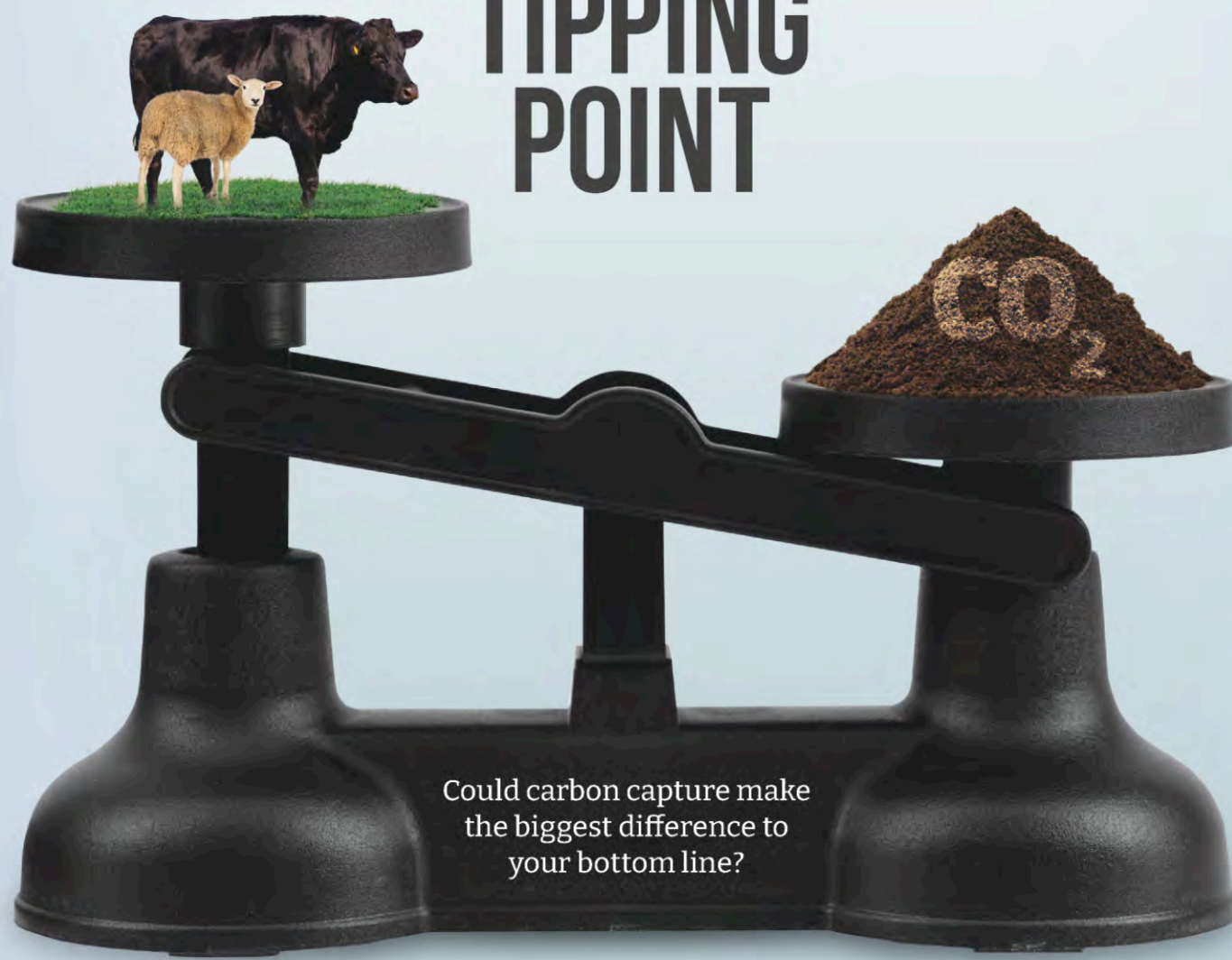
QMS
Quality Meat Scotland

# the cut

QMS QUALITY FROM FIELD TO FORK

ISSUE 01 SPRING/SUMMER 2021
QMSCOTLAND.CO.UK

## TIPPING POINT




Could carbon capture make the biggest difference to your bottom line?

# Now **everyone** can join in.

## At NFU Scotland we always look for ways to give more to our members.

A NFUS Farming or Crofting membership now entitles your family and additional business partners to be rewarded just like you are, at no extra cost.

NFU Scotland

**www.nfus.org.uk**

the cut

ISSUE 01 SPRING/SUMMER 2021

QMS
Quality Meat Scotland

**QUALITY MEAT SCOTLAND**
Rural Centre
West Mains
Ingliston
Newbridge, EH28 8NZ
t: +44 (0)131 510 7920
e: info@qmscotland.co.uk
www.qmscotland.co.uk

**PRESIDENT**
Kate Rowell

**CHIEF EXECUTIVE**
Alan Clarke

**EDITOR**
Lesley Cameron
e: LCameron@qmscotland.co.uk

**THE CUT**
Published on behalf of QMS by
Connect Publications (Scotland) Ltd
Studio 2001, Mile End
Paisley, PA1 1JS
t: 0141 561 0300
w: www.connectcommunications.co.uk

**CONNECT EDITORIAL TEAM**
e: info@connectcommunications.co.uk

**MANAGING EDITOR**
David Cameron
t: 07711 314219
e: david@connectcommunications.co.uk

**CONTRIBUTING EDITORS**
Pauline Burnett
Alana Black

**DESIGNER**
Mick Reilly

**SENIOR SUB-EDITOR**
Craig Gibson

# INTRODUCING A NEW BREED OF MAGAZINE – *'THE CUT'*

Like everyone, over the past year the team at QMS has faced enormous challenges. But what have we learned? The answer is, there's not much we can't achieve by working together and communicating effectively.

So, we carried out a detailed review of our communications strategy, and you are now holding one of our major new initiatives, *The Cut*, our relaunched publication for members and the wider meat sector.

The former QMS industry magazine, *Livestock+*, was an important element of our communications strategy. However, we felt it was simply not fulfilling its potential. There was significant opportunity for improvement.

We surveyed extensively across the sector, asking those on the front lines what they wanted, what they needed. We listened, set out a new editorial plan and, we believe, delivered. It is with great pleasure that I welcome you to the first edition.

Our objective is to look in-depth at some of the key issues impacting on our industry, to share knowledge and insight, and to create a platform for discussion that helps us move forward with confidence.

QMS
Quality Meat Scotland

The new-look QMS logo represents all meat sectors

> *Our objective is to take an in-depth look at some of the key issues impacting on our industry*

In this issue, our theme is sustainability, and we examine many elements of this vitally important but complex subject, tackling topics from carbon capture to the latest sustainable animal food stuffs and sustainable packaging.

The eagle-eyed amongst you will also notice that we have a new QMS logo. Our desire was to create a new brand identity that encompassed our core aims and objectives. So, we challenged our creative team to come with a design that embodies everything that QMS stands for.

You will see that they have cleverly built in the three core products at the heart of everything we do: beef, sheep and pork. They are brought together in the imagery to project the central pillar of our existence, quality.

I hope you will enjoy this first edition. Please let me know what you think and how we can continue to make *The Cut* a great read.

***Lesley Cameron,***
***Director of Marketing and Communications***
*LCameron@qmscotland.co.uk*

# the Contents

ISSUE 01
SPRING/SUMMER 2021

The pandemic hasn't stopped Andy Waugh as he continues to serve up the highest quality of produce in sustainable and innovative ways.
Page 36

## The new gold rush

With carbon trading breaking records for livestock farmers around the world, is Scotland prepared to reap the rewards of this new cash cow?
Page 6

## Regenerative Farming

Regenerative farming is gaining traction – but what potential does it hold for Scottish livestock businesses?
Page 26

## Myth busting

Are veggie burgers and insect sandwiches really what will make us and our planet healthier? The science is now proving conclusively what many already firmly believe: meat IS good for you.
Page 40

## Agritech pioneers need you

Professor Bruce Whitelaw on how meat-sector insiders can help secure Scottish agritech's global status. Page 56

## Food for thought about soy

A Scottish company is helping countries around the world end their dependence on environmentally harmful animal feed.
Page 48

### MOVING ONWARDS AND UPWARDS IS IN OUR DNA

The right data and latest tech have the potential to change agriculture and the possibilities for farmers are exciting.

Page 32

### A PACKAGE OF POSITIVE CHANGES

New production methods will mean that more plastic will be recycled in the future, which is good news for meat producers.

Page 64

### CHEWING THE FAT

UK Farmer of the Year rounds off the first issue of *The Cut* with his choice of fantasy dinner guests and produce.

Page 67

## Up next

### THE BIG BREXIT QUESTION

Next issue will mark nearly a year out of the EU. *The Cut* puts Brexit's impact on Scottish agriculture under the microscope.

### FOOD AND DRINK TO US

We look at QMS's hugely successful partnership with Scotland Food and Drink and examine its outstanding results.

# WE HAVE SOME GREAT STORIES TO SHARE!

As an industry, we can often feel under threat when discussions about sustainability, climate change and agriculture start to swirl. However, in my view, this debate should be welcomed and embraced as an opportunity to learn, adapt and prosper.

The trends are there for us all to see and recognise. It's very clear that we're farming at a time when consumers increasingly want to engage with their food, know where it comes from, and how it's produced. While the pace of demand for this is now increasing, the truth is that it is something farmers have been crying out for, for decades.

Since 1996, the Scotch Beef and Scotch Lamb brands have held the coveted European Protected Geographical Indication (PGI) status, which will be retained post-Brexit. 'Scotch', meanwhile, has become synonymous on home and world markets alike with the highest of standards. This is in addition to the quality and taste of the final product.

By buying Scotch, shoppers are not only eating quality meat with full transparency at all stages of the supply chain, they are also helping to preserve Scotland's iconic landscape, sustaining a vital Scottish industry which supports 50,000 jobs. And they are upholding generations of experience and embedded culture.

Rather than launch a defensive battle, we should all take this opportunity to engage positively, inform properly, and tell our own stories. We are in an excellent position to do so.

I'm excited about the launch of our new magazine. It gives us the perfect platform on which to explore these issues of crucial importance to our industry and to highlight the work that is being done across the sector to meet the public's demands.

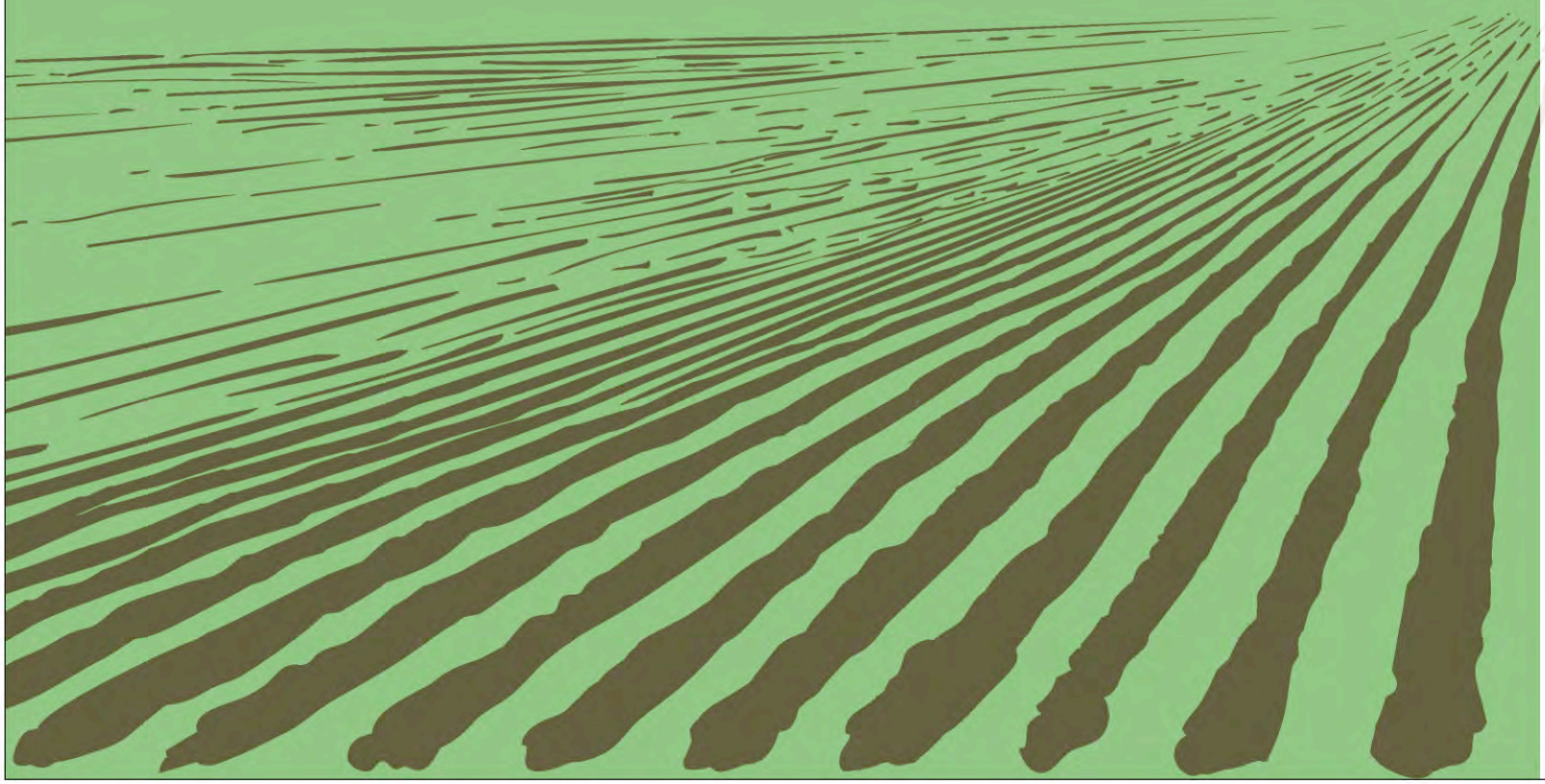
> *"Let's take this opportunity to engage positively, inform properly and tell our own story*

My hope is that these articles will challenge, inspire and provide the tools to move forward, especially as sustainability, climate change and the role diet, and meat in particular, become an ever-growing concern for consumers.

Sit back, grab a cup of tea, and enjoy QMS' first issue of *The Cut*.

***Kate Rowell,***
***Chair of Quality Meat Scotland***

# The new GOLD



With carbon trading breaking records for livestock farmers around the world, is Scotland prepared to reap the rewards of this new cash cow?

# RUSH

WORDS PAULINE BURNETT

The fields livestock roam in are now the hot ticket on the world's trading floors. As businesses seek to offset their environmental toll or showcase their commitment to the planet, carbon capture is the new must-have and global analysts predict a purple patch for green finance over the next five years. Now regenerative land management practices focused on the soil's ability to sequester carbon are delivering bottom line benefits for farmers, and livestock managers around the world are beginning to cash in.

In January 2021, Australian business Wilmot Cattle Company broke national records by selling carbon credits worth £289,000 to Microsoft, while in the USA, crop and cattle farmer Kelly Garrett traded credits to the tune of £210,000 to e-commerce giants Shopify.

Both farmers were ahead of the curve as carbon trading for soil is in its infancy, but it's a burgeoning market and one that farmers can access directly via a string of sites offering land managers links to multinational organisations looking to green up their investment portfolios. Wilmot Cattle Company's deal was managed by US Regen Network, which aims to "align economics with ecology to drive regenerative land management", while Garrett sells his credits on carbon removal marketplace nori.com.

The route to market is there, but is Scottish livestock farmers' ability to join the clamour for carbon credits being hampered by a lack of clarity and need for clear government policy? Christopher Nicholson, Chairman of the Scottish Tenant Farmers' Association, thinks so.

"We're missing a trick," he says. "If I were the landowner and went out to plant 100 hectares of trees, even though they're

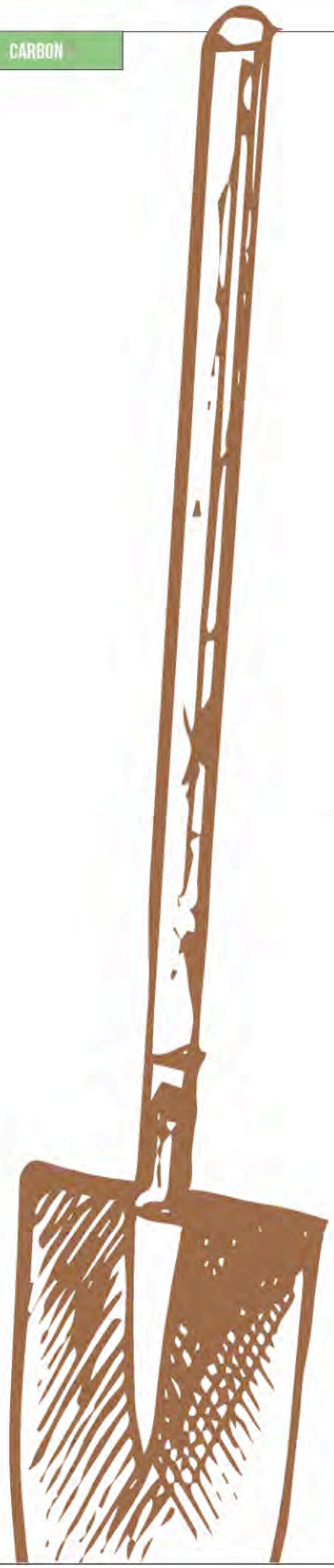
*Our panel*

**CHRISTOPHER NICHOLSON**
CHAIRMAN OF THE SCOTTISH TENANT FARMERS' ASSOCIATION

**EMMA PATTERSON TAYLOR**
PROJECT MANAGER, THE CARBON POSITIVE PROJECT

**ANDREW MACDONALD**
HEAD OF FOOD AND FARMING SCOTLAND, SAVILLS

**DAVID MICHIE**
NFUS'S POLICY MANAGER (CROPS) AND EX-DEPUTY DIRECTOR AT THE SOIL ASSOCIATION



not going to be contributing to the net sequestration of carbon until they're about 10 or 15 years old, I can sell those carbon credits up front. The mechanism for doing it is there. But if I suddenly changed all my grazing pattern to mob grazing and deep-rooted types of grass, there's currently no mechanism for me to sell those carbon credits and no authority in Scotland that can provide a verifiable baseline for soil carbon."

Christopher farms at Kidsdale Farm, Whithorn, Wigtownshire and has been collecting data for the past decade at least.

"I've been testing soil organic matters every year, but that's me going out with a shovel and sending samples off to the lab. That's not good enough as a baseline because it's not verifiable as I'm not getting an independent person to do it. What's missing in this country is an independent, verifiable baseline from which to move forward. I'm hoping that in future government policy ensures that soil will be monitored for carbon content."

This verification is important because environmental integrity is key. The principles of carbon accounting systems all over the world means that the emission reduction represented by a carbon credit is:

- real – accurately calculated
- measurable – able to be compared with a baseline condition
- verifiable – able to be confirmed by an independent third party
- permanent – unable to be reversed
- additional – above and beyond business as usual
- enforceable – able to be withdrawn, should it be discovered credits were created fraudulently.

> *"I hope that in future government policy ensures that soil will be monitored for carbon content"*
> Christopher Nicholson

It was having years' worth of data which could be verified that led the Australian and American farmers to their own pot of gold. Here in Scotland, many land managers are measuring their own soil samples, and have been for many years, but the picture of how to verify their results is muddy. With lots of different tools out there, farmers are unsure who to turn to, and whether their data can stand up to scrutiny. The ideal scenario is that a common standard and equitable calculation methodology be established as a benchmark to ensure that each farm can be audited, and its data relied on.

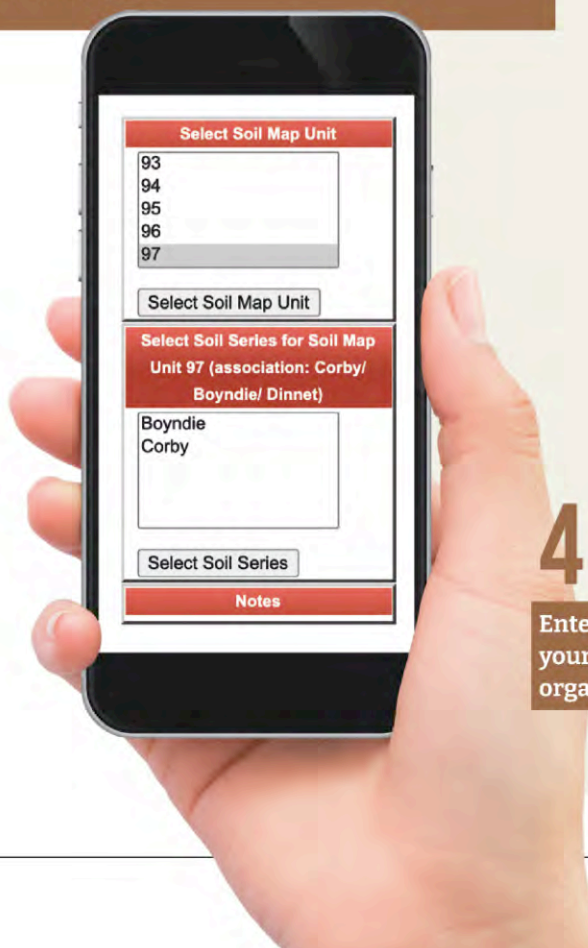
The James Hutton Institute's Soil Information for Scottish Soils identifier, launched in 2013, enables land managers to gauge their soil, but the holistic approach assessing the whole farm's ability to assess its carbon capturing capabilities – and get paid for it – is the missing link.

The answer may lie in a major project being funded by the Scottish Government, which ministers could sign off on as soon as this summer. The Scottish Agricultural Organisation Society (SAOS) Carbon Positive scheme, set up in conjunction with the James Hutton Institute and Forest Research, has been gathering new data to establish a picture at a national and individual farm level of the carbon that is stored and being managed on-farm. If approved by government, the scheme will provide a searchable map for each farm holding which allows data on

# How does your soil organic matter measure up?

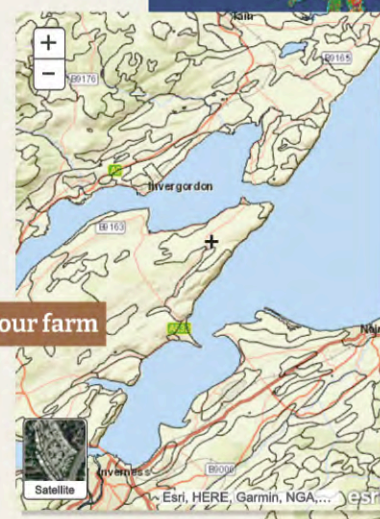
You may already know the answer to this, but if not, the James Hutton Institute's Soil Information for Scottish Soils identifier is a good starting point for finding out. Funded by Scottish Government, it's a free and easy-to-use tool for land managers to compare their sample data with typical values in the national Representative Soil Profiles of Scotland database.

See om.hutton.ac.uk




**1** Find your area

**2** Find your farm





**3** Compare cultivated and semi-natural soil types

**4** Enter a value for your measured soil organic matter

**5** View management information on how to reduce or improve management

Soil organic matter is an essential component of good soil quality and contributes to nutrient retention, stable aggregates and improved water retention and drainage.

- Storing more organic matter in the soil helps combat climate change by locking up the carbon dioxide ($CO_2$) taken out of the atmosphere by plants.
- Losing soil organic matter contributes to increased atmospheric $CO_2$ which may exacerbate climate change.

soil carbon or woodland carbon to be overlaid in layers so every farmer can clearly gauge their carbon stocks.

The Carbon Positive project will be ready for approval by summer 2021, as Project Manager Emma Patterson Taylor explains: "The premise of the platform is all around building understanding, awareness and accountability of the farming industry and of the natural assets that are under their stewardship. It's about establishing how management can help them improve. There are various emerging technologies, and there's a high likelihood that government will want to pay for outcomes around public goods management and soil carbon is clearly one of those. Our timelines might link in with that if ministers decide that we should be the soil database and provide the evidence base."

The SAOS commissioned the institute to carry out the soil carbon estimate and, although Patterson Taylor says it's important to stress that it is an estimate as all of these datasets are a moment in time, the SAOS is confident on the data they have on soil.

"We talk about the top 30 centimetres as that's what has been actively managed by a farmer and we can focus on the impact their management has. Woodland carbon stocks are known and easy to measure, peatland also has academically sound understanding. The Climate Change Committee has talked about peat stocks and tree planting as key areas where farmers can increase sequestration for the contribution to climate change mitigation, but grassland and soil is just not there."

Patterson Taylor believes that public payment for soil carbon management may also be on the horizon.

"There's potentially more imminent likelihood of public payment for soil carbon management than there is a private commercial one. By 2024, we need a replacement for CAP, so the Scottish Government needs to work out what their own payment system is going to be, and on what basis they're going to pay. There's a high likelihood that in one way or another payment will be for outcomes around public goods management of one kind or another and soil carbon is clearly one of those. However, we're in the run-up to the election and there's no clarity yet and I don't know when that will emerge."

So, should the public sector or the private sector be the bankers for this carbon sequestration? Resolving the climate emergency is clearly part of the public good, so the public sector has its place in promoting it through incentive schemes. However, the private sector is moving faster and may seem more attractive to farming entrepreneurs, so may hold the purse strings in the end.

In a webinar on regenerative farming in March, rural property specialists Savills explored the lag in policy in Scotland, and Andrew Macdonald, their Head of Food and Farming in Scotland, can see an opportunity for the farming sector.

"If you look at some of the more traditional private sectors, such as the supermarkets, many of them have their own brand of farm assurance, or

> *"The premise of the platform is all around building understanding, awareness and accountability"*
> Emma Patterson Taylor

*Case study*

Stuart Austin and his family

Stuart hard at work on the farm

# 'We are trying to demonstrate that livestock are part of the climate solution'

**WILMOT CATTLE COMPANY** run Angus, Herefords and Charolais cross cattle on three farms inland from the east coast of Australia. Via Regen Network, the company sold 41,000 tonnes of $CO_2$ to Microsoft for £280,000. Farm manager Stuart Austin explains how it happened.

"We've basically used animals as the tool to restore the ecosystem here, and we absolutely live by the mantra that you can't manage what you don't measure, so data is critical.

"Regen Network overlaid some Sentinel satellite imagery over our on-ground data points and came up with a very high correlation between what they saw and what we were measuring on the ground. And from that, they're able to calculate exactly how many tonnes of $CO_2$ we had sequestered out of the atmosphere as soil organic carbon.

"Every May we sample the same points and we're going back to the same site every year. Having that data set and consistency was what led us to being able to monetise that carbon.

"The grazing management has been what has achieved the gains. We moved to a small number of large mobs moving quite frequently through small areas, and not coming back to that area for a significant amount of time. We now graze mobs of up to 1,500 heads at a time through about a 20-hectare paddock and they're moving every one or two days. The rest period is anywhere from 30 to 70 days, sometimes up to 90 days when it gets a bit dry. With that number of animals and system of management, the liquid carbon pathway is constantly activated through photosynthesis as grazed plants are stimulated to grow again and the photosynthesis produces more sugars in the soil which leads to the increase in soil organic carbon.

"Our methane emissions were calculated using a government methodology that takes into account transport, fertiliser animals, and all our on-farm practices and we're emitting around 2,000 tonnes of $CO_2$ per annum and sequestering around 10,000 tonnes per annum, so we're massively carbon positive, and I would suspect that we're not the only ones that are in that position. We just have the data together to demonstrate it. In fact, we were ahead of the game as the satellite technology could only go back three years. The baseline was established in 2017 and the monitoring period was 2017-2018 and 2018-2019. The credits were issued in December last year and the crediting term will end in 2027.

"We are trying to demonstrate that livestock are a really significant part of the climate solution in terms of getting greenhouse gasses out of the atmosphere and into our soil."

their own quality standards that they expect from a supplier, and some of that includes carbon footprinting and has done for quite some time. So, it's not being driven by government or policy, it's being driven by the market itself. I would expect that we will see both direct and indirect incentive and opportunity from the private sector, in the form of direct customers of agriculture having increased requirements for green credentials. There will be specific measurables tied to that in the retail sector, but beyond that there will also be opportunity from investment funds or private corporates that are looking to invest in something green or to offset their own carbon footprint."

As Jim Walker's Suckler Beef Climate Group report made policy suggestions centred around reducing climate impact, including carbon footprinting, Andrew considers this an interesting indicator of the direction of travel. "If there is public sector support for agriculture," he adds, "it could very well be tied to things that are going to reduce the impact of food production on the climate, in the same way that in England the public money for public goods concept is coming into their whole food strategy." As the ex-Deputy Director at the Soil Association and now NFUS's Policy Manager (Crops), David Michie has a deep understanding of the challenge any amendment to policy might bring in order to access returns for carbon sequestration.

> *"Climate change is such a big part of all our futures that it's bound to bring a lot of opportunities"*
> David Michie

**WHAT'S YOUR EXPERIENCE?**
***Email info@qmscotland.co.uk to comment on this topic.***

"We want to be getting those opportunities, but it's probably too early to say what's going to happen," he explains, "particularly with Brexit, COVID, and the uncertainty around policy. England has a really clear vision, but how well they deliver that through policy is still uncertain as it's not known how any changes will be paid for. The advantage in Scotland is that we have a bit of certainty on that, but we're just not very clear on the direction that we're going in. Climate change is such a big part of all of our futures that it's bound to bring a lot of opportunities to the industry as well as challenges."

The opportunities are clearly there for land managers selling direct to multinationals, as the Australian and American deals have shown. However, Scottish soils are relatively rich in soil organic matter and carbon credits bought by multinationals focus on improvements in sequestration through better land management. If the same tack is followed by government schemes, that concerns Christopher Nicholson.

"There's a danger of future policy rewarding the sinners of the past," he says. "If you've got really rundown soil with low organic matter because of previous bad practice, it's going to be pretty easy to change that method and increase the carbon. I think that's what's happening in Australia. In this country we should be rewarding people for practices that

we know are good for soil carbon levels, rather than just rewarding those who have depleted levels in the past."

Andrew Macdonald agrees that this may be a drawback to Scottish farmers being able to realise carbon gains.

"The history of policy has been to reward an improvement from the current practices rather than to reward practice that is already in place," he says. "If you were to take a mixed farm in Scotland, which had a majority grass rotation with a bit of spring barley and there's organic matter of going back in the form of straw and dung the soil organic matter is 8% or 9%, then a farmer continuing to do that may not be considered as regenerative because it's not increasing from their starting point. However, their starting point will be significantly higher than, for example, an all-arable Cambridge-style soil.

"The baseline starting point has to be thought about carefully and applied equally," adds Andrew. "Policy that is applied across all of the country is by necessity quite a blunt instrument so it becomes even more important to know what the starting point is, and know what the baseline is, and to recognise existing good practice and existing healthy soils."

It's clear that whatever happens, data will be the key to unlocking any benefits, whether they come from the government or big business. But in the meantime, carbon capture is undoubtedly good practice and should be on everyone's radar.

"Putting long term carbon back into the soil, where it will remain for hundreds of years, can be achieved by farmers quite quickly," says Scottish Tenant Farmers' Association's Christopher Nicholson. "By changing how they graze, or their pattern of grazing, farmers can make significant increases to the carbon content of their soils within 10 years. That 10-year period is really important because we have an aim of net zero by 2045.

"That's too short a timeframe to allow planting of trees to do it. Farmers can achieve really impressive results, increasing their soil carbon by 25-30% in that period, and that's many, many times what a farmer will be emitting through diesel and methane."

*Learn more*

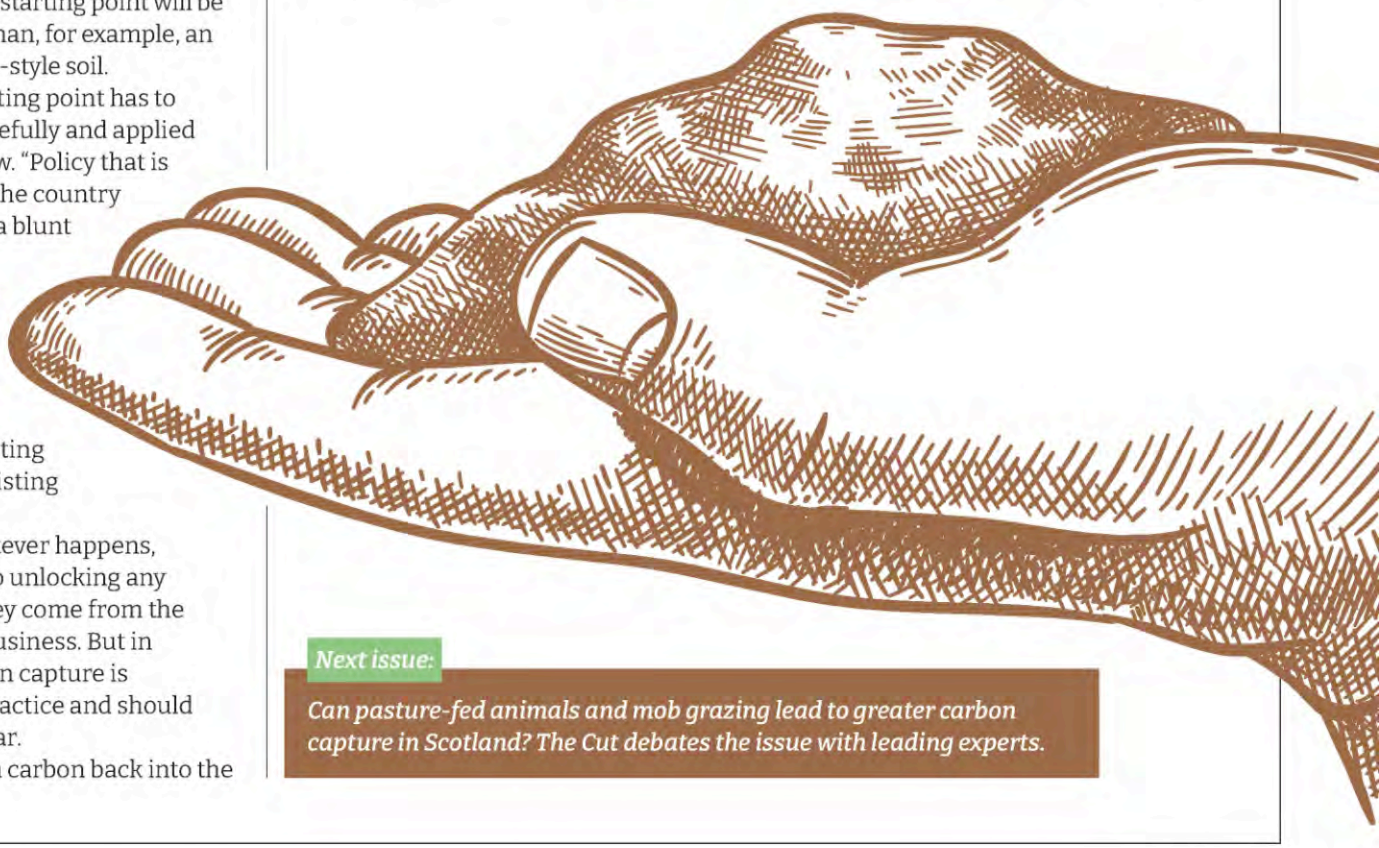
## Resources

Farming and Water Scotland have produced a Valuing Your Soils booklet.
**www.farmingandwaterscotland.org**

Savills' webinar on regenerative farming is available at
**www.savills.co.uk/research_articles/229130/312062-0**

Regen Network
**www.regen.network**

The SAOS Carbon Positive Project
**saos.coop/what-we-do/carbonpositive**



*Next issue:*

***Can pasture-fed animals and mob grazing lead to greater carbon capture in Scotland? The Cut debates the issue with leading experts.***

# MOVING WITH THE TIMES

*Alan Clarke,*
*Chief Executive of QMS*

2020 was one of the most challenging years we faced as a nation. It was remarkable to see how the Scottish Red Meat Industry worked together to keep the whole supply chain open, keeping food on the country's table.

At the same time, our sector has had to contend with the considerable hurdles presented by our exit from the EU and our need to tackle the climate emergency facing our planet.

There is still a long way to go and we cannot be complacent. But I firmly believe that the resilience and success that the industry has shown puts us in a strong position to grow and prosper in the years ahead.

Consumers now, more than ever, want to know where their food comes from and the world is buying local!

To meet this demand, the red meat production supply chain of farmers, livestock hauliers, auction markets, processors, secondary processors, feed merchants and vets have successfully changed their practices and, in some cases, their way of life, to ensure that consumers always have access to high quality red meat.

Catering butchers, retail butchers, food service providers, retailers and chefs have also all faced huge challenges; the loss of food service markets overnight and the reduction in exports through Brexit being just two.

However, we have seen retail sales of red meat increase significantly as people reconnect with their food and traditional businesses have established e-commerce activities with click and collect and online delivery.

Although it has had to be business as usual, practices in processors, auction markets, restaurants, butchers and

# WE'RE ON THE FRONT FOOT

*Sarah Millar,*
*Director of External Affairs for QMS*


> *"We will continue to highlight the benefits of the industry and its role in Scotland's future*

Our industry is being challenged to better demonstrate the environmental, economic and health credentials around red meat production and consumption to bridge the growing disconnect between farming and food production within the wider population.

At QMS, we aim to stretch our reach and reputation across the UK and Scottish parliamentary and civil service community. Our priority is to connect with parliamentarians and civil servants beyond the rural realms, so the sector is fully understood for its role as a driver for the nation's health, environment and economic success.

Traditionally, we have enjoyed excellent relationships with the government's Food and Drink and Rural Economy teams. However, we are increasingly aware that

retailers' may have changed for ever.

At QMS, we also had to change and so we carried out an internal staff restructuring to ensure that we could rise to all the challenges.

I would like to say a huge thank-you to our Board and every member of the QMS team who have been working remotely for the last year; they should be proud of how we have supported the sector during this time.

We have made a 360-degree change in our marketing and comms strategy, led the delivery of the GB "Make it" marketing campaign, and increased the use of social media, influencers and user-generated content to target a younger consumer demographic.

We have also developed online learning resources, delivered a series of industry development podcasts, provided remote quality assurance assessments, rebranded our Scotch butchers club, established a Scottish red meat group to support our levy payers with Brexit issues, co-ordinated the activities of the Scottish red meat resilience group and contributed to the many industry consultations from the Scottish and UK Governments and participated in policy groups established by the Scottish Government.

One key achievement has been the agreement with AHDB and HCC on the long-term solution for levy repatriation meaning that on average, £1.2 million of producers' levy money currently trapped in England will be returned to Scotland annually.

Our new publication highlights the activities undertaken by each QMS department and looks at our highest priority areas going forward; that includes the climate change crisis and sustainable red meat production. We hope you find this interesting and please don't hesitate to contact me at any time.

> *I would like to say a huge thank-you to our Board and every member of the QMS team*

conversations and decisions have been taken out with these departments that impact the sector. We weren't part of these and needed to be.

We want to be on the front foot, reaching decision-makers in all quarters before the decisions are made, not being caught out because we weren't part of the conversation.

To make this happen, we will deploy a programme of farm and supply chain visits, regular topical and market briefings, consultation responses, and impact assessments on key legislative areas. These will be aimed at all parliamentarians and publicly available.

This is in addition to holding bi-annual parliamentary receptions and regular liaison with those in Government – specifically targeting new MSPs from an urban background as well as those within the wider parliamentary office, such as office and constituency managers who are often the first point of contact for the general public.

We are increasing the focus now while so many pieces of legislation and policy are changing post-Brexit. We have an opportunity to work not just with parliamentarians and civil servants, but with our wider stakeholders to make sure our activities are proactive and aligned. With the levy returning to Scotland, there will be more financial support available to extend this activity.

Following the Scottish Parliament elections in May, we're building a greater understanding and mapping of who the key decision makers and influencers are and looking to offer a programme of activities over the summer during parliamentary recess.

We will build on the excellent work of the Scottish Red Meat Resilience Group, led by QMS, which brings the key organisations in the sector together to address issues and produce collaborative responses to key challenges.

We will continue to highlight the benefits of the industry and its role in Scotland's sustainable environmental and economic future, including leading on delivering the industry's activity around COP26 in Glasgow in November.

Our ultimate ambition is to see QMS sought out as a safe source of independent advice and insight and to be seamlessly involved in conversations and decisions that affect our industry. Having a more proactive role in this aspect will help positively shape the industry for the future, demonstrating the value of the Scottish red meat sector as a key contributor to meeting the nation's Net Zero goals, and managing the green landscape Scotland is known for.

# IT'S OUR TIME TO SHINE

*Bruce McConachie, Head of Industry Development for QMS*

Something no-one could have predicted about the last 12 months is that livestock farming in Scotland would weather the almost perfect storm of 2020 in a position of stability and public support. There were big challenges, but from a soaring sheep trade to the public embracing the provenance of their food, there are encouraging signs on the horizon for us as producers. We will emerge from the storm.

We have a chance to show too, that Scottish livestock farmers are at the beating heart of the Scottish countryside, and it's essential that they remain there to play their part in addressing the social and economic challenges in rural Scotland, as well as playing their part in tackling climate change.

QMS has a unique role to play and, in particular, the Industry Development team. It is committed to giving Scottish livestock producers the tools to drive the industry forward, ensuring that every livestock business has the information and knowledge to capitalise on the opportunities that lie ahead. We can help achieve this with a combination of technical information supported by on-the-ground examples, as well as pioneering and supporting new research in efficiency and sustainability.

During lockdown, we had to refocus our attentions and remodel how we engage with producers across Scotland. We have learned a huge amount to take forward to benefit all our future work.

In spite of being unable to engage face-to-face, we have maintained our drive and commitment to deliver industry leading

> *"We want your input on what the future should look like*

# THE BREXIT BREAKDOWN

*Tom Gibson, Director of Market Development for QMS*


The ink had hardly dried on the UK's biggest trade deal in recent history before exporters were exposing the anomalies of a system that was not fit for purpose. A full financial quarter has passed since the UK's departure from the European Union on 1st January, and exporters are still being challenged by costs, complications and loss of contracts.

Before Brexit, sending a pallet of goods, such as red meat, to Berlin was as easy as sending it to Birmingham. You only needed one consignment note, but now our exporting processors need to comply with 18 different export procedures and the importer on the other side needs to complete eight different processes in terms of the export paperwork and customs documentation.

Brexit, and the reduced demand from EU food service markets due to the

work, none more so than our recent Scotch Beef PGI Traceability and Performance Project. The project tested and analysed DNA information to identify the immense potential for the Scottish beef industry if DNA and phenotype data was harnessed.

In addition to our online engagement, we have driven the development of virtual tools that can give producers the ability to make management decisions on farm, to increase the sustainability and resilience of their businesses.

One of the dynamic new ways we can engage with producers is by creating weekly technical content focused on subjects that are relevant to producers and deliver them in a variety of forms, including our QMS podcast. The podcast has just passed its first birthday and is moving from strength to strength, covering topics from accountancy to worming.

Looking to the future, businesses will be forced to be more agile and resilient, and we believe Industry Development has a key role to play in future-proofing farm businesses.

We want to support and develop bold new research that can inform and guide the industry and help us build resilience into the red meat sector through economically, environmentally, and socially sustainable businesses.

Our levy payers need to have the information and tools that are relevant to their businesses at their fingertips and that is something that we will provide long after life returns to normal.

QMS is your organisation, and Industry Development is your team, so talk to us. We want your input on what the future should look like, and how to get there. Knowledge is power and it is our responsibility in Industry Development to make sure that our levy payers have all the knowledge they need so they can drive our industry into a future filled with dynamic, sustainable, efficient, and profitable businesses.

coronavirus pandemic, has resulted in a significant drop in export volumes but has increased demands on exporters, created complications and added costs and contract losses.

The UK is now classified as a "third country" which means there are certain rules on what the EU can and can't import from us. For example, the EU will not allow the import of fresh mince or fresh meat preparations, it needs to be frozen. That has resulted in a loss of contract for certain exporters because the customer on the other end demands fresh and we can't give it to them.

We've also seen added costs to comply with the European Export Health Certificate regulations which require a vet to sign off every consignment that goes to Europe, whereas before we could just send it on its way.

The effects have rippled throughout the supply chain with hauliers withdrawing their groupage services.

> *"The export process to the EU is not fit for purpose*

A groupage service is where one truck takes multiple, small loads from different exporters to the EU, but with that service withdrawn, some of our smaller exporters now don't have a route to market into the EU because they don't have enough volume to take a full truck.

I think the industry as a whole would look at this and say that the export process to the EU is not fit for purpose. The distribution systems that we have in place here in the UK going into Europe were all built on 'just in time' supply chains to go into retail and food service, with the aim to get the product there as fresh as possible. Our current system simply doesn't work for food supply chains where we need to get the product there within 24 hours.

Export volumes are low, and I worry that when food services start to come back in Europe and the demand increases, our problems are going to grow. Do we have enough vets to sign the volume of certificates? Will there be enough customs staff to process the imports? What are delays going to be like when we double the number of export consignments?

While export is challenged, domestic retail demand for red meat has been a success story. The UK retail market is doing well, with demand driven by grocery multiples and butchers. Consumers have been reconnecting with red meat. But it would be good to have the best of both worlds.

# 2020 WAS THE YEAR TO MAKE IT!

*Lesley Cameron, Director of Marketing and Communications for QMS*

Social behaviours are changing. Local, ethical and sustainable issues are all now high on shoppers' agendas, particularly among QMS's priority target audience, 18-39-year-olds. The key question then is, what do we do to ensure that the Scotch brands and SSP are constantly at the forefront of consumers' minds?

The answers lie in using insights and data to align everything we do with our target audience. Discovering what is important to them ensures we can build a positive relationship and connection to our brands.

We are well aware that the 'Scotch' brand is a very strong story to tell; it's clearly one of the most important points of difference to other brands on the market.

However, to push forward, we have grasped the opportunity to create a more relevant and aligned portfolio of brands. We were driven by the desire to move away from our previous three static campaigns a year, to an 'always on' integrated strategy which brought the Scotch Beef PGI, Scotch Lamb PGI and Specially Selected Pork brands to life. Our activity had to be much more cohesive, consistent and continuous to maximise its impact.

When I joined QMS, I conducted research to define our target market and set up cluster groups of consumers by utilising data from the likes of Kantar and YouGov. I needed to understand if the younger audience, who were already reducing their meat intake, were interested in receiving information about red meat and its benefits. Our research also helped us better understand their values, interests, and communication channels.

We then used this data to form our new 'Make it' strategy, launched in 2020. This

# COUNTING THE COST OF COVID-19

*Stuart Ashworth, Director of Economic Services for QMS*

Steps taken at the outset to try to contain the spread of Covid-19 had an immediate effect on the red meat industry, leading to a considerable rebalancing of the supply chain both in the UK and EU. In the sheep meat sector, for instance, export demand just halted overnight, causing farm gate prices to collapse.

Prices did recover through the early summer of 2020, even though prime lamb slaughter volumes were higher than in the same period the previous year and spent the second half of the year 10 to 30 per cent higher than 2019.

In the first quarter of 2021, supplies tightened and farm gate prime sheep prices continued to climb to record high levels, passing even the early season peak.

In terms of cattle, prices fell soon after Covid-19 control measures were introduced. However, they quickly

was a revolutionary step for QMS and its brands. We moved away from traditional forms of communication and invested in social media and digital platforms.

Our tone of voice changed from defending red meat to having positive conversations about it and showing the pride that our industry has in its production.

Last year also saw us run our first national "Make it" campaign, in collaboration with AHDB and HCC. It has been a huge success, with £12 million beef and lamb retail sales across the UK and £1.17 million total sales in Scotland.

This year, we are building on these solid foundations and are confident that our strategic approach and highly effective campaigns will bring the results we seek. We will focus on the key strategic pillars of:

- Sustainability
- Health and wellbeing
- Lifestyle
- Quality assurance
- Animal welfare
- The Scotch Difference.

Our aim is as simple to say as it is complex to deliver. In the year ahead, our dedicated marketing team will produce highly relevant, carefully targeted, essential content that is aligned with our core pillars and consumer attitudes. What will success look like? It will be ensuring that the current consumer perception of our brands is maintained and making sure that red meat is always in the weekly shopping trolley.

> *When I joined QMS, I did research to define our target market*

recovered through May and June of 2020 and spent the autumn above their five-year average.

The number of prime cattle passing through UK abattoirs fell below 2019 levels in the final quarter of 2020 and, with supply remaining tight into the first quarter 2021, prices jumped higher in March, reaching new seasonal records.

Pig meat started 2020 on a firm footing and then, in contrast with other sectors, prices edged forward until the middle of the year with no evidence of any Covid-19 related fall.

Then in the second half of 2020, supply and demand shocks related to human and animal health hit the European market and the option of a cheaper alternative from the EU eventually fed through to UK supply chains. Prices dipped below earlier levels in the final quarter of 2020.

Processing sector disruption then hit the UK pig sector hard through the winter months, limiting slaughter capacity, leading to a backlog of pigs on farms and pressuring prices at a time when feed costs were also rising sharply. While the market has begun to recover, producer prices were still down 13.5 per cent on last year moving into April.

> *Measures to combat Covid-19 impacted on demand for meat*

Measures taken to combat Covid-19 also impacted on demand for meat. The switch away from dining out immediately reduced the sales of catering butchers but led to a surge in demand at high street butchers and multiple retailers.

It also affected the balance of cuts sold, with an initial panic buying phase supporting demand for products like mince, before consumers settled into their new circumstances and began to expand their cooking skills, boosting sales of steaks.

Public health restrictions overseas have also impacted on export demand. Exporters whose key market was food service lost out compared to exporters with a client base supplying multiple retailers.

Globally, one side effect of the pandemic has been increased consumer awareness of where their meat comes from, leading to increased support for local suppliers.

That change is obviously good news for Scotch product in Scottish stores, though for a nation that sells the vast majority of its output to the rest of the UK or internationally, it raises a different set of challenges for traders.

# TEACHING THE TEACHERS ABOUT SUSTAINABILITY

*Jen Robertson and Alix Ritchie, Health and Education Managers for QMS*

A big project for our Health and Education team has been supporting teachers with knowledge and materials on sustainability to inspire their classes. It's an increasingly hot topic, so over the last few months Team H&E, Alix Ritchie and Jennifer Robertson, have been running a series of webinars for teachers and educators called Food, STEM and Sustainability (in collaboration with the Food & Drink Federation Scotland, RHET and The Rowett Institute).

More than 200 teachers have signed up to the sessions, which also gives them access to a brilliant digital learning zone for further self-teaching, an optional course that counts towards continuous professional development (CPD) and resources that can be downloaded for the classroom.

We asked Alix and Jen about why sustainability matters...

**Why are you teaching teachers about sustainability?**
Two years ago, sustainability was a term used occasionally. Now it's part of the everyday lexicon and we are hearing and seeing it everywhere. Education Scotland is pushing it and pupils are asking about it, so increasingly teachers from different disciplines are coming to us saying they are struggling to find the resources to teach it in their subject.

**Why have they come to you?**
That's exactly what we do. Our resources are intentionally kept broad so they can be integrated into any subject across the curriculum, whether STEM subjects - science, technology, engineering and maths - or home economics or geography. Farming Foodsteps, our new interactive digital quiz and games about the food chain, has been very popular, and not least over the last few months as it can be used for home learning or in the classroom.

**How do the webinars help?**
They support all of the resources with the story behind sustainability in the red meat supply chain to give teachers a broader understanding that they can share with their pupils, as well as a chance to ask experts important questions.

**Why does it matter?**
Because there is a lot of (mis) information in the media and on social media about the impact of red meat on the environment. It is essential that we reach young people, who influence this generation, and are the next generation of buyers, with the facts so they can make their own informed decisions. Teachers are very valuable conduits in this way.

**What do they learn?**
That it's holistic – sustainability is not just about reducing the methane that goes into the atmosphere, it's also about good soil. It's about social and economic sustainability, about good animal welfare and nutritious food for a healthy nation.

**What can we in the industry learn?**
That there's a thirst for knowledge about it among consumers. Knowing how to communicate messages to those who aren't connected to farming positively arms the industry.

**What can the industry do to help?**
It's well worth spending 10 minutes on Farming Foodsteps to get a feel for the language and themes that resonate and are relevant to young people, and how as a farmer or processor you might communicate some of the key messages when asked. You might even learn something about another part of the supply chain you didn't know before! And please share it will any teachers you know who are working in secondary schools.

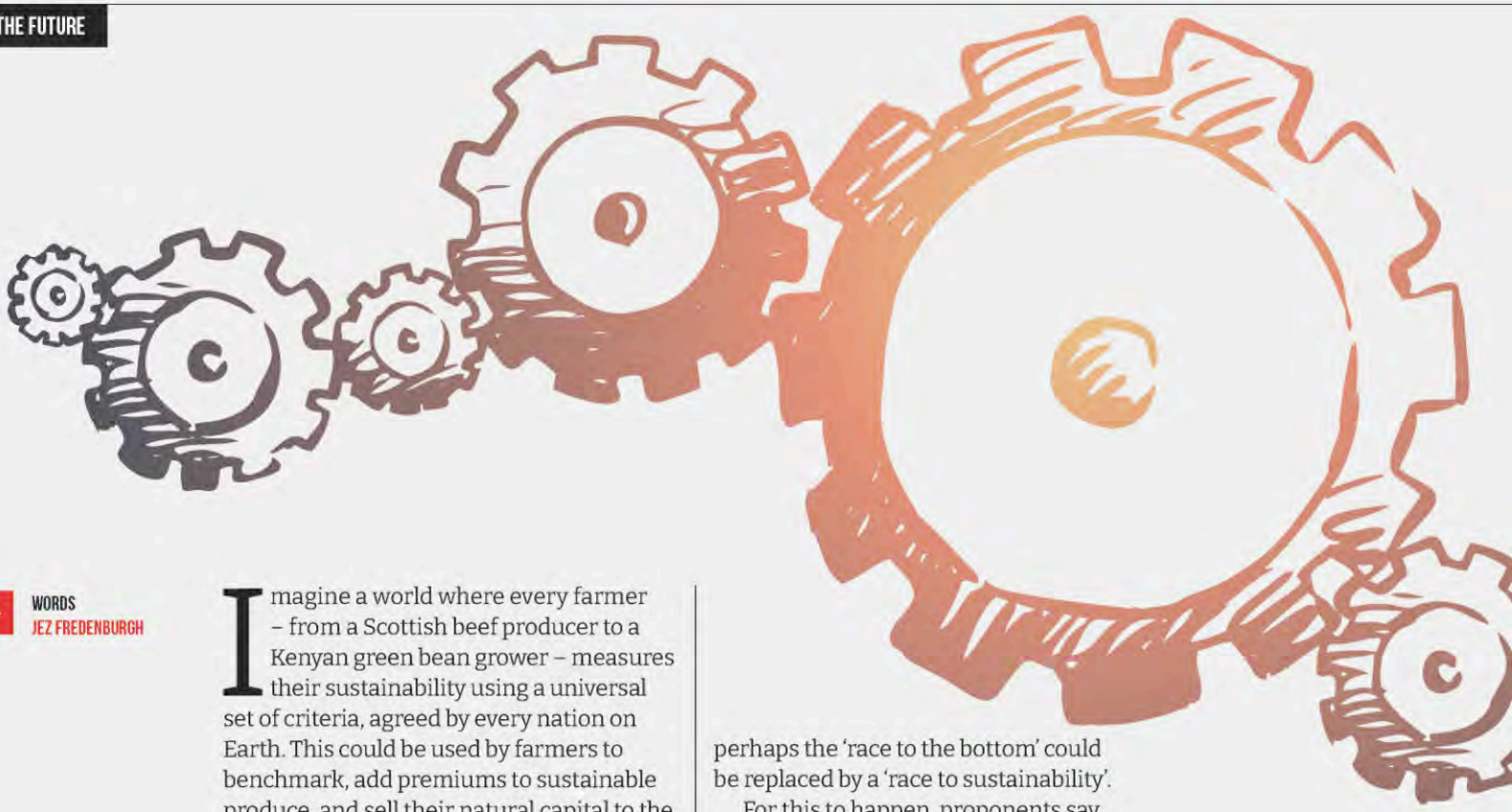
> *"Two years ago, sustainability was a term used occasionally. Now it's part of the everyday lexicon and we are hearing and seeing it everywhere*

**What are you most excited about?**
That Farming Foodsteps has had such a good response, but especially that it covers elements of the supply chain that haven't been widely taught before. It's always evolving and we have exciting new developments coming up.

**What next?**
A new sustainability game. Watch this space.


# ‘Sustainability metrics’ and their key role in the future of global food competition

Pioneering work to measure every farm’s sustainability could revolutionise the food system, with big benefits for Scottish farmers. **Jez Fredenburgh** reports



WORDS
JEZ FREDENBURGH

Imagine a world where every farmer – from a Scottish beef producer to a Kenyan green bean grower – measures their sustainability using a universal set of criteria, agreed by every nation on Earth. This could be used by farmers to benchmark, add premiums to sustainable produce, and sell their natural capital to the private sector.

For Scottish livestock farming, with its wealth of natural resources, grasslands to sequester carbon and potential for sustainable production, this system could help the sector tell its story better, stand out from the crowd and show consumers that home-grown meat can be part of a sustainable diet.

With transparent information at their fingertips, consumers could finally compare the sustainability of Scottish beef and lamb to imported meat or plant-based alternatives.

Governments could use the data to allocate payments for public goods, target areas for improvement and set trade terms based on sustainability criteria. The most unsustainable imports could be banned or face a hefty tax.

Retailers and food manufacturers could use it to drive more ecological supply chains by choosing to work with the most sustainable suppliers. Banks could even use it to offer better lending terms to the most sustainable farming businesses.

Ultimately, the most polluting foods might be priced out of the system, and perhaps the 'race to the bottom' could be replaced by a 'race to sustainability'.

For this to happen, proponents say adoption by all nations is critical to create a level playing field and get buy-in from every food chain actor.

Worldwide agreement sounds daunting but is perhaps closer than one might think.

The UN's Food and Agricultural Organization has been researching and developing a set of universally applicable metrics and its 193 membership countries have already agreed on the framework (see more in panel).

> *"There are more than 100 sustainable assessment tools globally. It's very confusing*

Getting the whole world to move as one is proving logistically and economically tricky though, and so starting in one country and then going global may be more likely.

Step forward the UK and the groundbreaking work of a group of British farmers and the Bristol-based Sustainable Food Trust (SFT).

Over the last five or six years its working group has developed a set of metrics it believes could be used on any

farm, anywhere in the world. Interest in the framework is rapidly gaining the attention of major food chain actors and governments in the UK and abroad.

## HOW WOULD IT WORK?

"There are more than 100 sustainability assessment tools globally," says Patrick Holden, farmer and CEO of the SFT. "It's very confusing, so we're trying to create a harmonised system and common language that can be used universally.

"This could be used by governments to address the market failure which means that the most damaging food

# "There is a lot of work to do still, but we can do it"

Jean-Marc Faurès

***UN Frequently asked questions***

**A SET** of metrics has already been agreed by 193 countries under the UN's Sustainable Development Goal 2 (SDG), which aims to promote sustainable agriculture.

Getting all countries to collect data is proving difficult though, partly because it can be expensive, and not all farmers have access to technology. Currently, countries are being asked to use their annual farm surveys and add extra questions, with information collected by their national statistics office.

Despite difficulties, the globally agreed metrics are a significant step in the right direction, says Jean-Marc Faurès, regional programme leader at the UN's Food and Agricultural Organization, which is spearheading the project.

"These indicators are a good starting point and will hopefully inspire debate – they also have the advantage of having been approved at the global level," he says.

"The potential is that the world could finally measure its progress towards sustainable agriculture and identify areas for improvement."

## DEFINING SUSTAINABILITY

The metrics cut across the three dimensions of sustainability – economic, environmental and social, and have 11 sub indicators, including soil health, fertiliser use, water use, biodiversity, decent employment and food security.

Jean-Marc believes we could get to the point where every product can be compared using a globally agreed system.

"'Sustainability' is a fuzzy word – it is extremely hard to measure. Still, we need to find a way to do it. It [is likely to be an] ever evolving subject relative to societal values of the time," he says.

"Progressively, the most polluting products will not be able to reach a supermarket shelf and this will move farmers towards more sustainable practices."

## GLOBAL GOVERNANCE

The UN plays an important role in the global governance of metrics associated with the SDGs.

"The UN is the forum where all countries meet and agree on common rules. It is a long and progressive process, but I don't know a way of managing such a complex issue like this without the UN," adds Jean-Marc.

"The private sector is also interested. But they say to us 'give us the same rules and then we can compete fairly' - so this is why we need global governance.

"If only a few farmers drive towards sustainable farming, it will not be possible for them to compete with less sustainable practices in other countries.

"There is so much work to do but I am hopeful we can do it – we need to find a system that is not only economically driven, but also encompasses the social and environmental dimensions of food production."

## "We don't have time to wait for the perfect metrics"

Dan Crossley

***Food Ethics Council***

**WITH** the world facing climate and ecological emergencies, there is not time to wait for the perfect set of sustainability metrics, says Dan Crossley, executive director at think tank The Food Ethics Council (FEC).

Instead, the world needs to agree on metrics that are "good enough" and that farmers buy into, he says.

"We need to be pragmatic about finding the right metrics. For me, it means agreeing on a top line set of core metrics and then having other metrics that are more flexible [for each situation]."

It's also important that farmers don't spend all their time collecting data, rather than producing food and nurturing the land, he adds.

### WHOSE DATA?

The data generated would need to be managed and stored appropriately and not by corporates, says Dan.

"There would need to be some sort of independent body to manage the data," he adds. "A world data organisation fills me with dread as it's probably a 30-year project. Instead we should think about what already exists. Maybe every country could have its own centralised body."

Key would be that this data was free from corporate involvement and that farmers were able to access the data to benchmark, share knowledge and make improvements, he adds.

### DRIVING CONSUMPTION CHANGES

Sustainably-labelled products have existed for years, but they're piecemeal and not accessible to all, says Dan, so it's unclear how much a different labelling system would alter purchasing decisions.

Metrics could be more helpful in enabling change along supply chains, such as retailers choosing to avoid buying the most unsustainable products, he adds. Ultimately though, societies need proper, joined-up food strategies to drive change, of which sustainability metrics should be one part.

is currently the cheapest. Most farmers would change to more sustainable practices if they could earn more money, so we need to narrow the gap for them."

It could also be used in trade, says Patrick. For example, the UK could ban US food imports which didn't score high enough using the metrics.

The framework also has the power to change the way farmers communicate with consumers, adds Adele Jones, deputy CEO at the SFT and its project lead.

"This could potentially replace all consumer labels," she says. "For consumers, it means they will be able to look at one pack of chicken against another and actually make an informed choice."

The framework includes 11 metrics that cover the economic, social and environmental sustainability of a farm: soil, water, air and climate, biodiversity, energy and resource use, nutrient management, plant and crop health, animal husbandry, social capital, human capital, and productivity.

These are subdivided into more specific metrics. For example 'soil' is assessed through measurements of organic matter, biodiversity and structure, while 'livestock management' is measured by diversity, health and welfare and 'social capital' is measured through community engagement.

"Farmers collect a lot of this information already through multiple audits," says Patrick. "Our aim is to have one audit a year, which would supply retailers, certifiers and government with all the information they need.

"Farmers could use this information to benchmark against others, identify any areas for improvement and add premiums to their produce. It has the potential to be very empowering for the farmer."

## HOW COULD LIVESTOCK FARMERS BENEFIT?

It's hoped the metrics could build on the high standards Scotch beef and lamb are already known for.

Using a 'traffic light' labelling system covering perhaps four main categories (nature, climate, resource management and health and wellbeing), consumers would be able to glean a more rounded understanding about a product's sustainability, argues Adele.

"The livestock sector needs to get better at communicating stories to consumers... it doesn't have a choice.

"For livestock farmers in particular the metrics could be helpful," she says. "Everyone is talking about the green house gases (GHGs) that livestock produce, but no-one is talking about their benefits for biodiversity, habitat creation, landscape management and carbon sequestration. So, these metrics could help provide a more holistic view."

> *"Farmers could use this information to benchmark against others, identify areas for improvement and add premiums to their produce. It has the potential to be very empowering for the farmer*

The Scottish agricultural sector accounts for 18 per cent of all GHGs in the country, according to independent inquiry, Farming for 1.5C, and livestock account for around 48 per cent of that, according to Scottish Government figures.

However, one side of the story often not told is that GHGs removed from the atmosphere through land use and forestry is equal to 72 per cent of agricultural emissions. Scottish livestock production is also predominantly rain-fed, which is not the case in all parts of the world, and is also based on home-grown forage. The sector also employs 50,000 people.

## HOW MUCH INTEREST IS THERE?

Farmers in the UK could soon see the metrics used in everything from government agri-environment schemes,to retailer supply chains.

The Scottish Government is interested in integrating the metrics as part of its future farm payments system, says Patrick, and recently held a day-long meeting with the SFT about it.

Defra is currently trialling the framework, and the Welsh Government is keen to use it for annual sustainability audits as part of its new farm payments scheme. The private sector is also getting involved.

"NatWest bank, which has about 30 per cent of farming business accounts in the UK, is trialling the metrics and says it could potentially be used to offer preferential interest rates to more sustainable businesses," says Patrick.

"Tesco, Sainsbury's and Waitrose are also interested, and Morrisons is trialling the metrics as part of its net zero carbon targets. Major food companies, including Arla, McDonald's and Nestlé, are also getting involved.

"We need all actors in the food chain included so that there is common interest in getting the harmonised system right."

## GOING GLOBAL

The SFT plans to present the metrics at this year's UN climate conference, COP26 in Glasgow, and hopes the UK Government will get on board.

"Our Prim Minister could announce at COP that we are going to take a lead in developing a harmonised set of metrics for the world's farmers and that Brexit has, weirdly, given us the opportunity to do this," says Patrick. "Essentially, we need a Paris [climate] style agreement on food."

If this doesn't happen, a 'coalition of the willing' made up of interested actors, may be the way forward, says Adele.

# COULD REGENERATIVE revolu THE LIVES

# FARMING tionise SCOTTISH STOCK SECTOR?

Regenerative farming is gaining traction – but what potential does it hold for Scottish livestock businesses? **Jez Fredenburgh** reports

A QUIET MOVEMENT IS happening on farms across the country which is seeing a growing interest and transition towards regenerative agriculture. For Scottish farming with its wealth of natural resources, the potential to optimise production, improve profitability and build environmental resilience is huge, say its practitioners.

"We're exploring the possibilities of regenerative agriculture and gathering as much information as possible, because it's very clear that it's going to be the movement that solidifies farming going forward," says Bruce McConachie, Head of Industry Development at QMS.

"Scottish agriculture really has an opportunity to harness the benefits of regenerative agriculture more than any other production system that I can think of," he says.

"We have varying land types, different topography and altitudes, plus it builds on principles that Scottish farmers – especially livestock managers – have been following for a long time, which is to utilise their natural assets and create a business around them.

"So, for Scottish farmers, regenerative agriculture isn't about a wholesale change. It's about tweaking a little bit here and there, to make sure we're getting the most from the landscape."

## WHAT IS REGENERATIVE FARMING?

Using modern day soil science, regenerative farming builds on the knowledge of centuries of farmers and indigenous people. It goes beyond farming sustainably and seeks to continuously improve the land and its resources, rather than simply maintain its current state.

By working with nature to develop a more holistic farming system, regenerative farming seeks to improve soil health, and thereby reduce inputs, while increasing production, biodiversity and environmental resilience. In essence, nourishing and nurturing the living organisms in the soil is an integral part of successfully farming what lives above it.

> *"Regenerative agriculture is about improving the heart of the land; its fertility*

Grazing livestock are integral to this system, helping to feed soil organisms and reduce artificial inputs. Using rotational grazing, or mob grazing, which allow grasses to recover, is also central.

"Regenerative agriculture is about improving the heart of the land; its fertility," says Niels Corfield,

### Numbers

**38%**
of the globe's land surface is farmed (crops and grasslands) (UN FAO)

**111%**
of annual global $CO_2$ emissions could be sequestered if all current cropland and pastureland in the world switched to regenerative practices (Finca Luna Nueva, EARTH University, and Rodale Institute)

A teaspoon of productive soil contains between **100 MILLION AND 1 BILLION BACTERIA** (USDA)

**24%**
percentage that the average number of 352 species of mammals, birds, butterflies and moths in Scotland has fallen by since 1994 in Scotland (The State of Nature 2019 Scotland)

Brothers Andrew and Robert Brewster

*Case study*

## "The more we've worked with nature, the better it's got"

Brothers Andrew and Robert Brewster have been practising mob grazing on their 300ha farm in Angus for a decade, with positive results for their soils, cattle and finances. At first, they strip grazed 40 bullocks, but soon began moving all of their cattle.

"We had this realisation about how much more beneficial mob grazing is to the land and animals than set stocking," says Andrew. "Now we move all the cattle 365 days of the year – sometimes it takes 20 minutes, sometimes an hour, but we've been doing it for so long that it feels normal."

Although their parents converted the whole farm to organic in 1990, the brothers have made further incremental changes towards regenerative agriculture over the years.

"Most of our ideas have been inspired by the grass-fed movement in America," says Andrew. "We've found that the more we've worked with nature and understood how it works, the better our farming system has become."

One change has been to replace ryegrass with cocksfoot, which grows in the surrounding verges all year round. "We have started to see herbs and native grasses reappear," says Andrew, "and our pastures now look totally different."

"Plant roots can efficiently build soil organic matter, but they need to be grazed by cattle at the right time," he explains. "If the plants are grazed too young or too mature, the sequestration ability is poor."

By breeding hardier cattle (Angus and Hereford crosses) and developing better grazing management and more productive grasses, the brothers are able to keep cattle out for longer and have reduced silage needs. They've also moved to summer calving to coincide with the best quality forage.

"It's made a massive difference to our red diesel usage," says Andrew. "Our carbon footprint is much lower, and although our animals are older when they're slaughtered (about 26-28 months), they benefit the environment by sequestering carbon throughout their lifetime."

All farms are different, says Andrew, so farmers will need to find what works for them. "You do need to be open to ideas though, and have an interest in soil and getting away from your current set-up," he says.

"Regenerative farming could be absolutely huge in Scotland, if farmers can get the right animals and the right ground."

an independent regenerative farming advisor and trainer.

"It's about increasing the carbon captured, the water stored and the dry matter produced. Each year you should see a steady increase in grass growth, which translates through to increased production."

Key regenerative farming practices include not disturbing the soil, keeping soil covered, growing a diverse range of crops, and providing food for the soil bacteria and fungi, adds Bruce.

"Intensive agriculture has overlooked a lot of nitrogen fixing crops like peas, beans and legumes that are beneficial for soil health, but not directly linked to animal productivity," he says. "But productive crops will grow better if the soil is being well fed by the less productive plants."

### THE POTENTIAL FOR SCOTTISH FARMING

Regenerative agriculture holds many benefits for Scottish farmers, say advisors, including the opportunity to increase stocking numbers while reducing costs.

"It's a common misconception that regenerative farming involves reducing stocking numbers," adds Bruce. "What we're talking about is a process of finding the right stocking number for the land.

"Every farm has a maximum sustainable output - what

regenerative agriculture does is find that and increase it gradually by harnessing nature and reducing inputs. The potential for growth in the industry through this is fantastic."

Moving to regenerative farming also significantly reduces a farm's cost of production, and can increase profitability, suggests Niels.

"You could potentially move to input-free production, although this wouldn't be suitable for all farms, particularly at the transition stage. But you would certainly see reduced input costs," he adds.

Housing and feed costs can also be reduced, since with proper sward management livestock spend more months outdoors grazing. With all nutrients recycled on farm, waste could also become a thing of the past, eliminating the need for NVZs, he believes.

As soil health improves, the nutrient density of crops and the livestock grown on it also increases, with tangible benefits for food and human health.

"Better nourished plants also mean better nourished animals that are more resilient to disease and parasites, with reduced health costs," says Niels.

There could also be opportunities for cross-industry collaboration between livestock and arable businesses to integrate livestock into the system, perhaps through grazing cover crops.

> *"Change is inevitable and it's about choosing your path*

With consumer interest in food production at an all-time high, regenerative agriculture also offers multiple marketing opportunities.

Bruce adds: "As far as public goods go, we could be hitting the whole suite – meat with integrity, animal welfare, environmental protection, reduced greenhouse gas emissions, improved biodiversity and economic resilience.

"Scottish farming has an image like no other, but anything we can do to build on that reputation is only going to benefit us."

## BUSINESS AS USUAL IS NOT AN OPTION

In 2018-19, only 28 per cent of Scottish farms were profitable without support payments – for Less Favoured Area livestock farms, this was less than 10 per cent, according to Scottish Government figures.

"Business as usual is not an option," says Niels. "The current farming system is driving climate change, while also being susceptible to it. It's unprofitable for producers and there is very little in it unless you are a seller of inputs. Change is inevitable and it's about choosing your path."

## QMS SUSTAINABLE RED MEAT ACTION GROUPS

Launched last year, these new groups are aimed at livestock farmers who want to understand the relationship between carbon, pasture-based livestock production and profit, says coordinator John Evans, QMS Cattle and Sheep Specialist.

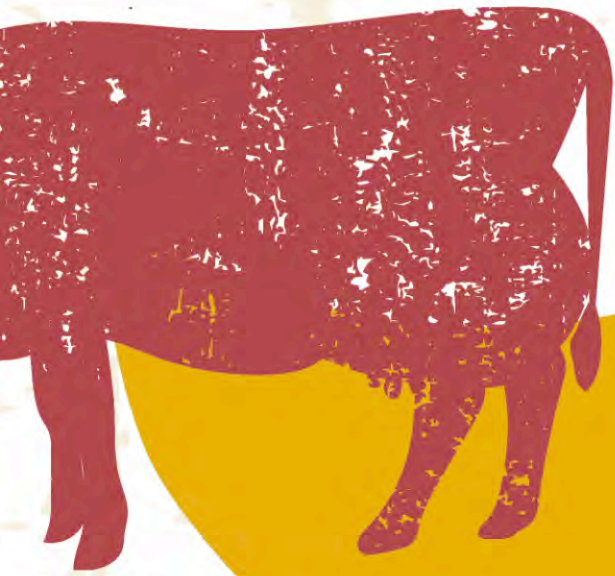
The project uses closed discussion groups, where farmers share best practices, benchmark and look at carbon auditing in detail. Among other subjects, groups will look at soil health, optimising production, and grazing options, and will host speakers according to what participants want.

Groups kick-off properly in May and June, and will have four meetings a year for three years. Currently there are seven groups, each with about 15 farmers. Contact jevans@qmscotland.co.uk

The uncertainty of transitioning may be hard, particularly for farmers operating on such small margins, adds Bruce. "However, a lot of times it's not as big a change as people think, and often they are already more regenerative than they think. It can involve small, incremental changes."

Being open to new ideas, reading as much as possible, and talking to those who've done it, are key to a successful transition.

"Be confident, because Scottish farming has all the potential, and I am a firm believer that there is a system out there for every farm. If you can find that sweet spot – that system that suits your ground, your farm and your stock – you will absolutely fly," says Bruce.



*Learn more*

## Regenerative farming resources

### ORGANISATIONS/ GROUPS

www.qmscotland.co.uk/grazing
www.farmingforabetterclimate.org
www.rodaleinstitute.org
www.regeneration-academy.org
www.scu.edu.au/regenerativeag/about
www.regenerationinternational.org/our-network
www.pastureforlife.org
www.rbst.org.uk

### DIGITAL MEDIA

- **From the Ground Up** (YouTube)
- **Investing In Regenerative Agriculture and Food** (podcast)
- **Kiss the Ground** (Netflix)

### BOOKS

- **Dirt to Soil,** by Gabe Brown
- **Call of the Reed Warbler**, by Charles Massey
- **The Omnivores Dilemma**, by Michael Pollan
- **Grass-fed Cattle**, by Julius Ruechel
- **Man, Cattle and Veld**, by Johann Zietsman
- **Regenerative Ranching**, by Jaime Elizondo

# Moving onwards *and* upwards is in our DNA

## The right data and the latest technology have the potential to change agriculture for the better and the possibilities for farmers are exciting

When QMS' DNA Strategic Group tasked Dr Jonathan Birnie with exploring how DNA tracing could enhance the Scotch Beef brand, the primary objective was to increase protection of the product's unique status on the global stage.

His work quickly confirmed that DNA technology could indeed be used to reinforce the protected geographical indicators that secure its provenance.

What the Strategic Group did not expect was that he would identify a number of far-reaching possibilities, gleaned from enhanced gathering of DNA data, which could have significant benefits for Scottish beef farmers. In his view, it could change the future of farming.

Jonathan and the project team faced a number of challenges. They had to prove beyond doubt that the technology could help prevent fraud and deliver unparalleled levels of traceability. And importantly, that any new system had to deliver value for money. A number of potential approaches were quickly disregarded because they were impractical for farmers or too costly.

However, given that key data is recorded for every animal in abattoir, such as weight and age, it seemed obvious to start with this information and build from there. Jonathan confirmed that connecting the slaughtered cattle back to detailed DNA data from their mothers was a highly efficient way of establishing provenance. He'd found the answer.

"If you simply test the DNA of the mothers, you can build a system which will allow full traceability," he explains.

In his proposed solution, farmers would collect a DNA sample from the mothers using a simple ear tag. This generates a sample which can

WORDS
KIM McALLISTER

> *"If you simply test the DNA of the mothers, you can build a system which will allow full traceability*

then be sent to the laboratory to extract the necessary information, without putting any additional burden on to the farmers

The data would then be used to build a national picture using the mothers' genetic information, creating a high level of product traceability that would provide a much greater degree of protection to the Scotch Beef brand. It would, potentially, also be a world first for Scotland.

While it will take time to build up this DNA database, Jonathan and the project team are keen to feed back results to farmers as quickly as possible. They expect performance records for herds to be available within the first year of any programme, if rolled-out to the national herd, allowing farmers to use the information to make their businesses more efficient and more profitable.

> *"We want to see farmers do well, we don't want to make it awkward. A farmer has to be a jack of all trades*

Now, to the wider opportunities. If Scotland can successfully build a DNA database of the entire Scotch Beef herd, farmers can start to use that information in more advanced ways.

"It's the potential that makes me most excited about this project," Jonathan says.

"We want to see farmers do well, we don't want to make it awkward. A farmer has to be a jack of all trades – there are competing demands on their time. They need simple, useful information to build their businesses. We want to help farmers make decisions based on information that wasn't readily available before."

Jonathan goes on to say that the DNA information can be used to help scientists build 'genomic maps' which show the characteristics of the different animals, such as fertility and ability to hit spec. This can inform breeding decisions – farmers can selectively breed for improved growth rate and food conversion ratios, for example.

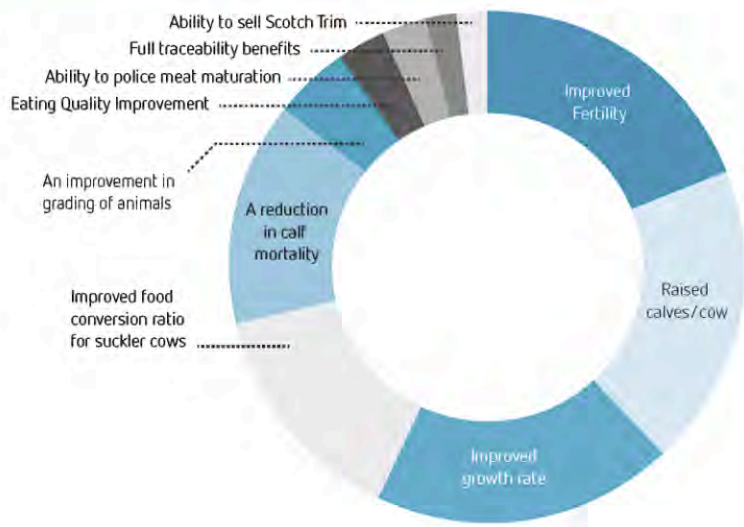
Farmers could use the genomic maps to reduce the calving interval, which would not only make the cows more productive, but it could also save on inputs such as feed and fertiliser.

"The potential is there to benefit production and the environment at the same time – being productive is about reducing input as much as increasing output," he adds.

Further down the line, a range of other benefits could also be delivered through genetic enhancement, like increased eating quality and enhanced resistance to disease.

"I spoke to a sheep farmer recently who used to select his breeding ewes based on how healthy they looked at the end of the season," he says. "It took him years to realise that the ones who looked healthiest were in fact the ones who weren't exhausted from rearing lambs – he'd been breeding infertility! My point is that the data isn't always readily available for farmers to make their decisions differently – we aim to help them select the best of the herd, to decrease the time between calving

## DNA Composition of Potential £165 million annual improvement



for example. Currently the national average calving interval is 401 days – ideally it should be 365 days. At a cost of £2 for each additional day in the calving interval, with the additional 36 days costing around £72 per beef animal, that gives a potential saving across the Scotch beef herd running into tens of millions of pounds."

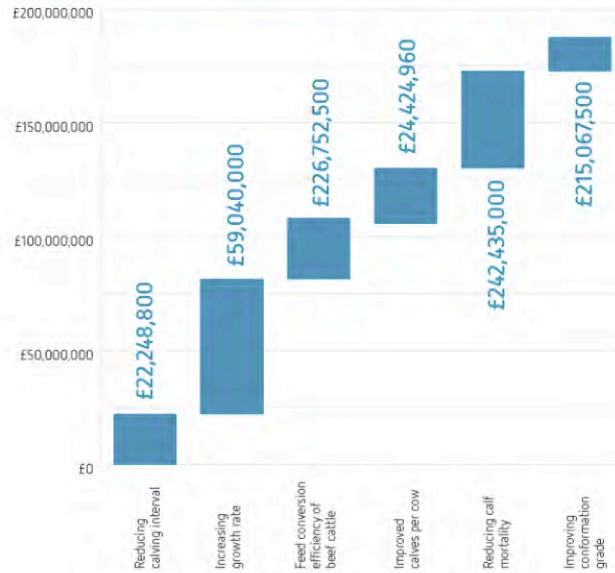
Similar savings could be achieved in areas like increasing the number of calves per cow, improving the growth rate, improving food conversion ratio, a reduction in calf mortality, an improvement in carcass grading and improving the eating quality, says Jonathan.

"We want to get feedback to the farmers quickly and show them the value of collecting data – but there's a bit of a culture change needed there," he says.

"There is a clear pathway to development over the long term, where Scottish beef farming will continue to gather clear genetic data on an increasing range of animal traits. The effective use of this data will lead to a transformation in Scotch Beef herd profitability."

Thanks to the potential identified, through this project, Jonathan and his team, alongside the project team at Quality Meat Scotland have established that properly harnessing DNA and genetics can provide tools to help Scottish beef farmers drive the industry forward, by using data to make businesses more sustainable, more efficient, and more profitable.

## Total predicted annual benefits against base year




MAC&
WILD

# AT THE CUTTING EDGE

The pandemic hasn't stopped **Andy Waugh** as he continues to serve up the highest quality of produce in sustainable and innovative ways

It's been a quite a journey for Andy Waugh, from helping his father as a child in the family's game butchers in the Highlands to opening three Mac & Wild restaurants, one of which was described by *The Times* food critic Giles Coren as "the best restaurant in the world"!

Despite the coronavirus pandemic putting a halt on his burgeoning restaurant empire, Andy, like other entrepreneurs, has embraced e-commerce to help continue his crusade to provide the best quality game and meat from Scotland which has also had a minimal impact on the environment.

Today, he runs an online Mac & Wild butchers and fishmongers, a drinks and cocktail site, as well as his latest venture, Restaurant Kits. This not only provides a platform to sell Mac & Wild's 'cook at home' meal kits – such as the legendary Venimoo Burger – but also provides an outlet for other independent businesses to make the most of the booming DIY restaurant kit marketplace; and some well-known Michelin-starred restaurants are already using the service.

While Andy is looking to add more Mac & Wild dishes to the Restaurant Kits site and attract more big names, his key focus is on the quality of the meat, its provenance and its environmental impact, and Scotch Beef is at the heart of what Mac & Wild all about is.

Naturally, Andy gets his wild venison, rabbit, grouse and pheasant supplies from Ardgay Game, his family's game butchering business located 40 miles north of Inverness, but he also buys meat from other trusted sources. These include Scotch Beef from MacDuff's butchers, based in Renfrewshire but who take their beef from a select handful of farms, Macbeths who have their own herd of Highland and Shorthorn cattle, and Scotch Lamb from Fearn Farm, near Tain.

He said: "At Mac & Wild, we are into extreme traceability. This means we can tell customers the farms, estates, farmers, hunters and butchers who contributed to bringing our meat and produce to their tables. It's not simply about the flavour and taste; we firmly believe that growing up intimately connected to the process of rearing and caring for the animals we ultimately consume is what sets our meat apart. We like to think of ourselves as advocates for those looking to eat better meat.

"We work with partners who share our philosophy that natural and wild is almost always best; often they are small-

WORDS
TIM POWER

> *"We firmly believe that growing up intimately connected to the process of rearing and caring for the animals is what sets our meat apart*

scale farms or producers who care passionately about the animals they rear or hunt and the environmental impact of what they do."

Andy explained: "There's nothing more sustainable than an animal that grows in the wild with a totally natural diet. There's zero input from humans, other than the fact that we have to cull them, so the carbon footprint is negligible. This is the meat our ancestors ate so we know it's good for us, and it has the added benefit of not impacting the planet."

This ethos and focus on game and quality Scottish ingredients proved so popular with the restaurant-going public in London that Andy and his partner Calum Mackinnon decided to open a third restaurant in 2018, this time in Scotland to get back to their Highland roots at the Falls of Shin, near Lairg in Sutherland, and to expand the offering to include other experiences for visitors.

So, after such success and promising growth, Andy admitted he was in near despair when the coronavirus pandemic struck. He said: "I would be speaking to my dad in absolute tears because it was so emotional to close the restaurants and have no idea of when they were going to open up again and how to deal with all the finances.

"I really had to look inwards, but had some good advice from my dad, who told me: 'When you're going through tough times you need to keep on paddling, boy!' So that's exactly what we did and we very quickly pivoted into being an online butcher. That was an important business exercise because you have to say to yourself, what exactly is my business, what are my brand values

> *"There's nothing more sustainable than an animal that grows in the wild with a totally natural diet*

and, more importantly, what will people buy from me?"

That was an easy question to answer, because, for Andy, it has always been about the meat, ever since he left Scotland in 2010 to run a Saturday market stall in Hackney, London, to sell his family's game products. It really took off in 2012 when Andy and Calum tapped into the growing street food movement with The Wild Game Co business, which won 'Street Food of the Year' at The Young British Foodies Awards. Next came the 'pop-up' restaurant phenomenon where Andy had his 'Road to Damascus' moment, as he explained: "Pop-ups were so trendy at the time and it was a great way to get the experience of running a restaurant operation for an evening with minimal overheads.

"I remember our first pop-up in 2014, which was three courses: an option of fish or meat, plus a pudding for £30. As it was venison, of course everyone went for the meat option. I started looking at this table and the diners were all were eating the steak – a venison topside – and they were all looking at each other nodding and smiling; you could see the enjoyment on their faces which said 'this is bloody

good'. At that moment, I just felt so incredibly proud and I loved the fact that my family's products, which were usually exported, were being enjoyed by Brits and particularly London foodies. It was a really emotional moment and one I always hold on to whenever I'm stressed... which is quite a lot recently!"

The success of the pop-ups brought investors, which led to Mac & Wild's first restaurant in London, which won 'Best Signature Burger' at the National Burger Awards 2015 and was named by the *Evening Standard* as one of the top five places to eat game in London. This success was repeated with the second London restaurant when Mac & Wild's Venimoo Burger was voted the 'best burger in the UK' at National Burger Awards 2016, and Giles Coren, in an unusual display of hyperbole – and lubricated with many whisky cocktails – claimed that Mac & Wild was the "best restaurant in the world" in his influential restaurant review column. Andy said: "My success was quite accidental because Scottish game and meat is all I knew, but the whole provenance aspect is so key to our storytelling and is something that customers want from their dining experience."

Andy believes that this growing interest in provenance and the quality of animal rearing is something that farmers can tap into, but he said there is much more work to do on the carbon footprint side.

He said: "The farmers I know are great exponents of open and honest farming and are completely transparent about how they rear their animals..

"I believe that farmers want to be carbon negative which means putting more carbon into the ground than the air. Personally, I think we should be rearing more native breeds, such as Highlanders and Short Horns, which are hardier and slower growing and can reduce carbon as they can live off the land themselves.

"I'd also like to see more traceability in the industry so we, in the restaurant business, can say with confidence to our customers exactly where the meat comes from and how it was raised. When an animal goes to the slaughterhouse, it gets tags on each kind of cut but when it goes to a secondary butcher and is cut into an individual steak, it is quite hard to keep track of. We need to be able to track it much better, like having a meat passport.

"Another area I'm interested in is the carbon cost of meat and meals. However, I tried to calculate this myself for my menu and it was pretty complicated, but I can see this developing in a few years so every diner will understand the carbon cost of their meal.

"It's just about educating people; everyone needs to think about where their food comes from and the impact on the environment."

> *"It's just about educating people: everyone needs to think about where their food comes from*

While the horizon is less than clear for hospitality in the new post-Covid landscape, Andy is confident that his Mac & Wild brand will continue to develop. He said: "We have a new Mac & Wild outlet going into the new Bonnie & Wild food hall at the Edinburgh St James retail development and we will continue to develop new ways to build on our brand as we've got a really engaged audience and people like the concept and our ethos. They are very keen on Scottish products and Scotland, so we will continue to partner up with businesses that share our ethos and we'll also be looking at developing visitor experiences too, to help get some of those London pounds up to the Highlands and support our local economy where we are from."

Are veggie burgers and insect sandwiches really what will make us and our planet healthier? The science is now proving conclusively what many already firmly believe; meat IS good for you. Here, public health expert **Professor Alice Stanton** uses science to debunk the claims of the doubters once and for all

# MYTH BUSTI

NG

*Myth 1:*

## We're eating too much meat and dairy

"As a cardiovascular preventive medicine physician who has been operational in the area for 30 years, I wanted to know what the evidence was behind claims we should eat less meat and dairy.

"And, in fact, the data shows that people are dying because they're not eating enough dairy.

"In the transport industry there's lots of emissions coming from cars. But we haven't said, take away all cars from the world. Likewise, in the agrifood industry, there are emissions from both plant and animal-sourced foods. Lots of people are saying get rid of the ruminants, get rid of the cattle and the sheep, however, like the electric cars, there are technologies that are being developed and it's madness for us to put the health of our children at risk. Particularly the least advantaged because, guess who's going to be eating those veggie burgers? It's going to be the least advantaged and they are going to be eating calories and salt and sugar, and they will have worse health because of that."

*Myth 2:*

## Too much meat will kill you

"An excessive red meat intake is over 700 grammes a week. There's low-grade evidence that too much red meat leads to an excess of diabetes mellitus and of colon cancer. Many investigators call this low-grade evidence because, when you're doing nutritional studies, you look at who's eating a lot of red meat and who's eating very little. And are there more heart attacks, strokes, diabetes and cancers in the ones that are eating a lot of red meat?

"There *is* an excess of these diseases in those eating a lot of red meat – about a 5 per cent increase – but there's a much stronger association with obesity, and a much stronger association with lack of fruit and vegetables. And if you're eating too much red meat, well, then there are two possibilities: you're either eating too much of everything, or you're eating too much red meat, but too little fruit and vegetables. It's actually nigh on impossible to disentangle that, so it's not clear that the 5 per cent excess of deaths is associated with excessive red meat eating."

*Myth 3:*

## Methane from cows is killing the planet

> *"There are two parts to the discussion – human health and planetary health. We need both"*

"There are two parts to the discussion: human health and planetary health. We need both, and we need a balanced approach to both. Plant-based and animal-sourced foods are currently creating emissions. You can't actually have a plant-based diet without emissions – the whole farm system doesn't work – however, with changes, animal-sourced foods can be completely carbon neutral.

"In Scotland and Ireland, where I'm based, we live off our reputation of being pasture fed, and that is more environmentally friendly, so that's what we should continue doing. I'm really encouraged by what I'm hearing from the sustainability experts that actually you need to enhance soil fertility. You need grazing animals to do that, and fertile soil actually stores more carbon. If you're growing more product, you're actually capturing more carbon from the atmosphere. So, more carbon sequestration will help, as will looking at our hedgerows and our forestry and our woodlands. Methane reductions are also possible now with breeding. These will be further improved using emerging breeding and genetics techniques, and further improved again by the feed additives from algae sources. I'm absolutely optimistic that we can achieve environmentally friendly farms with pasture-fed animals.

"There is a small amount of Omega 3 in red meat and there appears to be more in pasture-fed animals and we are looking at the impact of multispecies swards on meat quality, rather than perennial ryegrass monocultures, and we are optimistic that there may be further enhancement with that. Not to mention the benefits of multispecies swards for nitrogen fertiliser reduction are dramatic."

*Myth 4:*

## Veganism is better for you

"Actually, if we stop eating red meat, we will have problems with iron deficiency anaemia, in women in particular, because they are more likely to get it because of issues with menstruation, childbearing, and lactation. That's a real problem for women and for their babies. We will also have problems with brain development and bodily development of young children because they need heme iron, balanced protein and B12 and vitamin D, all of which come from red meat, or red meat is contributing to that. Likewise, for weakness and fatigue, and sarcopenia, which is muscle weakness that occurs with old age, if we take away a rich protein and micronutrient-rich product like red meat from older people, we will have more ill health. So, you have got to find the sweet spot of optimal intake. And it's somewhere in meat consumption at around two to five times a week.

"Now, if you are vegan or vegetarian, you can take those micronutrients. And you can work very hard on having a balanced amino acid or protein intake, but you have to work hard, do your research and say, 'OK, that legume product has enough of that amino acid if I balance it with that legume product', but the meat alternatives that are currently available are so salt and sugar rich that they absolutely will not be beneficial if they are the replacements. Getting that message out to the general public is challenging because there's a lot of publicity the other way.

"Even if vegetarians and vegans eat a very good diet, they still need to watch iron, B12 and Omega-3 intake as the plant Omega-3s are shorter chain and don't have the same benefits. Our ability to transform them is very, very limited. It's not an easy problem to solve. There are two aspects – quantity and quality – so getting people to eat more whole foods that are rich in the essential micronutrients is important, and there are different ones from plants and from animals, so you need both or else you need to take a very well-informed group of supplements. And even that might not be enough because there are multiple other micronutrients that are present in whole foods and the evidence is that they are doing good. So even with taking a limited set of extra vitamins, that isn't the whole story."

> *"If we take away a rich protein and micronutrient-rich product like red meat from older people we will have more ill health"*

*Myth 5:*

## Processed meat is the 'baddie'

"There's a little bit more evidence against processed meat. However, the current analysis is not looking at processed foods as a whole. There's a very strong association between the amount of ultra-processed foods in your supermarket trolley and the likelihood of obesity. And, unfortunately, the average percentage of your calories in the form of processed foods in Europe and the USA is 50 per cent, and if it's 70 per cent, you're twice as likely to be obese.

"There was a really interesting study, which recruited 20 people for two weeks, when they ate whatever processed food they liked in the amounts that they wanted and, for the other two weeks, they ate a huge variety of whole plants and animal-sourced foods, again, whatever they liked. Over the two weeks on the ultra-processed food diet, they ate an additional 500 calories per day and gained a kilogramme, and on the unprocessed whole food diet, they ate 500 calories less, and lost a kilogramme. So, if that occurs for months and years, you can imagine the difference in weight.

"Ultra-processed foods are designed to be addictive – there's a sweet salt, sweet spot which means many people, but not all, will crave more and more and that feeds into obesity. An excess of processed anything is not a good idea. The information against processed meats is relatively small by comparison with obesity, salt, lack of fruit and vegetables. I'd get those right first. Go where the big problems are. I would advise processed meat maybe once or twice a week is sensible given the data we have. I wouldn't agree with some people who say zero.

"Obesity levels are increasing across Europe. We need to approach portion control and ultra-processed foods and sensible eating habits."

*Myth 6:*

## Insects are the way forward

"I think there will be a future for meat alternatives as we move forward, and the current offerings are not good enough. Insects do provide a rich source of protein, but it's not clear whether they contain all of the other micronutrients. I'm a clinical pharmacologist, so I'm used to doing clinical trials on drugs. So, every new drug has to go through a series of tests, and you would try them in a small group of humans first and then in bigger groups. And you'd watch very carefully what's happening. If we are going to make such a food transformation and switch to plant-sourced proteins, insect-sourced proteins, or cultured meat, we will need to do it in a very careful fashion, similar to introducing a new drug. I'm not hearing of any of those trials or research being done in any kind of a coherent fashion. Imagine if someone said to you, 'Here's the COVID-19 vaccine that we developed last week, shove out your arm there and we'll see how it goes.' Would you take it? No. Well, we need to do that for the alternative foods that are being developed. I think some of them will win through and I think there will be new opportunities, but they need to prove themselves just like Devenish Nutrition did with on the Omega-3 enriched chicken meat. We put it into humans and studied the response. I'm not hearing of that happening with the with the insect meat alternative. So that's a large-scale experiment being done on humans that would not be acceptable in any other area."

> *"Insect meat alternative products are a large-scale experiment being done on humans that would not be acceptable in any other area"*

## About Devenish Nutrition

Devenish chairman Owen Brennan OBE turned a Belfast feed mill into a £200 million agri-technology global group with sites across Ireland, the UK, USA, Mexico, Turkey and Uganda, where teams of nutritionists focus on the importance of optimising nutrient utilisation in soil, plant, animal, environmental and human health. They call their approach 'One Health – from Soil to Society'.

At their beef and sheep research farm in County Meade, the teams are currently working on two beef research projects in conjunction with Harper Adams University. The aim of the finishing beef project is to find a solution to the loss of growth at around 100-120 days into intensive finishing. The calf research programme is examining how the calf can be prepared at weaning to optimise feed utilisation.

They are also developing a seaweed product which early studies show reduces methane by 95 per cent and the farm aims to be carbon neutral by 2025.

## About Professor Stanton

Professor Alice Stanton is a leading member of the Royal College of Surgeons in Ireland (RCSI) and was invited to join the stakeholder committee to develop Ireland's Agri-Food Strategy to 2030.

An academic physician with a 30-year career in clinical pharmacology and preventive cardiovascular medicine, she has focused on clinical trials with drugs and lifestyle measures to protect against heart disease and strokes. She combines her academic work with the RCSI, with a role as Director of Human Health at Devenish Nutrition, an agri-technology company based in Belfast and led by her husband, Owen Brennan, OBE.

When Devenish developed Omega-3 enriched chicken meat and eggs in 2013, Stanton carried out a small pilot study, followed by a larger 160-person trial, carried out as a double blind, randomised controlled study in 2018, then published the results in a full paper last year.

The results showed significant increase in blood levels of Omega-3 and reduced blood pressure, a public health biomarker Stanton was looking for as Omega-3 provides protection against heart attacks, strokes, dementia, diabetes and cancer.

Stanton saw this enriched food met a demand for alternative sources for optimal health as only 20 per cent of the world now has optimal long-chain Omega-3 intake. Omega-3 usually comes from oily fish like salmon and mackerel, but most of the salmon eaten now is farmed, so don't make long-chain Omega-3s as they would in the wild where they eat plankton and smaller fish, rich in long-chain Omega-3s (DHA and EPA). Farmed fish can be fed Omega-3-rich fish meal, but with the rise in aquaculture, that has become a scarce and expensive resource.

Chickens can also be fed Omega-3, which then becomes enriched in their meat and in their eggs. As chicken meat and eggs are more widely and more regularly eaten than oily fish, Stanton sees this as a particularly important advance for children's health as babies and children need Omega-3s for brain and body development.

# A GLOBAL BURDEN OF DISEASE

Dietary excesses and deficiencies and the causation of non-communicable diseases

Source: The Lancet, 2017

*Excessive calorie intake*

**5 million deaths**

AND 148 MILLION DISABILITY-ADJUSTED LIFE-YEARS [DALYS]

*Deleterious effects of an excessive intake of red meat*

**25,000 DEATHS AND 1 MILLION DALYS**

**60,000 deaths**

AND 34 MILLION DALYS

IRON DEFICIENCY ANAEMIA (WHICH CAN IN LARGE PART BE PREVENTED BY MODERATE CONSUMPTION OF RED MEAT HAEM-IRON) WAS RESPONSIBLE FOR CONSIDERABLY MORE DISEASE BURDEN

*Diets high in salt*

**3 million deaths**

AND 70 MILLION DALYS

*Worldwide, we are not eating enough dairy foods nor enough oily fish - diets low in milk and in seafood-derived omega-3 PUFAs caused*

126 THOUSAND AND 1.5 MILLION DEATHS, RESPECTIVELY, AND 2.7 MILLION AND 32 MILLION DALYS RESPECTIVELY

# Trends that will impact our future

## We can take advantage of major changes in the way we shop, eat and socialise

Planning any strategy requires looking at which of today's trends will have relevance in the future. At Kantar we focus on the shopper, monitoring what they are buying, where they are buying it and how they are consuming it – both on a global and local level. This gives us a unique perspective on what will influence our future shopping habits and how best the industry can position itself to take advantage of them.

Since the start of lockdown, we have recorded double digit monthly growth for almost all categories. A move towards online shopping has also resulted in the channel accounting for 14 per cent of our spend, with 24 per cent of shoppers buying their groceries online in January. In terms of categories, frozen and fresh meat were the fastest growing after alcohol, as we indulged at home with the pubs closed. This increase in spend has also been accompanied by a rise in the calorific content of our shopping baskets, which have grown ever further during lockdown, exacerbating the obesity challenge which governments were already grappling with before the pandemic. These two factors – online shopping and our behaviours around our health – present some challenges and opportunities for the industry. How to maintain growth as the industry annualises on 2020's incredible sales rates but in a way that contributes positively to the nation's health?

This surge in take home shopping came at the expense of the hospitality sector, leading to further challenges in terms of carcass balance, but also an opportunity as shoppers look to replicate at home the meals they'd ordinarily be having in out of home outlets. This has led to an unprecedented increase in take away deliveries, particularly among older shoppers. We have spent an extra £193 million on beefburgers through delivery services in the past year alone. This is also evidenced with an increase in premium cuts with growth higher than standard or value tiers.

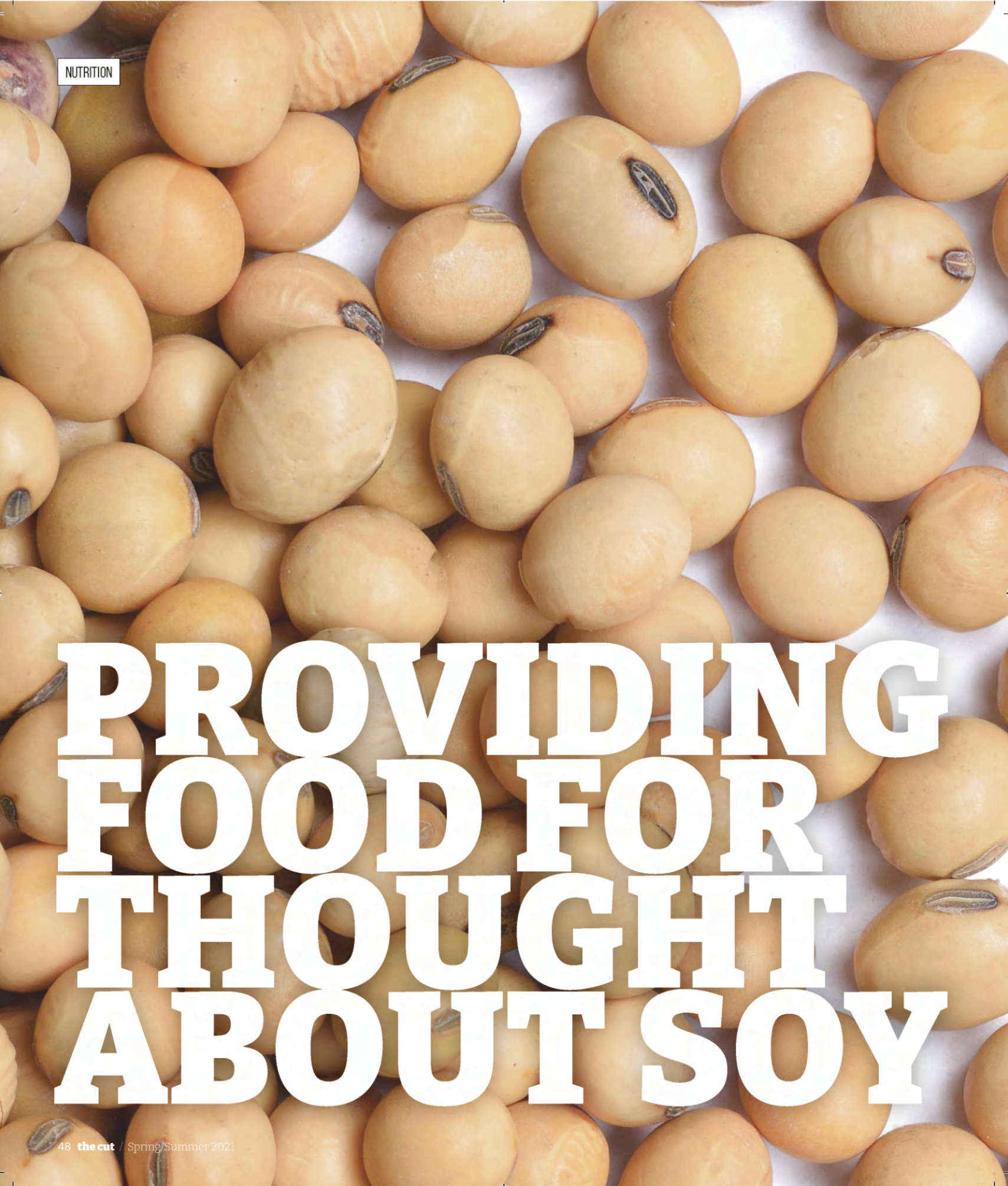
The growth of plant-based food continues its stellar rise and is still stealing headlines. And while it still represents just 2.8 per cent of the total value meat, fish and poultry sold in Great Britain in January, plant-based has grown consistently over the last three years. It is also worth noting that under 28s make up only 7 per cent of this spend, showing that the appeal of meat free is broader than we might expect. Some 12 oer cent of shoppers identify as flexitarians and are actively reducing their meat consumption, whilst the proportion who say they are vegans and vegetarians is much lower – 2 per cent and 5 per cent respectively. It's flexitarians the industry needs to engage with to ensure that meat remains part of their repertoire. There is also evidence to show that some shoppers are naturally consuming less meat overall. This group might not identify as flexitarians but are still putting less meat in their shopping basket over time. The reasons for reducing meat consumption are varied but two factors that are regularly mentioned in our surveys are concern about the environment and health.

Prior to COVID-19, concerns regarding the environment felt like periodic spikes in our consciousness rather than a persistent drum beat, however with the COP26 summit taking place in Glasgow this year and the US re-joining the Paris agreement it is expected that the environment will come into focus once again. Our global study, Who Cares Who Does, released in September last year, revealed that shoppers are more concerned about climate change, plastic, and deforestation than they were in the previous year. When asked who is responsible for limiting environmental damage and plastic waste, most say it falls to manufacturers to act – given the choice between retailers, governments, consumers or manufacturers.

> *"The growth of plant-based food continues its stellar rise and still steals headlines*

In terms of positioning itself for a successful future that delivers on shoppers needs and wants, there is an argument to be made for responsibly grown, sustainable and locally produced beef, lamb and pork that fits into our changing lives, and contributes to a healthy lifestyle.

*For further information contact lesleyann.gray@kantar.com*



# PROVIDING FOOD FOR THOUGHT ABOUT SOY

**CLEAR VISION**
David MacKenzie promotes products that benefit the environment

Scottish companies are helping countries around the world end their dependence on environmentally harmful animal feed, writes **Will Peakin**

Soy is an integral part of so many people's lives; as the basis of foodstuffs such as meat and milk substitutes, vegetable oil and, of course, soy sauce. Global production has increased markedly in the past 50 years; in the 1960s it was around 25 million tonnes, today it is 350 million.

The reality is that growth has come at a significant environmental price. The United States, Brazil, and Argentina are together responsible for about 80 per cent of the world's soy production. In South America particularly, it has caused "widespread deforestation and displacement of small farmers and indigenous peoples around the globe," according to the World Wide Fund for Nature (WWF).

In contrast, soy-based food substitutes, oils and condiments account for a mere 4 per cent of production; more than three-quarters (77 per cent) goes into animal feed. However, there are those who are working strenuously now to provide alternatives to the mainstream.

Among them are Harbro, based at Turiff, and Norvite at Insch.

David McKenzie is the Beef and Sheep Director at Harbro. "We have developed a clear policy on soy usage in ruminant diets now and for the future which provides farmers with a clear choice of being able to use a full range of non-soy carrying feed products," he says. Harbro is also rare among feed producers in never having used palm kernel, production of which is a significant contributor to habitat destruction and global warming, in its products.

Everyone is aware of how widely used soy is in the industry, David explains, because it is a very effective 'bypass protein', one which resists degradation in the animal's rumen and passes into the lower gastrointestinal tract to provide essential amino acids. That process reduces the amount of crude protein in the diet, in return reducing harmful ammonia evaporation and nitrogen excretion.

Soy's harmful impact on the world's forests – and consequent demands for environmentally sustainable products from food retailers – has led Harbro to develop a strategy of removing it from the company's finishing feeds. "We want to support farmers in providing products that meet consumers' expectations," he says. "We have to provide nutritional solutions

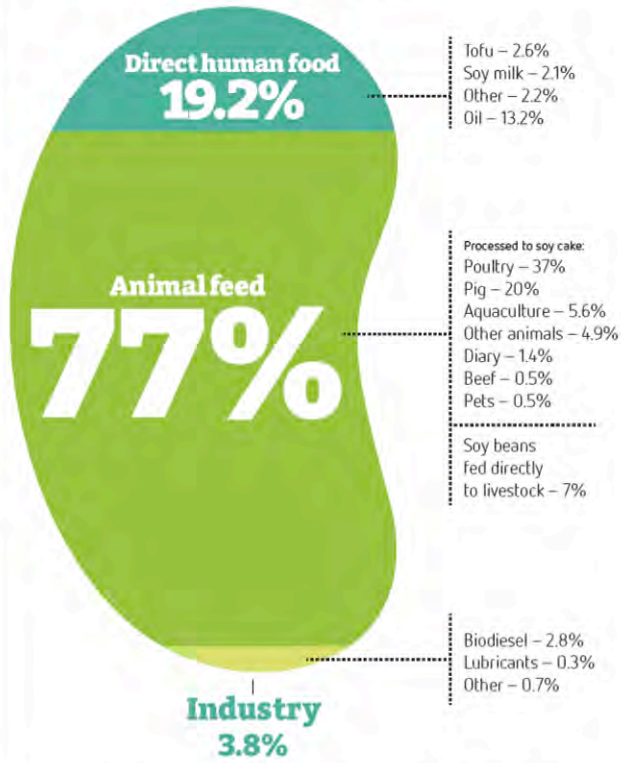
for farmers, particularly those growing their own cereals, that meet that consumer demand."

Harbro, a family-run business established in 1997, has always had a focus on supporting on-farm grown feed materials and, where this is not possible, using materials from its Scottish and UK bases

A recent example of this came at the beginning of 2019, when Harbro entered into an agreement with Whyte & Mackay Distilleries to take the spent maize grain from its Invergordon distillery. Given the product name InverGold, it has high levels of energy and bypass protein and is an ideal concentrate replacer that drives increased milk production and milk protein. Coupled with an existing long-term contract for draff from Whyte & Mackay (the two companies have enjoyed a 30-year partnership), the agreement extends Harbro's provision of moist feeds to 60,000 tonnes-plus a year.

The company, which trades in 20 countries, also has one of the UK's largest nutrition departments

## Global soy production 2017-19




Data source: Food Climate Resource Network (FCRN), University of Oxford, and USDA PSD Database

of its kind, comprising degree and PhD qualified nutritionists and links to leading scientists. It also works closely with key universities and research institutes in the areas of genetics, nutrition and environmental improvement. David, who has been with Harbro for 22 years, leads a team of 16 people – with a combined experience of 182 years – who work closely with farmers to understand the challenges and draw on the expertise and insights of academia to achieve practical resolutions, as well as introducing new approaches developed from research onto the farm.

"Historically, we have had very strong links with the Rowett Institute in Aberdeen and now with the University of Glasgow Veterinary School, where we have invested in a combined residency and master's programme working towards a European college diploma, as well as running an in-house research and development programme," he says. "This ensures that Harbro is able to bring the latest information and innovations to its customers."

## Novel alternatives to soy

There has been an increasing demand for ingredients to feed livestock that are high in protein, but the most widely used - soybean meal - has been shown to have a significant environmental impact. This has created a need for the agricultural industry to consider alternative, novel proteins that could be more sustainable - such as insect protein. World Wide Fund for Nature UK (WWF-UK) and Tesco have commissioned a project to develop a roadmap for scaling of insect protein production for use in animal feed.

**www.tescoplc.com/updates/2020/can-insects-help-save-the-planet-how-tesco-is-working-on-innovative-ways-to-reduce-deforestation/**

As with everyone, the past year has been a challenge for the company. "We can still get livestock data," he highlights. "Customers have been sending videos and performance data of their stock. But, obviously, we've missed being present on-farm. We do a lot of benchmarking; that's not changed, but the way we have had to do it has."

According to the latest Scottish Agricultural Census, published last June, total cattle numbers have steadily declined to a new 60-year low. In 2020, there were 1.71 million cattle in Scotland, a one per cent drop on 2019. Cattle numbers in Scotland have been trending down since a peak in 1974, when there were 2.78 million cattle. Meanwhile, the cost of feed, vets and animal housing has increased. Combined with the introduction of the Single Farm Payment in 2005, which stopped payments based on the number of cattle owned, this has led to a fall in the profitability of cattle.

"This has really put pressure on fixed assets and on future investment," says David. "Even this winter, we have seen a rise in the cost of animal feed, but we have tried to protect our customers from that where possible. Without a thriving and sustainable industry, we don't have a business – so we want to do everything to ensure that the industry is profitable and that our customers are profitable. That's our aim, that's the aim of QMS, and that's why we are engaged in helping to shape the future of the industry.

"We need to be proactive about the positive messaging around the industry, and we need to back-up that messaging. For me, it's been fascinating to see how some of the work we have done in Europe, in Scandinavia for example, has made a real difference. The amount of R&D, trial work and investment in UK agriculture – in genetics, nutritional science, and sustainability – that is being recognised globally is quite significant and I think we all need to promote that to consumers more."

> *"It's been fascinating to see how some of the work we have done in Europe has made a real difference"* David MacKenzie

At Norvite, they are fully aware of how much livestock production and its impact on the environment is under scrutiny from policy makers and the general public.

"As feed manufacturers and advisers Norvite takes its role to support feed efficiency very seriously," a spokesman says.

Reaching the net zero carbon target is a massive challenge with many layers of complication. Put most simply, the aim is to maximise production whilst minimising inputs and farmers have a number of strategies to consider:

- Improve performance through biological efficiency
- Produce as much feed on farm as possible
- What you can't produce, source locally
- What can't be sourced locally, source sustainably

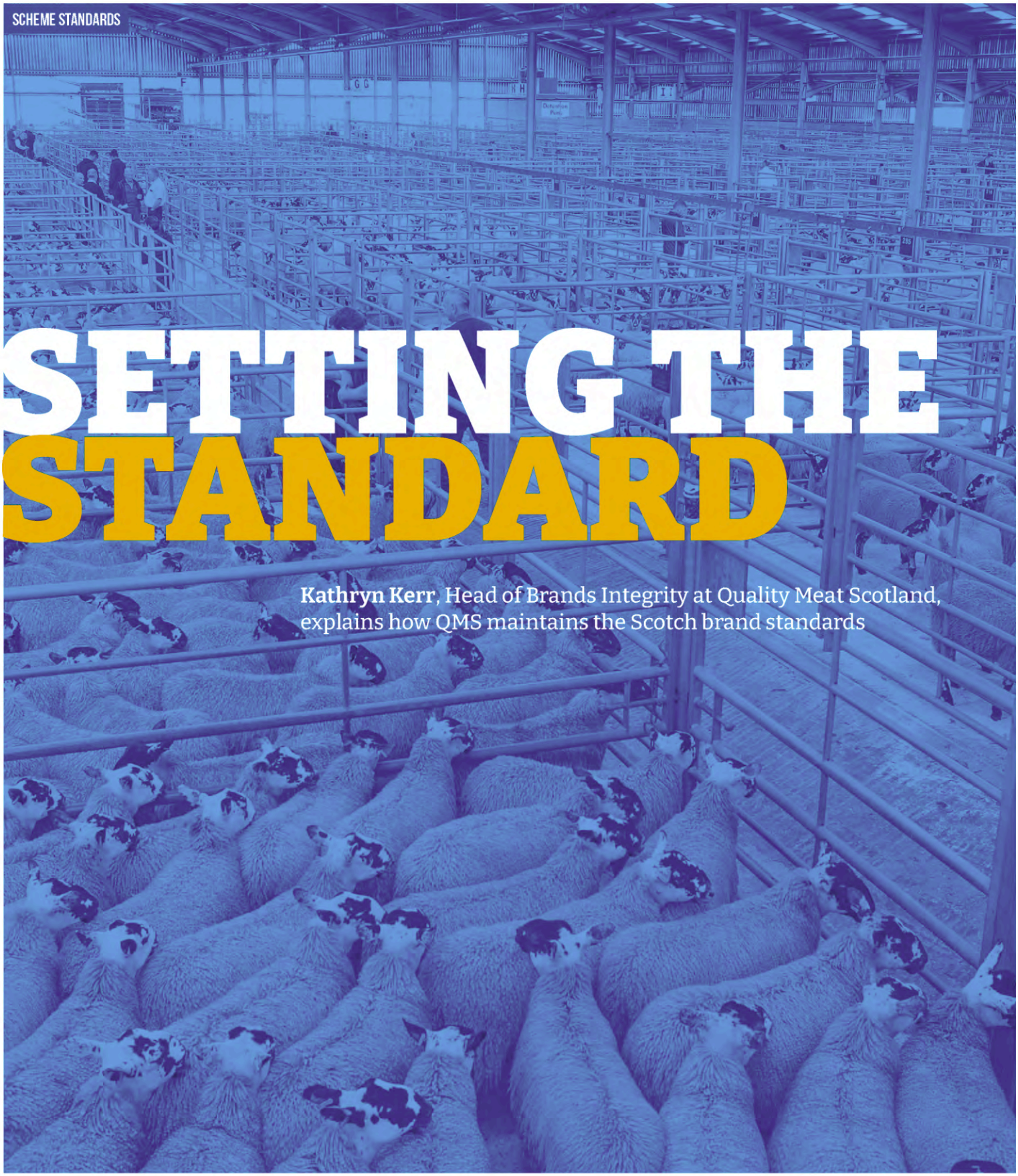
Norvite has built its success on a heritage of home mixed feeds, working closely with farmers to benefit livestock systems. The focus is on manufacturing specialist animal feeds and supplements which optimise animal health and performance.

Commissioning the Norvite Expeller Oilseeds (NEOS) plant in 2015 provided Norvite with both oil and expeller meal (NEOpro) from locally grown rapeseed. NEOpro is treated to enhance protein quality and this product, NEOlac, was Highly Commended in the AgriScot Product Innovation Awards in 2017.

Initially promoted to the dairy sector as a soya meal replacement, NEOlac has found wider appeal in both cattle and sheep diets with farmers recognising and valuing its sustainable credentials

"The launch of ALpHA, an alkaline additive which supplements protein in cereals, has saved an equivalent of 3,000 tonnes of soya over the past 12 months. This treatment is used at Norvite's blending plants as well as being popular on farms across Scotland and Northern England.

"These measurable and manageable changes help to make our sustainability targets achievable," he adds.



# SETTING THE STANDARD

**Kathryn Kerr**, Head of Brands Integrity at Quality Meat Scotland, explains how QMS maintains the Scotch brand standards

The Scottish red meat industry enjoys a worldwide reputation for high standards of production.

To carry the Scottish red meat industry's three premium brands – Scotch Beef PGI, Scotch Lamb PGI and Specially Selected Pork – livestock must have been born, reared and slaughtered in Scotland and spent their entire life on QMS Assured holdings.

Whole chain assurance underpins the integrity of these premium brands and provides reassurance to consumers of provenance, highest standards of production, animal welfare and wellbeing to deliver a quality eating experience.

This whole of life brand eligibility is delivered by a suite of assurance schemes for cattle, sheep and pigs, as well as feeds, haulage, auction market and collection centres and processors.

The Cattle and Sheep Assurance Scheme is an essential element. The longest established scheme of its kind in the world celebrated its 30th anniversary in 2020 and has more than 9,500 scheme members. Since 1996, the Scotch Beef and Scotch Lamb brands have held the coveted European Protected Geographical Indication (PGI) status which legally protects the brand names from imitation by meat from out with Scotland or from products claiming 'Scotch' status.

QMS annually reviews the suite of assurance scheme standards, which are contracted by QMS to Lloyd's Register, an independent inspection and certification company accredited by the United Kingdom Accreditation Service (UKAS) to ISO/IEC 17065, the international standard for product conformity certification. The Scottish SPCA also carries out joint visits to QMS approved livestock farms along with Lloyd's Register farm assessors.

WORDS
FIONA RAMSAY

> *Whole chain assurance underpins the integrity of these premium brands and provides reassurance to customers*

Traceability of product is key and checker systems are available to farmers, auction markets and abattoirs for determining the brand eligibility of Scotch assured livestock. The Scotch Potential Eligibility Cattle Checker (SPECC) allows users to check whether individual animals are potentially eligible for the Scotch Beef PGI brand. The QMS website also provides a Status Checker which allows users to check which holdings are currently approved members of the QMS Cattle & Sheep Assurance Scheme.

Almost 100 per cent of significant pig farming businesses in Scotland are members of the QMS Pigs Assurance Scheme. The Scottish Pig Health Scheme includes an abattoir health monitoring

programme operated by Wholesome Pigs Scotland Ltd, which is a robust health-checking mechanism that helps producers achieve continuous herd health improvement.

**Q. The overall strategy of QMS is to support the development of a sustainable, professional, resilient and profitable Scottish Red Meat Industry which makes an important contribution to Scotland Food and Drink's target of £30bn by 2030. Where does Brand Integrity fit into this strategy?**

**A.** The Brands Integrity department is integral to the Scotch brand. Our department aims to provide reassurance to consumers that all products carrying the Scotch Beef PGI, Scotch Lamb PGI and Specially Selected Pork logos are produced to some of the highest standards in the world.

The Scotch brand provides the consumer with total assurance that the product they buy is reared to a stringent set of standards covering all aspects of animal welfare, food safety and general good practice, with more than 90 per cent of Scotland's breeding cattle population, more than 80 per cent of the breeding sheep flock and almost 100 per cent of significant pig farming businesses covered by QMS quality assurance.

**Q. How does the UK compare to other countries in terms of its meat quality standards?**

**A.** Scotland is unique in the sense that we have a whole life assurance chain, meaning that everything eligible to be sold as Scotch Beef, Scotch Lamb or Specially Selected Pork has been born, reared and slaughtered in Scotland and spent its whole life on a QMS Assured holding.


**Above:** Assured logos offer peace of mind for consumers

**Q. QMS is currently conducting a benchmarking project against 12 countries – what is being benchmarked and why?**

**A.** There are a number of items that are being benchmarked against other standards such as husbandry procedures, antibiotic use and sustainability. This allows us to measure up where the QMS Standards sit with other assurance scheme standards across the world. When the benchmarking is complete, this will allow us to see where our scheme sits in comparison to others and it will allow us to highlight any changes to our standard setting committees and highlight where there are any gaps to help us continually improve the schemes.

**Q. Have there been any recent changes to standards?**

**A.** A review of the Auction Market and Collection Centre Assurance Scheme Standards has been completed and came into effect in

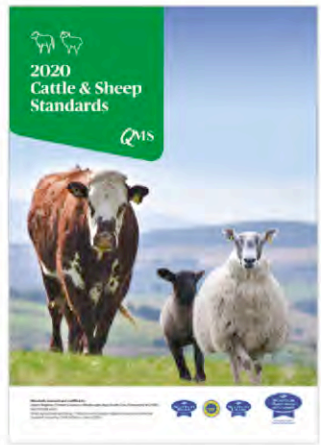
April 2021. The Standard Setting Body gave careful consideration to all feedback received during the review process and there have been new standards introduced, as well as updates for clarity.

On the pig front, there have been some changes which mean that, as we are no longer in the EU, members are no longer exempt from trichinella testing. These changes result in some additional measures – one being additional risk assessments with regards to controlled housing conditions (CHC) which are undertaken by scheme members to allow official vets to sign off that the pig meat or pig meat products come from CHC-compliant premises. Changes to the pig standards also came into effect in April 2021.

**Q. How does QMS maintain the success of the Scotch brand?**

**A.** The agricultural industry is continually evolving, and it is important that QMS maintains its relevance by ensuring that the standards remain practical and up to date with legislative and technical changes to support the Scottish Red Meat Industry. The Scotch brand offers consumers in the UK and overseas the guarantee that animals have the best quality of life on farm and throughout the live supply chain resulting in the highest quality product and livestock farmers are an important part of its success.

Kathryn Kerr




**Above:** Auction Market and Collection Centre Assurance Scheme Standards

> *The agricultural industry is continually evolving, and it is important that QMS maintains its relevance*

## The meat of the facts and figures

*Businesses covered by QMS quality assurance*

MORE THAN **90%** OF SCOTLAND'S BREEDING CATTLE

MORE THAN **80%** OF THE BREEDING SHEEP FLOCK

ALMOST **100%** OF SIGNIFICANT PIG FARMING

QMS REVIEWS STANDARDS REGULARLY IN LINE WITH LEGISLATION AND CHANGES WITHIN THE INDUSTRY

THE SCOTTISH RED MEAT INDUSTRY PRODUCES TOP QUALITY BEEF AND LAMB FROM THE GRASS AND ROUGH GRAZING WHICH MAKE UP OVER **80%** OF SCOTLAND'S AGRICULTURAL LAND

THE QMS ANIMAL WELFARE AND WELLBEING CHARTER RECOGNISES THE FIVE FREEDOMS OF ANIMAL WELFARE AND WELLBEING WHICH ARE SUPPORTED AND APPROVED BY THE SCOTTISH SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS (Scottish SPCA)

# YOUR COUNTRY NEEDS YOU

As £74 million is injected into a new agritech hub, can Scotland's farmers help develop a brave new world? **Professor Bruce Whitelaw**, Interim Director of The Roslin Institute, hopes so

WORDS
PAULINE BURNETT

Just outside Edinburgh lies one of the most dynamic epicentres of livestock-based scientific knowledge and innovation in the world. Easter Bush farm may have had humble beginnings, but now it's a £200m research and development complex that's home to more than 500 PhD students and research scientists working to improve animal health, food security and the global climate.

Made up of The Roslin Institute, The Royal (Dick) School of Veterinary Studies, the Moredun Research Institute and Scotland's Rural College, it's Europe's largest concentration of animal science research expertise.

Now, however, a £74 million cash injection – announced in March – to support a new virtual agritech hub, is set to cement the Scottish centre of excellence's position on the global stage.

Professor Bruce Whitelaw is the Interim Director of The Roslin Institute. He explains that the money will be used to create three virtual hubs, along with their supporting infrastructure, to significantly increase focus on the scientific direction researchers are headed.

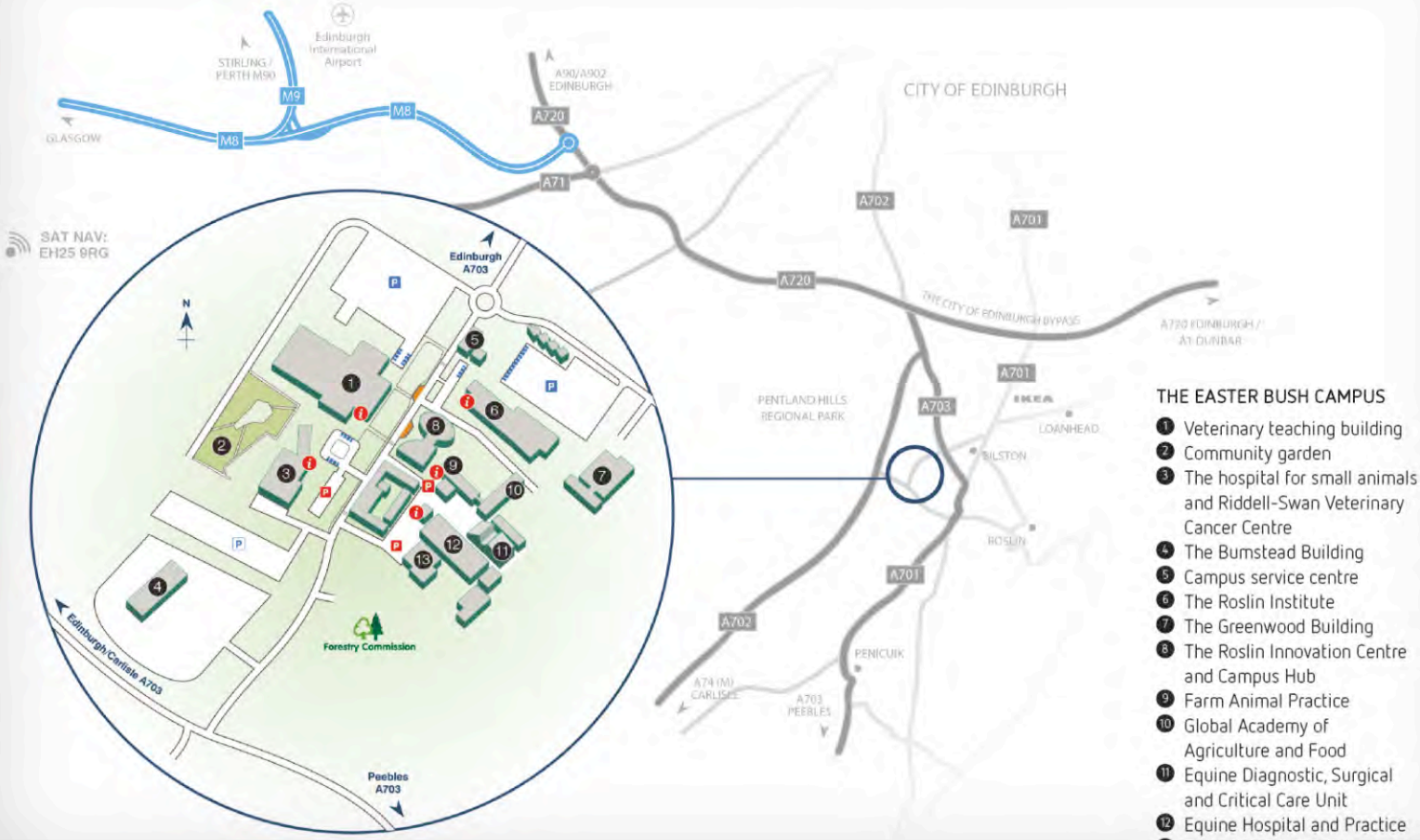
"It will create wonderful new opportunities for more dialogue with farmers and livestock managers to help drive the direction of projects and increase the benefits that are derived from the data that is produced," he says.

"I'm hoping what the agritech hub allows us to do is to have that engagement with farmers and the industry to make sure that we are asking the right questions and we are answering the right challenges."

The first hub centres around data-driven breeding, incorporating data into progress of genetic gain within animals and how scientists capture more phenotypic data from animals in fields, to give depth to that information. At the moment, The Roslin Institute primarily works with large international animal health or animal breeding companies, and its pig programme has a strong and long-standing relationship with Genus plc. Now Genus is the international leader in providing genetically superior pig breeding stock and has its headquarters in Basingstoke, but they do all their science in Madison, Wisconsin, and in Tennessee and their nucleus herds are in the States.

The second hub will focus on aquaculture health and genetics as it's one of the largest growing meat sectors in the world. "Scotland is good at it and we can be even better," says Bruce.

The third hub is around disease transmission, which was brought to the fore with COVID-19. "My colleagues had been modelling how tuberculosis travelled through bovine populations, so they switched




THE EASTER BUSH CAMPUS

1. Veterinary teaching building
2. Community garden
3. The hospital for small animals and Riddell-Swan Veterinary Cancer Centre
4. The Bumstead Building
5. Campus service centre
6. The Roslin Institute
7. The Greenwood Building
8. The Roslin Innovation Centre and Campus Hub
9. Farm Animal Practice
10. Global Academy of Agriculture and Food
11. Equine Diagnostic, Surgical and Critical Care Unit
12. Equine Hospital and Practice
13. Farm Animal Hospital

overnight to model COVID-19 in humans, using the same tools and approaches."

The endemic diseases the hub will look at in animals here in Scotland differ from those in India or elsewhere.

"We currently do some work on foot and mouth disease virus and while that's a fear in the United Kingdom, it's a daily existence in India. African swine fever is decimating pigs in China and we have it in Europe, but we don't have it on our island yet, so the data can come from everywhere and it needs to. A large Landrace pig sitting in a farm in the Scottish Borders has a very different environment to face there than it would in Arkansas, China, or northern India. And the genetics and the way those animals are bred has to be tailored for those environments. You cannot breed animals for different environments around the world unless you get data from those environments," Bruce explains.

Genetics has been the focus of Bruce's career. His first appointment was to the Agriculture and Food Research Council's Animal Breeding Research Organisation, working on the then novel idea of producing human pharmaceutical proteins in animal bioreactors. He subsequently held research position at the Biotechnology and Biological Sciences Research Council's Institute of Animal Physiology and Genetics Research, and then The Roslin Institute. He is Professor of Animal Biotechnology at the Royal (Dick) School of

*"Data is the future, and we need to arm our farmers, our society, our businesses to be able to manage and benefit from that"*

**Professor Bruce Whitelaw, Interim Director of The Roslin Institute**

Veterinary Studies and, having pioneered the use of lentivirus vectors (a method by which genes can be inserted, modified, or deleted in organisms) for transgene delivery, he is currently establishing robust methodology for genome editing in livestock.

"Whether it's coming from a farm building, an animal, or the land, data is key," he says. "It's just a different world and how to deal with electronic data in real time is challenging. It's like watching a football match and the score keeps changing and you've got to respond to it and that's the challenge. By being able to bring data together the amount of information that we can pour out to farmers will dramatically increase."

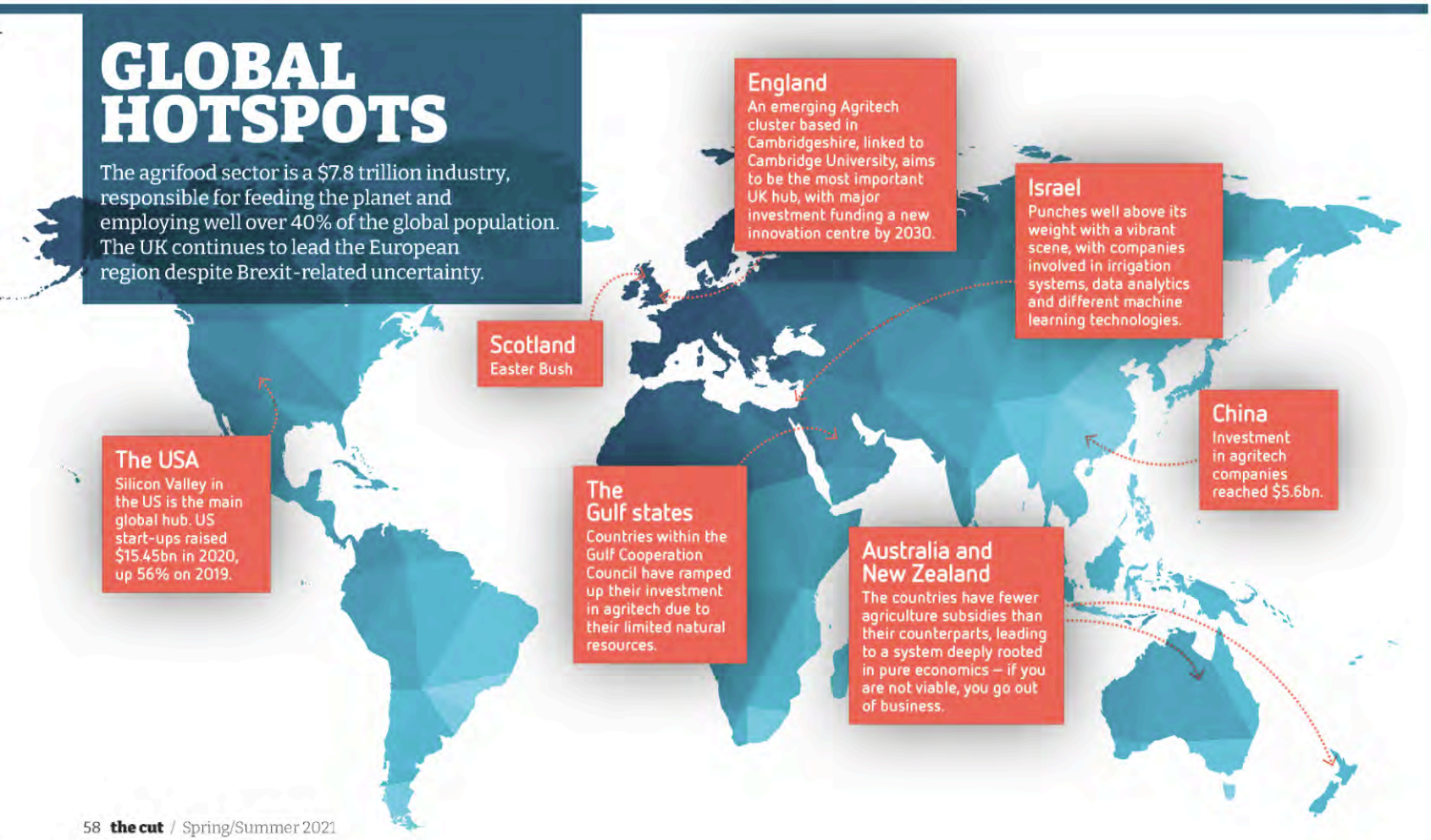
> *"The agritech hub allows us to have dialogues with farmers and the industry because we might not be asking the right question. We might not be answering the right challenge"*

While Easter Bush can facilitate the conception of ideas and offer huge data capabilities and information, it can't do everything, so working with partners across the board, across the food chain and across a variety of meats is essential. It already has a network of partners – everyone from Tesco to the Animal and Plant Agency, Scottish Government's Animal Health and Welfare Division, and Defra, but now they are looking for more.

"What we can do at Easter Bush is the academic bit and we can do that we do it quite well," adds Bruce. "Now and again, we create a fluffy white sheep that gets the headlines, and away we go. It's great for Scotland, and it's great for the region, but we can't deliver our agritech vision without having partners. A criticism often levied against academia and universities is that they are ivory towers, but through the agritech hub we want

## GLOBAL HOTSPOTS

The agrifood sector is a $7.8 trillion industry, responsible for feeding the planet and employing well over 40% of the global population. The UK continues to lead the European region despite Brexit-related uncertainty.



to have that reach all the way through the various industries, all the way down to the end customer. Depending on which way you look at it, that's either the farmer or the consumer. It will only work if everyone comes to the table. It also only works if there's humility because each player has their skills."

An outright goal of the funding is to bring jobs into Scotland, something Bruce sees as an interesting dichotomy as digitalisation and data use within agriculture is actually reducing employment chances. "We're going to create new opportunities for innovation and enterprise within the food supply chain," he says. "It's quite a jump to think of the scale of the data sets and the speed that they would come in at and how you actually interpret it, and we need to upskill the talent base to allow us to do it." That, he says, will require teaching across the board – students at university, schoolkids, practitioners and people who are actively involved in the industry at different levels. It's an ambitious task, but given the progress so far, it seems eminently doable.

The horizon of opportunity is also vast given the challenges facing the meat industry: changing customer preferences, antimicrobial resistance, zoonosis and carbon zero are extremely important societal goals, and Bruce acknowledges it needs everyone to play their part in facing them.

In terms of livestock, technologies coming together are focused on the microbiome, this mixture of bacteria that we have in ourselves. A quasi-real-time readout of the microbiome makeup in a cow's rumen could inform on its health, its feed intake, and its nutritional status. Done in a predictive manner, it could indicate that animals need fed, or act as an alert system if animals are going down with a disease.

"We're not there today," says Bruce. "We don't have the technology to do that, but we do have sequencing machines which are the size of a phone, and it's only a small step away before they can go into a bolus that goes into the gut. We need the infrastructure to capture the data that would come from that, put it into some sort of

## GLOBAL AGRITECH DEALS

The areas funders are getting excited about...

**£3.8B**

**Midstream technologies**
Food safety and traceability tech, logistics and transport, processing tech.

**Innovative food**
Cultured meat, novel ingredients, plant-based proteins.

**£1.6B**

**£1.6B**

**Ag biotechnology**
On-farm inputs for crop and animal ag including genetics, microbiome, breeding and animal health.

**Novel farming systems**
Indoor farms, aquaculture, insect and algae production.

**£1.1B**

**Farm management software, sensing and IoT**
Ag data capturing devices, decision support software, big data analytics

**£639M**

**Farm robotics, mechanisation and equipment**
On-farm machinery, automation, drone manufacturers, grow equipment.

**£272M**

Source: Agfunder

massive server somewhere, and then analyse it before it goes back to the phone of the person who owns the cow."

Bruce is passionate about making sure Scotland is at the forefront of this brave new world because, as the global pandemic has illustrated, animal health is inextricably linked to human health.

"I read a really interesting article about African swine fever in China," he says. "Because it decimated the pig population it made the Chinese farming community get more involved with other animals to try and supply that protein requirement. In doing so, it increased the proximity of humans to animals they wouldn't necessarily have been close to. And in doing so, increased the likelihood of COVID-19. It might not have led to Covid, but the concept is there. So, when we talk about pandemics, yes, pandemics that affect us as an animal, but equally pandemics that affect the animals that we live with. The goal would be to come up with resilient, robust animal populations that will be able to withstand these."

As we emerge from the Covid crisis and face what many perceive to be an even larger problem, Bruce and his teams are on the front foot on alleviating climate change too.

"We also don't buy the argument that it's animals that are causing the climate problem. Yes, they're part of the problem. But they're not *the* problem. We could get rid of all farmed animals – I'm not advocating that – and we'd still have an issue. So, we need to work out how we can change the perception of farmed animals, and we need to do that through activities which make them more carbon neutral. And it's not just the genetics, it's a whole spectrum of how we work with animals. That's a large goal of where we're going with these hubs."

Above: Professor Whitelaw on a field trip to the Indian Council of Agricultural Research's farm in northern India in 2015

So, as automation will go on across the board, in all our sectors and all our industries, collaboration with the guys in 'ivory towers' has the opportunity to bring huge benefits to the way we work on farm. While the agritech hub develops the new tools, new tricks and new gizmos, we need to be at their side, helping to shape this new world and learning how to benefit from it. We're ready to embrace the future, are you?

CASE STUDY

# Does rainfall influence the evolution of sheep?

In Ethiopia, where one-third of smallholders own sheep, a better understanding of environmental adaptation in native livestock breeds may help inform breeding and management strategies, so the group based at Easter Bush's Roslin Institute sought to investigate if the environment had influenced changes in the sheep's DNA to help them to thrive in different climates.

In one of the largest studies based on a single region, the researchers analysed the genomes of 94 sheep from 12 different areas of Ethiopia and examined them alongside detailed climatic information for each of the geographic regions.

Researchers compared the genomes of the sheep and found more than three million small differences in specific segments of their DNA. They then looked at the altitude, temperature and rainfall in each of the 12 geographical regions in the study and measured how many times these genetic variations occurred in sheep living under each of the environmental conditions.

There was a stronger association between the frequency of these genetic variations and precipitation levels compared with temperature or altitude, suggesting that rainfall is a more important environmental driver for genetic adaptation.

TIMELINE

# AGRITECH IN SCOTLAND

Key milestones in the development of Easter Bush and its influence in agritech development

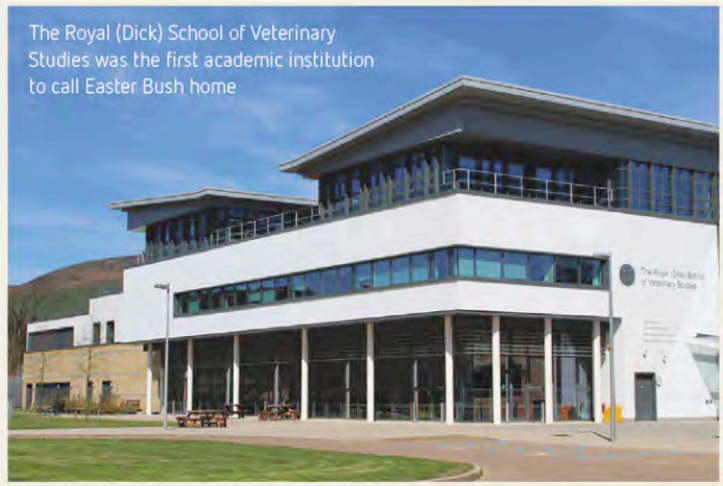
## 1582
The University of Edinburgh is founded.

## 1947
The Royal (Dick) School of Veterinary Studies begins using Home Farm at Easter Bush for large animal teaching. Meanwhile, the Agricultural Research Council creates a range of publicly funded research organisations, including the University of Edinburgh's Unit of Animal Genetics.

## 1983
The Unit of Animal Genetics is closed, and the Poultry Research Centre and the Animal Breeding Research Organisation are combined with the Institute of Animal Physiology (originally at Babraham, near Cambridge) to form the Institute of Animal Physiology and Genetics Research, based at Roslin.

## 1993
The Roslin Institute opens after it's decided that Babraham and Roslin should be developed into independent Institutes.

## 1996
Dolly the Sheep is born on 5th July at The Roslin Institute and becomes a global scientific icon.



The Royal (Dick) School of Veterinary Studies was the first academic institution to call Easter Bush home

## 2011
The Roslin Institute moves from Edinburgh to Easter Bush with annual productivity gains of £247 million through its breeding and genetics research.

## 2013
The UK Government publishes a Strategy for Agricultural Technologies and funding is provided for four new Centres for Agricultural Innovation, including Agri-EPI and CIEL.

## 2016
Roslin Technologies is born. The company is a unique joint venture between the University of Edinburgh and two investment and business development partners and aims to improve sustainable protein production across the livestock and aquaculture sectors.

## 2017
The Institution of Engineering and Technology identifies the potential application of the 'Internet of Things' in farming and invites the Agri-EPI Centre to speak at Holyrood on how an 'Internet of Agricultural Things' could give the Scottish agri-food sector a new lease of life.

## 2018
The Animal Cells: Stem Cells unit is established, focused on the production of primary cells and induced pluripotent stem cells (iPS cells) from companion animals and livestock. These cells are capable of differentiation to many different tissues in vitro. Roslin scientists produce pigs that can resist Porcine Reproductive and Respiratory Syndrome Virus (PRRSV), one of the world's most costly animal diseases, by changing their genetic code.

## 2019
The Roslin Pigs unit offers biobanking, genotyping and genomic analysis services and a breeding program design project to Danish Genetics.

## 2020
Roslin Technologies launches Vetsina Animal Diagnostics, aimed at improving the speed of diagnosis and facilitate the development of point-of-care products. Roslin scientists also support work to tackle coronavirus. Meanwhile, The Centre for Tropical Livestock Genetics and Health, based at the Roslin Institute, is featured in a high-profile Decade of Health campaign, funded by the Bill & Melinda Gates Foundation, sharing collaborative, pioneering research that benefits the health of people around the world.

## 2021
£74 million funding for Easter Bush infrastructure announced. The City Region Deal awarded to Easter Bush breaks down as £27 million from the UK Government, £1.3 million from the Scottish Government, and £31.3 million from the University of Edinburgh. While the cash will help to develop data-driven innovation, a surprisingly large chunk of the £74 million will be spent on road access and power autonomy through a power station and what Professor Bruce Whitelaw describes as "muckle big cables" to link massive supercomputers within the Edinburgh International Data Facility. "It's the infrastructure for us to work with people and come up with tomorrow's solutions," says Whitelaw.

# Tackling the problem of parasites

Infestation in sheep is linked to methane gas, so there's a huge incentive to tackle the issue – and that's exactly what is being done

WORDS
TIM POWER

Scientists have confirmed a link between parasite infestation in sheep and the increased production of methane – up to 33 per cent – which can not only have a deleterious effect on animal health and farm productivity, but contribute to greenhouse gas production and climate change.

The pioneering work at Scotland's Rural College (SRUC) has been carried out by Professor Mike Hutchings and his disease systems team. They have been researching the link between parasites and climate change since they undertook a project more than 10 years ago to create a map of predicted liver fluke distributions in the UK, based on forecast changes in the climate.

Mike explains: "Parasites, climate change and animal health are interrelated, like a complementary circle. Changes in climate will create warmer and wetter regions which, in turn, will encourage parasites such as worms and flukes to increase in intensity, and then infect animals.

"For a farmer, that means infected animals do not grow as fast so they have to be kept longer on the farm to reach market weight, thus reducing efficiency and producing more methane than they would if they went to market earlier."

The disease systems team's research has been expanded to examine whether animals infected with parasitic worms produce more methane than those without parasites, and that's where SRUC's Green Cow facility has played its part. SRUC has six sealed respiration chambers that can measure gas emissions from livestock, so Professor Hutchings took infected lambs and sheep to compare their emissions with uninfected animals.

Although sheep build up a natural immunity to parasitic worms, they are most vulnerable when they are newborn lambs or during lactation, so the team ensured that their animals were at the peak of their parasitism cycle during the tests.

"We acclimatised the animals for a few days within the facility before they were put into the chambers so

> *"Parasites, climate change and animal health are interrelated, like a complementary circle*

## GREENCOW FACILITY IS AT THE CENTRE OF RESEARCH INTO METHANE EMISSIONS

SRUC's £2.8 million GreenCow facility is spearheading the institution's world-leading research into developing ruminant livestock farming systems that achieve high quality food production while reducing the methane emissions per unit of food produced.

The research at the facility focuses on the analysis of the emissions created by different breeds of livestock by varying the animal's diet or use of additives, in order to devise ways to reduce methane production. SRUC is also researching genetics to explore the possibility of breeding low-emission livestock as well as developing other simpler methods for predicting methane emissions for animals.

The GreenCow unit, which was designed in Scotland and opened in 2011, has been developed to the highest specifications in terms of animal welfare. In addition to the six respiration chambers designed to provide very accurate emission measurements, it also has six training pens, which are identical to those within the chambers, to allow the animals to acclimatise to their surroundings before entering the chambers.

This research has attracted interest from overseas and SRUC is involved in a growing number of international partnerships including collaborations across Europe and in New Zealand.

SRUC is also using its GreenCow research to develop more practical alternative tools for measuring methane emissions, both in outdoor and indoor environments.

they were not stressed. Once inside the chambers, we fed them a set amount of food at specific times during the day so we could measure the gas emissions over a few days to get an accurate timeline of methane production," he adds.

One of the effects of parasitism is anorexia, as the animals voluntarily reduce the level of their food intake – a mechanism still not yet fully understood – and this brings problems for farm productivity as it slows their growth rate.

"Although this is bad for the farmer," says Professor Hutchings, "You would think this would be good for the environment as less food consumed would mean less methane produced, but it is not the case. Our research in the GreenCow facility showed that although the volume of feed consumed is lower, the methane gas produced per unit of food consumed is actually higher in the infected animals than uninfected animals by as much as 33 per cent.

"This means that infected animals will not only take longer to reach market but during that extended time in the fields they will produce more methane per unit of food consumed. So now you've got this potentially huge increase in the estimates of the greenhouse gas cost in parasite-infected areas."

However, Professor Hutchings cautions that this relatively small pilot study only provides a snapshot of what happens when animals were at the peak stage of parasitism and more research needs to be done to discover the mechanisms behind this increase in methane production. A PhD project is being developed to research this area in more detail and to build better indications of the true cost of parasitism in terms of greenhouse gas production.

"For the farmer, it creates another incentive to control parasites," adds the professor. "Not just for increased efficiency in farm production, but as a way of dramatically reducing their greenhouse gas emissions from the farm: it's a win-win situation."

# A package of positive changes

New production methods will mean that more plastic will be recycled in the future, which is good news for meat producers

WORDS
JOANNE HUNTER

Plastics with a host of functional characteristics are relied on in meat packaging to optimise supply chain security. In a highly regulated, closely scrutinised market decisions with consequences for the environment and public health get made at every stage of the production chain.

Films and flexibles, rigid trays and containers offer the barrier properties to guarantee hygienic conditions, modified atmosphere technology for long shelf life, and puncture resistance to protect meat on the bone.

Shrink film, vacuum or skin packs, sleeves and bags, are typical applications for soft plastics; a versatile, relatively cheap and ubiquitous material which is labelled 'hard to recycle' because the recycling infrastructure across the UK and Europe is currently limited to mechanical methods. Constraints force them down the path of single-use products which at best get incinerated for energy recovery.

Unfortunately, whatever escapes an organised waste stream can leak into the environment and endanger natural ecosystems.

But change is afoot for 'problem' plastics. A future in the circular economy is almost within touching distance thanks to developments in advanced processing methods which rescue the valuable constituent polymers so they can potentially recirculate over and over in new products.

Food-safe recycled plastics have been proven in pre-commercial and actual market trials in the

UK and Europe and the plastics industry eagerly awaits the green light from food-safety regulators to make chemical recycling part of an integrated system designed to handle all post-consumer plastics waste in much greater volumes. This will extend the reach of a packaging circular economy to include meat production, allowing it to strip out a whole category of emissions.

A global supplier to fresh and processed meat customers estimates that 94 per cent of the recycled content it will need for 2025 will have to come from chemical recycling. "Our climate goal is net zero carbon emissions by 2040, achieving full circularity by 2025," says Jonathon Durnford, responsible for strategic sustainability at Sealed Air. "We are talking about designing 100 per cent of our products to be recyclable or reusable by 2025 and incorporating 50 per cent recycled content."

Most of the company's food packaging is polyolefin-based and suitable for chemical recycling that produces the taint-free product that consumers demand.

Industry reference source McKinsey predicts that by 2050 nearly 60 per cent of plastics production could be based on plastics reuse and recycling, with a 50-50 balance of mechanical and chemical recycling. Sealed Air has invested in an advanced recycling developer using pyrolysis to turn waste into different products. Plastic Energy, in a UK trial, demonstrated that flexible packaging plastics can be returned to micro-circular loops that "keep molecules in play". High volumes of clean scrap collected by Tesco from customers went through processes to produce naphtha from which Sabic made new plastic pellets "with properties the same as virgin plastics". Sealed Air used this as feedstock for a thin 25-micron high barrier film for Bradburys Cheese. Similar technology went into a food-grade polypropylene (PP) tub for Mondelez Philadelphia Cream Cheese, with Berry Global as the packaging partner.

Closing the loop for post-consumer PP requires food-grade packaging sortation and powerful decontamination technologies and NextLOOPP has proved the concept capable of delivering food-grade recycled PP for the packaging industry.

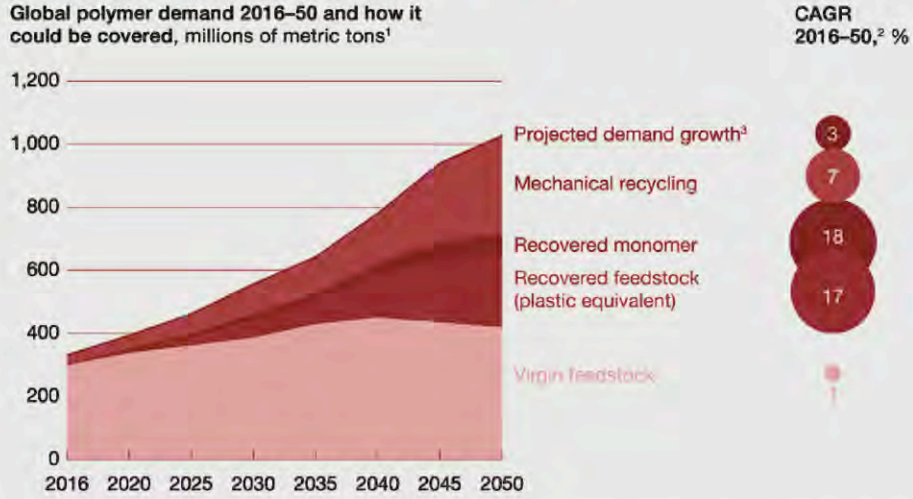
"This has never been done before," claims Nextek managing director Prof Edward Kosier. "The future has to be high yield and high purity at full speed," and he says the system met expectations in trials with a German recycler. Fluorescent markers – intelligent labels – separated any prior food-use materials from many other applications at 95% purity on first sort – the EFSA minimum – and "sorted twice we can easily get more than 99% purity", operating at up to three metres per second and two tonnes per hour.

> *"This has never been done before. The future has to be high yield and high purity at full speed*

BASF uses the 'biomass approach' that mixes product from different waste and renewable sources at an integrated production site. Certified by independent auditors, BASF ChemCycling offers waste savings,

## By 2050, nearly 60 per cent of plastics production could be based on plastics reuse and recycling

**Global polymer demand 2016–50 and how it could be covered,** millions of metric tons[1]




[1] Scenario based on a multi-stakeholder push to boost recycling, regulatory measures to encourage recycling, consistent progress on technologies, and a $75p-per-barrel oil price.
[2] Compound annual growth rate. Mechanical recycling limited by downcycling and applicable materials, monomerization limited by applicability to condensation polymers only, pyrolysis limited by likely rise in input costs.
[3] After demand reduction, assuming annual global GDP growth of 3.1%.

lower carbon emissions, fossil-oil savings, and identical chemical and physical properties to virgin material. German brand Gutfried commercialised the technology in 2020 with organic sausage packaging by Südpack.

One of Europe's biggest food tray manufacturers runs a large-scale facility in the Netherlands that reuses old trays to make new ones, the system entirely based on PET and the bottle-to-bottle concept. The industry and recycling process has been built on the back of bottles and trays are almost seen as a contaminant in that recycling stream. "Our challenge is to get levels of pots, tubs and trays up within the UK market," says Faerch's Andrew Osborne-Smith. A control of the standard of baled material could be possible to validate through a British standard.

NEARLY **60%** of plastics production could be based on plastics reuse and recycling by 2050

Sustainable packaging for fresh and processed meats goes beyond turning bales into flakes and polymers to monomers. Instead, it enters the realms of active and intelligent technology designed to avoid food waste and associated greenhouse gas emissions. Scottish company Insignia Technologies has developed 'smart plastic' labels that count down the weeks or days left to eat a product at its best and safe, or show when the shelf-life of chilled perishable foods has been compromised in transit. A time temperature indicator (TTI) device which Sainsbury's commercially launched on packs of ham, uses colour-changing pigments which react when exposed to specific gases.

Why add to the emissions load of farming and food production when there are better, kinder alternatives for the Earth? When those choices finally come on-stream, an important milestone in reaching the climate ambitions of meat producers will have been reached.

# Recycling regulations come back to Britain

When the United Nations Climate Change Conference COP 26 convenes in Glasgow in November, it will focus on reducing carbon emissions and the plastics sector sees recycled content in packaging playing a critical part in that.

Regulatory approval processes are back on British soil and set to dramatically change the legislative landscape for UK plastics production. A chasm lies between today's levels of food-grade recyclate and anticipated future demand and hopes are pinned on chemical recycling getting the green light so a recycled 4% fraction of flexible packaging can make headway towards the 80% recycling rate of paper fibre.

The UK suffers from inconsistent and fragmented collection of recyclables which the plastics industry calls "a critical limiting factor". New capacity must be created to sort and process growing mountains of post-consumer, commercial and household packaging.

A modified extended packaging producer responsibility scheme aims to introduce a fee structure that covers the full net lifecycle cost of packaging. But it lags behind a new tax of £200 per tonne rate for packaging with less than 30% recycled plastic due to come into force April 2022.

Following Brexit, regulatory responsibilities are passing from European Food Safety Authority (EFSA) to the UK's Food Safety Agency (FSA) whose senior policy advisor Tim Chandler has reassured industry that chemical recycling will be considered: "This is especially important for plastics which may have been difficult to mechanically recycle or perhaps it hasn't been economically viable to do so previously." The first authorised published list concerning recycled plastic processes is expected in 2022. The European Commission is updating a roadmap on FCM rules: "We will need to follow this closely because it could have direct implications for our legislation," says Chandler.

Food contact regulations were amended following exit from the EU but for now there is no consolidated version for all the UK's four nations. Transposed food contact plastic materials regulations remain in force up to the end of the transition period. For dossiers not yet authorised by EFSA by end of 2021, a new application must be made to FSS.

Recycled plastics can still be put on the market for food contact applications in the interim, but business operators must ensure that they meet the general legislative requirements for food contact materials, including the additional requirements for plastics. For placing on the EU market, safety assessments are carried out by EFSA.

# CHEWING THE FAT

UK Farmer of the Year, **Peter Eccles**, on his fantasy dinner party

Peter is Farm Manager at Saughland Farm, one half of the Lothians Monitor Farm. It's an 800-acre mixed livestock arable farm, owned by the Callander family, with 1,800 breeding sheep and 100 suckler cows. Along with the Callanders, Peter and his wife Eilidh created a joint venture which showcases their own produce as well as supporting local farm and artisan producers. Apart from their beef box business, Native and Wild, they run a new vending machine farm shop, Lothian Larder, and accommodation on the farm, with farm tours in the offing. Peter won *Farmer's Weekly*'s UK Farmer of the Year in February 2021.

The farm produce is available by mail order


Lothian Larder, the new vending machine farm shop

"First on my guest list is Sir David Attenborough. He's just a fascinating man and I'd like to talk to him about how we're going to prevent catastrophic human impact on the planet. I'd also like to meet newly-appointed Cabinet Secretary for Rural Affairs, Mairi Gougeon, to discuss buying local, supporting local and industry, and agri-tourism. With the rise in litter left by visitors to the countryside, I'd talk to her about how we can make it fun to enjoy the Scottish scenery and places without having an impact on nature and other people's lives, and how visitors can do it responsibly.


Mairi Gougeon

The only thing I have on the list of not to talk about is COVID. No more COVID! I would have said Brexit too, but I'd be interested to understand from Mairi how we're going to move forward as a nation. I'd team them up with Joel Salatin, the American farmer, lecturer and author with a wealth of knowledge in implementing sustainable farming systems and developing direct routes to market, so I could learn more about the amazing work he does and his whole philosophy on sustainable agriculture.

Lastly, it's Rod Stewart, because we love his music and I've had many a Rod Stewart hairstyle in my time. He'll bring humour, a bit of rock'n'roll and devilment.

The whole concept will be a dine on the farm experience, celebrating local produce and seasonality, so we'd have a bit of a tour of the farm, then come back to the steading where we'd cook outside on hot coals.

We'll probably start with a couple of glasses of Farmer Strength Drovers Gin from The Wee Farm Distillery, then make a gin cocktail with Rapscallion Soda. Our starter would be farm-shot wood pigeon and a seasonal salad with some Old Leckie pancetta from Stirlingshire, which is terrific. We'd have a wine flight by Cairn O'Mohr for the whole dinner.


Rod Stewart

The main would be surf and turf – ribeye steaks from our own Black Baldie Cattle, born and reared on farm then dry-aged for 35 days. We hang it on the bone, a traditional method which allows natural evaporation, so the flavour and succulence really intensifies. We'd serve it with East Coast Lobsters – they arrive all prepped for you – and a seasonal salad with our homegrown new potatoes.

For dessert it's Eilidh's sticky toffee pudding, which is to die for, teamed with Over Langshaw Farmhouse's Peanut Butter and Jam ice cream, then finish with a cheese board from I. J. Mellis in Edinburgh.

After dinner, we'd sit around a fire pit to watch the Western Isles rock band Peat & Diesel, drink hot toddies made with Glenkinchie whisky and Eilidh's homemade honey, and have a singalong with Rod. Great!"

***See @native_and_wild_meat_boxes on Instagram and Facebook.***


qmscotland.co.uk

**the cut**

ISSUE 01 **SPRING/SUMMER 2021**

QMSCOTLAND.CO.UK