British Cattle Conference

Organised by
The British Cattle Breeders Club

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‘Building the Brand to Promote our Uniqueness’

Annual Conference Papers
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British Cattle Conference

Organised by
The British Cattle Breeders Club

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All good things come to an end, so they say and the 2019 British Cattle Breeders Conference was the culmination of my year as Chairperson. The theme of the 2019 BCBC was all about building the brand of UK genetics, breeding and livestock farming to build on our uniqueness. The mix of talks from farmers, researchers, geneticists, students and the agricultural industry including retailers, identified unique ways to take cattle breeding and associated businesses to new markets and identified new opportunities.

Over the two and half days of workshops, conference papers, lunch, coffees and dinner, conference attendees engaged in lively discussions and embraced the opportunity to inform themselves of the latest developments in research, technology and best farming practices from the UK, Jersey, USA, Australia and New Zealand to enhance the future of UK cattle breeding and genetics.

The conference was opened by Minette Batters, President of the NFU, who highlighted both the challenges and opportunities of the upcoming potential Brexit deal or ‘No deal’ options for agriculture and in particular livestock. This was followed on day two by Christine Middlemiss, UK Chief Veterinary Officer, who focused on UK USP’s when exporting on a global market and how we needed to continue to focus on our high standards of animal health, welfare and traceability.

Several papers were presented by industry and breeding experts including Dr Stephen Miller from USA, Dr Robert Banks from Australia and Max Tweedie from New Zealand presenting papers on how farmers can access genomics and EBV’s more readily for ensuring breed viability and consistency, increasing rate of genetic gain more efficiently and at lower costs than before. They all emphasised the need to keep repeating the basics of good breeding practices and recording data.

Over the two and half days seven papers were presented or co-presented by farmers who detailed opportunities to develop, protect, build and promote their brands ranging from specific breeds, developing new markets for their outputs or using breeding strategies to improve efficiency, health, and consistency of their products. These papers were hugely personal and gave a very positive outlook on the challenges, achievements and future ambitions.

I thoroughly enjoyed working with the BCBC committee, our President, Professor Mike Coffey and of course our hardworking secretary Heidi Bradbury, I would like to take this opportunity to thank them once again for all their support and hard work to secure such fantastic speakers and sponsors without whom the conference would not have been such a success. Thank you for electing me it has been a truly great honour to have been Chairperson and to have played a part in the Club’s rich history.

I have no doubt that the Conference will continue to go from strength to strength and feedback from delegates has again emphasised just what a fantastic forum the BCBC is. I would like to wish Laurence Loxam every success for his year ahead and have no doubt that the 2020 conference will also be one to remember.

Any Westland
Chair

Message from the Chair

‘It’s a wrap!’ – BCBC Conference 2019
The British Cattle Breeders Club

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1990 Sir Richard Trehane (retired 1997)
1997 Mr John E. Moffitt CBE, DCL, FRASE (retired 2005)
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1962–1993 Colin R. Stains
1999–2000 Janet Padfield
2000–2015 Lesley Lewin
2015 onwards Heidi Bradbury
A new dawn for a productive and sustainable UK agriculture

As we have already seen from the conference theme, we are in a time of unprecedented change and opportunity; I want to ensure that we make 2019 a year of action which harnesses this once in a lifetime opportunity to set our future.

At the NFU, my job is often dealing with the unknowns or the uncontrollable, and making that road that gives certainty for others to drive on. I think that has made the role of President of the NFU all the more important at this critical time for our industry and our country.

I cannot stand here without mentioning EU exit, but you will be pleased to know I won’t dwell on it, as we cannot judge the success of EU exit without a vision of where we want to be beyond it. To put it simply, there’s not much point in building a road unless we know where we want it to go.

Key priorities

Avoiding a no deal outcome on the 29th March – we need a deal and the only deal on the table at present is that which the Prime Minister has negotiated with the European Union. It’s not perfect but it allows the UK and EU the time to shape the long term trading relationship we need with our primary market.

Ensuring that we have an Agriculture Bill that is fit for purpose – This should go down as a landmark act for farming’s future relationship with society. Previous legislation has left a lasting legacy – will the same be said of this Agriculture Bill? Will it have the budget to ensure long term agreements can be provided? Who will be able to participate in these schemes? Will the funds be directed towards our farmland?

Making a clear and long-standing commitment, to protect UK farm standards – We have world beating standards for animal welfare and health in the UK. These standards must not be undermined by low cost and poor welfare products, undermining our food values. We will not allow Ministers to chlorinate their conscience in order to sign a trade deal, so they must put it in writing now.

In addition to these three key areas, there is also the very real issue, which many of you might be facing in the room today, of access to labour both now and in the future. Much of our industry both at farm level and within processors is based on the access to foreign labour. We are already hearing of a number of farmers having to make difficult decisions about their future due to a reduction in the number of skilled individuals who are coming to the UK as herdsmen. We must find a solution to this both for now and in the future.

Trading with the EU on WTO terms

The UK currently exports £13bn of food and drink to the EU – if we crash out, overnight we move from the free movement of goods with EU partners to trading on WTO terms.

EU tariffs applied to exports

The EU has confirmed that in the event of a no deal, it will apply its existing tariffs to imports coming from the UK. WTO rules mean it could do no less.

Technical restrictions on EU trade

We export around £3.5bn of animals and animal products to the EU each
year. In a disorderly exit, the UK would not be on the EU’s list of authorised third country exporters and without that, the trade in animals and animal products would cease overnight. The government is not willing to put a timescale on how long it will take the UK to gain the necessary export status from the EU. It is within the gift of the European Commission, but many close to the process believe that 6 months is an optimistic appraisal and even longer could be realistic.

Uncertainty on free movement and citizens’ rights
The government has not yet made an announcement of what will happen to the rights of EU citizens living in the UK in the event of there being no agreement with the EU.

The government seems unwilling to make a unilateral decision on EU citizens living in the UK, without assurances that UK citizens living in EU countries will receive reciprocal rights and protections.

However, we should acknowledge that the Prime Minister recently said that the UK government has no intention of asking EU citizens to leave the UK in the event of there being no deal. We must never forget that there are people and their families considering their futures and they deserve no less than certainty in writing from the government.

Agriculture Bill
The Agriculture Bill is crucially important for the farming sector. It seeks to provide continuity and stability for farmers as we leave the European Union (EU). Its passage will pave the way for a bold and ambitious new approach to domestic agricultural policy that can be designed specifically for the needs and recognising the unique characteristics of UK agriculture, once we leave the Common Agricultural Policy (CAP).

In fact, it provides fairly broad powers for current and future governments to put in place a comprehensive and effective agricultural policy for the future, reflecting much that the NFU has called for.

Including provisions that support farmers:
• To undertake important environmental work
• To improve the productivity of their businesses
• To manage the volatility and tough market conditions that falls outside their control
• To strengthen their role in the supply chain
• To provide greater transparency and data sharing within the industry

But our challenge in the coming months is to improve the Bill to ensure it provides a watertight framework in which government can support farmers as productive and sustainable food producers – with all the accompanying benefits for delivering public goods.

Strategic Priorities – Food
The NFU believes that the Agriculture Bill should be amended to not only support domestic agriculture, but to ensure food security and stability of food supply.

The government has a strategic interest in ensuring a sufficient level of domestic food production and the Bill should ensure that there are powers for the government to support UK agriculture, so it can continue to meet these expectations.

Agricultural focus
We believe the Bill should focus specifically on agriculture, underpinning a farming model in the UK that is sustainable, productive and plays an active role in delivering food production and public goods. Ensuring that future financial assistance, relates explicitly to agricultural activity, farm businesses or farmland. Whether that’s incentivising measures to protect soils, water and air or improving agricultural productivity.

Multi-annual budgets
We believe that the Bill should establish a multi-annual budgetary framework that provides certainty for farmers and allows them to plan and invest for the future.

UK frameworks
The Agriculture Bill must adequately address the issues stemming from devolution and maintain a level playing field amongst the home nations.

International Trade Deals and UK standards
A further issue relating to both the Agriculture Bill and the Trade Bill currently passing through Parliament is the issue of international trade negotiations and respect of UK standards.

The NFU’s position on food production standards and post-Brexit trade is clear: our future international trade arrangements should not serve to allow food imports which undermine the high standards that British farmers are proud to produce to and for which the public trusts and values.

We believe that both Bills should ensure that British farmers can continue to produce food to the current high environmental and animal welfare standards of which they are proud, whilst being able to compete on a level playing field with producers elsewhere in the world, without being undermined by cheaper imports produced to lower standards.

Failure to do so would undermine the principles that should be at the very heart of the Bill – an efficient, productive, profitable UK farming sector meeting the needs and expectations of the British public, both in terms of the food they eat and the public goods they value.

Labour
Labour availability is an issue for the whole food chain. 40% of workers in food manufacturing are non UK born. Around 9% of agricultural workers are non UK born.

The NFU have welcomed the fact that the government intends to engage with the farming sector over the next 12 months and we hope to make vital improvements to proposals. The new immigration policy must reflect the
economic importance of the food and farming industry to Britain, and a system must be developed that serves sectors of the economy based on need rather than misleading measures such as skill levels.

**Celebrating farmer’s environmental efforts**

Farming’s environmental performance is always under some sort of scrutiny and the NFU will shortly launch a major new initiative to ‘take back control’ in responding to criticisms to help counter any negativity.

We want to tell our members stories in their voices – to provide a platform to champion their efforts and give an honest and balanced appraisal of the environmental situation on our farms.

This is a significant piece of work for the NFU and I look forward to welcoming many of you to a conference to launch this initiative as well as signposting you to a forthcoming report ‘United by our Environment, our Food, our Future.’

**United by Food**

We are all united by food and that is the name of our plan to develop a comprehensive food strategy for the UK. My vision of our sector beyond Brexit is one of a progressive farming and food industry, whose businesses are valued and connected to the health and wellbeing of all consumers and fulfils our moral obligations in a global economy and a changing world.

My vision for farming is therefore one that is inextricably linked to food, people and our planet and we must take our position and future seriously. We have one planet for us all to feed from yet our industry continues to feel the injustice of environmental and welfare NIMBYism. The EU and our own successive administrations have a history of increased regulation – while exporting our consciences to other parts of the world. It is morally reprehensible to push the bar higher for domestic production, while allowing imports below it.

We need to spell out to Government where we want to be with a united voice and a united vision. That vision has to be about business growth, delivering for citizens and delivering for consumers.

A vision that is supportive of the nation’s health and wellbeing through safe, affordable and sustainable food, serving consumers at every price point.

**Standards and Integrity – Preserving our strong domestic standards while guarding against fraud in a volatile world.**

**Moral Imperative – Affordable food is a modern day success story; the planet needs to feed 67 million extra mouths every year, what is our contribution to this challenge?**

**Health and Nutrition – Significant dietary imbalances, driven by societal imbalances and nutrition scares are prevalent in the media. We have all heard that we should eat more fruit and vegetables but did you know we also need to increase starchy carbohydrates by 69%. We should not be in the business of demonising certain food groups; there is no such thing as bad foods, only a bad diet.**

**Respecting Nature – there is an ever increasing need to increase food production globally, while protecting natural resources and biodiversity. The UK footprint is amongst the best in the world. We need to make the best use of our strengths, our natural resources, our skills and capability to deliver for the environment and deliver on food security.**
Strategies for ensuring breeds’ viability in the genomics era – beef breeding as an information business

Dr Robert Banks
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Synopsis
Recognised breeds have played valuable roles in the development of beef industries world-wide, based on combinations maintaining valuable characteristics and making genetic change. This history has depended on combining skills of animal observation and understanding market needs, with use of technology and marketing and communications. As pressures on land use and from competing food sources rise, and ‘genetics’ morphs into ‘genomics’, the pressure to utilise breeds’ genetic resources is going to become more acute. In parallel, the very basis of breed organisation will be challenged, as the overriding importance of sound performance data becomes clearer. The challenge of how to collect, share and use the most appropriate data to underpin genomic selection is being tackled in a range of ways in different countries.

Introduction
The beef industries of most developed countries depend on a range of breeds and crossing systems, with a corresponding variation in how genetic improvement is delivered. The role of breeds (breed societies, associations) in genetic improvement also varies.

In this paper I will outline some challenges and opportunities facing breeds, and in particular, explore some key strategic choices generated by the advent of genomic technologies.

Firstly, let me make clear how I think about breeds. A breed is:
• A population or gene pool of animals, often originally deriving from a particular region.
• The animals in that population typically have distinctive and relatively uniform appearance (size, colour markings, horns etc), which to some extent acts as a marketing device and is frequently managed as such.
• The animals in that population typically have characteristic performance for various traits (size, growth rate, carcase traits etc), which will differ from other breeds to varying extents for various traits.
• And ‘it’ is an organisation of people, working together in some way to promote their interests

Historically, what the cattle did (in terms of their typical performance) determined the role of the breed, its market share and distribution.

Increasingly, it is what the people do that determines the fate of a breed, and I will argue that this will become even more the case in the genomics era.

I take some important things as givens:
• Selection is possible for all traits impacting profit.
• Recording (and genetic analysis) is essential for genetic improvement.
• Genetic merit impacts market share – it’s critical to commercially meaningful survival.

The business of breeds
If we think of a breed society or association as a business, how does it operate?

In simple terms, members invest time and money in recording, selection and marketing, potentially making some change to the performance characteristics of the animals, and capture some share of total value chain margins via sales of bulls, cows, semen etc.

In Australia, the share of total on-farm income that accrues to bull-breeding is around 6–10%: the average price of bulls is about 6–10% of total lifetime progeny value per bull.

We have limited data on breeders’ operating margins, but in broad terms they:
Are strongly influenced by current prices for slaughter stock.

They are not markedly different from margins achieved in commercial production, but carry the additional risk of investments in recording and evaluation, infrastructure and marketing.

In Australia, the breed societies operate as not-for-profits, aiming (to varying extents) to invest any surplus in some combination of R&D and marketing.

From a genetic improvement perspective, there is a simple equation that strips the business down to fundamentals (see Figure 1 above).

The overall aim is to maximise returns from whatever investments are made – this applies whether we are talking about single vertically integrated organisations such as pig or poultry companies, or breeds with many members supplying bulls to larger numbers of commercial producers.

What makes this model challenging for breed societies is that the overall outcomes reflect the decisions of many individual members, and those decisions vary – individual breeders invest different amounts in recording, they likely vary in the ways they make selection decisions, and they make genetic progress at different rates and in different directions (see Figure 2).

This variation is unusual if we think of breeds as brands: it is as if the features of a car depended to some extent on which distributor you got it from. I’ll return to this point.

The other aspect of the breeding business which is very different from most branded products or services is that the breeders within a breed ‘co-create’ the value. This is because the work that individual breeders do – the recording and selection – helps both them as individuals but also the other breeders. The data collected on individual animals contributes to the evaluation of other animals in the breed, and breeders exchange (usually by buying and selling) genetic material with each other.

In economic terms, this makes a breed society a club – an organisation in which members contribute to generate or something together which they could not generate or create as individuals. A golf club is an example: members share the costs of owning a course, paying a professional, having a members’ bar and so on.

Figure 2: Variation in value-add between herds within a breed.
A breeding ‘club’ takes this one step further through the direct injections of pedigree and performance recording data and of genetic material, which together generate the average and variation in genetic merit for all the various traits. Adding to the ways in which breed societies are unusual business models is that to varying extents the members compete with each other in bull selling.

A jargon term for this mix of cooperation and competition is ‘co-opetition’ (https://en.wikipedia.org/wiki/Co-opetition).

These interesting aspects of breed societies represent a challenge and an opportunity. The variation in behaviour of members can be seen as an inefficiency, and the typically imperfect flow of signals for genetic improvement encourages more investment in marketing than in genetic improvement – which is ultimately the source of success for the breed.

To many, these challenges result in breed societies being seen as a frustration, and the strategy inherent in much implementation of genetic improvement technology has been to remove the frustrations – by establishing single enterprise businesses, such as pig breeding companies. In these ultimate decisions about investment in recording and selection are made at a single point, even when multiple individuals contribute to the decision-making.

My point here is not to suggest that breed societies should aim to be more like vertically integrated companies, although that would be a legitimate strategic choice. It is to note the way in which decision-making about investment and selection are distributed, and vary, among members, and that this distributed investment is loosely coordinated by a combination of the society’s rules, and by the market.

I am not suggesting that breed societies are inherently a bad (or good) thing; they are a form of organisation that has emerged quite naturally, and have potential to be effective or not. Perhaps their most significant feature is the variation amongst their members: effectively utilised this variation is the source of evolution, just as variation in genetic makeup is the source of evolutionary change, and of genetic improvement in livestock.

I am not focusing so much on the organisational effectiveness, as on examining how the ways breed societies work might be impacted by implementation of genomic methods.

Genomic selection – what’s different?
The starting point here is the key technical features of genetic improvement in the pre-genomics era:

- phenotype + pedigree = EBV
- accuracy (information) disperses in proportion to animals’ relatedness
- accuracy (information) is spread primarily via movement of animals
- risk, which is mainly about investment in recording, is spread widely across the members of a breed society
- and we typically see characteristic patterns of amount of recording and of rate of genetic progress

A core aspect of this era is that effectively, to determine the genetic merit of an animal, you have to record something about that animal: its pedigree and some aspect(s) of performance.

What about genomics? Implementation of genomic methods is primarily about genomic selection. The basic features of genomic selection can be shown summarised:

- Reference population. This is all animals with a genotype and some measure of performance, which can include an EBV based on their progeny or other relatives’ performance
- Genetic analysis that incorporates pedigree, genotype and performance information, and which can therefore calculate EBVs for animals that only have genotypes.

The method of choice here is multi-trait single step, such as is now implemented in BREEDPLAN

Once these two items are in place, animals outside the reference population can be genotyped and obtain useful EBVs.

The game-changing (‘disruptive’) aspect of this model is the establishment and utilisation of a reference population:

- the reference population is animals with phenotypes (records) and genotypes.
- the reference population can be a discrete herd recorded for some defined set of traits, it can be animals in or from a range of herds recorded for a variety of sets of traits, or a combination of the two.
- anyone can then draw on the reference data simply by genotyping an animal and including the genotype in a genetic evaluation.

Note that in principle some core of animals with identified pedigree has always existed — the difference is that now, one can utilise information from the reference without needing to know pedigree. (This points to a very important fundamental — it is now possible to determine pedigree, and much else about animals, without maintaining a herd book).

The core of this change is that we can decouple evaluation (determining an animal’s genetic merit) from recording. To stress the point, previously, if an individual member of a breed society wanted to determine the genetic merit of their animals, they needed to invest in recording those animals.

Now, they can achieve this by pulling tail hairs and submitting genotypes to the breed genetic evaluation. One immediately obvious consequence of that fact is the potential for free-riding, depending on who invests in the reference and on what terms others can access it.

This potential for free-riding is just one aspect of how genomics challenges a breed society business model. I will briefly outline the aspects, with suggested approaches in each case.
Before doing that, it is important to stress that genomics offers real opportunity for significantly faster and more valuable genetic progress. We are starting to see the practical evidence for that in beef breeds in Australia. The increases in accuracy of predicting progeny performance are substantial – up to 20% depending on breed and trait, meaning that stud breeders can select young bulls and heifers, with more accuracy for more traits, meaning faster and more valuable genetic progress is possible.

**Strategy for breeding businesses**

Strategy for any breeding business is ultimately defined by the answers to two questions which both interact and at the same time involve specific challenges for multi-member organisations.

Those questions are:

- what to breed for?
- what to record?

I’ll examine each one, with particular focus on how they apply in the case of breed societies. First, a comment on how these two questions have tended to be answered in beef breeding, and how this is changing in Australia.

Traditionally, breeders seem to have selected for the things that are relatively easy to record. Growth rate, or weight, is the best example, so we have seen selection for increased growth rate and size through life in most breeds in most countries during the last 20+ years. A minority of breeders have carefully recorded birth weight and adult cow weight, and to some extent (increasingly in the last 10–15 years) have selected to bend the growth curve – holding birth weight, going for rapid early growth, then putting a cap on adult weight. This pattern is now a central feature of the $Indexes being developed by most breeds using BREEDPLAN in Australia.

Simply selecting for what is easy to record is not sensible.

**What to breed for – the breeding objective:**

All breeds have typical performance for a range of traits that affect income and/or cost through the value chain. The breeding objective is a formal statement of how much the breed wishes to change performance for one or more of those traits. Geneticists tackle this by working out the impact in financial terms, and using those ‘relative economic values’ (revs) to weight different trait EBVs in a selection index.

The first key point here is that the breeding objective ultimately defines the direction of genetic improvement – what traits will be changed by how much.

Ideally, a breed will have a well-defined breeding objective, and that will at least inform individual breeders’ selection choices.

In the genomics era, the breeding objective becomes significantly more critical, because it explicitly tells us the value of different trait records which should shape investment in the reference (the breeding objective has always been important, even if not often formally developed and widely utilised). For example, a trait with very high rev is much more valuable to record than one with a low rev. This feeds directly into decisions about investment in the reference population.

**What to invest in – what to record:**

The second key point is all about what to record, or more precisely, what to record in the reference. It is the size and trait coverage of the reference population that determines what value breeders and others can extract through genomics.

Ideally, in the reference population, the breed will get sufficient numbers of trait records for all the traits in the breeding objective, or traits that are closely genetically related to those, as possible. Sufficient numbers is not a fixed thing, but breeds should aim for 250–1,000 new animals recorded and genotyped per year – higher numbers simply generates greater genomic accuracy.

This clearly leads to asking the question “how does the breed fund the reference?” There are several points that can be made here:

- If this is left to individual breeders, how can the breed guarantee that it will get enough records for all the important traits?
- If the breed is investing in specific recording activities or herds, either alone or in partnership with (for example) R&D agencies, how to recoup the costs? Even if there is no charge applied, the funds will have had to come from somewhere.
- If the breed has a mix of reference recording, through breeders’ individual efforts in combination with some form of ‘central’ recording, how to recoup the costs, and provide some recompense to the individual breeders?

There may not be any one definitive answer to these questions, but I believe that some principles can be identified:

- If everything is left to individual breeders, their propensity to invest in trait recording, in particular for hard-to-measure traits, will be powerfully affected by the recording cost and the likelihood of getting an adequate return, likely via bull sales. If there is uncertainty around those returns, there will be under-investment in trait recording, and the breed’s capacity to exploit genomic selection will be compromised.

This implies that some form of payment for records must be considered. That leads to the questions of:

a) How much to pay for trait records?
b) How to generate funds to pay for trait records?
c) What form should the payment take?

- How much to pay? I believe that solving this question depends on the relative economic value of the trait, coupled with any range in
anticipated recording cost. For any combination of trait records, we can calculate the impact on index accuracy, and evaluate that against the recording cost (see Figure 3).

Any breed can construct its own version of this chart, each time new investment decisions must be made, and use it to prioritise investments. An extension of this principle is that the data recorded by each member of the breed and contributed to the reference can be assessed for the value of its contribution.

This leads to considering whether to actually pay, or provide something in return, for that contribution. Currently, as discussed above all breeds effectively rely on bull (or semen) sales covering those costs, and/or contributions from research funds of some sort. Even if both these options still apply, consideration does need to be given to recompense for the breeders who record performance, otherwise the overall recording effort will almost inevitably decline, and with it, the value of the reference population and the potential to benefit from genomics.

• How to generate funds to pay for trait records? In principle, this is straightforward: simply impose a levy on genotypes processed within the genetic analysis – the total cost of records divided by the anticipated number of genotypes.

In practice, the breed may wish to differentiate between different uses of reference data. To explain, a bull breeder will obtain more value from a genotype, if it leads to sale of a bull, than a commercial producer. It would be possible to vary the levy in proportion to the anticipated number of expressions of the genes of the genotyped animal.

• How to pay? The easy answer to this is ‘via cash’. The problem with this easy answer is that it implies that breed societies become a form of bank, holding reserves, receiving payments for services (which they do now), and making to some members.

In practice it may be simpler to provide some form of credit for breeders or other individuals who contribute data to the reference – making services available to them at reduced rates. The US dairy employs this model currently.

The genomics challenge to all breed societies

In the pre-genomics era, most breed societies largely left genetic improvement to chance and the market.

This generated considerable underperformance (lower rate of genetic improvement than possible) and wide variation in that rate within and between breeds. Together, this generated massive opportunity costs for everyone in the value chain (and the communities that depend on them).

Genomic selection will force breeds to focus on two core strategic questions – what to breed for, and how to fund reference populations.

There are simple metrics available that can inform the decisions needed, including metrics relating to the variation in contributions made by individual members.

Furthermore, the scope to redefine membership is a significant opportunity. Commercial producers, processors and even retailers and consumers can be seen as partners in data capture and therefore potentially new classes of members.

Large breeds will potentially find these challenges easier to overcome, basically because their costs of reference can be spread over more commercial expressions, especially with wide use of AI. However, the basic ratios commercial expressions: stud numbers are roughly constant, so there is scope for smaller breeds to close the gap.

In this context, international collaboration is potentially more valuable for smaller breeds, because there are diminishing returns to scale in the accuracy of the reference population. Breeds should explore
sharing data between countries, and enhance the effectiveness of this by coordinated use of elite, genotyped young sires across countries.

Central to all these challenges is the question 'how to pay for all this', on top of the costs of genetic evaluation and other roles of breed societies. (One response is to simply use the performance data and (genomic) pedigrees – why have breed societies at all?)

Finally, breeds should certainly explore scope for long-term funding relationships with industry and/or government organisations. Beef cattle breeding is more affected by market failures than the vertically integrated industries, co-funding of reference data offers a very efficient way of reducing the opportunity costs of those failures.

The core of my message is that ‘genomics’ provides the opportunity, and the very powerful challenge, to re-think how breed societies work as organisations. The metrics that are readily available around genomic selection can be used to re-shape how breed societies work: what are their rules around use of the key information resource, how are costs distributed? The breeds that emerge from the genomics era intact and viable will have inevitably had to trial new ways of doing things, but in finding practical, equitable and efficient ways of generating and using information, they will have a much stronger foundation for sustained viability than previously.
Abstract
An insight to a project in New Zealand, progeny testing 5 breeds of bulls across 2200 commercial cows a year head to head in country ranging from steep hills and low stocking rates to high input lowland country. How is this project using objective information to shape breeding decisions and breeders’ thinking? And how could information of this kind change an industry and the prominence of high-quality beef in a world where consumer is key and vegans are only a meal away?

New Zealand Beef Breeding
Over the last two decades, New Zealand has experienced a dairy industry boom. The national dairy herd has grown from 3.4 million cattle in 1993 to 6.49 million in 2017 (Beef+Lamb, 2017). As a result, 69% of the national kill of adult cattle is now of dairy origin – comprised of cull cows, Friesian bulls, and dairy-beef calves reared for finishing. This has meant a major shift in the use of land to its most profitable use. Beef production on better quality land has contracted to make way for dairy cattle, and on poorer quality land has contracted to make way for expansion of forest plantations (Tweedie et al. 2018).

New Zealand’s temperate climate has resulted in pastoral systems of beef production, whereby farmers apply management practices that attempt to match nutritional demands of animals to the pasture growth curve (White et al. 2009). This is partially achieved through mixed livestock systems, where different species and classes of livestock have different requirements throughout the year; and by careful timing of reproductive cycles to coincide with pasture growth (Tweedie et al 2018). In this, sheep are nearly always run with beef cattle – much of which are rotationally grazed in pasture only systems. The beef cow is considered the ‘pasture groomer’ for other livestock classes and is often fed the poorer quality pasture on the steeper parts of New Zealand farms.

B+LNZ Genetics Beef Progeny Test
The B+LNZ Genetics Beef Progeny Test (BPT) has now completed its 5th Cohort. It is one part of an extensive beef genetics research programme carried out by B+LNZ Genetics and its research partners on commercial New Zealand beef farms.

The BPT was established as a result of 4 questions:
1. What is the right type of cow for New Zealand hill country?
2. What genetics are required to maximise finishing performance and hit market specifications?
3. How do we balance maternal with finishing traits?
4. Do the EBVs for these traits work and do they need improving?

As a result of those questions the BPT was established based on the following objectives;
• Quantify the value of investment in better bulls
• Demonstrate the tools in the breeder’s toolbox
• Improve the tools currently available for New Zealand beef breeding
– Do so on genuine commercial farms

The project has now completed its 5th beef cohort of around 2,000 cows (not including a further 1500 terminal dairy
cow matings) representing 5 large commercial stations across New Zealand over a very broad range of land types. Some 50 Angus, Hereford, Simmental, Charolais and Stabilizer sires are progeny tested annually. Some sires have been as old as 12 years (with high accuracy EBVs and many calves) and as young as yearlings (low accuracy sires). Cows are un-shepherded at calving and steer and terminal heifer calves are recorded for growth, structural soundness, docility, carcase quality (both ultrasound and abattoir assessed). Maternal heifer calves are also recorded for novel fertility traits as yearlings and for repeated reproductive outcomes, cow type and cow fate/longevity.

The project undoubtedly has a strong extension/adoption theme. The uptake of Estimated Breeding Values (EBVs) and other genetic tools has been mixed in New Zealand beef breeding to date. In sheep breeding, the uptake is advanced and many of the rams sold are first grouped on $Index to be valued for sale. Given a vast majority of farms run both sheep and beef on the same land – this is an interesting difference. A strong focus on adoption, rather than the traditional model of a focus data harvesting for research (only) – is a defining and unique aspect of the BPT.

**Extension learnings from the BPT**

As this project has progressed there have been some interesting extension observations that have been distilled into messages for potential application in the UK.

**Bake your bread before you butter it**

In other words – repeat the basics reinforced them as much as possible before getting into the detail. Often in research – and as science based professionals, we are most excited and driven by the next and newest piece of information. This is often not the case for those farmers who don’t have a keen interest in genetics specifically – but of course have to purchase sires every year.

They need to hear the basics repeated – reinforcing that EBVs actually work (and are useful) before going the next step and selecting sires using them. This following case study is a breakdown of how we ‘baked the bread’ by validating Breedplan growth EBVs in 5 breeds of cattle.

**Expectation: 200 Day Weight EBV**

In the calf, roughly half the genes come from the cow and half come from the bull. That means we would expect half the benefit of a sire’s EBV to be passed on to the calf. In the theoretical example, Table 1 it is expected sires with heavier 200 Day Weight EBVs will wean heavier calves e.g. for every extra 1kg of sire 200 Day Weight EBV you expect to get an extra 500 grams of actual calf weaning weight on farm. This can also be seen in Figure 1 with an expected slope of 0.5, where the bulls from Table 1 are plotted on Figure 1.

**Reality**

It was found that for every 1kg more in 200 Day Weight EBV, 490 grams was gained in average weaning weight on farm. Effectively 99% of the expected weaning weight advantage predicted by EBVs is being realised on NZ commercial farms. To reiterate, this was achieved across the country with 2200 cows, on five large scale commercial farms, five breeds and with high and low accuracy sires (see Table 2 on page 16).

Although a fairly crude way to assess

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**Table 1: Theoretical bull EBVs matched to calf outcomes.**

<table>
<thead>
<tr>
<th>Bull</th>
<th>200 Day Weight EBV</th>
<th>Progeny difference (kg's)</th>
<th>Calf average weaning weight (kg's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bull 1</td>
<td>+20</td>
<td>-10</td>
<td>235</td>
</tr>
<tr>
<td>Bull 2</td>
<td>+40</td>
<td>0</td>
<td>245</td>
</tr>
<tr>
<td>Bull 3</td>
<td>+60</td>
<td>+10</td>
<td>255</td>
</tr>
</tbody>
</table>

**Figure 1: Theoretical bull EBVs matched to calf outcomes.**
the performance of sires EBVs in predicting the performance of their calves

– percentage of EBV that turned into calf performance can be compared across all Breedplan traits that the BPT assessed.

– 90% of sires EBV turned into actual calf growth.

– Across 18 Breedplan traits assessed – 73% of sires EBVs turned into calf performance (see Figure 2).

Farmers learn from farmers

In a general sense, the farming population in New Zealand is heuristic. This means that they learn from experience and from the experience of others. They are typically practical and like to see things done in a way that they can apply in their own businesses. In New Zealand the ‘Farmer of The Year’ farm tour field days are always hugely attended – in contrast to many of our extension days. This is put down to their love of ‘seeing how others do it’.

The BPT has built a champions network of leading farmers through the BPT. The BPT sites are leading farms in their areas. For example, Rangitaiki Station on the Central Plateau regularly achieves 70% + in calf rate to one round of Fixed Time Artificial Insemination (FTAI) despite having over 1400 cows and 10,000 ewes in an extensive environment of 8300 ha. The properties were selected because they are widely regarded as sources of information for other farmers due to their success and scale.

As a result, we now use the farmers and their staff in our messaging. They present genetics content at our field days and are the frontmen for our advertisements promoting the use of genetic tools. The BPT has shown us that farmers like to hear it from farmers and the BPT site managers are the projects biggest advocates.

In 2018 B+LNZ Genetics hosted a Virtual Beef Breeders Conference. This was an online forum with live, interactive videos and on demand sessions that were pre-recorded. The videos featuring breeders were by far the most viewed. This lesson reinforced our findings.

Breeders. You have the mandate to measure

A difficulty in the industry is encouraging breeders to be objective. Putting the power in their hands to be the ones collecting high quality, complete data is a challenge for genetic evaluations around the world. For breeders to then use that data for selection – resulting in genetic gain, is the ultimate. Without subsiding or incentivising breeders to collect data – how do you encourage it?

Make it competitive

The BPT allows for excellent benchmarking for commercial farmers. As most of the average site metrics i.e.
farm cow herd performance, growth rates, kill results etc. have been available to farmers to benchmark their own businesses against.

All BPT kills are off grass and cattle are grown and finished on the farms they were born on. Groups for slaughter are created at 12 months of age and cattle are run in those groups with all cattle from the given group being slaughtered on the same day. Figure 3 below shows the improvement (within the first season) between kills for farm slaughter performance. Each farm improved the percentage of cattle hitting the Beef Eating Quality index at successive kills. Results were shared between the farms. This made things competitive and encouraged the swapping of information on how to improve the respective sites results. A similar result was achieved by being totally transparent and sharing the sites FTAI results between the farms.

**Putting in dollar terms**

Farmers in New Zealand are motivated by economic opportunity. When all subsidies for agriculture were removed overnight in the 1980s – attitudes to farm profitability changed. As a result, when there is extra value obtainable from the use of technology – it is often taken advantage of. It is often said ‘money talks’ (see Table 3 on page 18).

**Your story to tell?**

The world is changing. We are no longer as connected to our urban cousins as we once were. Their understanding of our challenges and empathy for our rationale for doing things has appeared to have declined. Their own motivations are changing and we inevitably have to meet them if we wish to have a future breeding and growing cattle for markets.

The 2018 publication of the 2018 EAT-Lancet Commission report recommended developed countries cut their red meat consumption by 80% to ‘protect the earth’. This report is both damming of red meat and misleading. It perpetuates the idea that industrial farming and grain diets for finishing animals is standard practice and the norm globally (EAT, 2018).

January is in fact ‘Veganuary’. According to the Vegan Society – the highest number of vegans per capita are found (in order) Australia, UK and New Zealand. By their estimates – 1.16% of all people in the UK are now vegan – a number that has doubled year on year since 2015. Arguably these people aren’t going to be convinced easily to eat red meat again and their minds are probably set on the issue. However, they represent the extreme end of a growing group of society that is unhappy with red meat and its perceived impact on society (Vegan Society, 2018).

**Figure 3**: Year 1 BPT kill performance lifted which successive kills.

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1: Whangara  
2: Rangitaiki  
3: Tautane  
4: Mendip Hills  
5: Caberfeidh

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**ANNUAL CONFERENCE 2019**
Beef in places like the UK and in NZ could infact consider this an opportunity. If our product is to be differentiated to meet the needs of this modern and ever discerning consumer, then there needs to be some serious consideration given to the positioning of it. Grass fed, sustainable systems are likely a part of the answer to this.

Rebuilding the trust

In New Zealand we have the famous Whittaker’s Peanut Slab. In 2018, the makers of this fine chocolate bar were named New Zealand’s most trusted brand for the 7th year in a row. They have generated an enormous amount of good will with NZ consumers over time by giving the people exactly what they want. Based on the things that concern the modern consumer – could the UK Red Tractor Brand be built to gain the same trust Whittakers has in NZ but with UK red meat consumers? This brand could stand for trust and for the leading standards of meeting their demands/concerns. Progeny tests are excellent vehicles to produce meaningful statistics and information to fuel the debate on the trust red meats has with the consumer. Progeny tests are more than just research data sources or adoptions projects for farmers – they can be arms to the debate with those with genuine concerns about red meat.

Sustainability, welfare and eating quality appear to be recurring issues with the modern consumer and those dissatisfied with the state of red meat. An example of Progeny test derived metrics used in New Zealand is that in 20 years NZ sheep + beef farmers have reduced Greenhouse Gas emissions (GHG) from livestock by 30% (Beef+Lamb, 2017). Reinforced by a powerful article – ‘New Zealand scientists breeding sheep to fart and burp less’ – which sheds light on the development of genomic reference populations for selecting sheep for reduced GHG (ABC, 2018).

In a similar vein, traits like Body Condition Score and Parasite Resilience are meeting the consumers wish for high animal welfare and Intra Muscular Fat for eating quality – all traits that were developed from New Zealand sheep Progeny testing.

Conclusion

With good design – Progeny Tests can be so much more than just research data sources. Traditional models have been about generating data for research with little adoption or consumer end point advantages in mind. An industry project such as the BPT has had impacts on NZ farmers and (hopefully in time) consumers – could it have the same effect in the UK?

Acknowledgements

• AbacusBio Ltd
• Beef Progeny Test herds
• Simmental NZ
• Focus Genetics

References


Beef+Lamb (2018) BLNZ welcomes launch of one billion trees fund. Beef+Lamb New Zealand, Wellington, New Zealand. URL https://beeflambnz.com/news-views/blnz-welcomes-launch-one-billion-trees-fund?clide=bfWF4Lr3ZWkWaWVAYmxuemdi bmV0aWNZLmNvbQ%3D%3D&recipientid=contact-80ac29f0030e411bed100155d320899-221e85caab464d3998fba7ef29c7b84&eclid=7bf 7a7f2-6f8-e811-a845-00d3ae0b82e&fbclid=IwAR307dDWOMx5kVm9xGvL-yW7BQgbnlieQ6SBqymFGdOGrm8Q7O8dNZJHbGQys


Table 3: Sires with improved EBVs had calves of increased value.

<table>
<thead>
<tr>
<th></th>
<th>So why bother?</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 Day Weight EBV</td>
<td>The heaviest sire’s calves had an extra 43 kg as yearlings. At $3/kg* that’s worth an extra $129 per calf</td>
</tr>
<tr>
<td>600 Day Weight EBV</td>
<td>The heaviest sire’s calves had an extra 66 kg at 18 months. At $3/kg* that’s worth an extra $198 per calf</td>
</tr>
<tr>
<td>Days to Calving EBV</td>
<td>Cows that get in calf early have more productive lifetimes. 1 day of conception date results in an approximate extra 1% calving rate. That’s an extra calf at $900 or $9 per cow</td>
</tr>
</tbody>
</table>
Using 100% AI on a 100-cow suckler farm

Matthew Murphy
Farm Manager, Newford Farm, Athenry, Co. Galway, Ireland

Summary
• 100-cow suckler herd bringing all progeny to slaughter.
• Cows are all first-cross Angus and Hereford bred from the dairy herd.
• Targeting terminal traits in sires, as milk yield is not a problem and no replacements retained.
• 91% in-calf rate in 2018 from 11-week breeding season.
• 100% AI used in 2018.

Introduction
Newford Farm is a 100-cow suckler-to-beef herd established by Dawn Meats and Teagasc in 2015 and located in Athenry, Co Galway, in the west of Ireland. The project was set up to demonstrate the physical and financial performance that can be achieved from a suckler herd utilising first-cross cows from the dairy herd and bringing all progeny through to beef.

The management structure of the project is made up of members of Dawn Meats, Teagasc and the Irish Farmers Journal, while McDonalds also provides support for the project. I am the farm manager and work full-time on the farm, with the support of Michael Fagan, a Teagasc technician, as well as employing a student for three months in spring.

The backbone of the system is to maximise output from grazed grass, with a target set at the outset of finishing 70% to 80% of progeny off grass at an average of 20 months of age.

Ireland has experienced rapid expansion in the dairy herd since 2010, with an abundance of Angus and Hereford progeny available. Milk yield in these first-cross animals is excellent, but a trait that often lets these animals down is their beef characteristics. With this in mind, we decided at the beginning of the project that if we were going to reach our finishing targets, a lot of work needed to go into sire selection and maximising the terminal traits of our progeny. The decision was made to use AI on the cows and use two stock bulls to mop up after six weeks of AI. However, the success of AI was such that we sold the two stock bulls in 2017 and switched to 100% AI.

Why I use AI
As stated, the cows on this farm have good maternal characteristics – they have plenty of milk, are docile and we have found they go back in calf with relative ease. The farm brings all progeny to slaughter and AI is a proven reliable tool to utilise the best terminal genetics available. The cow brings the milk to the table and by crossing with high-reliability terminal bulls with good carcass weight and conformation breeding values, we have an excellent grass-based finishing animal. Trait reliability is a key component because high reliable terminal sires will have calves on the ground that will hit their performance targets and hopefully leave profit on the farm. Reliability is also of great concern when it comes to calving ease, with a major component of the system to have cows calving with minimum intervention.

Putting theory into practice
The main focus for me before I start breeding is the condition of cows. We know that for a cow to start cycling as soon as possible after calving that she should be at a body condition score of between 3 and 3.5 at calving. Therefore, preparation for breeding in the Newford herd commences at housing or shortly after. Cows are penned according to their body condition, allowing a feeding programme to be implemented that matches intake with cow nutritional requirements.

With this in mind, we identified 36 cows at housing in November 2018 and fed 3kg of soya hulls until mid-January. This level of supplementation is higher than previous years, but takes account of lower-quality silage, while there are a greater number receiving supplementation due primarily to spring and summer drought being hard on young cows and those rearing twin calves. This relatively short period of concentrate feeding has cows in better condition at calving and we have found cows return to heat much quicker. Maintaining a tight calving interval will far exceed the cost of supplementing cows with concentrates.

At Newford, the aim is to get cows and calves outdoors as soon as possible after calving. The spring of 2018 presented lots of challenges in this regard, with difficult ground conditions and poor grass growth preventing early turn-out of all groups. Cows were prioritised over steers and heifers and once weather conditions improved.
improved cows and calves quickly settled.

At the beginning of April, cows were already seen coming into heat and their tag numbers were recorded daily as part of routine herding. Weather and ground conditions were excellent and I was encouraged by the number of cows showing heats. The breeding season began on 24th April and AI was used for 10 weeks only. We deliberated on extending this to 11 weeks, given the challenging spring, but had found in previous years that there were very few cows served in weeks 10 and 11, so we stuck with our decision.

Heat detection is the key to a successful outcome when using AI. Two heat detection aids are used in Newford farm – tail painting and vasectomised bulls, while regular supervision is also a critical component. We use tail paint on the cows to see which cows are coming into heat. This is a very cheap and effective way to see which animals are in heat. We top this up with a different colour as cows are served and as required during the breeding season.

We also use vasectomised Friesian bulls during the breeding season, with one bull run with each group of 50 cows. We purchased the vasectomised bulls for €850 each in 2018 and kept them in quarantine for three weeks before letting them out with the two groups of cows.

The day they arrive on the farm, they enter quarantine and are blood tested. The bloods are then sent for analysis to Enfer Scientific to do a full health check, with bulls remaining segregated from the herd until clear results are returned. A chin-ball harness with paint is fitted to each bull (this leaves a paint mark on the rump of the cow when the teaser is mounting the cow or resting his head on her rump).

The teasers are let out with the cows at the start of the breeding season. In 2018, one of the bulls was quiet for the first week, but as more cows came into heat, he became quite active and both bulls did an excellent job marking the cows.

Once-a-day AI was used in 2016 and it was so successful that I have continued this method. The way we work once-a-day AI in Newford is cows are served every day at noon. If a cow is in standing heat in the evening or morning, she is served at noon. If she is still showing standing heat in the evening after being inseminated earlier in the day, she receives another AI straw the following morning.

It is important to point out that in 2016 an AI technician was called to the farm daily. Since then, I have become fully trained in the technique and I carry out all insemination on the farm now. Regular monitoring is also an important component of AI. Cows are checked at least five times daily and any cows in heat are separated from the group in the morning.

Cows are docile and with the help of reels, a paddock system and a farm roadway, this task is completed quickly each morning without too much stress to man or beast. I was very sceptical of going down the AI route, especially with two very good bulls on the farm. It takes time to check and get cows into the yard, but, in my opinion, the calves on the ground and their performance have more than convinced me of the advantages of using AI.

The 10-week breeding period in 2018 and the scanning results on 2nd August show:

- 91 cows in-calf out of 100 bred, a 91% in-calf rate.
- 60 cows held to first service.
- 20 cows held to second service.
- 11 cows held to third service.
- Four sets of twins scanned.
- Nine cows empty.

I am very happy with the results showing 91 out of 100 cows bred in-calf. One of the key components of a profitable suckler system is that cows are in-calf and a tight calving spread is maintained. This in turn means you have a weanling, store or finished animal to sell at the end of the year. I was also pleased that 60 cows held to the first service, which means we will continue to have a very busy calving period this February. The empty rate of 9% is well below the national average and I would be quite satisfied if I achieve this annually.

Sire selection

One of the most important jobs I do each year is to select the terminal sires that we use on the herd. These are key decisions, as the progeny of these bulls will be finished on the
It is critically important that the sires are easy calved and deliver progeny that have good growth rates, perform well at grass, have conformation, kill out well and, most importantly, leave profit on the farm. This is why each year I will spend a few evenings looking over the Irish Cattle Breeding Federation (ICBF) list of terminal sires. There is a very simple filter function on the list of AI bulls that allows a farmer to identify bulls with traits that are desired. By inputting the desired selection criteria into the computer search option, it will highlight in seconds the available bulls.

The criteria for sire selection on Newford Farm has been:
- Five-star terminal index.
- >80% reliability.
- <7% calving difficulty for mature cows.
- >30kg predicted carcass weight for mature cows.
- <6% calving difficulty for the 1st and 2nd calvers.
- >25kg predicted carcass weight for 1st and 2nd calvers.
- Straw costs less than €15.

This is time well spent on any farm and it allows me to pick and choose the bull to suit my type of cows; i.e. AA/HF with an average weight of 655kg. It is also worth noting that we make the decision based on the sire’s terminal figures and sire breed is not a factor in this decision. Figure 1 shows the sires used in 2018.

We had used Fiston and Gammin in 2016 and are very happy with their calves on the ground at the moment. They were easily calved, have good shape and are performing exceptionally well on the cows. When these came up on the 2017 and 2018 list, we were happy to use them again. Another bull that we tried for the first time in 2017 is Willodge Goldcard and we chose him because he has exceptional figures for calving (4.6%), carcass weight (31kg) and reliability of 87%.

Calving score 2018
A strong focus on calving ease has paid dividends since the project commenced, with calving scores for 2018 listed in Figure 2 on page 22.

Unfortunately, the benefit of the additional carcass weight in the final sale price was eroded by a lower beef price, but at least we are trending in the right direction with carcass weight.

We keep good-quality grass in front of cows, calves and finishing stock at all times. This means that we can incorporate more grass into the animals’ diet and, therefore, produce animals more profitably. The tables below show the most recent weights for each category of stock (see Figure 3 on page 22).

Conclusion
Since the start of this project in 2015, we have been trying to maximise performance at every level on the farm – breeding, grassland, health,

Figure 1: Sires used in 2018.
and nutrition. It has become clear that the key to becoming a profitable suckler-to-beef farm is to use the best genetics available and that will work on this farm. In my opinion, to achieve a positive outcome I will use AI on all cows and will be able to predict the type of animal I will have at slaughter. AI might not suit every suckler farmer, but for someone who was quite sceptical in the beginning, I will be sticking with it for the foreseeable future.
Suckler beef production – the future

Henry Scholefield
Beef Shorthorn Cattle Society’s Beef Student of the Year 2018 and University of Nottingham BSc, Agriculture Student

Summary
Undoubtedly the greatest challenge facing UK agriculture at present is the potential impact Brexit may have on the sector. Suckler producers must improve the efficiency of their herds’ performance to make their businesses more profitable and resilient in order to survive these challenging times.

Introduction
The current economic and political climate has generated tremendous uncertainty with a lack of clarity regarding what will happen when the UK leaves the EU. This poses a challenge to beef farmers who, as Table 1 shows, are subjected to low profit margins which are highly sensitive to market fluctuations. The potential reduction in farm subsidy payments coupled with the danger of cheaper food imports flooding our market post Brexit mean beef producers must improve the profitability of their systems or face going out of business.

Through reducing input costs associated with feed and fertility whilst maximising saleable beef, a sustainable suckler herd needs to make a sufficient gross margin to cover their share of the farm’s fixed costs independent of subsidies. A functional suckler cow should be able to achieve this by efficiently utilising the farm’s resources to produce beef that meets buyers’ specifications. Beef Shorthorns have developed from a dual-purpose breed and their wide range of desirable traits encompassing fertility, hardiness, milkiness and feed efficiency make them ideally suited to become more prevalent in British beef systems.

Fertility
A suckler herd must maximise the kilograms of calf (output) produced per cow each year as calf sales account for the majority of herd output. This can be achieved through improving fertility, targeting a 365-day calving interval and maximising calves sold per 100 cows bulled. Table 1 shows a suckler cow costs £227 per year to keep (without including fixed costs like labour), therefore barren cows are a disaster for a farmer in terms of profitability as these cows are not producing any output to pay for themselves.

A compact calving period is required to make herd management easier as well as producing calves with higher and more consistent weaning weights, increasing output (QMS, 2015). Table 2 on page 24, shows a calf born in the 6th three-week block can be 115kg lighter at weaning than a calf born in the first period. A cow calving in an earlier block is likely to conceive sooner as it will have had longer to recover before going to the bull (AHDB, 2014).

Table 1: A gross margin for an average performing, Upland spring calving suckler cow per year. Output consists of the value of the weaned calf at 250 days old.

<table>
<thead>
<tr>
<th>Output</th>
<th>£/cow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calf Sales (195p/kg, 273kg calves, 90 calves reared/100 cows)</td>
<td>441</td>
</tr>
<tr>
<td>Less Replacements</td>
<td>156</td>
</tr>
<tr>
<td>Total Output</td>
<td>285</td>
</tr>
<tr>
<td>Variable costs</td>
<td>£/cow</td>
</tr>
<tr>
<td>Cow Concentrates (£200/t)</td>
<td>26</td>
</tr>
<tr>
<td>Calf Concentrates (£238/t)</td>
<td>13</td>
</tr>
<tr>
<td>Vet &amp; Medicines</td>
<td>30</td>
</tr>
<tr>
<td>Straw bedding</td>
<td>48</td>
</tr>
<tr>
<td>Misc (commission, haulage, tags, levies)</td>
<td>21</td>
</tr>
<tr>
<td>Total Variable Costs (before Forage)</td>
<td>138</td>
</tr>
<tr>
<td>Gross Margin (before forage)</td>
<td>147</td>
</tr>
<tr>
<td>Forage Variable Costs</td>
<td>75</td>
</tr>
<tr>
<td>Purchased Bulk Feed</td>
<td>14</td>
</tr>
<tr>
<td>Total variable costs (inc forage)</td>
<td>227</td>
</tr>
<tr>
<td>Gross margin/cow</td>
<td>58</td>
</tr>
</tbody>
</table>

these cows could be crossed with continental breeds which have traditionally faced calving problems due to the high birth weight of calves.

**Longevity**

Replacement heifers cost over £1000 to rear or buy with no cash return on this investment until the heifer’s first calf is sold up to two years after calving. Rearing home-bred heifers requires space and feed, limiting the farm’s capacity for rearing other stock. Should replacement heifers be purchased, the farmer risks importing diseases such as BVD and IBR (AHDB 2015). Longevity is therefore an essential trait of a functional suckler cow to minimise costs and cash flow implications as well as improving biosecurity.

Increasing herd life by one year can lead to a £22/cow gross margin improvement (SAC, 2017). As well as increasing output, improved fertility reduces replacement costs as infertility is the major reason for culling. Longevity can also be improved through breeding decisions, both by selecting hardier breeds such as the Beef Shorthorn but also by using EBVs for longevity to inform selection of breeding stock. If buying in replacement heifers health testing is compulsory for all animals sold at their sales, minimising the risk of ‘buying in’ such diseases (Beef Shorthorn 2016).

**Temperament**

Animal injury was the second largest cause of agricultural fatalities from 2012–2017, therefore functional suckler cows must be safe to handle and manage (HSE, 2017). Although any breed can be highly dangerous, Beef Shorthorns are known for being quiet and docile. This temperament makes them useful for grazing public access land, for instance in National Parks. Crossing Beef Shorthorns with flightier breeds could improve the offspring’s temperament.

**Feed Efficiency**

Feed can account for 75% of beef farmers’ variable costs so savings here could substantially increase profitability (Teagasc 2017). Grazed grass is by far the cheapest feed; Table 1 on page 23 shows concentrates cost over £200 per tonne, therefore minimising concentrates fed to cattle by maximising grazing is essential. Grazing management is key to maximising efficiency of pasture utilisation and grass intake. Paddock grazing systems where cattle are grazed on a small area for a short time result in a 92% increase in useable dry matter yield per hectare compared to a set stocking grazing system (AHDB, 2016). Many farmers are reluctant to adopt such a system due to the investment in fencing and water infrastructure and the time required to implement the system. The fact that grass yield is almost doubled using no more fertiliser inputs means paddock grazing will lower the forage variable costs per cow substantially from the £75 seen in Table 1 as well as reducing the need to purchase bulk feeds, quickly repaying any initial investments in fencing.

Smaller cows are the most feed efficient as their smaller size means they require less energy to maintain themselves resulting in lower feed requirements than larger cattle. Adult size is very much influenced by breed, with continental breeds typical heavier than native British breeds. Their smaller size and ability to forage enables native breeds to thrive off poorer quality, less fertilised pasture whilst requiring minimal concentrate feeding, lessening the £26/cow concentrate cost seen in Table 1.

The ability to thrive off poorer pasture coupled with their docility make native breeds such as Beef Shorthorns ideal for conservation grazing. Cattle play a pivotal role in controlling coarse vegetation and improve sward structure of difficult to manage, ecologically diverse areas such as Lowland Heathland. Grazing such areas with native breeds entitles farmers to £45/hectare under the Countryside Stewardship Scheme (DEFRA 2018). With post Brexit subsidies looking likely to be paid for

<table>
<thead>
<tr>
<th>3 week calving periods</th>
<th>Age at weaning days</th>
<th>Weaning weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>221</td>
<td>283</td>
</tr>
<tr>
<td>2nd</td>
<td>200</td>
<td>260</td>
</tr>
<tr>
<td>3rd</td>
<td>179</td>
<td>237</td>
</tr>
<tr>
<td>4th</td>
<td>158</td>
<td>214</td>
</tr>
<tr>
<td>5th</td>
<td>137</td>
<td>191</td>
</tr>
<tr>
<td>6th</td>
<td>116</td>
<td>168</td>
</tr>
</tbody>
</table>

Source: QMS, 2015.
environmental services such as these, farmers must capitalise on these potentially lucrative schemes where possible.

As Table 1 shows, bedding costs £48/cow. Outwintering cows can save on bedding and feed costs meanwhile freeing housing for the farm’s younger cattle (NBA, 2012). Outwintering is only applicable to drier farms where welfare issues and excessive poaching can be avoided. Durable, thicker skinned native breeds such as the Highland or Beef Shorthorn will respond better to outwintering than for instance less hardy, dairy-cross suckler cows.

**Maternal Ability**

Through improving suckler cow’s maternal traits it is possible to maximise the kilograms of saleable calf whilst minimising input costs. Selecting cows renowned for their milkiness can facilitate excellent calf growth rates. A strict culling policy for cows lacking milk, suffering mastitis or not milking on all four quarters is necessary both to maximise calf growth and reduce time and money spent hand feeding calves. Many beef producers use Holstein/Friesian cross suckler cows to enhance milk production in their herds. Dual purpose breeds such as a Beef Shorthorn could replace dairy cross cows in these systems as, whilst producing ample milk to rear a calf, Shorthorns are harder, require fewer inputs and produce offspring with superior carcass qualities when compared to dairy cross cattle.

**Meat Quality**

With the modern market demanding lean, small cuts of meat, heavy and fatty carcasses are financially penalised when sold. Although human management and feeding is fundamental, breed affects size and meat quality. As Figure 1 shows, 49% of cattle do not meet ideal market requirements, therefore functional suckler cows must produce saleable calves which meet buyers’ specifications (AHDB, 2017). Closer co-operation with buyers is needed to help farmers better understand the quality of carcass required.

Enhanced co-operation can result in schemes such as the Morrisons Shorthorn Beef Scheme whereby Morrisons pay a 20p/kg bonus on Beef Shorthorn and Beef Shorthorn cross heifers and steers under 30 months old (Morrison, 2016). Provided the cattle meet the correct carcass conformation and fat level, this guaranteed premium reduces price uncertainty, particularly valuable given the future uncertainty regarding agricultural support policy. As well as tender and flavoursome meat, consumers demand beef from herds of high health and welfare status. Post Brexit, the beef industry must make better use of the UK’s exemplary welfare standards and the supreme quality of our native breeds’ meat in marketing British beef both to defend it against cheaper imports and to encourage exports to a wider range of non-EU markets such as China.

**Conclusion**

To be sustainable, a functional suckler cow must ultimately be profitable. Through excellent maternal traits and fertility, suckler cows need to produce highly sought-after calves from minimal inputs. Beef Shorthorns meet these criteria as these fertile, docile cows can thrive in lowland or upland environments due to their hardiness and versatility. Being low input, high output, Beef Shorthorns constitute a modern day, market-orientated, functional suckler cow.

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**Figure 1:** Percentage of English prime beef cattle falling within/outside target specifications in 2016. (Source: AHDB, 2017)

![Figure 1](image_url)

**References**


The BRITISH CATTLE CONFERENCE
run by the British Cattle Breeders Club

will be held on

20th to 22nd January 2020

Telford Hotel and Golf Resort, Great Hay Drive,
Sutton Heights, Telford, Shropshire, TF7 4DT

More details from the Secretary on 07966 032079
Email: heidi.bradbury@cattlebreeders.org.uk
Website: www.cattlebreeders.org.uk
Take our industry higher; shout about the sire

Alex Brown
Breeding Projects Manager, AHDB, Stoneleigh Park, Kenilworth, CV8 2TL

BCMS

The Cattle Tracing System (CTS) maintained by the British Cattle Movement Service (BCMS) contains information on births, deaths and movements of all cattle in the UK. It is also a source of cattle pedigree information as it is compulsory to include dam information on the passport. It also has space for sire information, but unlike dam information, it is not a compulsory field. Levels of sire recording on passports have been historically low, but we have seen a steady increase in the percentage of sires recorded since 2010 (see Table 1 below).

Estimation of genetic potential

Estimated Breeding Values (EBVs) allow us to assess the genetic potential of an animal for breeding. Improving genetic potential has cumulative and permanent benefits to the cattle industry, and particularly in the dairy industry we have seen that utilising EBV information when making breeding decisions has had a positive impact across a range of traits, including not only production traits, but also health and fertility.

EBVs are calculated using a combination of performance data and pedigree, which is used to detect genetic links between individuals. In the beef industry, where performance recording is managed by individual breed societies, with evaluations carried out by a range of different partners such as BREEDPLAN, Signet and EGENES. Uptake of performance recording varies by breed, and pedigree information is restricted to animals registered with the relevant breed society. A different structure is seen in the dairy industry, where the majority of performance recording is undertaken by milk recording organisations and breed societies, who also collect information on pedigree. This data is then shared with AHDB Dairy, who work alongside EGENES to produce the UK dairy genetic evaluations for all dairy breeds.

EBVs from commercial phenotype data

There is a vast amount of routinely recorded data across the cattle industry that could be harnessed for genetic evaluations. One example of this is carcase trait data collected by abattoirs. By combining this phenotypic data with pedigree information sourced from BCMS, AHDB have worked alongside EGENES to produce the National Beef Evaluations launched in November 2018, and the Dairy Carcase Index, launched in April 2018.

The abattoir data shared with SRUC for these EBVs and index covers approximately 40 per cent of the national kill. However, at the present time only 50% of the data provided by abattoirs is completely useless for genetic evaluations, because no sire was recorded within BCMS. In some cases we are able to determine sire based on pedigree and insemination data provided by breed societies and milk recording organisations, but we have no other way of accessing pedigree data for commercial animals.

BCMS itself also provides further opportunities to harness routinely recorded data for genetic evaluations. Information on dead or alive status for tagged calves is being used to produce EBVs for calf survival in Limousin and dairy breeds, with other beef breeds in the pipeline. Other traits that we intend to explore via the BCMS database include longevity and calving interval, and alongside APHA data EBVs for bTB resistance in beef cattle are also in development.

Barriers to sire recording

We acknowledge that sire recording is not always possible, for example

<table>
<thead>
<tr>
<th>Year of Birth</th>
<th>All cattle</th>
<th>Dairy cattle</th>
<th>Beef cattle</th>
<th>Dairy x Beef cattle</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>18.4</td>
<td>4.9</td>
<td>24.0</td>
<td>17.5</td>
</tr>
<tr>
<td>2011</td>
<td>18.4</td>
<td>5.3</td>
<td>23.8</td>
<td>17.6</td>
</tr>
<tr>
<td>2012</td>
<td>20.2</td>
<td>9.5</td>
<td>24.2</td>
<td>18.7</td>
</tr>
<tr>
<td>2013</td>
<td>21.1</td>
<td>9.6</td>
<td>24.4</td>
<td>19.6</td>
</tr>
<tr>
<td>2014</td>
<td>23.5</td>
<td>11.3</td>
<td>25.5</td>
<td>21.7</td>
</tr>
<tr>
<td>2015</td>
<td>26.2</td>
<td>14.2</td>
<td>27.1</td>
<td>23.5</td>
</tr>
<tr>
<td>2016</td>
<td>29.5</td>
<td>17.8</td>
<td>29.3</td>
<td>25.8</td>
</tr>
<tr>
<td>2017</td>
<td>32.0</td>
<td>21.2</td>
<td>34.5</td>
<td>28.5</td>
</tr>
<tr>
<td>2010–2017 average</td>
<td>23.7</td>
<td>11.7</td>
<td>26.6</td>
<td>21.6</td>
</tr>
</tbody>
</table>
when more than one bull is left to run
with the herd, or mixed straws are
used for insemination. AHDB have
developed a suckler breeding plan to
help farmers record sires used on
groups of animals which is freely
available to order.

We also recognise that the current
BCMS system is unsuited to
recording dairy sires, as there is high
usage of foreign bulls whose identifi-
cation numbers are not recognised
by BCMS. However, with 50% of UK
beef now originating in the dairy
herd, it is vital that beef sires are
recorded in BCMS wherever
possible. This will improve both the
breadth of bulls for whom EBVs are
available, and also improve the
accuracy of evaluation. If we can
achieve this, we will see faster
genetic progress within the beef
industry, and have a positive impact
on the productivity and profitability
on farm.

Benefits of recording

Improving your choice of beef
genetics

Genetics companies react to market
requirements. The availability of
semen for a wide range of easy
calving beef bulls has been
improving since demand for beef
genetics in the dairy herd.
Successfully improving the breadth
and accuracy of genetic evaluations
such as the AHDB National Beef
Evaluations and the Dairy Carcase
Index will allow genetics companies
to source bulls that best fulfil
customer requirements.

Demand information. Not only will
genetics companies respond to
overall customer demand, a 2015
survey by AbacusBio showed that a
key reason for a farmer not providing
EBV information during the sale or
purchase of animals was due to lack
of interest from the customer.
However, the key reason for farmers
not requesting EBV information was
because it wasn’t provided by the
seller. Greater communication
between genetics providers, bull
breeders and bull buyers is needed
in order to create an environment
where the display of genetic
information is standard.

The benefits of sire recording do not
stop at an individual level. Even if
you don’t directly use EBVs when
making breeding decisions, you can
still make a difference by recording
known sires. More data would mean
greater reliability of EBVs across
more sires and thus gains made by
those routinely using EBVs to inform
their selection decisions will improve
cattle performance across the whole
industry.

Accessing premiums

Multiple supply chain partners offer
premium schemes for animals that fit
market requirements. A number of
these current premiums are based
on named sires, so recording sire
information through BCMS will
provide access to these premiums.
Think to the future as well as current
trends. As consumers become ever
more attentive to where their food
comes from, traceability is becoming
an important issue. With retailers
already working to trace their product
back to the farm and the animal,
knowing the full pedigree for that
animal could be the next stage.
Building a brand – British beef

Robert Drysdale
Consultant Farm Vet and Farmer,
Warnham, West Sussex

Why should farmers, the primary producers, contemplate branding beef? Surely that is the job of the retailer or the Levy Boards?

Introduction
Are we promoting beef to our customers the way other products advertise to them? Branding and marketing are areas of business farmers rarely, if ever, take part in. In the past 20 years our customers have changed – as the public have become, at least in their opinion, more aware of local, national and global issues, more educated in how their food is produced and farming practices, better informed of the health and welfare of animals.

Social media and the Internet are largely behind the change. It is time farmers realise our customers are no longer just the retailers or restaurants selling our produce, but the consumers shopping in the supermarket or reading the menu now ultimately choose to buy what we grow. Do farmers understand how to sell their wares? Do farmers understand how to brand their products? Can we build a brand that is ‘British Beef’ as we approach Brexit and the opportunities this represents for a country only 70% self-sufficient for beef?

We all have friends that support our industry, but if we think laterally there is potential to influence a large part of our home market: laying out the social network of the average farming family the number of people that could be educated and encouraged to buy British Beef would be remarkable.

A good example of branding in action
Great British Beef Week is now in its fifth year: started by a farming group this is an industry wide initiative devoted to promoting the good things about British Beef. Taking a multi-channel approach, #GBBW uses social media, the press etc. to disseminate marketing and consumer information aimed at consumer education and grow consumption.

Branding
To understand how to build a brand firstly we must understand what a brand is: the overall experience of a customer that distinguishes an organisation or product from its rivals in the eyes of the consumer.

Brand management: the processes undertaken by brand owners to maintain, improve, and uphold their brand so the name is associated with positive results. This involves:
- Consumer perception
- Consumer satisfaction
- Consistency of product
- Marketing strategy

It is hard to see any concerted efforts to brand beef – at farm, as an industry or even at country level? We seem to expect the levy boards (AHDB, HGC, LMC and QMS) to undertake all our branding, whilst the combined budget of all UK red meat levy boards being approximately £30M is expected to be split across farmer education, research and industry promotion both internally and globally. Whilst the dairy industry has its own cross industry bodies there is nothing similar in beef: the Dairy UK work alongside The Dairy Council, to help brand milk based products to the consumer.

Is there scope to create a brand for beef that truly fulfils consumer expectations? Whilst the likes of Scotch or Welsh Beef have been designated PGI (Protected Geographical Indication) status, this can add value but how does the average farmer gain or influence this?

Social licence
Still a relatively new concept, yet one that requires consideration by all farmers, especially when looking to build a brand. Social License refers to the level of acceptance, or approval, by the public and stakeholders to allow operations to continue.

We must look to educating our consumers and ensure they understand how beef is produced in the UK – otherwise there is a likelihood more and more public pressure will come to bear on the industry. British Beef should be promoted in terms of its welfare and assurance standards alongside the level of traceability within the industry, when compared to other countries. We have an industry that takes its roles and responsibilities very seriously: reducing and removing antibiotics from the food chain, having no growth promoters or hormone treatments, and focusing on grass production alongside sustainable agriculture.

Consumer trends
By considering social license and embracing the customers’ view of
what ethical beef production is, it should be possible to harness goodwill and develop a British Beef brand. Consumer trends, such as veganism, instead of being seen negatively, should be used to develop sales and improve the returns to the industry by differentiating British Beef from our competitor’s.

The UK is effectively an island nation, with demand for beef outstripping our production by 25–30% each year. The consumer is looking for reasons to buy our beef, and we should be providing them with the information to justify and validate their purchase.

Beyond the name – influencing the brand

Eating quality, in terms of taste and tenderness, and consistency of product must be addressed if the brand of British Beef is to grow. Beef is one of the main meat proteins, and has to compete with chicken and pork for weekly shopping as well as eating out. The price of beef means it is always going to be seen as an expensive choice, so any problem with this purchase – often on tenderness or flavor – could be seen as damaging to the brand. Brand management is vital if we are to halt the drop in beef consumption, and a consistent eating experience will be integral to this.

As farmers we have minimal, if any, influence on the consistency of beef once it is processed. Breed itself has little to do with eating experience, compared to sex, age, feeding practices, stress and handling prior to or during transit. Producing numbers of cattle to a set process with age and diet managed for best consistency would make one of the biggest differences to the brand. Chickens and pigs are grown in their 100s and 1000s with the genetics and diets strictly controlled to produce a very consistent product to a price.

Grass fed, grain fed, pasture for life, organic, breed specific – all these can be seen on beef labelling in the supermarket or butchers counter. Restaurants and food outlets proudly state they are selling local beef or specific breed or even farming system – but does the consumer understand the differences? Do we, as farmers, understand the impact all this can have on the final product? Repeatable experience and a quality product – that is brand management. Are we ready for this?

Conclusion

There is so much we could all do as farmers to help develop our beef market, lift demand and add value to the beef price, before looking to export our product. We have a captive market that wants British Beef but do we understand what is needed to fulfil this contract?
Breeding pedigree Limousin bulls for the commercial producer

James M Cooper
Tomschoice Limousins, Harrogate, North Yorkshire

Who we are

With my wife Sarah, daughter Laura and son Ben, I own and manage Tomschoice Limousins, perched on the side of the beautiful and picturesque Nidderdale Valley between Harrogate and Skipton in North Yorkshire.

I felt very proud to be asked to talk today; we are not big farmers, we have not had huge prices for bulls or cows and we are not regularly winning at big shows. We don’t breed show heifers, show cows or produce bulls to produce show calves. So why have they asked me to come to talk today?

I would like to talk to you about building a brand to promote uniqueness and how we have tried to produce bulls for commercial farmers and for use on heifers.

To date we have sold 7 bulls to studs in the UK and Ireland, the 8th is currently in the process of negotiation. This is unusual for a single pedigree herd, it hasn’t happened by chance and is the basis of this presentation. How have we managed to do this and why? (see Figure 1).

I am by birth a Lincolnshire boy where my Father was a tenant farmer. I was brought up in a crumbling house with crumbling farm buildings until Lord Carrington bought the Estate in the 70’s and modernised it.

Unable to gain the farm tenancy I became a Trainee Manager in my future father-in-laws food company in Ripon.

After marrying, Sarah and I bought a small cottage locally to Ripon, did it up and then sold it, in return we bought a crumbling house with crumbling buildings (I have returned to my childhood again!) and 40 acres of not very good grass. We have then invested time and money, blood sweat and tears over the last 30 years. We now farm 130 acres of ring-fenced grass that we have dramatically improved. We also have a sign on the gate that says we are a wholly owned subsidiary of the HSBC group!

Figure 1
How we started

The first cattle we purchased were Limousin cross and Hereford cross Friesians and we gradually built up to circa 20 cows, progeny would sell at Skipton store sale just before Christmas where we usually did well. I soon realised however that producing 20 animals a year was not going to pay many bills.

Therefore, we decided to look at going pedigree where we thought there would be more income. Naively I assumed that you won at a few shows and everyone would come flocking to buy your animals! Hah! Our first pedigree purchase was Stoneleigh Ginger at Leyburn in 1996 with heifer calf at foot and in calf again. My friend Tom picked her out, she was Tom’s choice! Since then we have sold the wrong ones and kept the wrong ones, and are still doing it today, but in a more informed way!

We have steadily increased numbers to 53 cows calving this year with the aim to get to around 60.

Where we were

We started going to a few shows and for the first 3 years consistently stood at the wrong end of the line, the only time we managed better than last was when we had two in the same class! But we were learning, when you are at the bottom of the heap the learning curve is steep and swift.

We started to take a few bulls to Carlisle but didn’t manage to sell anything of note until we had some success in 2000 with a bull at 4200 gns. A few show winners, breed and interbreed champions came along in the next few years but we still were struggling selling. Why?

I started to look at what we were breeding more closely, were our bulls not good enough?

Frankly, some weren’t, but a good few were, we weren’t getting potential buyers to the pen before a sale, why not? We were producing good strong bulls with plenty of cover but they were lost in the market with hundreds of other bulls. Or, we were getting the occasional buyer to the farm, but weren’t completing the sale. Were we too expensive? Was it me being a poor salesman or were the bulls not right?

By 2009 we were trying to chase the perfect bull, the £100k bull. We were producing show winning bulls that no one wanted to breed from! Bulls with bad calving figures that had plenty of condition.

The nearest we got was one at £13k and another at £10k in the October but most had gone to kill, bad legs or just not saleable.

The need for a plan

We needed to make changes.

We started to listen to and think about what potential customers asked for.

The first question when looking at a bull nearly always was, ‘will it calve?’ closely followed by the second, ‘will it kill me?’ then ‘will the calves grow?’ Another remark often made was ‘the bull has too much condition on, don’t want him’ and, ‘he’ll just melt away’.

The Limousin Society Bull Survey in 2011 also confirmed this with the top three comments being:

• Easy Calving
• Docility
• Over feeding of Sale Bulls

I had been to University (as a very mature student!) and achieved an MBA, a Master’s in Business and Administration or depending on your point of view, Master of B****r All. What had I learnt?

I had spent time learning about marketing, differentiation, unique selling points, customer satisfaction and making purchasing a delightful experience. It was time to try to apply some of what I had learnt.

The plan

We needed to have a unique selling point, something that would differentiate our product.

We came up with an idea of what we would like to do.

We wanted to produce:

1. Easily calved progeny with short gestation

We did not just want easy calving as we didn’t want to produce cattle with narrow hips and no growth, therefore thinking slightly laterally we decided upon trying to purchase a bull with ‘Short Gestation’, reasoning that if the calf was in the cow for a shorter period of time it would be smaller.

Research by Ferell & Orouk et al. 1991 showed that the increase of body weight of a calf from 6 to 9 months is about 3 times greater than the increase from 3 to 6 months and by 230 days growth is at circa 1/3 kg per day.

Having decided that we wanted to produce bulls with short gestation lengths we needed to find the sire.

We purchased Homebyres Drummie, at Carlisle May 2010, he was decent looking but most important he was in the top 1% of the breed for gestation length whilst still being in the top 25% of the breed for 400 day growth.

Then, as usually happens, a major setback, he proved to only be semi-fertile due to a twisted tube and whilst we got some cows in calf it was a real struggle.

Back to find another bull we chanced upon Kaprico Eravelle. Top 1% for gestation, top 1% for 400 day growth. An outlier, a genetic curve bender and different breeding to anything we had. His locomotion was good, a decent head, a very big pair of testicles and he was as long as a train; he had a lovely temperament and was from a Johnes 1 accredited herd.

We had our first calves in December 2010, they all but fell out at around 282 days, they looked like little fawns. Oh my goodness, what had we bought? Thank goodness we had used some AI as well, the calves looked awful then suddenly at about 6–8 weeks old somebody had been in the shed overnight with a bicycle
pump and had pumped them all up! Bingo!

From this point we have consistently out-performed the breed average for gestation length and it has become a major unique selling point for us (see Figure 2).

2. High docility

We started to halter train everything on farm as yearlings. Convenient for customers, but, really a method of selection; operating a three strikes and you’re out rule, that is three attempts at halter training and if you aren’t coming round and/or showing aggression you are down the road. We have lost one or two good looking animals following this policy but the herd is much better without them (see Figures 3 and 4).

3. A Decent Looking Bull with Good Locomotion

Bulls still need to look the part and satisfy a good stockpersons eye. Potential customers often complained that bulls were too fat, over conditioned. As a consequence we decided to sacrifice a small paddock and started to turn bulls out pretty much every day starting a week or so after weaning.

We found that they were waiting at the door every morning wanting to go out. There were some day’s weather wise over winter when they were soon stood at the gate wanting to come in as well! We rarely get locomotion issues now, exercise keeps them fit.

4. Good growth rates

Weighing calves every 100 days we found that they were doing just as well with the additional exercise; the young bulls particularly had less fat
cover and looked raw. What we are now seeing is that we are producing bulls with reduced 400 day weights as we rein in the feeding regime but at the same time the bulls are of higher genetic worth; that is their progeny will grow at a superior rate. The results from the DEFRA/AHDB Feed Efficiency trials will be interesting to see. Once incorporated in to the Limousin genetic evaluation it will hopefully help us in the future to see better what is happening and continue to provide genetics for traits that are commercially relevant to our customers and the wider supply chain.

5. Meat in the right places
Back fat scanning revealed that our animals were leaner and at the same time the muscle score was higher, a result of the breeding plus the exercise regime. The Limousin Society started research in 2011 as part of their Breed Improvement Plan to produce Carcase Trait GEBVs, with the first results published in 2016. As soon as we could we started to collect genotype data for our animals to see what type of carcase we were producing and what their genetic merit was. Whilst not a substitute for the eye of a good stockman it is another tool to use when selecting breeding animals.

Our first two sons from the new regime went to Carlisle in October 13, they looked very raw against the vast majority of other bulls at the sale but they sold well, averaging a little over 600 0gns; very acceptable!

Unique selling points
Now that we were starting to produce a Unique Product we decided that we would also try to add value to the animal by offering if for sale with extras to try to get people to our pen pre-sale or onto farm.

1. Maintain High Health Status
We had joined the BCVA Health Scheme in 1999, this swapped into the SAC Scheme in 2002, and we achieved Johnes and BVD accreditation in 2004. Whilst one or two buyers would find this interesting it wasn’t until Limousin Society health declarations at sales started in 2007 that this really came to the fore. Then we started to get a few more buyers to the pen pre-sale and on farm. We were at the forefront with a known health status and have remained so to this date.

2. Semen test the bull prior to sale
Our vets had started to push us to semen test stock bulls annually, for a bulk quantity they would also semen test our young sale bulls at a better rate. Advertising the bulls as semen tested definitely brought more potential buyers to our pen pre-sale. We also started to semen test bulls sold from home as luck penny. Whilst realising that this does not guarantee a bull to work it gives us confidence in what we are selling and gives confidence to the buyer in the product he is purchasing.

3. DNA test for parentage, myostatin and GEBVs
Previously we had done some sire determination DNA testing, from 2011 we decided that it would be better to DNA everything at a week old when the animal was tagged. Job done.

The Limousin Society introduced Myostatin testing in 2011 and we decided to test at the same time as we parentage tested. The vast majority of the herd is carrying 2 copies of the F94L gene, bringing enhanced muscling with no impact on calving ease. As with the Myostatin testing we decided to have all calves analysed for the Carcase Trait GEBVs and to publish the data. We have found there to be a strong correlation between the visual appearance of a bull and his Carcase trait GEBV (Figure 5 opposite).

4. Guarantee the bull to work and stand behind him
We decided that buying a bull that didn’t work properly was like a car without an engine we would therefore promise that the bull would be guaranteed to work or your money back.
5. A policy of complete openness and honesty

If any bull has any minor defect, we find it better to tell the buyer rather than having them find it themselves.

We publish all data. GEBV data, coupled with the Myostatin testing, has allowed us to have a better insight into the potential breeding attributes of young bulls, to the point where, if we have someone coming to farm to buy a bull we can offer honest opinion on whether it is the bull for him or her! It is no longer just about looks.

The result

When we realised that we had a unique product we took 18000 straws of semen from Kaprico Eravelle and with Norbreck Genetics marketed him in the UK and Ireland, we sold all the straws in 18 months. As a consequence Bull studs became interested in his progeny and subsequently in other bulls from different sires that we are breeding (Figure 6).

When we compare the profiles of all of the bulls that we have sold to stud, what do we see? Similarities?
• Short Gestation
• Better than average Growth Rates
• Large testicular development and high docility.
• The bulls sold more recently that have been tested also exhibit some high GEBV values for carcase traits. The Carcase trait GEBVs generated by the Limousin Society also demonstrate that a uniform carcase can be produced to meet a range of specifications for the retailer. High value cuts, with width, depth and length of loin.

It has taken us some time to find a like for like replacement for Eravelle.
We have high hopes for our latest addition to the herd, Goldies Nicholas (Figure 7).

We hope that he will in turn be as successful for us going forward as Eravelle has done previously and we hope to be marketing semen from him towards the middle of next year.

Looking forward

What originally started off as an idea to try to create a unique product and selling point has now morphed; and it is the start, of what I believe is a survival strategy.

I can see a continued decline in the UK Suckler herd coupled with, or because, of increased use of sexed semen in the dairy industry, meaning that there will be more beef produced by an increasing number of spare dairy cows.

I believe it likely that we are going to see increasingly vocal vegetarian and vegan groups and increasing environmental pressure on beef production.

All at the same time as we are producing a product that is in terms of £/kg of protein is expensive compared to imported beef, chicken and pork.

All these pressures and an increase in the use of Beef AI in the dairy industry will most likely lead to a decline in the number of stock bulls required.

I would like to think that by breeding bulls with a short gestation that not only does it allow us to compete against other Limousin breeders but allows us to compete favourably against other breeds across the beef sector. We would like to be the herd of choice for studs to purchase their bulls from with a high health status and bulls that meet their requirements for looks, gestation, growth, docility and high genetic merit. There is little doubt that the Limousin produces a wonderful carcase that can be finished in a variety of ways to a variety of weights with excellent texture and taste to suit the retailer. Listening to market signals and deploying all new and emerging technology is key in achieving this. We value the continued underpinning investment by organisations such as the Limousin Society, AHDB & DEFRA in producing breeding tools. Our industry has a responsibility to demand it from them and become fully engaged in future long term development that will ensure we remain commercially relevant.

Continually having bulls working in stud propagates our Tomschoice brand to commercial producers and the dairy industry with the studs marketing our name for us. In turn this helps propagate our brand and helps to generate sales at home and at the Auction Markets.

The plan is that this will help us flourish and continue to breed bulls in what I believe will be a difficult future environment.
Growing exports can it be done?

Jonathan Eckley
Head of Asia Pacific, AHDB, Stoneleigh Park, Warwickshire

Synopsis

Pork exports into China and other world markets have grown significantly in recent years. We will look at how those opportunities were identified for British producers, what impact this has had on the industry and what lessons have been learnt. The success story of British Pork may help us find potential opportunities for UK beef and dairy products.

The agri-food industry is a major contributor to the UK economy. However, the industry is constantly under economic pressure – export provides an opportunity to balance out domestic preference for cuts by selling those products that do not have a strong market at home. For example, the domestic consumer has high demand for pork loin but low demand for liver. Exports often enable greater carcass utilisation, adding significant value to the UK agriculture sector (see Figure 1).

In 2017, UK exports of pork and pig meat products surpassed the 300,000 tonne barrier for the second consecutive year. 2016 was the first time the volume broke through this barrier since the pre-2000 era and represents a near three-fold increase in total pig meat exports from the UK since 2002. During this period, shipments from the UK have increased by 71%. However, the main driver, particularly, in more recent years has been the increase in exports to third-country markets: This has been 14 times higher in 2017 than back in 2002. Having access to market has been a key driving factor in this increase, notably the UK gaining access to the Chinese market in 2012, which has been a game changer for the British pork sector.

Seeking global opportunities for UK products and having access to multiple markets is key in adding value through export. Achieving market access agreements with target countries is a prerequisite for trade. The process of securing access includes comparing controls currently in place and achieving ‘equivalence’ agreement that health (both human and animal) and hygiene are not compromised by imported products. Only then can Export health certificate conditions be agreed and granted (see Figure 2 on page 38).

The growth in fifth-quarter exports has been a key driver behind the growth of UK pig meat exports in recent years. In the five-year period from 2012 to 2017, UK exporters increased pig meat offal exports by 68%, with all of the growth being driven by third-country markets outside of the EU. In 2017, the value of these fifth-quarter shipments to the UK pork sector was nearly £80 million.

China is the world’s most populous country, with a population of 1.4bn. It is the fourth largest country in the world and the second biggest economy. China is also the world’s second largest importer of goods – taking 10% of all global imports.

Though it spans a large area, China has a shortage of land suitable for farming and many mouths to feed.

Figure 1: Monthly UK pig meat exports, 2002–2017 (tonnes)
Although domestic agriculture is modernising quickly, demand outstrips supply in many sectors. The pork sector is no exception. Despite imports only making up a low percentage of total pork consumption, in 2017, Chinese imports amounted to nearly 2.5 million tonnes. Therefore, even as the largest global pork producer, Chinese import demand has a huge influence on global trade flows (see Figure 3 below).

The UK gained access to China in 2012. By 2014, China surpassed Germany as the largest market for UK pig meat exports. Today, China remains the leading destination for UK pig meat exports with around a third of total exports being destined for Greater China. In 2017, shipments to China were valued at £70 million.

UK pig meat exporters have also been successful in a number of other Asian markets. Looking at the five-year period from 2012, shipments to the Philippines are significantly higher with strong growth also recorded to Japan, South Korea and Singapore. Growth in demand for high quality pork has also been strong from the USA: shipments over the same period have increased threefold and in 2017, the market was the fourth largest outside the EU for British pork exporters.

Exporters have invested considerable resource into developing export markets. The meat export market is built on relationships: people actually do business with people, which is particularly the case across Asia. Exporters have worked hard on all markets building strong relationships with key importers in a number of them. A UK presence at leading trade shows around the globe provides a great platform for companies to meet key in-market supply chain participants. This can just be the start of the journey to doing successful business: resource from exporters has had to be focused on developing and fostering relationships to build mutual trust, which will only then, lead to business being concluded. Even

**Figure 2:** Annual UK pork and pigmeat exports by category, 2010–2017 (tonnes)

![Figure 2](https://example.com/image2.png)  
Source: AHDB, IHS Maritime & Trade – Global Trade Atlas © / UK HMRC

**Figure 3:** Annual pig meat exports, EU, China and Third-Country markets (tonnes)

![Figure 3](https://example.com/image3.png)  
Source: AHDB, IHS Maritime & Trade – Global Trade Atlas © / UK HMRC
when relationships are cemented, it has been key that exporters have retained the hands on, face-to-face approach. China is a good example of this, where all UK exporters with approval for China have developed their business, and have team members based in market, dealing face to face with their clients. However, exporters will still make regular visits to market, to continue to build and maintain the personal touch. The global pork market is competitive space. The importance of this area of work, which is a credit to the professionalism of our UK pig meat exporters, cannot be underestimated.

Overall, global trade in beef has recorded significant year-on-year growth over the last five years. In 2017, 8.3 million tonnes of beef was traded worldwide, a 19% increase compared with 2012. Over this period, southern and eastern parts of Asia have become increasingly important destination markets for the world’s beef production with the rise of affluent populations in these regions supporting beef consumption. Shipments to the larger importing countries in these regions rose to almost 2.5 million tonnes in 2017, increasing their combined share of global imports from 15% in 2012 to 30% in 2017. Key destinations for beef imports in Asia in 2017 were China, Japan, Hong Kong and South Korea. Collectively they accounted for 83% of trade with Asia. Other important growing markets are the Philippines, Indonesia and Singapore, all recording year-on-year increases in 2017. The only exception was Malaysia where shipments fell by 4% year-on-year in 2017.

China continues to be the main driver behind the increase in imports for the region overall, with an increase of 115,000 tonnes in 2017, a 20% rise on the year. This is closely followed by Japan, who increased their imports of beef by 14% over the course of 2017 to remain the world’s third largest importer of beef.

Dairy exporters are also adding value to the UK sector. 2017 data shows a year of strong growth for UK cheese exports, volumes were 7% higher on the year. While the EU is still the main market for UK exports, it was encouraging to see increased exports to third-country markets. Shipments to Asia were 27% higher.

There are key growth opportunities for the British Agri-Food sectors. Authorities and industry must continue to work collaboratively to achieve access to as broad a range of markets as possible. Understanding and meeting the needs of the consumer in both existing and potential export markets will be key to the continued success of our sectors. Although producers are somewhat removed from export markets, they are well placed to provide context around how the product was produced. The UK’s agricultural heritage combined with high production standards through the supply chain is a key to the image of UK products overseas. This information is an important component of what the UK has to offer in terms of messages to communicate to consumers on international markets. For those further down the supply chain, understanding the context in which the consumer will come face-to-face with their products provides vital insight. Adapting to consumer needs is not just relevant for those exporters expanding existing markets, it is also relevant for new exporters, those entering new markets and those launching new products.
Genetic advancements in American angus

Dr Stephen Miller
Director of Genetic Research, Angus Genetics Inc (American Angus Association)

Introduction
The American Angus Association (AAA) was established in the USA in 1883 and has grown to be the world’s largest beef breed association. In 2018 registrations totaled 327,067, a level that has remained relatively constant in recent years. Annual registrations of Angus in the USA total more than the next 10 largest breeds combined. The exact net influence of the breed on the nation’s beef industry is difficult to quantify exactly. Considering information from bull turn-out surveys, it is estimated that the Angus content of the nation’s herd is around 70 percent. This comes not only from registered Angus bulls, but hybrid and composite bulls with significant Angus content. A review of the American Simmental Association top 100 sires used indicates the average Angus breed composition is 26% within that breed (American Simmental Association, 2018). Similarly, Angus hybrids in the Limousin and Gelbvieh breeds branded as Limflex and Balancer, respectively also convey Angus genetics to the national herd. Through many different channels the US beef industry is heavily influenced by the genetics of Angus cattle. With the breed having such a large influence, the genetic direction and advancement in the breed also determines the long-term advancement of the industry. This paper discusses how both a demand for fed cattle through the Certified Angus Beef Brand and the role the Angus cow plays in the cow herd have contributed to the strong demand for Angus genetics. Long-term growth of any brand cannot be sustained without a quality product to back it up and the continued genetic advancement of the breed through performance recording, genetic evaluations (EPD), selection indexes ($Values) and genomics have all played a role in this advancement. The long-term success of the breed will require a continued balanced approach to selection and results of a new survey of breeders has highlighted the breeder’s emphasis for the future. Finally, a new program that places genetic information on commercial calves at the point of sale is the Association’s newest program to continue to drive demand for quality Angus genetics.

Creating Demand for Angus Beef
The ultimate success of any breeding program will be determined in the commercial market place. Simply selling genetics amongst breeders is not success. To be truly successful there must be a commercial demand for the genetics. In the case of Angus, the role the Certified Angus Beef (CAB) Brand has played and continues to play cannot be overlooked. Started in 1978, CAB was not an overnight success, but is now widely recognized as the original and world’s largest fresh beef brand (McCully 2018). In 2018 there were 1.215 billion pounds of CAB sold, an increase of 8.1% from 2017. To meet this demand the commercial sector also produced a record number of cattle with 5.18 million meeting the Angus type and 10 quality-based specifications for the brand, a 14.3% increase over 2017 (Certified Angus Beef, 2018). It is this strong demand for quality beef that is driving the commercial demand for quality bulls. Simply having Angus bulls is not good enough. Of the Angus type cattle that do not qualify for CAB, 90% fail due to inadequate marbling (McCully 2018) making continued emphasis on improving carcass traits important to breeders.

Genetic Improvement Program
The story of genetic improvement for carcass traits in the Angus breed is an excellent example of technology adoption. The genetic trend for carcass quality and the role ultrasound scanning has played is a true success story. This relationship is obvious when one lines up the AAA marbling genetic trend with the adoption of ultrasound scanning (Figure 1 on page 41). Considering a lag between scanning bulls and subsequent gains in progeny it is clear that ultrasound has played a large role in this genetic progress. It is also a testament to the cattle breeders’ ability to take a measurement on a live animal that is heritable and turn it into genetic gain. This progress is facilitated through Angus’s National Cattle Evaluation (NCE) using scan records and carcass data in a joint model, with ultrasound providing indicator traits that are highly correlated to carcass records. The AAA has a long history in adoption of selection technologies with the publishing of the first sire evaluation report in 1974, with NCE adopted in 1985 which became joint with the Canadian Angus Association.
in 2000. In 2001 the transition of EPD calculations to an ‘in house’ procedure began and in 2004 the first $Value selection indexes were released.

Angus Genetics Inc (AGI), was established in 2007 as a wholly owned for profit subsidiary of AAA. As a company it performs genetic evaluation services for Angus as well as other breeds. Today AGI services the US and Canadian breed associations for Angus and Charolais as well as the American Maine Anjou Association and the International Senepol Cattle Breeders Association. In 2009 AGI launched the first genomically enhanced EPD for the breed, an advancement that has continued to grow. The Angus NCE updates new pedigree, performance and genomic information weekly and has now been run continuously for 430 consecutive weeks. A summary of the suite of traits evaluated and the information behind them is summarized in Table 1 opposite. This represents a joint evaluation of the American and Canadian Angus Association’s data. Although smaller, the Canadian Angus Association contributes a significant proportion of data to some developing traits, such as heifer pregnancy, which is just one example of the benefit of joining multiple countries in a joint evaluation.

The first ‘trait’ listed in Table 1, is the total number of animals ‘genotyped’. In this context, genotypes refer to animals genotyped with a medium to high density genotyping array that contribute 50K SNP markers into the Single-Step genomic evaluation. The AAA stores all DNA samples onsite and now has 1 million samples, that will have been submitted for genotyping for genomic prediction, parentage or genetic condition testing. In 2018 there were 162,469 genomic tests submitted for genetic evaluation purposes, a 28.3% increase from 2017. Now about half of all animals registered are genotyped, an area that continues to grow. The growth in genomic testing is illustrated in Figure 2 on page 42. In 2017 AGI reduced the price for a 50K genotype from $45

**Table 1:** Summary of data used in Angus genetic evaluation.

<table>
<thead>
<tr>
<th>Trait</th>
<th>Animals with Records</th>
<th>Total Animals²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genotypes¹</td>
<td>584,327</td>
<td></td>
</tr>
<tr>
<td>Growth³</td>
<td>9,410,150</td>
<td>10,953,282</td>
</tr>
<tr>
<td>Calving Ease</td>
<td>1,610,248</td>
<td>9,977,668</td>
</tr>
<tr>
<td>Ultrasound⁵</td>
<td>1,985,315</td>
<td>3,483,972</td>
</tr>
<tr>
<td>Carcass⁴</td>
<td>121,003</td>
<td>4,578,712</td>
</tr>
<tr>
<td>Scrotal Circumference</td>
<td>942,903</td>
<td>2,540,829</td>
</tr>
<tr>
<td>Mature weight</td>
<td>217,371</td>
<td>1,377,650</td>
</tr>
<tr>
<td>Dry Matter Intake</td>
<td>23,355</td>
<td>1,194,694</td>
</tr>
<tr>
<td>Heifer Pregnancy</td>
<td>97,321</td>
<td>1,155,120</td>
</tr>
<tr>
<td>Docility</td>
<td>287,270</td>
<td>1,475,066</td>
</tr>
<tr>
<td>Foot Score⁷</td>
<td>15,469</td>
<td>1,088,823</td>
</tr>
</tbody>
</table>

¹ represents weekly evaluation Dec 28, 2018 and includes the joint evaluation of American Angus Association and Canadian Angus Association data.
² includes extended pedigree and parents without records or genotypes.
³ genotypes used in the genetic evaluation of each of the traits.
⁴ animal with either a birth, weaning or yearling weight or genotype.
⁵ counts are for ultrasound intramuscular fat.
⁶ counts are for carcass weight.
⁷ counts are for foot angle.
to $37. When applied to the animals genotyped in 2018, this represented a $1.3M saving to breeders. This increased value in genomic testing has resulted in a growth in female genotyping, which will further improve the accuracy of the genetic evaluation by better characterizing the dam or ‘bottom side’ of the pedigree.

Like performance testing, Angus breeders have fully embraced genomics as the next tool to expedite genetic improvement. The genetic evaluation includes all genotyped animals in all trait predictions allowing a genotyped animal to receive a genetic prediction for all traits. Take feed intake as an example of a trait that is expensive and hard to measure. There are just over 23,000 animals with feed intake measured, but all genotyped animals will receive an EPD through their relationship to measured animals as determined with the genotypes.

Emphasis on Maternal Traits
Angus dominates the market place, not just because of the demand for CAB and the progress breeders have made in end product traits, but due to the Angus cow’s place in the commercial cow herd as well. Angus is a breed that is used to not only produce CAB, but are an important component of most maternal ‘mother cow’ programs, termed ‘suckler cows’ in the UK. To continue to improve traits important in the maternal herd a number of EPD have been launched including maternal calving ease and mature weight in 2005, heifer pregnancy (fertility) and docility in 2012 and foot score was in 2018. It is important for breeders to be able to properly balance gains in terminal traits like growth and carcass against traits important in the cow herd. This focus among breeders on maternal traits are well illustrated in Figure 3 below and Table 2 on page 43. These are the result of a survey that was conducted in conjunction with consulting company AbacusBio from New Zealand that targeted Angus breeders and commercial operators as well. The project is reviewed the current Angus $Value breeding indexes and was aimed partially at understanding trait priorities among industry segments. Figure 3 illustrates how the respondents break down across seedstock and commercial segments. As expected, response was highest from Angus breeders, but also included an excellent response from the commercial segment as well. Across all these segments Table 3 illustrates how important ‘cow traits’ are with all of the top-ranking traits, clearly related to the cow herd. The top 4 traits were cow survival, docility, foot score and heifer pregnancy. Cow survival is a trait for which there is no direct EPD currently, although breeders can get at important components of survival such as fertility and foot structure with the EPD available. This survey reinforces the need for a cow survival or longevity EPD, something that is a current research priority for the association.

Figure 2: Genomic testing in male and female American Angus cattle overtime.

Figure 3: Response to survey about $Value indexes and trait prioritization across industry segments.
In 2015 the American Angus Association launched a program to enable breeders to collect and submit foot scores. The AAA scoring system is illustrated in Figure 4 below. In 2016 a new long-term strategy for the Association was launched and one of the top priorities for research was foot structure. To address this need an EPD was developed and launched as a research EPD in 2018, with a 2019 official EPD likely.

Analyses of the foot scores recorded as illustrated in Figure 5 on page 44. Indicate that the majority of scores that are not ideal (5) are greater than 5 on the 1–10 scale. If there is a problem with foot angle it is most likely to be too shallow and with claw set the problem is a propensity to cross over. The resulting EPD then only considered scores 5–10 on each scale as this is where the majority of the data lies. Both foot angle and claw set were determined to be moderately heritable (0.25) indicating that the records as scored by breeders were sufficiently accurate to develop an EPD.

Introducing Angus LinkSM

In 2018 American Angus launched a new program for commercial calves called Angus LinkSM. The chain of genetic information has always been strong on the seedstock end of the industry through to the sale of a bull to a commercial cow-calf producer, but after that information chain was broken. At the point of sale for a commercial calf, which is typically a live or video auction, there has been little to no genetic information available on calves. Angus LinkSM now connects this information chain by placing 3 scores related to feedlot performance and carcass grading ability as well as an overall profitability score based on ancestor EPD, considering multiple breeds. This program has the potential to increase genetic progress by creating a stronger demand for bulls with better EPD.

Consider the value progression as illustrated in the flow diagram in Figure 6 on page 44. Once the Angus LinkSM scores are respected in the market place, calves with better scores will sell for more money (bubble 1). Once the commercial calf producer realizes that calves with better scores are bringing more money, they will purchase bulls with EPD that will increase their calves scores (bubble 2). As commercial cow-calf producers increase their emphasis on traits that increase calf scores (EPD for relevant traits), they in turn drive demand and pay more for bulls that fit this criterion (bubble 3). With seedstock breeders realizing bulls that have an EPD profile that better fit the Angus LinkSM program are in stronger demand and are bringing higher prices, they will adjust their selection emphasis to meet this demand and increase genetic progress (bubble 4). In the end the market will

![Figure 4: Foot angle and claw scoring guide for American Angus cattle.](image-url)
determine the value of EPD traits and the Angus Link℠ program simply places these EPD values into the market place in a more direct way to allow this value to be determined.

In Conclusion

The Angus breed has risen to be ‘America’s Breed’ where it dominates the market. Claiming this position has been the result of a strong demand for Angus cattle in the feeding and meat industry as well as in the cow herds throughout the country. Meeting all these demands for genetic performance is not easy and Angus breeders have been dedicated to performance recording, EPD, selection indexes and now genomics to make the cattle that meet the market. The demand for better cattle will never stop and hence the cattle breeder’s job is never done. Always focused on the commercial market, the future of Angus breeding will continue to be one of employing the latest in technology to drive positive change forward.

References Cited


High herd health status on British farms is part of our world-leading animal health and welfare standards

Fraser Jones
Dairy Farmer

Oliver Hodgkinson
Vet, Disease? Not On My Farm!
MSD Animal Health, Walton Manor, Milton Keynes

Fraser Jones from Calcourt Farm, milks 1,000 Holstein Friesians across multiple sites in Welshpool, Powys. He farms in partnership with his father Maurice and is currently installing a new unit to increase herd size to 2,000 in early 2019.

Oliver Hodgkinson joined Trefaldwyn Vets in 2009. He works with 200 beef, sheep and dairy farms in the Powys and Shropshire area. Oliver drives his client base to be proactive with preventative healthcare instead of firefighting problems and provides planning and benchmarking services to support them with this. In 2018 he was named Farmers Weekly Farm Advisor of the Year.

As trade deals are consulted and negotiated over in Westminster, the same message is repeated: the high standards of animal welfare on British farms is part of our unique selling point and we should not compromise on it.

Animal health is a crucial part of animal welfare, as well as productivity.

Disease? Not On My Farm! is a campaign from MSD Animal Health that promotes the importance of proactive, preventative healthcare as it has never been more important for farmers to understand the value of managing disease on-farm.

Working with farmers and vets as they tackle their disease prevention challenges, Disease? Not On My Farm! is championing their successes to share best practice across the industry.

Oliver and Fraser have successfully worked together to eliminate BVD from Fraser’s 1,000-cow dairy herd. As a result, animal health, welfare, fertility and productivity have improved.

Oliver was the driver for tackling BVD in the herd. Due to the large herd size, logistics and cost, the process took four years but the changes are worth it. Fraser comments, ‘We didn’t fully appreciate the massive cost of BVD to our farm until we got rid of it’.

Vaccination
Fraser already vaccinated for IBR, leptospirosis, rotavirus and BVD. However, persistently-infected calves were still being identified through blood sampling. Oliver reviewed Fraser’s vaccination strategy and realised that whilst he was doing the right thing by vaccinating, the booster vaccines (a crucial part of establishing immunity) weren’t always being administered on time, or at all. Oliver used the farm’s regular TB testing as an opportunity to improve vaccination protocols and upskill Fraser’s team. All calves are now vaccinated for BVD at three months old, and any animal over six months old at Christmas is also vaccinated. This means every animal receives the BVD vaccine.

Eliminating persistently-infected calves
Whilst vaccination is a big step towards protecting cattle from BVD, it is also crucial to identify and cull any persistently-infected animals. This is most applicable when buying in-calf heifers or renting bulls.

At Calcourt Farm, Oliver and Fraser’s team test every calf with an on-farm snap test. They receive the results in 20 minutes and can cull the calf immediately and test the dam for the virus. Coupled with bulk milk testing that analyses antibodies, they have a robust system to identify infected animals.

Biosecurity and hygiene
BVD also travels via contaminated objects and dirt, and improvements to biosecurity and hygiene helps control...
many other diseases beyond BVD. Fraser quarantines any new animals, and now calves everything on one site to reduce movement of cattle. Fraser is currently installing a new dairy parlour, which is optimised for biosecurity – from foot washes, to fertility monitoring systems, to showers for his staff.

They also check cows for bulling rectally now rather than vaginally resulting in less infections. It has also further improved fertility.

Results

- No PI animals identified in 3 years
- Free of BVD for nearly 2 years
- Antibiotic use dropped by 20%
- Improved fertility rates

Oliver explains, ‘By controlling BVD the overall health of the cattle, particularly the calves, has benefited, and fertility has increased. Recent PD testing showed levels of around 80 per cent, compared to 30 per cent previously. BVD has a significant immunosuppressive effect and is linked with other conditions like mastitis and pneumonia. I’m seeing much healthier animals since Fraser eradicated BVD’.

Fraser adds, ‘Being a Disease? Not On My Farm! ambassador has really focused my mind on disease prevention and brought home the importance of biosecurity. Disease is going to play a big part in farming in the future and we have to do everything possible to minimise risk and be proactive about disease prevention and biosecurity’.

BVD: what you need to know

The BVD virus

Spread by: infected dam to unborn calf, nose-to-nose contact between infected and naïve cattle, semen of infected bulls and from contact with contaminated objects, e.g gloves, slurry

<table>
<thead>
<tr>
<th>Transient BVD Infection (temporary)</th>
<th>Persistent BVD Infection (for life)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor fertility, milk drop, immunosuppression</td>
<td>Born, not created</td>
</tr>
<tr>
<td>Short infection: 10–14 days</td>
<td>Sheds virus repeatedly, for life</td>
</tr>
<tr>
<td>Long term antibody response</td>
<td>Doesn’t produce antibodies</td>
</tr>
<tr>
<td>Fertility impacts including abortion, deformities and PI calves</td>
<td>Usually dead within two years</td>
</tr>
</tbody>
</table>

The cost of BVD

- Increase in pneumonia cases
- Calf mortality increases
- Loss in productivity and yield
- Higher replacement rate
- Increased cost of labour and medicine

Check BVD status at bvdfree.org.uk before buying cattle.
Find out more about controlling BVD and other disease on farm at https://www.msd-animal-health-hub.co.uk/Farmers
Adding value: the power of pedigree

Andrew Le Gallais
Dairy Farmer and Chairman,
Jersey Milk Marketing Board, Jersey

Jersey has a rich history of the development of our Jersey cow in her Island home for over 250 years and I would be the first to admit that we are fortunate that this has occurred within a highly defined geographical space. This development has allowed us today to create value from a very special brand, Jersey Dairy, which is fundamentally underpinned by our unique pedigree cow.

The foundation of the breed was created when the States of Jersey, our government, first banned the importation of cattle from France in 1763 as the Channel Islands were being used as a back-door route for cattle exports to England and this trade was interfering with the development of what was becoming a nascent breed. In 1833, the Royal Jersey Agricultural and Horticultural Society, our breed Society, was formed to organise the development of the breed as well as the promotion of good agricultural practice.

By 1850, a scale of points of what was deemed to be the perfect animal was devised for both cows and bulls and in 1866 the Society formed the Jersey Herd Book to formally register animals and their progeny. The late nineteenth and early twentieth centuries saw a rapid and organised development of the breed alongside the development of the Jersey Royal early potato and it was not long before a flourishing export trade of live pedigree cattle was established globally along with strong sales of Jersey Royal potatoes to the UK market. Pedigree Jersey cattle and Jersey Royals became unique brands to the Island as a symbol of quality and genuine provenance.

In 1954, the Jersey Milk Marketing Board was formed, under Govt statute, initially to manage the supply of milk from a thousand very small farms to local dairies in St Helier, Jersey’s capital, but with the advent of the financial services industry in the early sixties and its demand for office space, these dairies soon sold their premises and the first central dairy in the Island was built by the Board in 1966. This successfully supplied the needs of the Island for the next forty years by which time it was becoming very difficult to meet modern dairy processing standards.

In 2009, the Board sold the original dairy site and the following year moved to become a neighbour of the Society in the northern parish of Trinity thus establishing a headquarters for the Dairy Industry in the Island and, with it, the development of a much greater symbiotic relationship between our organisations for the benefit of the Island’s breeders, de facto members of the Co-operative, and ultimately our Jersey cow. The Dairy’s relocation occurred soon after the States changed the law to allow the importation of bovine semen into the Island for the first time in 2008 and the Society was swift to amend its Herd Book rules so as to only allow the registration of progeny from international pedigree Jersey bulls which were a minimum of seven generations pure bred, with no known ancestors of another breed.

In investing in a brand new Dairy, the Board was clear that this facility should be compliant to the best standards of the day so as to be capable of processing a wide range of quality dairy products to adequately meet domestic needs as well as those of potential export customers. Operating in an Island with high innate processing costs, the Board viewed the development of an export trade as being fundamental to allow controlled growth of milk supply from our members, thus diluting the high fixed cost base of both our farms and the Dairy; above all, our aim was to add value to export products so as to sustain the business but avoid any form of cross subsidisation from the local dairy marketplace.

We now receive an annual intake of 14m litres from our eighteen members and due to planned retirements and an amalgamation of two herds, it is anticipated that there will be fourteen members by the end of this year. The Board ‘micro manage’ milk supply to the Dairy through a milk licensing scheme and regularly update the standards for milk supply to the Dairy so that at the present time, on average, ten per cent of farm gate milk value is derived from achieving bonuses, in line with market requirements. Currently, 30% of milk supply is processed into a range of niche bespoke dairy products which are exported to the UK and increasingly to customers in the Far East.

Jersey Dairy currently processes a range of fresh milks, including organic, UHT milks for local and export markets, creams, crème...
The breeding of dairy cattle is changing in this country in so many ways but with such a rich heritage of cattle breeding, often with indigenous breeds, I believe it is essential to recognise the important role that breeders and breed organisations can play in adding value to great British dairy products. Fortunately, through many very clever people at AHDB, this vast pool of information can be distilled down into some very practical indices and rankings to enable all cattle breeders and producers the opportunities to improve the efficiency of their farms and, increasingly, the welfare of their cattle. As the marketing of dairy products becomes increasingly globalised in the dominant commodity market, frequently resulting in sharp downturns in farm gate values, all milk producers have to become more commercially focussed and we, as breeders of pedigree cattle, are simply a subset of this primary grouping; the ‘patrician days’ of breeding cattle are firmly over and the emphasis in future can only be on embracing new technology and harnessing its development, before others take it away to use for their own corporate ends. To achieve this effectively requires not only a thorough understanding of the scientific principles which underpin the information, but also a concerted relationship with those who provide it in the first place; only then can we, as breeders and breed societies, share and promote the ‘uniqueness of dairy’ with our customers and thereby add much needed value to our brands before others convince them otherwise.

So, to conclude and elucidate my opinions in a practical manner, I would like to tell you a story about a visit to my farm of journalists from a major Chinese TV company some five years ago to film a documentary on the Island’s dairy industry: the...
Chinese visitors took a very keen interest in the cows and were soon taking close up pictures of the cow’s heads. Whilst everyone knows that Jersey cows are the most beautiful and photogenic, I nevertheless asked what it was that attracted them the most: ‘their eyelashes’ was the reply, ‘they are so long and dark’. I would like to leave you with one last message: as our Jersey cows’ eyelashes are long, dark and completely natural, could it be in the future that the difference between a 93 and a 94 point ‘excellent’ cow is the length of her eyelashes??!!

‘Building the Brand to Promote our Uniqueness’

The Club would like to thank all the following sponsors:

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Dovecote Park • Egenes • ForFarmers • Hectare Agritech
Hereford Cattle Society • Irish Cattle Breeding Federation
Neogen • Shepherd Publishing • SRUC
Everywhere we look, there are brands competing for our attention. As consumers, we shop smartly and carefully – on the whole. We look at different brands, we weigh up the options, and we tend to stick with those we trust.

We appreciate branding and advertising as a way for us to be better informed about the products we are buying.

From medicines to meat, electronics to eggs, there is a huge range of brands in almost every single product category.

Except maybe one. Milk.

Walk down any aisle in the supermarket, and you’ll see several – if not dozens – of different brands trying to attract the attention and purchasing power of a customer. But get to the milk section, and you’ll most likely just see non-branded, supermarket milk, with just one or two exceptions tucked away on a top shelf.

There is a distinct lack of branding in the milk sector. Look at cheese and yoghurts and you’ll see lots of choice. Look at milk, and beyond skimmed, semi-skimmed and whole options, there’s little else to buy.

The milk industry is lagging behind in driving branding forward. Dairy farmers are missing out on leading the way with exciting and innovative brands for the milk they are producing.

But the good thing about lagging behind, is that there are so many positive opportunities out there.

**What’s in a brand?**

Branding is a massive discipline, one that you could spend years analysing and understanding. Certainly, the nitty gritty of branding is well beyond my expertise.

But there are definitely areas of branding, as dairy farmers, that we can all get to grips with. We see brands every day, we know – instinctively – what works and what doesn’t. We can see for ourselves which brands are hugely successful.

Take Coca-Cola for example. They’ve built a brand around the product they essentially created and have retained ownership of that product despite constant challenges from competitors. They have successfully diversified and innovated into sub-brands too.

Everyone knows the Coca-Cola brand, everyone recognises the logo. And the majority of us will choose it – despite the higher price – over other options.

Closer to home, we might look to Heck Food. They have successfully built a unique brand around traditional products that we’ve been buying for centuries. They have a unique identity, a unique tone of voice, and some simple, innovative twists on standard products.

But they’ve changed consumers’ perception of sausages and burgers. They’ve built a brand that customers want to buy from, because they recognise something different in them. Better quality, better flavours, a better experience.

**What makes branding successful?**

That’s what dairy farmers and the milk industry as a whole need to do. Change perceptions about milk and build unique identities for their brand.

Compare two essential commodities – milk and water – for example. There’s no reason why bottled water should be priced at 62p per litre more than milk. That’s a 41% increase.

Beyond that, consumers then have an incredible range of choice when it comes to deciding the type of bottled water they’d like. They can choose supermarket brands, established brands like Buxton or Evian, or premium brands like SmartWater, Fiji and Cano – with a 50% difference in price for what is essentially the same basic product.

The only reason why this is the case is branding. Customers perceive bottled water to be worth the price, and they recognise there are different options to choose from.

By focusing on a unique identity, a unique proposition, dairy farmers can really open up the milk market. And by sticking to that identity, producers can achieve brand loyalty as they...
build a strong, positive relationship with their customers, helping them to understand and appreciate the milk market.

The current state of milk marketing

As it stands today, milk really isn’t marketed. It’s sold as a loss leader in supermarkets and smaller stores to get people through the door.

For decades, milk has just been seen as a standard essential, and it’s something I’ve been passionate about changing. I even wrote my dissertation on branded milk over 10 years ago.

Beyond the efforts of the Milk Marketing Board, there has never really been any push to market or brand milk. Even in its heyday, the Board was really just promoting the generic nature of milk.

Perceptions of milk have therefore remained largely unchanged:

Price is the key purchasing decision for the vast majority of consumers. Compare this with ice-cream, for example, where customers will happily shell out £5 for branded products like Ben & Jerry’s.

Semi-skilled milk is the most popular, with fat content being a concern of most shoppers, perhaps driven by poor branding. For example, whole milk is known as ‘full fat milk’ when it actually only contains 4% fat. Whereas customers buy ‘lean’ mince that still has over 5% fat.

Most customers buy from supermarkets, though location does play a factor. Particularly in rural areas where there is a drive to buy local, and following scandals like horsemeat gate, there is increased awareness of wanting to know where milk is coming from.

Consumers do want to know about the health benefits of milk – but there is very little being done to promote this.

What’s changing in 2019?

From my research in 2009 and my understanding of the marketplace now, it’s clear that if dairy businesses can establish a branded product with a unique selling point that resonates with consumers, then there is a very good chance the product will be successful.

There are lots of positive signs and lots of opportunities for success.

In 2009, Cravendale was the only non-supermarket brand for sale in large shops. Today, we’re starting to see the emergence of more brands, and those established big brands are moving into niche branding too. Muller have been pushing their Frijj brand, and names like St Helens Goat Milk, Yeo Valley and Yazoo are commonplace.

Brands are innovating. Arla has seen great success recently with the launch of their ‘best of both’ worlds, combining the taste of semi-skimmed milk with the fat content of skimmed, and the AHDB is investing more in R&D and marketing.

But we still have a long way to go. We still remain way behind other sectors and we’re facing even more competition moving forward, with the dramatic increase of alternative, non-dairy milk.

Whether it’s oat, soy or almond, all the different options are branded effectively.

Drawing passion and purpose from the Vegan Movement

The proliferation of non-dairy alternatives and the explosion of the Vegan Movement can actually be an inspiration to dairy farmers and the milk industry.

Veganuary has seemingly sprung up overnight, with advertising campaigns taking over buses and social media, supermarkets launching their own vegan product ranges and Gregg’s releasing a vegan version of their most popular item – the sausage roll.

According to the Vegan Society, vegans make up 1.16% of the UK population, and yet they seem to dominate the conversation and media coverage. When else have you seen 1% of the population drive the creation of extensive new product ranges, get large supermarkets to run advertising campaigns encouraging you to try their way of life, and drive the share price of high street bakery stores up by 100p?

How? Because they’re passionate about their cause and they’re driven to achieve change.

Vegans are the minority, the outsiders. They are working from outside the establishment, so they can represent a change, a different way of doing and a different way of acting. They are the challenger brand, so they can be bold and confrontational.

They stir up emotions and force consumers to think and reflect, as they’ve done with advertising campaigns – so much so that one councillor in Telford and Shropshire called for their ads to be banned given the region’s deep connections with agriculture.

Most importantly, vegans have a clear purpose and clarity in their message. They have a strong belief and a single-minded cause.

And as dairy farmers, we can definitely learn from that.

Changing the way we brand and promote ourselves

Collectively, we need to be clear and positive on our message. Currently, it’s a bit like Brexit amongst dairy farmers. There’s lots of ideas flying around but no real clarity on what we want to achieve.

We don’t need to waste our time and energy challenging vegan groups and trying to convince them to see the arguments from our perspective.

Instead we should be focusing on education and changing the conversation. We should be positive about ourselves, our brands and our products.

We need to promote what we do and how we do it. We need to showcase our passion for farming and agriculture. We should be proud of our
high animal welfare standards and the relationships we have with our herds.

In short, as a collective industry, we should be changing perceptions of milk and dairy. We should be promoting the quality of our products, the safety of British food, the health benefits and the value in buying local.

Building a brand from a local level
The industry as a whole can do more – but so can local farmers too. We can’t rely on big brands who have their own agenda and nor can we lean too heavily on the AHDB to promote our sector. We’ve got to roll our sleeves up and do our bit too.

It doesn’t need to be difficult to get started building your own brand and taking advantage of the opportunities out there.

The key is in planning and being aware of the marketing basics:

• Identifying your goals and objectives
• Understanding your own identity and USPs
• Pinpointing your target market
• Finding the best way to communicate with them
• Measuring your efforts

More and more local farmers are doing just this. We work with a local farm called Bidlea Dairy who have just diversified into pasteurising their own milk, having identified a demand in their region for local, high quality products.

They’ve recognised that a key segment of their audience is on social media and are using this to drive brand awareness and sales.

Similarly, social media and the online space is providing lots of innovative opportunities for the cattle market, with many farms promoting their stock via Facebook pages and Twitter posts before sending them to auction or using sites like Sell My Livestock. They’re building interest in their brand and their products.

Thinking innovatively about the positive branding opportunities
There are many ways we can promote ourselves as farmers, and lots of great opportunities for us. We might just need to think outside of the box. Look at the way related products have been branded in recent years.

Cheese – you can now buy an incredible range of cheeses and cheese brands, from basic to boutique. There are lots of artisan type varieties and dozens of flavour combinations.

Eggs – from caged and free-range options, to organic, corn-fed, blue, and brown – and that’s just one supermarket’s own range. You can also buy ‘big and fresh’ and ‘happy’ eggs, and those from specific farms.

You could also look to other products to see how they’ve successfully built up a brand around them. Coffee beans have distinguished themselves by branding around the region or specific area where they’re grown.

Many customers are now only looking to buy produce from British farms – as evidenced by the CO-OPs shift to only stock produce from the UK and the #BritishFoodIsGreat campaign by Love British Food.

Tonic water brands like Fever Tree have built a brand around their premium quality by enlisting other brands – namely gins – to promote their offering over competitors to produce a better end product. Who says milk companies can’t do the same by partnering with British Tea companies?

Then there are branding opportunities directly with the public. Farmers could go into local schools and promote the work they do, or – as Bidlea Dairy do – they could take calves to local fêtes and encourage children to interact and learn more about the dairy process. It could even be as simple as sharing on social media what you’ve been doing on the farm today and why.

This type of local education has been incredibly successful with Open Farm Sunday. Since OFS started 13 years ago, almost 2,000 farmers have hosted events and welcomed more than 2.2 million visitors onto their farms. In 2018 alone, 293,650 visited.

After visiting:
• 92% said they appreciated more the work farmers do
• 86% said they felt more connected to farmers who produce their food
• 78% said they were now proactively looking to buy British food.

Why does this have to be just once a year? Whilst there are some risks in opening up your farm to visitors, it can clearly be a positive, worthwhile investment – and one that would be easier if it were done more frequently.

It’s another great way to improve perceptions and change the conversation.

Ultimately, we need to focus on awareness and education.

When compared with other sectors, other markets and other products, there are clearly lots of great branding opportunities for individual farmers. But there’s also incredible potential for a combined effort across the industry.

As well as branding individual products, we should be working to re-shape our entire sector. We can change the way it is viewed by the media and perceived by the public.

We can transform the identity and branding of the milk market, but it’s not going to happen overnight. It will take all of us working together to accomplish this massive shift.

But it’s definitely possible.

By building awareness, driving grassroots initiatives and focusing on education, we can support huge change for all farmers in our industry.

There’s lots to be positive about. There’s lots of innovation to look forward to. And together, we can raise the profile of Great British Farmers and promote the quality of Great British Food as safe, healthy, delicious and nutritious.
Year-round housed dairy cows – what do the public think?

Amy Jackson
PhD student, School of Veterinary Medicine and Science, University of Nottingham, Sutton Bonington, Loughborough
(Research funded by AHDB Dairy)

Summary

Modern farming methods claim to offer an affordable, safe and diverse food supply to all. However, systems that confine animals or manage them in environments perceived as ‘unnatural’ can provoke negative responses from media, welfare groups and the public. This study set out to understand whether preferences within the UK vary for a number of attributes relating to milk and the way dairy cows are managed, and what might explain these differences. A survey asked 2,054 UK citizens to rank a set of 17 attributes relating to milk and aspects of cow management. Analysis showed significant differences in priorities and ranking order of the attributes according to a range of factors such as age, gender, education, dietary choices, knowledge, experiences and value system. Further analysis revealed six ‘segments’, each of which prioritised different attributes and had different socio-demographic backgrounds and attitudes.

Introduction

In UK dairy farming, current estimates are that 90% or more of the UK’s dairy cows access pasture in any one year (calculated from March et al., 2014). However, there are many reasons for housing cows longer and bringing feed to them rather than have them harvest it themselves through grazing. For example, a lack or surplus of rainfall in an area and avoiding long walking distances to pasture as herds grow or landbase shrinks (Van den Pol-van Dasselaar et al., 2014).

While any impact on milk quality from the way the cow is managed is of direct concern to a consumer of dairy products, other aspects related to a perceived intensification of milk production often hold interest for wider citizens. Larger scale operations and housing animals year-round are popularly perceived to have negative impacts on the environment, rural communities, the viability of other dairy farms, cow health and welfare, and potentially the quality of milk (Miele, 2010; Cardoso et al., 2016).

While these and similar views emerge frequently in research, it is not clear how widespread or similar these attitudes are within the UK population, and what knowledge or perception they are based on. Understanding these preferences for milk and cow management practices, and how they vary among different groups, may help the dairy farming industry to modify both housed and grazing farming systems to bring both sides of the debate closer to a consensus, to change the way it communicates modern dairy farming systems, or even to target milk produced in different ways at certain consumer groups.

Methods

An online survey we ran through a consumer marketing panel set out to ask 2,000 people from across the UK to rank a set of 17 attributes of a cow’s environment and management related to space, commodification, behavioural enrichment, naturalness, access to both grazing and/or the outdoors, and health and welfare alongside other added-value features of milk as a product.

Best worst scaling (BWS) methodology was used with the aim of achieving an accurate, scaled ranking of the relative importance of the different attributes. The exercise presented the 17 attributes an equal number of times in 12 different sets of five, with respondents asked to select the ‘most’ (best) and ‘least’ (worst) important characteristics to them in each test when first presented with the following question:

‘You are in a grocery shop, walking through the aisle for milk, dairy and plant-based alternatives. More information than usual has been provided about the different types of cows’ milk on display. This has been supplied by a trusted food assurance scheme. Irrespective of whether you are buying any milk or not on this occasion, you have time to spare, so you read the information provided. You will now see a series of questions. Each includes five pieces of information about the cows’ milk on display. Which feature is the MOST important and LEAST important TO YOU in each set of five, if price is not an issue? There are 12 questions in total.’
The aim was to examine the scaled rankings in relation to a range of different factors that might explain people's preferences and trade-offs. In addition to questions about gender, the region the participant lived in, their age, educational background, income, ethnicity and family, they were also asked about their attitudes and beliefs towards dairy cow welfare, experience, knowledge of dairy farming and values.

**Results**

2,054 completed survey responses were received over the period of a week. ‘Grazing most of the year’ emerged as the most important attribute (see Figure 1), which was not unexpected, but this did not score significantly differently to either of the attributes relating to ‘health and welfare’ or ‘cow comfort’. These three attributes were most important overall, with the lowest-scoring of this trio, ‘cow comfort’, proving significantly more important than the next nearest attribute, ‘fair price paid to farmers’.

Variations in ranking were also examined according to a number of other factors such as gender, dietary preferences, types of milk consumed, the urban or rural nature of where the respondent has lived, experience of keeping animals and values.

There was a significant difference between the mean scores awarded by men and by women for the ‘grazing most of the year’, ‘health and welfare’ and ‘cow comfort’ attributes, with the ranking reversed to be ‘grazing’, ‘health and welfare’ then ‘cow comfort’ in decreasing importance for men, and ‘cow comfort’, ‘health and welfare’ and ‘grazing’ in decreasing importance for women. Other noticeable differences included women scoring ‘calves staying with cows for several months’, ‘cows accessing open yards even though they live inside’ and ‘cows choose their own habitat and timetable’ significantly higher than men; and men scoring ‘milk tastes better’ and ‘latest technology’ significantly higher than women.

As the number of omnivores in the sample was very large (n=1,718), the rankings from this subset broadly mirrored the sample as a whole. However, those on a restricted diet of some kind – including vegetarians, vegans and dairy-free – prized ‘cow comfort’ highest, with their scores for ‘calves staying with cows for several months’ and ‘cows choose their own habitat and timetable’ also significantly higher than those provided by omnivores. Those consuming plant-based rather than cows’ milk, although small in number (n=122), also prized ‘cow comfort’ very highly.

Further analysis to search for groups which ranked the attributes similarly identified six ‘segments’, each of which showed significant differences in prioritisation for most of the attributes. The segments were all of a similar size – between 15% and 20% of the total sample.

- The first group prioritised health and welfare and cow comfort, but was very altruistic and also wanted the farmer to get a fair price for milk.
- The second wanted grazing and outside access for cows, but was the most urban.
- The third preferred the taste of milk above other attributes and had those most focused on achievement.
- The fourth was focused on supporting farmers and local milk, and was the most rural.
- The fifth was all about cow comfort and choice, and cows staying with their calves for several months; most of the vegan and vegetarian participants, and those who consume plant-based milk were in this group.
- The sixth was an unusual group; like the first, they prioritised health and welfare but only just, with little difference in scores between all

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**Figure 1:** Mean rescaled rankings for each attribute across whole sample (n=2,054)

- **comes from cows that graze outdoors most of the year**
- **is from farms ranked top in the UK for health and welfare**
- **is from farms that prioritise cow comfort above everything**
- **guarantees a fair price to the farmer**
- **is from cows that can walk outside into open yards at any time, even though they live indoors**
- **comes from cows that keep their calves for several months**
- **comes from cows that graze outdoors for at least a couple of months each year**
- **is from cows that choose their own timetable and habitat, inside and out**
- **is from cows fed a diet designed to meet individual nutritional needs**
- **comes from farms local to your area**
- **tastes better than other cow’s milk**
- **comes from farms where cows roam freely when indoors**
- **comes from small farms where just the family manages the cows**
- **is from farms where the farmer knows each cow’s history and character**
- **has a lower carbon footprint than other milk/plant-based alternatives**
- **is from cows given brushes and toys so they can express natural curiosity**
- **is from farms which use the latest technology and automation**
attributes. This group was very urban, the youngest, and had the lowest knowledge of dairy farming but scored themselves the highest.

Discussion and conclusion

This study raises questions as to what citizens, and consumers, actually value in the way a cow is managed and in the milk she produces, and what they associate with welfare and a better life for the cow. Literature suggests that consumers and citizens broadly view access to pasture or grazing as a proxy for good welfare, in that it supports a wide range of behavioural expressions for the cow, provides a ‘natural’ diet and – whether through impressions formed at a young age or as adults – is intuitively where cows belong. However, to also highly rank ‘farms that prioritise the comfort of their cows above everything’ and ‘farms ranked top in the UK for health and welfare’ suggests some devolution of responsibility for cow welfare and wellbeing to farmers, because these descriptions contain no details of what actually happens on the farm, but instead specify the outcome.

Of further interest is the far broader range of priorities expressed by subsets of the sample than the means of the whole suggests. When comparing to demographic, knowledge, experiential and value system factors, the same top three priorities emerge time and time again, but with differences in the top preference. However, the six underlying groups that emerge demonstrate even more variation in preferences, with each class expressing a different ‘top’ priority such as taste of milk, cow comfort, health and welfare or a fair price paid to farmers. This suggests that where these groups have also identified grazing as a moderate preference, this could be for a variety of different reasons relating to other benefits grazing might deliver such as naturalness, better tasting milk and so on.

The results of this study suggest there is significantly more variation in preferences between different citizens for how cows are managed and milk is produced than is currently appreciated. Furthermore, it is likely that where grazing does feature, it is as a proxy for aspects relating to that class’s top preference, for example it is perceived to improve health and welfare or cow comfort, or make milk taste better.

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References


The theme of the BCBC’s 2019 conference – Building the Brand to Promote our Uniqueness – is an explicit acknowledgement that commodity farming on a small-to-medium scale is a dead end for primary producers. Increasing numbers of farmers under financial pressure have turned to processing their milk on the farm, producing value-added products such as cheese in order to insulate themselves from the vagaries of the liquid milk market and save their family businesses. 1

In contrast to liquid milk – and even to dairy products such as yoghurt or ice cream – cheese, and particularly raw-milk cheese, presents consumers with the opportunity to taste the farming decisions that go into its production. Liquid milk tastes more or less ‘milky’ and sweet, and the flavours of yoghurts and dairy desserts are dominated by a primary lactic acidification or added sugar and flavourings. The flavour of cheese, on the other hand, represents the cumulative impact of multiple factors at the level of primary production.

Farming on Three Levels
Cheesemaking is farming on three distinct scales. At the macro scale, we have the pastures of the farm and the soil and climatic conditions that support the growth of its distinctive community of plants. The decisions by the farmer at this level have a profound impact on the chemical and compositional characteristics of the milk, and thus the cheese that can be made with it. Are animals kept on permanent grassland? What crops are grown and what does the rotation look like? Is the system organic? Are animals fed for consistency and insulated as much as possible from the vagaries and inherent quirks of the climate and the site?

Then we move to the meso level of cheesefarming: breed. Decisions about breed, and subsequent decisions about the most favourable characteristics to pursue, are inextricably linked to the macro-level decisions mentioned above. Putting a heritage cow like a Northern Dairy Shorthorn or Irish Moiled into a modern production system would be an economic catastrophe; conversely, a modern Holstein would wither within a conservation grazing setup.

Breeds such as the Montbéliarde are touted as having been bred to give milk with exceptional cheesemaking qualities, such as a high protein-to-fat ratio and low somatic cell count. However, the primary consideration when selecting a breed for cheese is its suitability for a given farming system. Over the course of a multi-year experiment carried out in the Auvergne the Montbéliarde cows, widely celebrated for their adaptation to grazing-based systems, struggled to maintain fertility with a completely grass-based diet, while the local Salers cows do not experience similar issues. Within extensive and high-value-added systems, hardiness and ability to get to the interesting food are paramount.

Finally, at the micro scale, cheesemaking is farming microbes. While most modern cheese operations add commercial cultures to their milk to facilitate a quick and efficient fermentation, carefully-produced raw milk comes loaded with its own population of acidifying and ripening bacteria, yeasts, and moulds. The role of the cheesemaker is then to process the milk in such a way that the interesting and beneficial microbes grow to dominate the finished cheese. The enzymes released by these microbes during the ripening process give rise to each cheese’s unique flavour and aroma.

As with the feeding and breeding decisions, each farm has the potential to host a unique population of diverse microbes, which have evolved in response to the climate and the environments created for them by the herdsman and the cheesemaker throughout the farm and cheese dairy. Think of this as creating a system selectively to breed microbes. This unique microbial fingerprint, again, is something that can be tasted in the flavours of the finished cheese. Cheese is milk made knowable, and rather than ‘adding’ value, the best cheesemaking reveals the inherent character and value of the milk itself.

Tasting a farming system
The decisions made by the farmer are writ large in the flavour and texture of the resulting cheese. We see this most clearly when we look at cheeses made from the milk of animals fed entirely on grass-based forage versus those fed a diet rich in maize and/or concentrates. Grass, unlike maize, is rich in beta-carotene, a fat-soluble pigment that gives cow’s milk its golden colour. The higher in grass the
diet, the richer the colour of the cheese. (Because beta-carotene is broken down by UV light, silage, which may be wilted in the field for several days before it is moved to the clamp or baled, produces cheese with a slightly lighter colour; this is even more the case for hay.) Conversely, maize silage and concentrates such as brewers’ grains or soya have no beta-carotene, and thus the milk produced in systems that rely heavily on them are lighter in hue. The differences go beyond just colour; milk from cows eating a diet of primarily grass has a higher ratio of unsaturated fatty acids, which results in fats that are softer at room temperature. All else being equal, grass-fed cheeses are softer and more pliant. 4

Field-level biodiversity can also be tasted in the resulting cheeses. Milk from animals that graze on biodiverse swards contains higher levels of terpenes, aromatic molecules that are the main component of essential oils. While these compounds cannot be detected by tasters in the milk or cheese, they do alter the ripening profile of cheeses in such a way that sensory panels can differentiate between mature cheeses made from the milk of animals on high-biodiversity versus low-biodiversity grassland in blind taste trials.5

Against this backdrop, the role of the breed becomes clear: to enhance the link between an interesting place and the flavour and characteristics of the resulting cheese. Cows with high energy requirements will need to consume a more significant proportion of their energy as concentrates to stay in condition, which weakens the link with the farm. Breeds with lower energy requirements can thrive on marginal land with high environmental value, and managed properly, can play an important role in the conservation of these delicate and endangered environments.

Organisations such as the Mountain Cheese Network, a coalition of scientists and cheese producers’ groups, recognise the systemic nature of this challenge, seeking ‘an optimal management of the complex and interconnected ecosystems of the chain from field to animal, farm, milk, and cheese . . . because each link greatly determines the final qualities of the cheeses.’6 Some of the world’s most iconic cheeses are made within austere, extensive systems, from the milk of the animals that thrive in them, from the rugged Salers of the Auvergne, to Swiss Etivaz, the products of thrifty breeds that stay healthy and fertile on biodiverse, scrubby pasture.

What British equivalents could be revived or created from the milk of cattle grazed entirely on Devonian moorland, in the upland hay meadows of the Yorkshire dales, or in lowland heath and wetlands? In addition to giving rise to thrilling new cheeses, these dual-purpose animals would have excellent carcass value, as well as play a valuable role in the conservation of these endangered habitats.

The cheese biodiversity chain

Here we present a model, the Cheese Biodiversity Chain, adapted from the work of Dr Henry Buller at the

![Figure 1: The Cheese Biodiversity Chain](image-url)
University of Exeter. Buller’s work serves to underline the importance of taste in the economic viability of extensive farming systems, which he and others have demonstrated previously in the context of the market for pasture-raised speciality meats. The model links the aspects of the system that carry intrinsic natural value – the biodiversity of the farm landscape, the genetic diversity of animals and microbes – with the extrinsic attributes of the goods produced within that system, in this case delicious and unique cheeses that sustain a price significantly higher than their counterparts produced within an intensive system at an industrial scale. (See Figure 1 on page 57) Moreover, by locating the processing at the level of the farm, the value of the cheese is realised by the farmer. This higher level of profitability not only makes way for a secure business, but promotes further investment in the farm and its health.

Why is this not the dominant commercial structure in the rural economy? Many small-scale cheesemakers, particularly within the UK, take their aesthetic cues from factory templates. Factory cheeses are made using commercial strains of microbes selected for their ability to produce consistent flavours, from the caramel sweetness of aged Gouda to the industrial microbial monoculture of the rind of Somerset Brie. These characteristics are added during the cheesemaking process, breaking the link between the farming system and the flavour of the cheese. For factories looking to make the cheapest cheese possible, this is ideal; for small producers looking to create a cheese that will sustain a significantly higher price, these cultures are an existential threat. If a similar-tasting cheese can be delivered for a quarter of the price, what rational customer would choose to pay more?

Conversely, no factory can replicate the flavour of a cheese produced within an extensive, biodiverse farming system, driven by the potential of its native microbial community. These are the flavours of place, and give us as an industry the opportunity to tell a story that customers can actually taste.

References

1 McGuigan, Patrick. ‘How British cheese took over the world (even the French love it).’ The Telegraph, 30 April 2015.
Conference delegates received an update on the topic of inbreeding in the UK dairy herd, covering national trends, tools available to manage inbreeding and latest research.

The workshop began with a review of the current inbreeding trends of the major UK dairy breeds. All but two breeds have been steadily increasing in inbreeding over the years, with Holstein pedigree females the highest on average at around 5% in the most recent year of birth. Although Holsteins are continuing to increase, the rate of increase has slowed since the mid-90s which is a positive trend. By keeping the rate of inbreeding to a minimum, natural selection removes harmful recessives over generations, ensuring favourable genetic gains and healthy animals.

Next, the results and conclusion of an SRUC study investigating the effect of inbreeding on animal performance were covered. The analysis showed that the effect of inbreeding was non-linear with inbreeding depression having a negligible effect on the example PTA (milk kg) when below 5%. The study concluded that the effect on individual PTAs were similar to other country findings and relating this back to the UK economic index, for every 1% increase in inbreeding above 5% we would expect approximately 10 £PLI to be lost in the resulting progeny due to inbreeding depression.

The final discussion covered current and new tools to help monitor and manage inbreeding. Current tools and methods available from AHDB discussed were;

- Herd Genetic Report to monitor herd inbreeding
- Inbreeding Checker to manage short-term inbreeding in the next generation
- Using a variety of bloodlines to manage long-term inbreeding

UK genomic inbreeding figures will be available for genotyped animals from AHDB Dairy in the coming year. This will give a more accurate estimate of how inbred an animal is by measuring whether two copies of a ‘gene’ are inherited as opposed to pedigree inbreeding, which is a probability that this will happen. Once UK genomic inbreeding figures are available to the UK dairy industry these will be incorporated into the AHDB Inbreeding Checker to manage future matings, along with the other proposed updates;

- Rather than control level of inbreeding by measuring against an absolute value (6.25%), the tool will be used to control rate of inbreeding change. This will give a positive or negative value. Unsafe matings will be indicated as those with an increase in inbreeding above a threshold, currently set a +1% increase.
- To control long term inbreeding, an additional step will be added to the tool once potential sires have been selected to use on the females. The tool will indicate if these bulls are closely related, encouraging the user to consider a variety of bloodlines in their choice of mating sires.
- Functional updates fed back to the AHDB Animal Genetics team from farmers and regular users of the tool will also be incorporated.

If you would like to sign up for a Herd Genetic Report please contact Dairy.Breeding.Evaluations@ahdb.org.uk with your milk recording number, trading name and address. Please note you must be fully milk recording with NMR, CIS, Dale Farm or QMMS to qualify for a Herd Genetic Report.
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