been transformed into a granular product to add to our soils. The only emissions we will have left on the farm will be in the manufacturing process of the insecticides and herbicides that we use.

Farming really has an answer to the global climate challenge. Our journey shows that with the right data, technology, and story, we can be price makers too. That's something worth striving for. ■

In need of some TLC

The agriculture sector faces uncertain times and it's the industry not our political masters that's going to have to make the running in the transition to net zero. *Richard Vecqueray* explains why

The agriculture sector is in dire need of some TLC: Transparency, longevity and certainty.

Deutsche Bank Climate Change Advisors coined the phrase in 2009 in the context of a raft of national climate change policies, and the lack of TLC back then, remains today.

Farming is under the spotlight as never before. The sector has been sometimes unfairly targeted by ecowarriors and idealistic journalism but it is true there is much we can, and must, change in support of the climate cause.

But in many ways the cart has been put before the horse. Pronouncements by governments and many key industries setting ambitious targets have been made without the roadmap to deliver them. And with 2050 (or even '40) around the corner, there is an urgency to sort this out.

It needs leadership and it's going to need to come from within because, it seems, we cannot rely on our governments for guidance.

Happily, there is some precedent for this. The UK agriculture industry has, for example, delivered material industry-wide change in areas such as animal welfare and in responsible use of antimicrobials in livestock to the point where it is seen as a global leader.

However, to become a global leader in the net zero transition is perhaps a bigger challenge.

One reason is that dearth of political leadership. While many western governments talk a good game (at events such as COP), they are failing. An example of this is the UK's imploding government, which recently rowed back on a number of targets for the car sector and stripped it of the TLC that it thought was there. The automotive sector has, however, taken the view that it just needs to press on in spite of the government. Downing Street has also all but turned its back on a national food strategy - that it commissioned in 2019! There's very little beyond a blaze of repeated targets.

Another reason is that structural change is clearly needed in agrifood supply chains delivering TLC and consequential security for farmers to transition over the medium term. But farmers are rightly concerned about setting off on the wrong foot, especially when these changes aren't in place.

With a bigger focus on what's going on behind the farm gate - and a lot of noise and "fake truth" about farming's position in the context of climate change - there's been a rush to price carbon, develop schemes that reward farmers for changes to farming practice, and generally run headlong into the "greening" of farming without understanding what impact this change will have on where, for example, food is going to come from.

It's all very well for politicians to say that we just need to produce more from less, but without a clear strategy to achieve that, the likely response will be to import food from elsewhere. That is to say, export the UK emissions to someone else.
This is a threat for the UK and an opportunity for Australia and New Zealand with their export focus and fantastic trade deal that Liz Truss offered.

The other main reason is the more technical issue of measurement. Right now, any rewards farmers are receiving for net zero transition are either based on changes to practice (with little measurement of outcome) or wildly inaccurate emissions averages being put up as reliable evidence.

Carbon is the current focus. We need to be able to measure the emissions of food production more accurately, and there is more on this in other articles in this *Horizon* publication. There is a huge question over insetting (reducing net emissions within the supply chain) versus offsetting (doing so, outside of the supply chain). If retailers are going to meet their commitments, they will have to inset, and this will need much more active and long-term engagement with farmers, the structural change I alluded to.

If this change was realised, an even bigger win is likely to come from biodiversity (net gain). This is where the agriculture sector has so much to offer (particularly if the fossil fuel industries do their bit on carbon, which if I'm honest is where most of the emissions mitigations should be seen). It's also where there is a very obvious public good.

But biodiversity is complex and we need to be able to measure this accurately too, at scale and in a way that helps us manage unintended consequences.

For my mind, it means that for us to succeed in meeting emissions and biodiversity targets, we are going to need a coherent data-backed strategy to get us there. That means the adoption of scaleable measurement techniques that can automate as much as possible and require little data entry from farmers, leaving them free to farm. And it means a national data exchange, so the right data can be managed and verified, and be controlled by farmers to be used appropriately to deliver the desired outcomes.

Our industry has a good track record of making improvements off its own bat. Technology projects (in the UK at least) seem to go much better when driven by the private sector.

Government has not got a grip on what's needed to achieve their own targets. In the face of this chaos, our farmers desperately need that transparency, longevity and certainty, that TLC. It's up to us as an industry to innovate, to change, and to show them that we care. ■

Digital twin holds the key

The variability of emissions in the beef sector means smarter analysis of farm systems is needed. Thankfully there's an innovative new approach to help, as *Hugh Martineau* explains.

If you're a beef farmer you may be feeling the heat when it comes to climate change – especially when it comes to measurement and reporting of emissions. Ruminant farming is responsible for a significant proportion of agriculture's contribution to climate change. And beef production is a challenge.

On the face of it, it's easy to understand why. The raw data on the GHG intensity of farm products has beef coming out top at 15-50kg CO2e/kg beef depending on the type of system and the efficiency with which it is run. This compares to three to 4.5kg for pork and between 0.95kg and 1.3kg for milk.

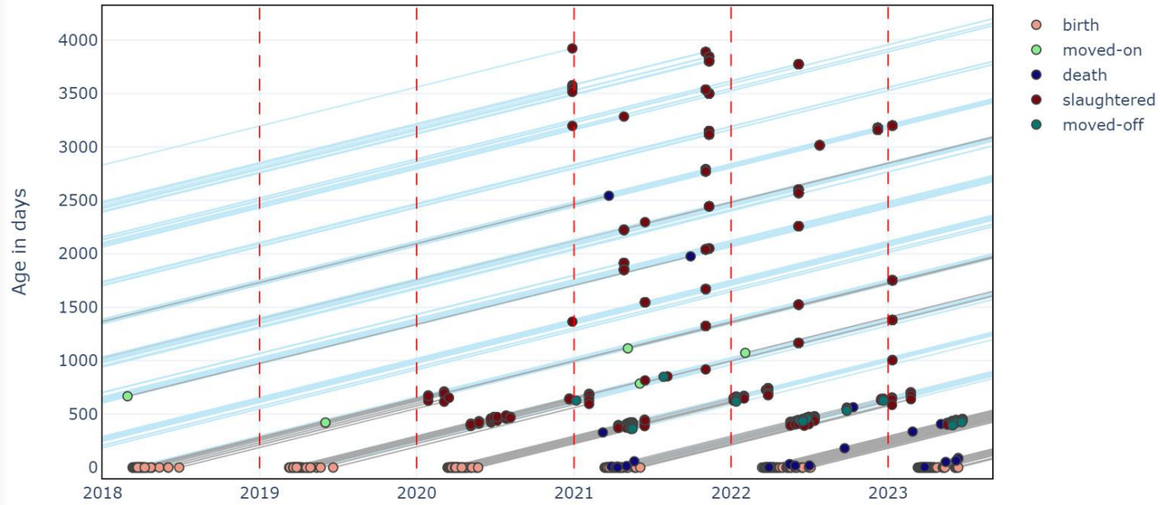
But we need to recognise the importance of ruminants in our agricultural systems and the nutrition they provide. Aside from the potential landscape benefits of pastoral farming, there is cogent reasoning that suggests measuring beef emissions not by weight of product but, for example, by nutritional density, paints a different picture.

Whether you buy into that logic is, to a point, not the point. What is important is that we find ways to measure what's going on, on the farm, and get a better understanding because while beef and dairy farming may not look great at a national GHG inventory level, there's huge variability farm to farm, and that suggests there's an opportunity to shine a light on better practice.

Beef production is complex and multi-annual. No two systems are the same. So how do you know what's good and bad? Where do the efficiencies lie? And how do we get beyond averages?

Traditional GHG assessments have been done over a 12-month window. But taking emissions divided by the output doesn't do much more than give you that average for that time frame. We need is to be able to contextualise emissions and inform future decision making to target emissions reductions.

This means looking at lifetime productivity - measuring everything over a cow's (and calf's) lifespan. Doing this can meet multiple objectives: Measuring the efficiency of the system; meeting supply chain requirements and government priorities; giving farmers a better understanding of what's going on; and creating the opportunity to positively communicate and influence.



A single farm can have significant variability even when in a relatively stable state as Figure 1 demonstrates. As farm businesses evolve and develop, the variability can be far greater which leads to a messy data landscape that needs a great deal of contextualisation.

By measuring over a lifecycle, it's possible to see how the system is evolving. Each diagonal line represents the life of an animal. The chart demonstrates how dynamic a beef production system is, helps contextualise emissions and importantly, it allows us to calculate emissions with far greater accuracy. Beef and dairy emissions calculations shouldn't be done without this information.

But to do this means access to data. Not just any data, but good data. The problem is that going up farm drives to collect this is laborious, costly, and often highly variable in terms of quality. There is core data such as animal movements, kill data and feed use that can be automated to reduce costs and add significant value to the analysis.

How have we done this? Well, much of the data we need sits in the British Cattle Movement Service. By accessing this, with the right permissions, alongside feed usage from the farm records (or feed company data), fertiliser applications, and kill sheet information, we can generate more accurate GHG emissions and also measure important KPIs such as age at first calving, days to slaughter and kill weights.

This allows us to produce a visual representation which shows the number of animals leaving a herd as output, the number of days on the farm, and the type of system being operated. All without even needing to ask much of the farmer!

By developing dashboards we can inform future strategies for emissions reductions. And we find the emissions intensities within a system can be very different, as much as four or five kg CO2e between animals in the same system. Averages mask this.

But what we really want to be able to do is quantify the opportunities for improvement, for example, KPIs around fertility, health, nutrition and resource efficiency for feed and fertiliser.

Having access to higher resolution data means we can produce lifetime productivity models for metrics such as liveweight gain, feed efficiency, nitrogen efficiency, breeding stock fertility, rather than focusing on annual inputs and outputs.

The model we have created is aligned with the IPCC 2019 methodology and allows us to test “what if” scenarios. For example, by changing the fertility and replacement rate parameters in the model (based on lifetime assessment), we can see the impact on lifetime productivity and the resulting emissions reductions.

We can model for groups of animals where they are behaving in a similar way or break it down into subsets, even a single beast. In effect, we have created a digital twin for the herd. That’s a significant achievement. People may think that granular, high resolution data is hard, but we’ve proved that the information already exists in a usable form and creates a big opportunity for better insights.

Our belief is that this sort of tool is going to be vital for the sector. The supply chain needs to know its Scope 3 emissions number but it cannot hope to make improvements without being able to contextualise what’s going on, on the farm, and then working with farmers to deliver changes in practices that will benefit the climate.

Our model can make this a reality. Analysis of lifetime productivity holds the key to bringing emissions down in beef/dairy systems. It’s moved us from a balance sheet snapshot to a view of profitability over a number of years. And every farm can do this. ■

Farm sustainability baselines offer benefits for growers

Sustainability targets set by food and retail companies are driving the need for accurate data and metrics. But it's not just about meeting corporate needs, as *Jim Flambert* explains

Farming is going through a historic shift in focus from all-out production agriculture to environmentally responsible and sustainable practice. For many farms this is a challenging time - and not just because of the input cost squeeze.

The green shoots of this change are being evidenced by a new emphasis among forward-thinking agrifood businesses that have set ambitious and challenging environmental sustainability goals. Inevitably, this has meant these corporates are having to get much closer to their farmer suppliers and understand how those farms operate.

This is not always straightforward. Farmers are, understandably, very protective about their businesses and often see being asked to share information (data) up or down the supply chain as something of an imposition.

But data sharing is going to become the norm. Farming represents approximately 0.5% of GDP in the UK, and yet accounts for 10% of our carbon emissions. Agriculture in the UK (and around the world) is going to need to be much more accountable.

It's no surprise, therefore, that we are developing an increasing portfolio of those corporate customers who are leading the charge in this space by working proactively with growers. The key here is shared knowledge so that both the agrifood business and the farmer can realise the benefits.

Our approach involves generating a baseline for a farm in terms of its greenhouse gas (GHG) emissions, or sustainability practices (for example regenerative approaches), or biodiversity measures. To do this we ask farmers to complete a survey which can take anything from two to four hours to complete if everything has to be entered manually.

This is not exactly what a hard-pressed farmer wants to hear which is why our focus has been to explore ways to streamline the process by making use of data farmers may already have in other systems.

By linking our survey with a farmer's farm management records, for example Muddy Boots or Gatekeeper, we can pre-populate it and verify that data so a grower only has to check it through and fill in the gaps. That can save as much as 60-70% of the completion time.

We have also built direct data links to carbon calculator tools, such as Cool Farm Tool, which means the data can be processed automatically and, where needed, reprocessed in the event the tool updates its models and calculations.

This enables us to generate dashboards in our Farm Metrics software for the growers and our agrifood clients. These can range from some headline numbers around emissions factors to nitrogen usage efficiency and farmer benchmarking with anonymised peers through to more detailed metrics around organic and inorganic fertiliser use, pesticide applications, yields, protein or oil content, and measures around biodiversity and practice adoption.

While the initial driver might be to enable a food manufacturer or retailer to have the metrics they need to establish their net zero progress, there are plenty of good reasons why farmers should want to engage and set aside that relatively small amount of time.

First is the simple fact that if you don't measure it, you can't manage it. We are seeing a shift away from chasing yield to targeting profitability. But profitability is made up of a number of dynamics from inputs usage and energy consumption to improved farming practices such as increased soil organic matter, tree and hedgerow planting, and sustainable tillage practices which can improve input use efficiency, water retention, and soil health, all of which drive that bottom line. The rise in the regen story is intrinsically linked to GHG emissions and farmers who are doing this well are, quite simply, becoming more profitable.

There are other benefits too such as payment of premiums for crops produced in a certain way, very often the adoption of regenerative farming techniques.

For us, this is not about generating carbon credits, it's about farming better. The rewards in better efficiencies, coupled with premium payments are, in reality, more tangible and less risky than selling credits in an unregulated and immature market. We are working on some exciting developments too. Satellite imagery is the next data layer we are starting to use to help verify tillage practices, crop types and areas, on which farmers may be receiving premium payments.

But we do have to be sensitive to the farmer's realities. Trying to get engagement in the middle of drilling, or a busy spring crop protection campaign is not realistic. And we have to ensure that we are acting responsibly when it comes to the use of their data, providing assurances on where the data will be used, by whom and to what purpose.

The progress is, however, encouraging...and necessary. In years to come we will need to be generating these metrics every year, not just a once-in-five-year snapshot, because the seasonal variability in farming is so great, and because there will be a growing need for higher resolution and increasingly accurate data.

Eventually, we may well need a central database of farm emissions so they can be correctly allocated across the supply chain, to ensure the allocations are fair and representative and avoid double counting. But that's one for another day. ■

New scheme set to get data flowing

Good data governance is vital if the UK agriculture sector is to make the most of the opportunities from data. *Tina Barsby* lifts the lid on a new initiative to foster trust between farmers and those wanting access to their data.

Data is driving pretty much everything we do in our lives. Whether it's shopping at a supermarket, going to see the GP, or engaging in social media, data follows you round, or you follow it.

It's no less true in farming where for years "information" about the farm has been collected in a range of formats - the farmer's head, farm diary, BPS claim form, farm management system and so-on.

While digital technology has been used in farming for some time, the ubiquitousness of smartphones, tablets and cloud-based computing has changed the game dramatically in the past five years or so. Suddenly, everyone is wanting or needing access to farm data because it's become easier to collect and share it. In theory.

Sharing data is not a bad thing. There is growing evidence that better farm decisions will be made where data can provide actionable insights. The drive towards net zero will need data to evidence progress.

Trade agreements and provenance need to be data backed. And the power of artificial intelligence will almost certainly bring more change and possibility to the mix.

Set against the benefits are of course the very legitimate concerns about who might be doing what with a farmer's data and if a farmer shares sensitive information (such as crop yields or inputs pricing), will they find it is used against them?

Some of these concerns are probably born more from perception than reality. After all, supermarkets know about our shopping habits through loyalty schemes. And there are myriad other examples where we probably "let go" of data about us because we often get something in return.

So a question I often ask when it comes to farm data is: "How sensitive really is your 'sensitive' data and what value could there be from sharing it?"

As you can imagine the range of responses is wide. But the common theme is that farmers are genuinely worried.

Step forward a new farm data certification scheme being run by *Farm Data Principles Ltd*, the not-for-profit entity driving what has hitherto been known as the British Farm Data Council.

In the summer of 2022, I and a number of like-minded individuals came together to announce the launch of BFDC with the intention of developing a set of principles around which the industry could coalesce as a badge of good practice when it comes to sharing farm data.

Since then, we have worked hard on the development of a certification scheme based around the publishing of a self declaration statement by a data handler on the BFDC website which confirms the way in which that organisation uses and manages farm data in line with the principles (see panel).

We are trying to strike a balance between robustness on the one hand and doability on the other, to increase the opportunity of engagement by organisations handling farm data in a scheme that produces the desired outcome: Responsible use of data which respects the rights of the farmer.

We have organised the principles into four themes: Your data is your data; keeping data safe; making data easy; and clarity about the value and benefits of data sharing.

While *Farm Data Principles Ltd* will be the owner of the scheme, an appointed third party will manage the processing and administration of certification applications on our behalf.

Our objective is to get the data flowing. But it is important the scheme recognises that farmers need certain assurances. We have spent some considerable time looking into initiatives that operate elsewhere in the world and have also drawn on previous industry-good work. This, we believe, has enabled us to take the best parts and mould a scheme that we believe is fit for purpose for UK agriculture.

Certification is voluntary of course, but we hope the proposed logo which certified organisations will be able to display will become a recognisable mark that farmers will want to see, and represent a status that data handlers will want to achieve. ■

Your data is your data

- The Data Originator, normally the farmer, owns and controls the data
- The Data Originator can access, edit, delete, and migrate data easily
- Data is not accessed or stored without explicit opt-in permission
- Data is not shared or sold without explicit opt-in permission
- There is clarity as to what parties are involved processing the data and why

Keeping data safe

- The security of users' data is essential
- Appropriate data security standards for an organisation's activities are adopted, and there is a clear explanation of why it is appropriate
- There are processes in place to maintain security of users' data in the unlikely event of a data breach

Making data easy

- Simple naming conventions are adopted and common across the organisation's tools
- Organisations strive to allow systems to talk to each other, and to support other organisations and systems to share data using best practice and conventions
- There is a proactive approach to providing training on data and data use, appropriate to the organisation's data users
- The organisation is accessible and responsive to requests, instructions, or complaints

Clarity about the value and benefit of data sharing

- Value will sometimes be monetary, and other times will be actionable insights
- There is clear explanation from the outset regarding what raw data is used and how; and where value is generated, it is clear what that value is and who benefits
- We clearly explain how we aggregate data, and what value it generates, and to whom

Get in touch...

Working with customers across the world, Map of Ag has offices based in the United Kingdom, New Zealand and Australia.

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