Fourth Report

GB Cattle Health & Welfare Group

September 2018

www.chawg.org.uk

CHAWG
Cattle Health & Welfare Group

The work of the GB Cattle Health and Welfare Group would not be possible without the valued financial support of both AHDB Dairy and AHDB Beef & Lamb, which kindly fund the secretariat and chair function for this cross-industry group.

The members of CHAWG are:

Agriculture and Horticulture Development Board (AHDB)

Animal & Plant Health Agency (APHA)

Animal Health & Welfare Board for England (AHWBE)

Animal Health Distributors Association (AHDA)

British Cattle Veterinary Association (BCVA)

Dairy UK

Department for Environment, Food and Rural Affairs (Defra)

Farmers Union of Wales (FUW)

Holstein UK/Centre for Dairy Information (HUK/CDI)

Hybu Cig Cymru (HCC)

Livestock Auctioneers Association (LAA)

National Beef Association (NBA)

National Milk Records (NMR)

National Office of Animal Health (NOAH)

NFU of England and Wales (NFU)

NFU Scotland (NFUS)

Red Tractor Assurance (RTA)

Royal Association of British Dairy Farmers (RABDF)

Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Scottish Government

University of Nottingham School of Veterinary Science

Wales Animal Health and Welfare Framework Group (WAHFG)

Welsh Government

CVOs' Foreword

The chief veterinary officers of Scotland, England and Wales welcome the fourth biennial report of the Cattle Health and Welfare Group of Great Britain.

We recognise the value of CHAWG's continued work in driving cattle health improvements, which have production and cost benefits across the sector.

As we move towards EU Exit, it is more important than ever that GB maintains and demonstrates high standards of animal health and welfare. This is critical to the GB cattle industry optimising production efficiency, underpinning trade, supporting food security, protecting public health and maintaining consumer confidence.

Cattle sector technology developments continue to be well supported and coordinated by CHAWG and, as this report highlights, partnership across industry has been critical to recent work on livestock identification and data sharing. We look forward to the sector demonstrating further livestock health and welfare benefits as work progresses on innovations such as livestock monitoring devices and telemedicine.

Disease monitoring remains a priority across GB, as highlighted at the first meeting of the UK surveillance forum in June 2018. The forum brings together the UK CVOs to focus on and develop the UK narrative, demonstrating and verifying our high standards of animal health. It is important that this UK narrative is owned by all of us with responsibilities in the livestock sectors. This report collates key information on GB livestock monitoring, showing the importance of surveillance to the GB cattle sector. We look forward to continued input from CHAWG as we shape the future of surveillance.

However, surveillance alone does not deliver high health standards, only demonstrates them. We need to work in partnership across government, industry, science and research, using a sound evidence base to agree disease priorities. We can achieve much more working together as parts of a system that delivers sustainable livestock production, than we can on our own.

Since the last CHAWG report, work has progressed on antimicrobial resistance (AMR). AMR is an issue of global significance, important to a sustainable industry and to all of our futures. Industry leaders have driven a proactive approach in grasping the nettle and leading on action, through encouraging best practice and facilitating development of systems for collecting data on antibiotic use. CHAWG continues to drive industry effort on subjects such as electronic medicine recording and improving dry cow management.

As the next UK AMR strategy is published, we will continue to work together with CHAWG to ensure all veterinary medicines use in cattle is responsible use – as much as necessary, as little as possible. We recognise that, in some circumstances, using an antimicrobial is critical to the individual animal's welfare. Key to responsible use is to ensure we continue to focus on prevention and strive for best practice biosecurity and animal husbandry.

Christine Middlemiss
Chief Veterinary Officer for the UK

Christianne Glossop
Chief Veterinary Officer for Wales

Sheila Voas
Chief Veterinary Officer for Scotland

CHAWG's work with population medicine and, in particular, lameness and mastitis control, highlights the importance of good herd health planning in reducing antimicrobial use on farm and improving productivity.

We recognise that veterinary practice is going through a period of change. The changing dynamics of practice structure and viability could impact access to veterinary expertise. CHAWG is well placed to work across industry to encourage farmers to recognise the value and economic benefits of preventative veterinary input on herd health planning, training and diagnostics.

In summary, we congratulate CHAWG on continuing to provide the link between individual farm management and the GB cattle health and welfare picture. We are optimistic we will see further advances in health and welfare over the next 24 months.

Christine Middlemiss
Chief Veterinary Officer for the UK

Christianne Glossop
Chief Veterinary Officer for Wales

Sheila Voas
Chief Veterinary Officer for Scotland

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1 Introduction

Welcome to the fourth report on the state of Cattle Health and Welfare in Great Britain.

The Cattle Health and Welfare Group (CHAWG) originally started out as an England-only activity but it quickly became apparent that disease and, indeed, welfare issues do not recognise national boundaries and thus the group expanded its scope to cover GB activity, viewing Scotland, England and Wales as one biosecure unit.

Effective farm health planning is the bedrock of our activities and, although there is much activity to report on BVD eradication and Johne's Disease, it is important to appreciate that mastitis, lameness, fertility and respiratory diseases are still major issues on many farms and thus CHAWG remains very active in these areas.

Antimicrobial resistance continues to be a major theme in our work. Antibiotic resistance, in particular, is not just a cattle issue, so it has never been more important for the whole farm animal sector to continue working together through RUMA (the Responsible Use of Medicines in Agriculture Alliance). CHAWG does, though, have an active subgroup whose remit includes looking at the best way to collect standardised data. This will both help the Veterinary Medicines Directorate (VMD) with its statutory duties and, at the same time, ensure that appropriate data is collected first at veterinary practice level and then, in due course, on farm.

Because of particular sensitivities around dairy cows, CHAWG has a subgroup looking specifically at dairy cow welfare. While previous CHAWG reports have broadly reported on areas of interest to this group, which are summarised in its GB Dairy Cattle Welfare Strategy (updated in January 2018 and reproduced in the Appendix), for the first time we directly reflect on performance against these goals – as indicated by the ▸ symbol.

This development is timely and welcome, especially as one of the UK's unique selling points is its high standards of animal welfare. Our positive progress on dairy cow welfare to date was exemplified when the EU Food and Veterinary Office (FVO) paid a visit to a number of Member States in 2017 to look at this area. The final report from the FVO noted how well coordinated the UK strategy was and had no suggestions for improvement, unlike other Member States visited. This is a real feather in our cap and a good example of how the industry can work together to mutual advantage.

I am extremely grateful to all members of CHAWG. Our quarterly meetings are very well attended and everyone is happy to contribute, both at meetings and in providing written contributions to these two-yearly reports. Many thanks to you all. I would especially like to thank Charlotte Bullock who provides the much-needed administration and secretarial assistance to ensure the activities are properly coordinated and action-orientated.

Finally CHAWG could not exist without the ongoing financial support of AHDB Dairy and AHDB Beef & Lamb. For this, we remain extremely grateful.

Tim Brigstocke
Chairman, CHAWG

2 About CHAWG

CHAWG's remit is to:

- Provide an industry forum that will encourage and coordinate a programme of economically focused improvements to cattle health and welfare across Britain
- Act as a forum to prioritise the research, development and knowledge interaction needs of the GB cattle industry in relation to cattle health and welfare, to ensure knowledge gap identification, coordination and minimal duplication
- Assist in the dissemination of knowledge across the industry through the participating organisations within the group and others, where appropriate
- Liaise closely with all stakeholders such as levy boards and educational institutions to promote consistent regional dissemination of national work and encourage the uptake of technological advances and best practice
- Provide guidance and be a resource for the Chief Veterinary Officers across GB and other relevant Government bodies on cattle health and welfare matters, including the early stages of policy development and other areas, where appropriate

CHAWG published its first report in 2012 and, with its limited resources, has focused on initiating work not currently being tackled by other bodies or initiatives but with the potential to impact heavily on the cattle industry, namely: Farm Health Planning (FHP); Surveillance and Monitoring; Bovine Viral Diarrhoea (BVD); and Dairy Cow Welfare – CHAWG is responsible for the GB Dairy Cow Welfare Strategy[1].

CHAWG operates a Cattle Antimicrobial Use working group, which is exploring opportunities for national sector level antimicrobial usage data to be collected and reported for both the beef and dairy sectors. This group works closely with the beef and dairy antimicrobial stewardship groups, both of which have been established to help deliver the targets on antibiotic use that were set by RUMA's Targets Task Force and endorsed by the Veterinary Medicines Agency in October 2017[2].

CHAWG took on the legacy of the Beyond Calf Exports Industry Forum, set up jointly by the cattle industry, RSPCA and Compassion in World Farming, in 2013. CHAWG has run the annual Farm Health Planning Seminars at the Livestock Event in collaboration with the British Cattle Veterinary Association, and provides a resource for Government through the Animal Health and Welfare Board for England.

CHAWG does not cover bovine tuberculosis (TB), as its prevalence, spread, impact and control measures are being managed collaboratively and extremely well through other sector organisations. CHAWG supports their efforts and directs any queries primarily to the TB Hub, **www.tbhub.co.uk**

[1] Previous reports of the GB Cattle Health & Welfare Group can be downloaded by visiting **www.chawg.org.uk**
[2] RUMA: Industry task force announces new antibiotic targets: **ruma.org.uk/industry-task-force-announces-new-farm-antibiotic-targets**

Top cattle health and welfare issues in 2017

CHAWG consulted relevant cattle industry bodies to obtain an understanding of what the industry itself feels are its main health and welfare challenges and listed these in the 2012 CHAWG report.

CHAWG again consulted widely in 2017 to identify the current priority issues for the Cattle Health and Welfare Group. The top issues identified for CHAWG activity are listed below.

- Antimicrobial use and targets for reduction
- Industry coordination
- Bovine Viral Diarrhoea
- Biosecurity
- Housing and Environment
- Data – Recording, benchmarking, open sharing
- TB – Bovine Tuberculosis
- Improving welfare/developing new high welfare systems
- Johne's Disease
- Lameness
- Surveillance for endemic, exotic and emerging diseases
- Youngstock health, management and lifetime performance

It should not be forgotten that many of the issues facing the cattle industry are also multifactorial and have breeding, feeding and on-farm management components.

3 Trends and demographic changes

a. Cattle and premises numbers

Table 1. Cattle numbers and premises in GB by purpose – dairy, beef and dual-purpose

	2017		2016	
	Cattle	Premises	Cattle	Premises
Beef				
England	2,789,773	34,921	2,723,637	34,770
Scotland	1,251,116	10,359	1,260,953	10,451
Wales	587,085	8,685	577,841	8,659
Total	**4,627,974**	**53,965**	**4,561,431**	**53,880**
Dairy				
England	2,280,203	8,438	2,337,582	9,080
Scotland	386,707	982	400,755	1,035
Wales	504,054	1,887	506,433	1,978
Total	**3,170,964**	**11,307**	**3,244,770**	**12,093**
Dual purpose				
England	301,624	1,727	293,298	1,805
Scotland	56,779	212	47,276	200
Wales	51,958	352	53,347	373
Total	**410,361**	**2,291**	**393,921**	**2,378**

Source: Defra/Cattle Tracing System (CTS)[3]

b. Milk production

Table 2. Average dairy herd size, yield and total milk production in the UK national herd

	Average size of dairy herds in UK
2017	146
2016	143
2015	142
2014	133

	Average yield in UK (litres/cow/annum)	Total milk production from UK national dairy herd (billion litres/annum)
2016/17	7,557	14.34
2015/16	7,942	15.14
2014/15	7,870	14.64
2013/14	7,712	13.92

Source: Defra

[3] More detailed statistics on cattle numbers are available at **www.gov.uk/government/statistical-data-sets/structure-of-the-livestock-industry-in-england-at-december; gov.wales/statistics-and-research/survey-agricultural-horticulture/?lang=en: www.gov.scot/Publications/2017/10/9554/downloads#res525859**

c. Beef production

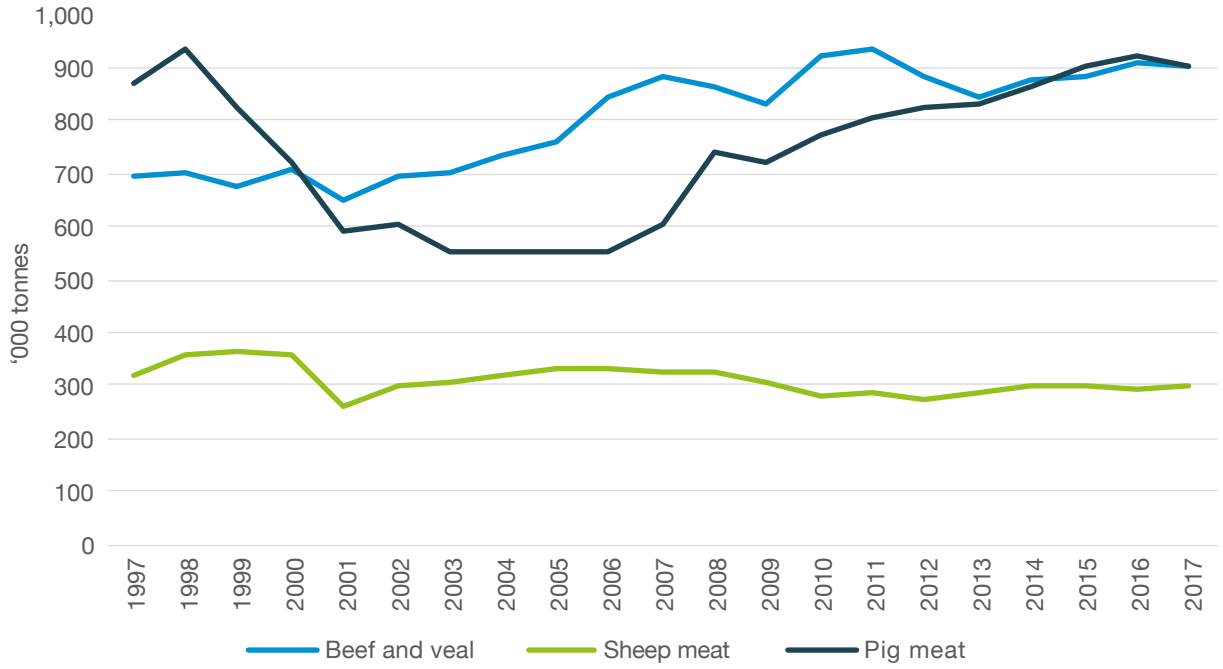


Figure 1. Trends in red meat production for the UK, 1997–2017

Source: Defra

d. Cattle slaughterings

Table 3. Cattle slaughterings by type (UK) and region, 2011–2015 ('000 head)

	Prime cattle	Cows and bulls	Calves	Total cattle	GB	England	Wales	Scotland
2017*	1,974	659	112	2,745	2,203	1,606	134	462
2016*	1,975	681	124	2,780	2,335	1,714	147	474
2015+	1,922	615	99	2,636	2,134	1,516	159	459
2014+	1,960	597	112	2,669	2,149	1,529	151	468
2013+	1,927	607	91	2,625	N/A	N/A	N/A	N/A

Key: *Data calculated January to December; + Data calculated June to May

Source: Defra

e. Cattle imports

Table 4. Imported cattle 2017 – animals imported to GB from main exporting countries

Country	England				Wales		Scotland				Total animals
	Breeding/ production		Slaughter		Breeding/ production		Breeding/ production		Slaughter		
	Cmts	Animals	Cmts	Animals	Cmts	Animals	Cmts	Animals	Cmts	Animals	
Netherlands	332	7,760	-	-	100	2,678	55	1,377	-	-	11,815
N Ireland	204	1,950	57	1,564	13	54	354	6,177	82	1,869	11,614
Ireland	167	3,062	-	-	100	1,714	64	944	-	-	5,720
Germany	129	2,991	-	-	14	449	14	282	-	-	3,722
Denmark	71	2,146	-	-	10	301	18	606	-	-	3,053
France	140	2,185	-	-	23	205	35	256	-	-	2,646
Belgium	15	236	-	-	29	552	-	-	-	-	788
Luxembourg	36	644	-	-	2	21	5	117	-	-	782
Others	20	70	-	-	3	6	8	69	-	-	208
Total 2017	1,114	21,044	57	1,564	294	5,980	553	9,828	82	1,869	40,348
Total 2015	1,329	26,158	64	1,997	332	4,873	597	10,693	253	5,337	49,058
Total 2014	1,841	36,804	59	1,700	561	10,365	700	13,086	289	7,915	48,593
Total 2013	1,456	28,008	106	3,538	369	5,836	597	10,085	403	11,366	58,860

Key: Cmts = consignments or numbers of lots in which cattle are imported

Source: APHA

f. Calving patterns

In Britain, over 80 per cent of dairy farmers identify themselves as all-year-round calvers[4]. However, the number of calvings in the national dairy herd peaks in autumn. The number of non-dairy (dairy cross-beef and suckler beef) registrations peaks in spring.

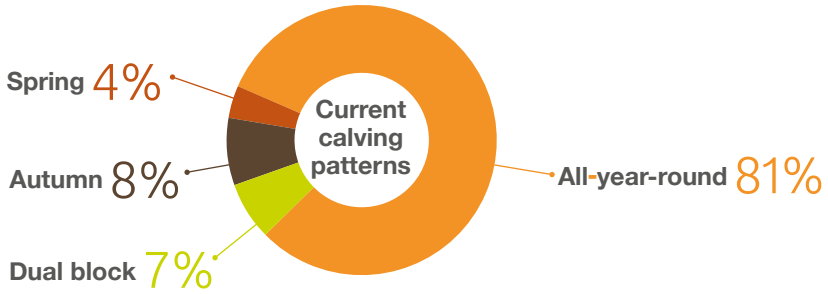


Figure 2. Percentage of GB dairy herds operating to different defined calving patterns

Source: AHDB

[4] AHDB Dairy Farmers Intention Survey 2016

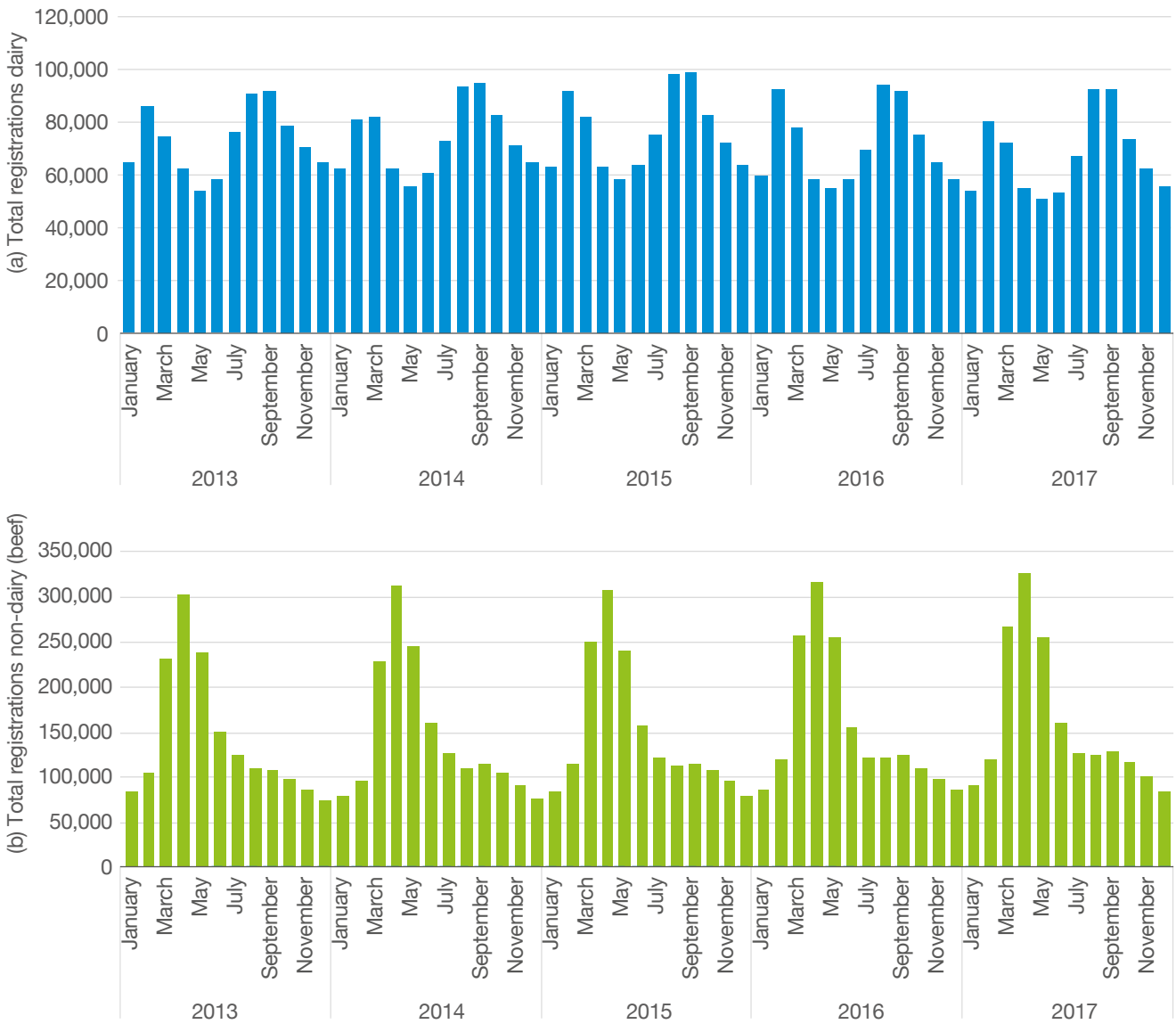
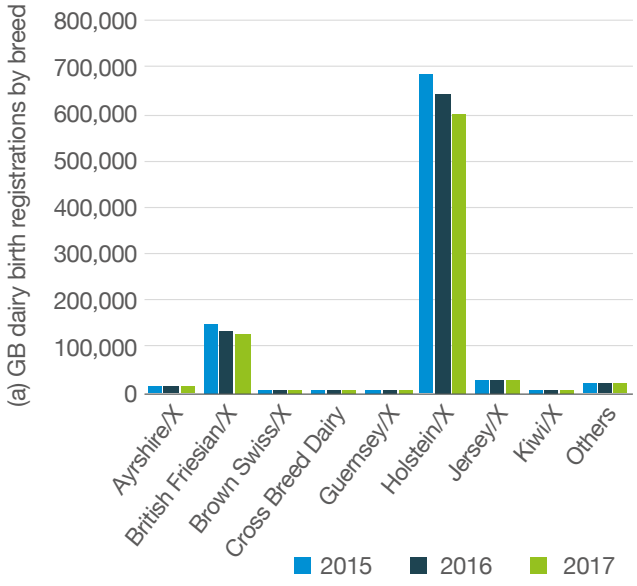
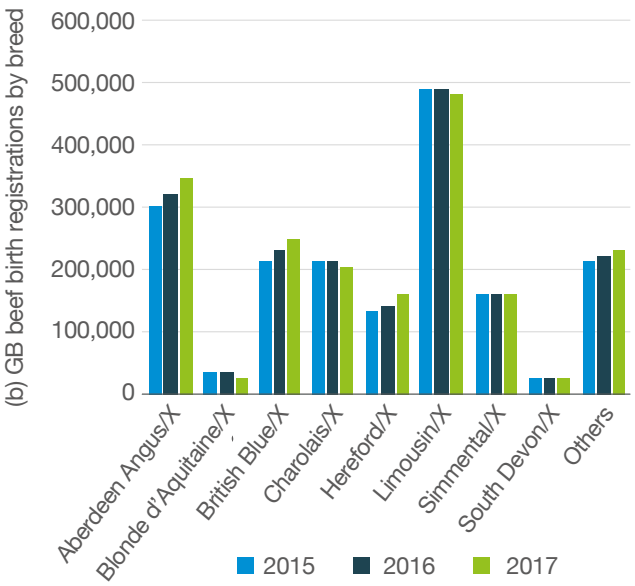


Figure 3. Seasonal distribution of calf registrations of (a) dairy and (b) non-dairy (dairy cross-beef and suckler beef) sired cattle in GB from 2015–2017

Source: BCMS

g. Predominant breeds





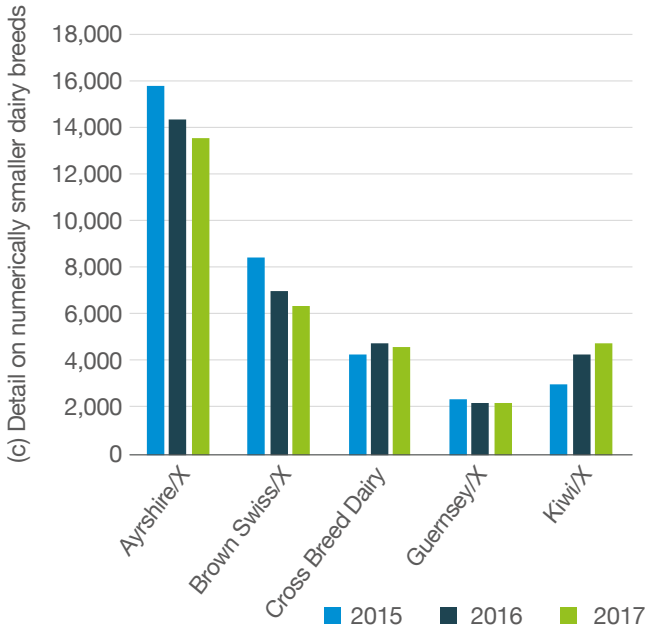


Figure 4. Predominant cattle breeds for (a) dairy, (b) beef and (c) detail on numerically smaller dairy breeds

Source: BCMS

4. Livestock identification and data exchange

There is real progress to report on livestock identification and mechanisms for data exchange, using government and industry-held data to drive improvements in productivity, health and welfare.

Following an announcement by Michael Gove, Secretary of State for Environment, Food and Rural Affairs, on 4 April 2018, a new multispecies livestock traceability service is to be created in collaboration with the livestock industry. The Livestock Information Service (LIS) will start to roll out from late 2019. Ultimately, this will bring BCMS (cattle), ARAMS (sheep) and eAML2 (pigs) into one multispecies database for England. It will be conversant with traceability in the devolved administrations to provide an overall UK view.

Over the past 18 months, an industry-led Traceability Design Users Group has advised Defra on the vision and design principles necessary to deliver an integrated, digitally enabled, real-time, industry-facing traceability system. LIS will meet the statutory requirements of Government for traceability and disease control, but will also provide a platform from which to develop further added-value services and drive industry initiatives on cattle health and welfare. This paves the way to co-design the Livestock Industry Data Exchange Hub (LIDEH), which was described in the 2016 CHAWG report, at the same time. LIDEH will be the adjunct to LIS, enabling the wider exploitation of industry data, for example for risk-based trading, using a more functional and better-connected government system as the starting point.

In Scotland, the development of the ScotEID[5] multispecies database and identification, registration and movement (IRM) system will continue. A commitment has been made by Scottish Government to include the registration of cattle births, deaths and movements in the system to augment its existing functions of recording sheep and pig movements and its use in recording BVD status and provenance in relation to Scotch beef and BSE eligibility.

Figure 5. Collaborators on the Traceability Design Board

[5] Scottish EID **www.scoteid.com**

5. Farm assurance

There have been considerable changes in farming practices, food retailing and consumer behaviour since the launch of farm assurance schemes in the 1980s. Farm assurance schemes continue to evolve and play a major role in driving improvements in animal health and welfare. Assurance schemes initially tended to concentrate on management 'inputs' to the animals on assured farms but, in recent years, there has been a welcome trend towards the introduction of measurements of welfare outcomes. The increasing use of such measures will provide a more animal-focused assessment of the welfare of animals on assured farms. Assurance schemes have also responded positively and promptly to the increasing societal concerns about the risks of antimicrobial resistance. Reducing antimicrobial use is critical to reducing the risk of development of AMR. Active animal health plans and reviewing medicines use are key elements in the drive to reduce use. The aim is to sustainably improve animal health so the need to use antimicrobials to protect animal welfare is minimised.

a. Farm Assured Welsh Livestock

Welsh Lamb and Beef Producers Ltd (WLBP) has owned the Farm Assured Welsh Livestock (FAWL) scheme since 1992, and currently has 7,500 members.

The FAWL scheme standard has been reviewed recently. The most significant change is a requirement, from 1 July 2018, for an annual livestock health and welfare review to be undertaken in conjunction with the farm vet. The five main points for consideration in the review, are:

1. Recurring problems and key issues, making recommendations to improve identified concerns.
2. Medicine records and data, including anthelmintic use, flukicide use, total antibiotic prescribed and utilised, making recommendations for responsible reduction of medicine used, where appropriate.
3. The use of Highest Priority Critically Important Antibiotics (HP-CIAs) and make recommendations for responsible reduction.
4. Prophylactic treatment and make recommendations for alternative disease prevention strategies.
5. Biosecurity.

WLBP has developed a suite of tools that are available free to all their members who are farm-assured. WLBP Farm Records allows members to complete all cattle and sheep registrations, births and deaths, and is linked to BCMS, as well as all the relevant sheep movement databases in the UK. The online Animal Health Planning Tool can be completed by the farmer and accessed by the farm vet for proactive comment, subject to consent from the farmer. The online facility also has the functionality to record medicine purchases and on-farm use. The Medicine Records function generates reports on antibiotic, anthelmintic and vaccine use, and the farm vet can also access this information for review.

As well as online, these features are available through a farm app, which can be used to record information in communication signal black spots, before uploading the information when broadband and mobile phone networks are available.

WLBP works closely with the veterinary profession in Wales and is part of the veterinary delivery partner group Iechyd Da in Mid and South Wales, which delivers statutory TB testing and Gwaredu BVD (Welsh BVD eradication scheme).

b. Red Tractor

Red Tractor carries out a complete review of all its standards every three years, and Version 4 of the standards was introduced in October 2017. Further changes were implemented in June 2018, in response to new targets for antibiotic use set by the industry, and the One Health drive to minimise the development of antimicrobial resistance through responsible use of medicines.

Dairy assurance

The recommendations added in October 2017 regarding responsible use of antibiotics in dairy cows included the requirement to collate usage records annually and use them as part of a wider veterinary review of antibiotics. It is now recommended that milk from cows under statutory withdrawal for antibiotics should not be fed to calves. Recommendations were also added regarding the provision of colostrum, in line with the AHDB Dairy advice on the '3 Qs' – Quantity, Quality and Quickly.

The top five non-conformances that directly concerned dairy animal health and welfare from 1 October 2016 to 30 Sept 2017, were:

1. Housing must be constructed and maintained to provide a safe environment for livestock.
2. An annual herd health and performance review must be undertaken by a vet.
3. Records for all medicines administered must be kept for five years.
4. Health and performance records must be reviewed regularly.
5. Records of the health and performance of livestock must be maintained.

Industry initiative: Red Tractor Dairy Welfare Outcome Assessments

In collaboration with AssureWel, Red Tractor introduced Welfare Outcome Assessments as part of the assurance assessment in October 2013. Please see Section 6b for more information on AssureWel and assessing cow comfort.

Beef assurance

In June 2018, changes were made to the standards to require that:

- All beef farms have an annual herd health and performance review undertaken by the vet
- Highest priority critically important antibiotics (HP-CIA) are used only as a last resort under veterinary direction, as demonstrated by sensitivity or diagnostic testing
- It is recommended that at least one member of staff responsible for administering medicines has undertaken training in handling and administering medicines

The top five non-conformances that directly concerned beef animal health and welfare from 1 October 2016 to 30 September 2017, were:

1. Health and performance records must be regularly reviewed.
2. Records for all medicines administered must be kept for five years.
3. A livestock Health Plan to proactively manage and improve health and welfare of livestock must be established and implemented.
4. Housing must be constructed and maintained in a manner that minimises the risk of injury.
5. Control measures must be in place to minimise the spread of disease within the farm and between other farms.

Industry initiative: Red Tractor lifetime assurance

The delivery of lifetime assurance for beef, where animals must spend their whole lives on an assured farm to carry the Red Tractor logo, rather than the 90 days before slaughter, continues to be an important objective to protect the integrity of the Red Tractor brand. Red Tractor's intention is to work closely with industry to achieve the move to lifetime assurance in a way that does not disrupt supply and is completed within a realistic timescale, at minimum costs to all links in the supply chain – not least farmers. Red Tractor is closely involved, together with other industry collaborators in the development of the Livestock Information Service (LIS), data from which will be key to enabling the delivery of beef lifetime assurance.

c. Quality Meat Scotland

The Quality Meat Scotland (QMS) Cattle & Sheep Assurance Scheme is an essential element in the QMS 'whole chain' consumer assurance programme, which has over 10,000 members. Since 1996, the Scotch Beef brand has held European Protected Geographical Indication (PGI) status and eligible cattle for the brand must have been born, reared and slaughtered in Scotland and spent their entire life on QMS assured holdings. Historically, the Cattle & Sheep Assurance Scheme Standards have been reviewed annually (effective date 1 January 2018). From 2018, the review cycle will move to two years, with an interim review meeting taking place in 2018, and the next formal review in 2019.

There are comprehensive standards in place to ensure the scheme delivers high standards of animal health and welfare. Notable recent additions have been:

- Importance of cattle being kept in a clean and hygienic condition that does not compromise animal welfare or food safety[6]
- Antibiotic collation template
- Animal Health Plan template
- Guidance on the responsible use of antibiotics via the RUMA website[7]

From 1 January 2017 to 31 May 2018 the top five non-compliances that directly concerned the health and welfare of cattle were:

1. Up-to-date medicine administration and disposal records.
2. Relevant Animal Health Plan must be in place for all livestock.
3. Animal Health Plan must be reviewed annually and updated.
4. Livestock accommodation must be well constructed, effectively ventilated and safe.
5. Documented farm biosecurity policy must be in place.

QMS has a close working partnership with the Scottish Society for the Prevention of Cruelty to Animals (Scottish SPCA), Scotland's independent animal welfare charity, to promote high welfare practices within Scotland's livestock industry. Both organisations are committed to ensuring Scotland is recognised as having some of the highest welfare standards in the world, through:

- Farm assessors carrying out joint visits with Scottish SPCA inspectors on members' farms
- Scottish SPCA inspectors visiting members' abattoirs
- Appointments on Standards Setting and Technical Advisory Committees
- Royal Highland Show partnership for the past two years, educating children, parents and teachers on the importance of good animal welfare

[6] Guidance on clean cattle for slaughter **www.foodstandards.gov.scot/downloads/cleanbeefsaf1007.pdf**
[7] Responsible Use of Medicine in Agriculture (RUMA) Alliance **www.ruma.org.uk**

d. RSPCA Assured

In January 2018, the latest iteration of the RSPCA welfare standards for Dairy Cattle, which are the standards used by the 'RSPCA Assured' scheme, were published. Within the document is a new section focusing on transition cow management, as well as new standards relating to both cows at pasture – including a calculation for the minimum number of days required to be at grazing – and the slaughter of pregnant animals in late gestation. There is also a stockperson's summary at the head of the main cattle health and welfare sections, giving an idea of expected outcomes if the standards are fully complied with.

Work is also underway to review and update the RSPCA welfare standards for Beef Cattle and it is expected that the next iteration of these standards will be published in 2019. As of May 2017, welfare outcome assessments have been conducted as part of the scheme's audit of its beef cattle membership, using the AssureWel welfare outcome assessment protocol for Beef Cattle. Welfare outcome assessments have been in place for dairy cattle farms since 2013.

e. Soil Association

The Soil Association currently has around 250 dairy and 800 beef licensees. A recent standard review has checked and strengthened the evidence underpinning the standards, providing clarity about the impact they achieve, simplifying how they are presented and providing practical guidance. Some standards have been brought into line with the EU Organic Regulation where the regulation has improved, or with other legislation, scientific evidence or industry practice where it has developed to a point where the Soil Association standard would make no difference. It is hoped that by harmonising these standards, certification will become more straightforward.

Welfare outcome assessment (as developed by AssureWel) is already fully embedded into the inspection process for dairy and was introduced in May 2017 for beef cattle inspections. With six years of dairy data, it has now become possible to equip inspectors with information that helps them make compliance decisions and give feedback that supports farmers to identify actions that can lead to welfare improvement.

From 1 April 2017 to 31 March 2018, the top non-conformances against EU Organic Regulation or Soil Association higher standards that directly concerned beef animal welfare, were:

- Gaining permission for use of veterinary treatments not approved in Health Plan
- Housing kept in a condition that is likely to cause animals injury
- Overstocking
- Provide cattle with comfortable, clean and dry bedding/resting area

From 1 April 2017 to 31 March 2018, the top non-conformances against EU Organic Regulation or Soil Association higher standards that directly concerned dairy animal welfare, were:

1. Overstocking.
2. Gaining permission for use of veterinary treatments not approved in Health Plan.
3. Provide cattle with comfortable, clean and dry bedding/resting area.

6. Developments in key health and welfare areas

a. Cows' environment

Introduction

A diverse range of systems are in place on British dairy farms. Herds may be housed all year round, kept at pasture all year round or, as most commonly occurs, housed during the winter months and kept at pasture during the grass growing season. Whatever the system, the vast majority of dairy cattle need to be housed at some point through the year due to climate.

AHDB Dairy estimates that 94 per cent of all GB dairy herds and 90 per cent of all GB dairy cows currently have access to pasture[8]. The length of the grazing period, the proportion of the herd with access to pasture and the number of hours the cows spend at pasture each day will vary, as these factors will depend on farm-specific characteristics such as local weather conditions, grazing conditions, and the individual cow's stage of lactation. It is widely acknowledged that the quality of a farm's management and stockmanship has a greater impact on a cow's health and welfare than the type of farm.

This new section in the CHAWG report will look at how cow comfort is assessed, current performance and new developments.

Assessing cow comfort

There are a number of established ways of measuring cow comfort. This includes scoring the cows for mobility, cleanliness, hair loss, lesions, swelling, and monitoring the cows' behaviour. An increasing amount of wearable technology (eg devices fitted to neck collars and leg bands) is now available to assist farmers with monitoring their herd's behaviour.

Dairy cows will spend the majority of the day engaged in three main behaviours: feeding, ruminating and lying down. Under optimal conditions, housed cows will typically spend around 3–5 hours feeding and up to 12–14 hours lying down (some of which will also be spent ruminating), with the remaining time spent on other activities such as drinking, walking, grooming, socialising and being milked.

Deviations from a typical daily 'time budget' such as this may indicate issues with cow comfort and/or herd health – although it is important to note that time budgets can also vary significantly from day to day, cow to cow and farm to farm. An AHDB Dairy-funded research project, undertaken by the Royal Veterinary College and the Evidence Group, used data loggers to record key aspects of cow lying behaviour, such as average daily lying time.

Data were taken from 23 dairy farms in order to establish an industry benchmark for farmers to compare their herds against. The project found that lying behaviour was highly variable: average daily lying time varied from 7.4 to 11.8 hours across the 23 herds and from 2.8 to 16.9 hours across various individual cows[9].

[8] AHDB estimate based on industry available data
[9] AHDB research project assessment of the welfare of dairy cows **dairy.ahdb.org.uk/dairy-cow-welfare-assessment**

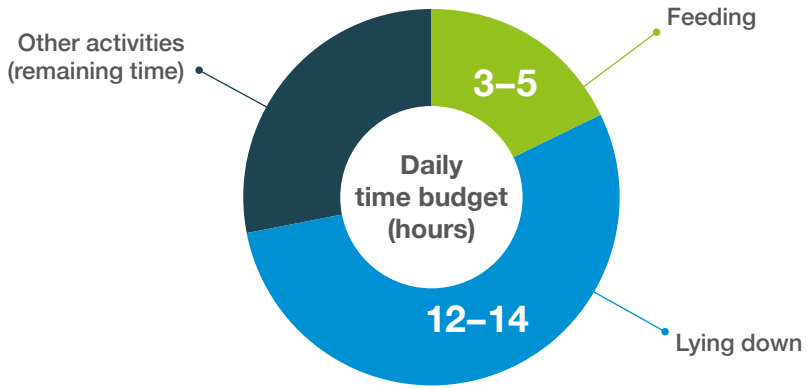


Figure 6. Daily time budget of a housed dairy cow under optimal environmental conditions

Source: AHDB

Industry initiative: AHDB Dairy resources on cow comfort

A number of AHDB Dairy resources are available on monitoring and managing cow comfort. These include Dairy Housing – A Best Practice Guide[10], which includes information on key aspects of housing design, and an online video called Optimising Lying Comfort[11], which features advice on how to optimise the cows' lying surface, lying and rising space, stocking rate and lying time.

b. Dairy cow welfare outcomes

Welfare outcome assessment is a practical and scientifically informed way of assessing and measuring dairy cow welfare and comfort. Measuring welfare outcomes need not only be carried out as part of an official visit by an assessment officer but can also be undertaken by farmers themselves as part of herd management.

Welfare outcome assessments can be used to:

- Assess the level of welfare achieved for an individual animal, farm or farm assurance scheme (eg Red Tractor Assurance, Soil Association Certification and RSPCA assured)
- Help improve farm assurance standards
- Identify and monitor welfare problems and solutions on farm
- Strengthen farm management through self-assessment, feedback and benchmarking
- Provide more reliable and direct assurance of animal welfare through the food chain, including to consumers

Welfare outcome measures include scoring mobility, body condition, hair loss, lesions, swellings and cleanliness. Industry consensus and harmonisation on a range of welfare outcome measures has assisted with the successful roll-out and uptake of these measures as part of farm assurance (Red Tractor Assurance, Soil Association Certification and RSPCA Assured).

[10] Dairy Housing: a Best Practice Guide, AHDB **dairy.ahdb.org.uk/dairy-housing-best-practice-guide**
[11] AHDB Cow Behaviour and Comfort **dairy.ahdb.org.uk/cow-behaviour-and-comfort**

Industry initiative: AssureWel to 'improve lives of millions of British dairy cows'

In 2012, a tool to provide welfare outcome assessments was launched across the UK. This tool was developed as part of the AssureWel project[12], led by the RSPCA, the Soil Association and the University of Bristol. The Soil Association and RSPCA Assured were the first to roll out welfare assessment on dairy farms. In 2013, Red Tractor, which assures 95 per cent of the milk produced in Great Britain, included the welfare measures into all their on-farm dairy assessments. During a Red Tractor assessment on dairy farm, cows are observed by the assessor and scored for mobility, body condition score, hair loss, lesions, swellings and cleanliness. The welfare assessment is now in its fifth year and the data collected is currently being analysed by researchers at the University of Bristol, with the aim of publishing it in the future.

c. Continuous welfare improvement

Continuous welfare improvement is one of the priorities set out in the 2018 Dairy Cattle Welfare Strategy. This is a new priority and the industry's aspiration is to demonstrate a positive 'welfare trend' and provide a basis for future investment and activity.

To ensure the skill set of people working on and with dairy farms is such that it improves dairy cow welfare, there is formal training provision for animal welfare available in the UK for different points within the supply chain – this includes on farm, during transport and at slaughter:

- DairyPro[13] is the industry's training and development hub, which aims to make access to learning easy for farmers and their staff. It is based on Continuing Professional Development (CPD) with points available for accredited learning opportunities and a Dairy Pro Endorsed rating awarded to those exceeding 20 points in a year
- FarmSkills[14] provides courses to farmers on a variety of subjects including mastitis, mobility, foot trimming, nutrition, calving, calf and heifer rearing and cattle handling
- FarmIQ[15] provides practical training courses and e-learning to farmers on a variety of topics around cattle and calf care
- Lantra[16] offers a range of courses including one-day training, integrated training, assessment and qualifications at various levels
- Animal Welfare Training[17] delivers professional welfare courses and training programmes throughout the UK
- Land-based colleges[18] throughout the UK provide training, education and professional development to dairy farmers, their staff and the wider dairy industry

d. Communicating welfare to the general public

A number of initiatives have attempted to narrow the growing knowledge divide between farming, general public and consumers.

Industry initiative: LEAF Open Farm Sunday and Open Farm School Days

Every year, Linking Environment and Farming (LEAF) coordinates Open Farm Sunday, which sees UK farmers open their gates for anyone to discover what farmers do to produce food. In 2017, over 250,000 people visited the 358 farms[19] that opened for the event. Many of these are dairy and beef farms, and provide an opportunity for consumers to better understand how farmers look after their cattle and what good welfare means.

[12] AssureWel **www.assurewel.org**
[13] Dairy Pro **www.dairypro.co.uk**
[14] FarmSkills **www.farmskills.co.uk**
[15] FarmIQ **www.farmiq.co.uk**
[16] Lantra **www.lantra.co.uk**
[17] Animal Welfare Training **www.awtraining.com/AWT**
[18] Land-based colleges **www.landex.org.uk**
[19] LEAF **leafuk.org**

Industry initiative: World Milk Day

World Milk Day celebrates the important contributions of the dairy sector to sustainability, economic development, livelihoods and nutrition. In 2017, the focus in the UK was to enhance understanding of the welfare standards used within the British dairy industry, which enables the British public to consume fresh, delicious and nutritious milk and dairy products throughout the year. The **#happycows** hashtag peaked at top spot on Twitter's list of trending UK topics[20].

Industry initiative: Proud of Dairy

In 2017, the NFU ran a **#ProudofDairy** campaign and asked farmers, advisers, vets and others involved in the dairy industry to showcase why they are proud to work in the dairy industry. The variety of messages included many welfare themes, including managing nutrition, husbandry, vaccines and health planning[21].

e. Research projects and activities

Providing optimum welfare for cattle requires a clear, scientific understanding of the animal's physical and emotional requirements. However, this must sometimes be balanced with public perceptions, which can be based more on emotion and perception than science. A number of industry research programmes aim to uncover both what is best for the animal and how to reconcile this with public perceptions.

As the vast majority of dairy cattle (99 per cent)[22] need to be housed during the winter months, it is paramount to public acceptability that cow comfort, health and welfare can be optimised during this period. Research is integral to informing the development and continuous improvement of animal welfare. In recognition of this, AHDB Dairy has funded a series of research studies from 2017 to 2021 to explore novel approaches to optimising cow welfare, better meeting the behavioural needs of dairy cattle during housing, and examining different public perceptions of housing and milk production.

Industry initiative: Understanding consumer perceptions

AHDB Dairy is funding a PhD at the University of Nottingham to study, for the first time, the consumer perceptions and cultural values surrounding the different ways dairy farming is carried out in the UK. Due to complete in 2021, the study will examine the attributes consumers most – and least – value about how milk is produced, what is responsible for those views, and how the industry can both explain what it does better, or even change the way it farms to make consumers feel more comfortable about its production systems.

f. Body condition

Assurance schemes require farmers to have systems in place to ensure the nutritional needs of the cows are met either by regularly documenting body condition scoring or by creating a feed plan for the milking herd, dry cows, heifers and calves. Condition scoring cows at critical times during their lactation to monitor changes in condition allows better decisions to be made to nutrition.

Cows normally lose body condition during early lactation because appetite takes several weeks longer to peak than their daily milk yields. Until their feed intake increases to the point where their dietary nutrient supply meets their nutrient demand for milk production and maintenance, cows are said to be in 'negative energy balance'. They will lose weight while in this state. The key to avoiding excessive body condition loss after calving is to calve cows down in the optimal body condition and keep them eating an energy and protein-dense diet.

[20] World Milk Day **worldmilkday.org**
[21] Proud of dairy **www.nfuonline.com/sectors/dairy/dairy-news/proudofdairy-success-a-celebration-of-the-secto/**
[22] AHDB Dairy Farmers Intention Survey

All Red Tractor assured dairy farmers must meet the requirements to provide sufficient feed to their cows. The feed plan must be reviewed twice a year, updated as required and kept for two years. Where body condition score is undertaken, the scores are reviewed with the vet as part of the annual herd health and performance review.

There are a number of resources, tools, apps and automatic 3D cameras available to help support farmers with regular scoring and reviewing body condition of their cows[23].

Industry initiative: AIC Feed Adviser Register

The Feed Adviser Register was set up by AIC and the feed sector in response to Government commitments to reduce emissions from livestock. To become registered, feed advisers need to demonstrate their knowledge in areas of animal nutrition, welfare, feed efficiency, animal health and environmental policy. Since the launch of the Feed Adviser Register in 2013, the number of feed advisers have increased annually. The number of registered advisers has increased from 654 in 2013 to over 1,100 in 2018, with 85 per cent of these specialising in cattle[24].

g. Culling and mortality

Dairy cows

Since 2015, the percentage of dairy cows culled or dying 100 days after calving has remained static at 5 per cent, which shows a long-term reduction. On average, cows are exiting the herd at six years of age. The number of lactations achieved when exiting the herd has remained static at 3.6 for the last two consecutive years, even though this is down slightly from 2010.

Table 5. A selection of Key Performance Indicators (KPIs) for the UK national herd 2016 and 2017

Parameter	Target 'Best 25%'				Median			
	2017	2016	2015	2010	2017	2016	2015	2010
Culling rate (%)	21	22	20	18	26	27	24	24
Culling/death rate in first 100 days of lactation (%)	3	4	3	4	5	5	5	7
Age at exit (years)	6.7	6.9	7.0	7.4	6.0	6.1	6.3	6.6
Age at exit by lactations	4.0	4.2	4.2	4.5	3.6	3.6	3.7	3.9
305-day yield (kg)	9,856	10,052	8,813	8,300	8,845	8,911	7,905	7,400

Source: NMR/VEERU

[23] AHDB body condition score guidelines **dairy.ahdb.org.uk/bcs**
[24] AIC Feed Advisor Register **www.feedadviserregister.org.uk/home**

Table 6. Dairy cow culling/leaving reasons – health related

Reason for cows leaving herd (% of leavers)	Kingshay (March 2018)			Kite Health (December 2017)		
	2017	2016	2011	2017	2016	2011
Mastitis/high Somatic Cell Count (SCC)	12.6	13.0	15.4	13.8	14.3	17.6
Not in calf/not seen bulling/ out of calving pattern	28.5	29.0	25.5	28.0	28.1	25.4
Lameness/legs & feet	9.8	8.8	10.4	11.1	11.4	9.4
Aborted	2.4	2.3	21	2.7	2.1	1.7
Accident/trauma/injury	5.5	5.2	5.6	3.7	3.8	4.4
Metabolic disorder	2.2	2.2	3.0	1.6	2.1	2.6
Calving injury/downer cows	3.4	3.8	4.2	3.	3.0	4.4
Infectious disease inc Johne's and TB reactors	8.0	8.4	7.2	5.14	4.5	3.2
Leaving % of total herd	27	26	27	26.2	27	26
Mortality % of total herd	1.6	1.5	1.7	2.7	2.8	3.0

Note: Kingshay data collated April 2016 to March 2017 and Kite data collated January to December 2017

Source: The Kite Health Monitor and Kingshay Dairy Costings Focus Annual Reports

Beef cows

Table 7. Mortality and replacement rates in English beef enterprises

	2017*	2016	2015
Non-SDA suckler herds			
Target	1.3	1.6 (Non-SDA)	2.3 (Non-SDA)
Herd replacement rate (%)	14.5	16.7 (Non-SDA)	17.2 (Non-SDA)
SDA suckler herds			
Cow mortality (%)	1.9	2.3	1.8
Herd replacement rate (%)	14.2	14.2	17
Spring calving suckler herds			
Cow mortality (%)	1.9	1.8	2.4
Herd replacement rate (%)	15.2	17.1	17.9
Autumn calving suckler herds			
Cow mortality (%)	1.1	2.2	2
Herd replacement rate (%)	9.1	14.2	19
Combined breeding/finishing			
Cow mortality (%)	n/a	1.7	2.2
Herd replacement rate (%)	n/a	15.0	18.2
Combined breeding/stores			
Cow mortality (%)	n/a	1.9	3.0
Herd replacement rate (%)	n/a	16.7	20.8
Beef finishing			
Mortality (%)	2.1[#]	1.2[#]	0.9[$]
Beef stores			
Mortality (%)	1.3	0.3	1.1

Source: AHDB Beef & Lamb Stocktake and Farmbench analysis 2015, 2016, 2017, English farms only

Key: SDA = Severely Disadvantaged Area. * Years reflect year of publication, which is one year after the production year to which the data refers. [#] includes all beef finishing system types.

[$] Includes only <16 months beef systems.

This data is taken from AHDB beef enterprise costings work, which includes survey data from a range of English beef production systems[25]. In general, herd replacement rates for the reporting year 2017 were lower than those of 2016. Suckler cow mortality rates showed the same trend in the majority of cases. Mortality rates for beef growing and finishing enterprises were more variable and may reflect a shift in the farms involved in the survey, which change from year to year.

[25] AHDB Beef & Lamb Stocktake report 2016 **beefandlamb.ahdb.org.uk/returns/stocktake**

Table 8. Mortality and replacement rates in Scottish beef enterprises

	2017	2016	2015	2014
Lowground (Non LFA) herds				
Cow mortality (%)	1.3	1.7	2.5	3.0
Herd replacement rate (%)	14	12	15	18
LFA extensive hill suckler herds				
Cow mortality (%)	2.5	2.3	2.3	2.8
Herd replacement rate (%)	14.5	11	11	12
LFA upland suckler producing yearling calves				
Cow mortality (%)	2.5	1.5	1.8	2.3
Herd replacement rate (%)	14.0	12.7	12	16
Rearer finisher herds				
Cow mortality (%)	1.3	1.6	2.8	3.5
Herd replacement rate (%)	13.5	13.6	15	17
Cereal beef finishing (<16 months)				
Mortality (%)	1.6	0.7	1.3	1.0
Forage-based finishing (<22 months)				
Mortality (%)	0.5	0.8	0.8	1.5
Forage-based finishing (>22 months)				
Mortality (%)	0.4	0.4	0.5	0.5

Source: QMS Cattle enterprise profitability in Scotland[26]

[26] QMS data **www.qmscotland.co.uk/sites/default/files/qms_cattlesheep_2016_1.pdf**

h. Mastitis

Individual cow indicators

Individual cow udder health parameters taken from a number of different data sources illustrate a clear improvement in udder health since 2010.

Table 9. Percentage of somatic cell count (SCC) samples from recorded dairy herds, by different criteria

Parameter	NMR				QMMS				TotalVet				CIS			
	2017	2016	2015	2010	2017	2016	2015	2010	2017	2016	2015	2010	2017	2016	2015	2010
Milk Samples SCC > 200,000 cells/ml (%)	19	19	20	24	17	18	18	-	16	17	19	25	17	19	20	24
Dry period new infection rate (%)	14	15	14	16	15	15	16	-	14	14	15	16	14	14	10	10
Dry period cure rate (%)	77	75	75	74	80	76	75	-	77	77	75	72	75	75	74	75
Lactating period new infection rate (%)	7	7	7	-	8	8	8	-	7	7	8	9	8	8	7	8
Lactating period chronic infections (%)	10	10	11	14	8	9	9	-	8	9	11	16	10	11	15	18
Average SCC ('000 cells/ml)	179	185	184	210	-	-	-	-	-	-	-	-	184	202	207	238

Source: 500 National Milk Record (NMR) datasets[27], selected as representative of milk recording herds, analysed by the Veterinary Epidemiology and Economics Research Unit (VEERU) at University of Reading; 140 herds using Quality Milk Management Services Ltd, 650 herds benchmarked using the Total Vet analysis software and 2,500 herds recorded by CIS.

Note: some differences will be due to subtle variations in how each parameter is calculated.

Key: Dry period new infection rate = % of new infections across the dry period; Dry period cure rate = % of cures during the dry period; Lactating period new infection rate = % of new infections at any recording during lactation; Lactating period chronic infections = % of cows remaining above 200,000 cells/ml for more than one recording during lactation.

Somatic cell counts

The data from 2017 continue to show an improving trend in milk quality in terms of somatic cell count (SCC). At herd level, we continue to see an increasing number of herds with low numbers of cows experiencing chronic high SCCs, and more herds with a low bulk tank SCC (below 200,000 cells/ml) with fewer chronic high SCC cows.

Numbers of herds with fewer than 10 per cent chronic high SCC cows has increased from 24 per cent of herds in 2010, to 51 per cent of herds in 2017 (Figure 7). It is notable that only 7 per cent of the herds which have fewer than 10 per cent chronic high SCC cows also have a herd SCC above 200,000 cells/ml (Figure 8). This is compared with the 94 per cent of herds with more than 15 per cent chronic high SCC cows, which also have a herd SCC above 200,000 cells/ml. This suggests bulk tank SCCs can be linked to chronic mastitis cases on many farms.

At cow level, both the average SCC of all milk samples analysed by NMR (185,000 cells/ml in 2017) and the percentage of cows with a low SCC (80.7 per cent in 2017) (Figure 9) continue to fall. We can see that the root of high SCC herds continues to be chronic high SCC cows, with over half (52 per cent in 2017) of the high bulk tank SCC milk samples coming from chronic high SCC cows (Figure 10).

[27] NMR reports 2016 and 2017 **www.nmr.co.uk/uploads/files/files/NMR500Herds-Report-2016.pdf** **www.nmr.co.uk/uploads/files/files/NMR500Herds-Report2017.pdf**

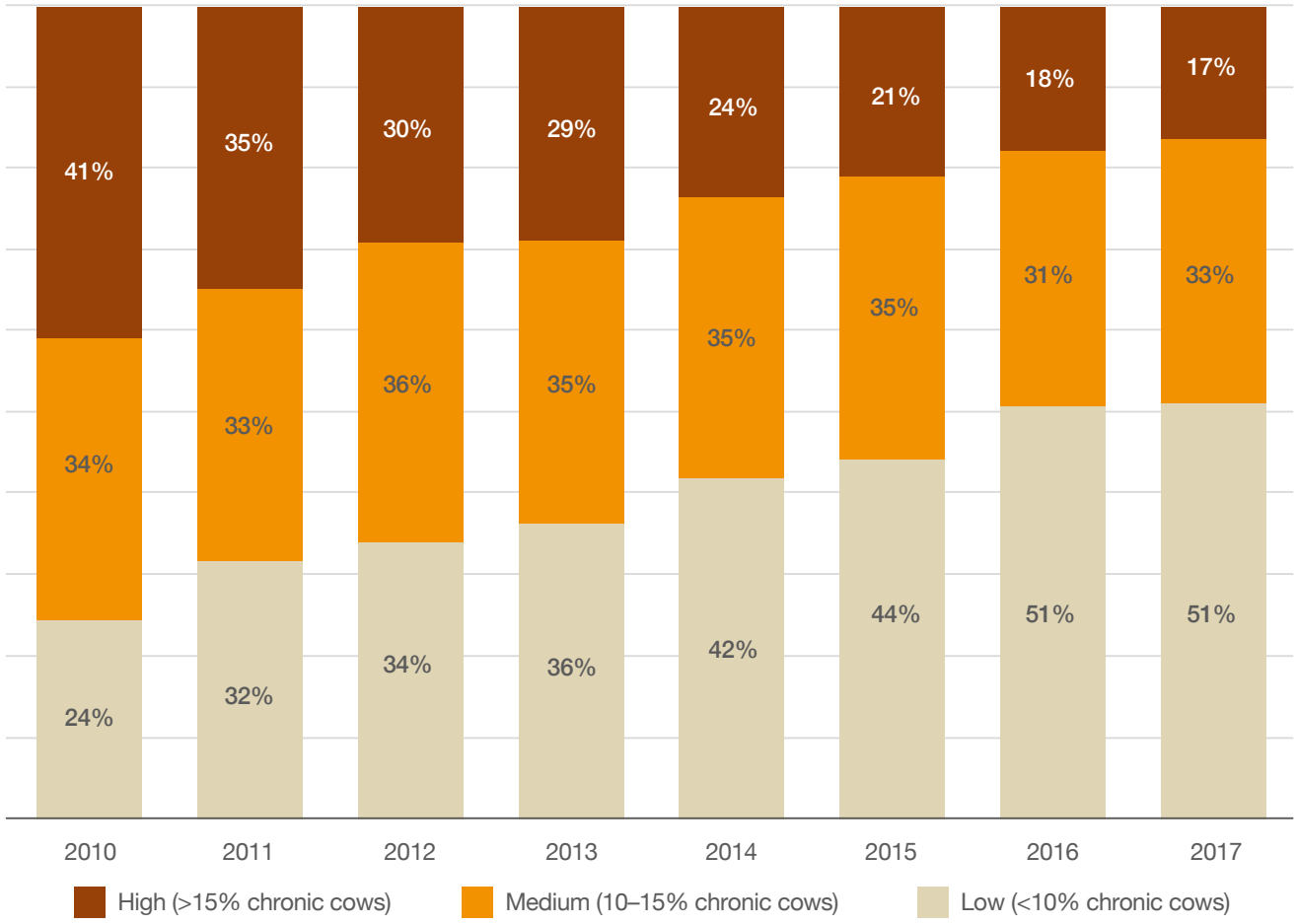


Figure 7. Change over time in the distribution of high, medium and low levels of chronically infected cows (with more than one SCC > 200,000 cells/ml) in the 500 NMR herds

Source: NMR/VEERU as previously

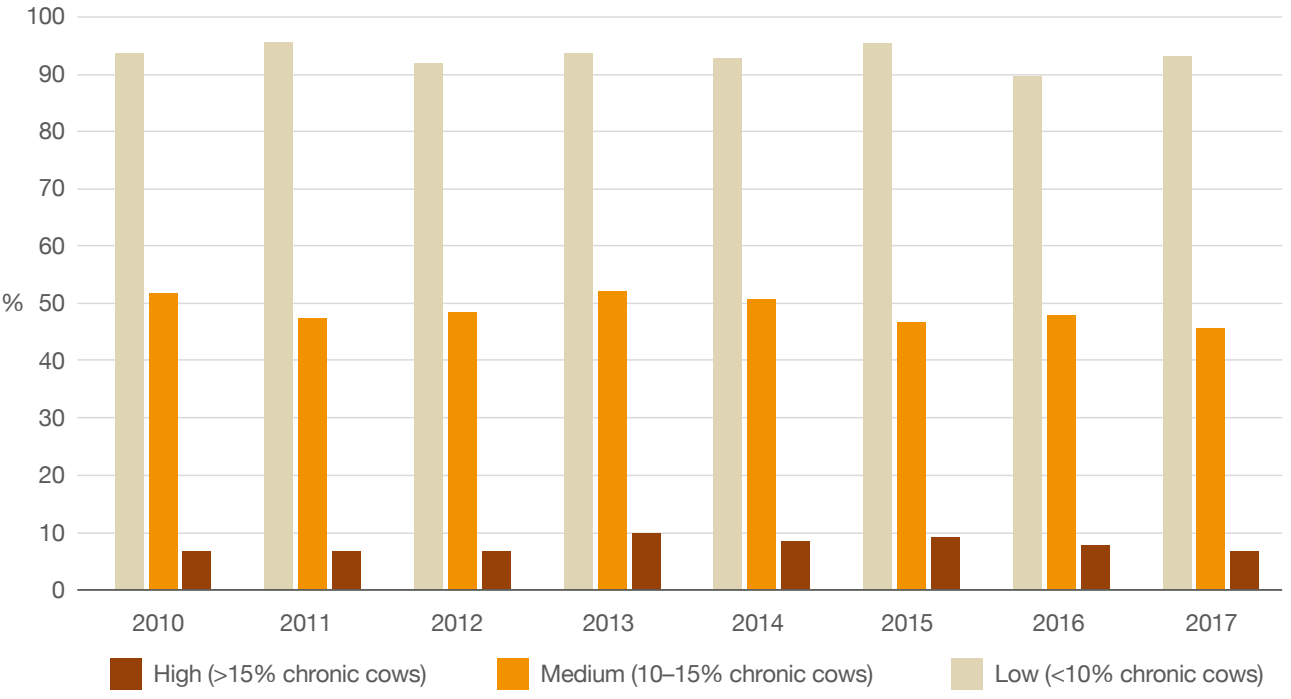


Figure 8. Percentage of herds with low herd SCC grouped by the level of chronic milk samples[+]

Source: NMR/VEERU as previously

Key: [+] Chronic is a milk sample with >=200,000 cells/ml milk

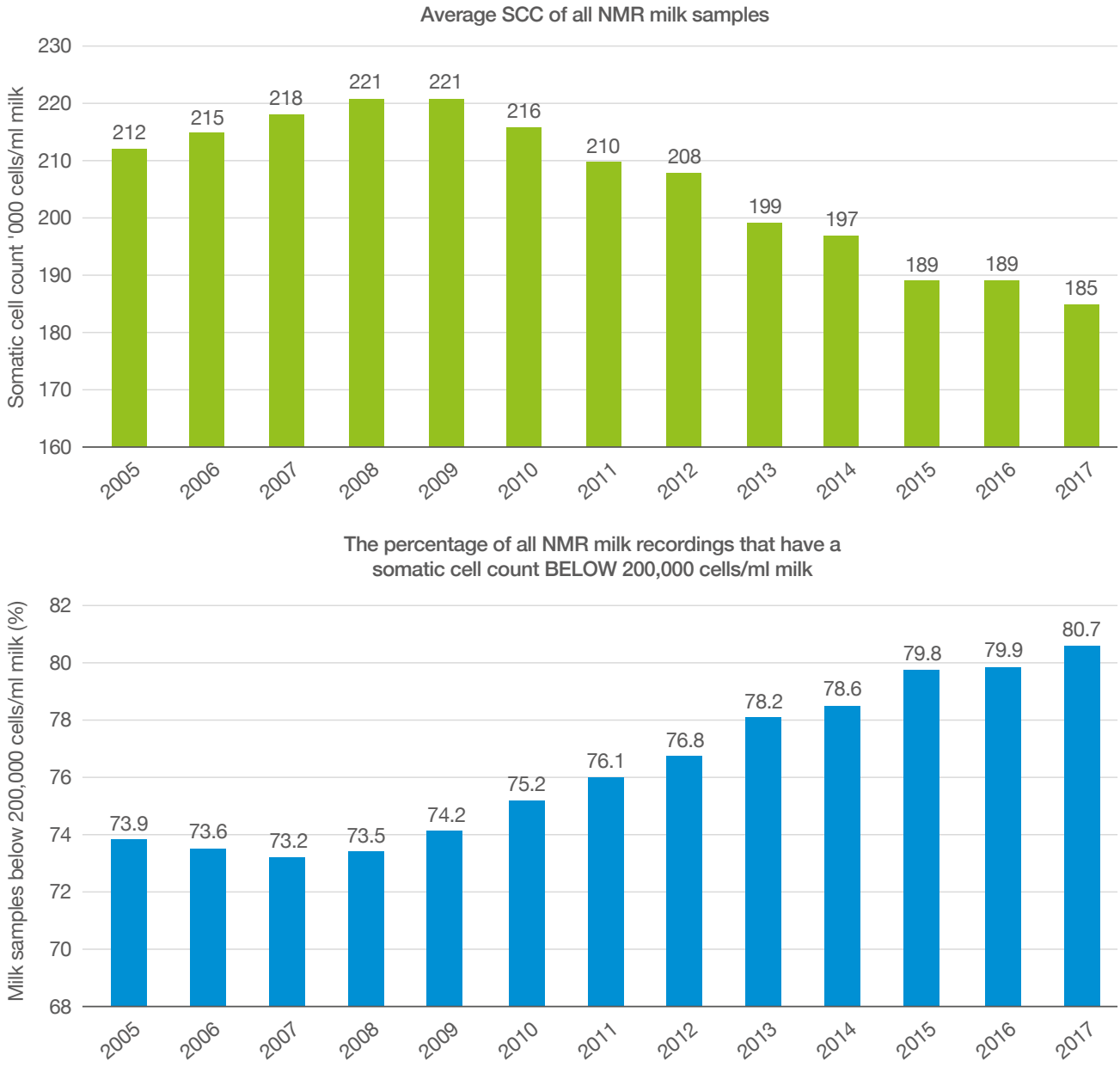


Figure 9. Trends of reducing average herd SCCs and increasing percentages of recordings <200,000 cells/ml

Source: NMR/VEERU as previously

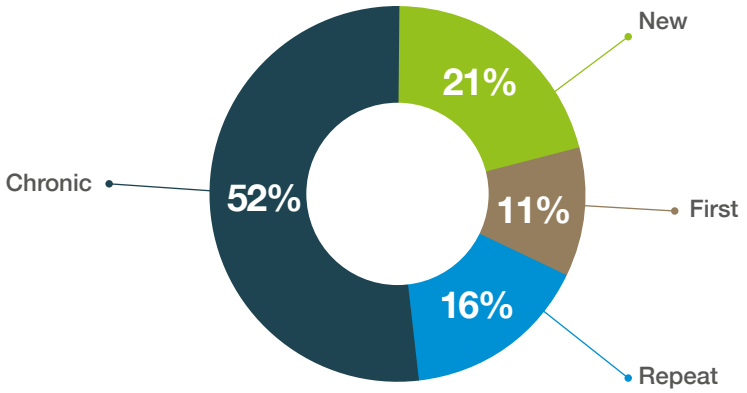


Figure 10. Distribution of high SCC categories from all NMR milk samples taken in 2017

Source: NMR/VEERU as previously

National bulk milk somatic cell count figures, collated by AHDB Dairy in Figure 11, are consistent with the trends already described, and indicate ongoing trend of improvement.

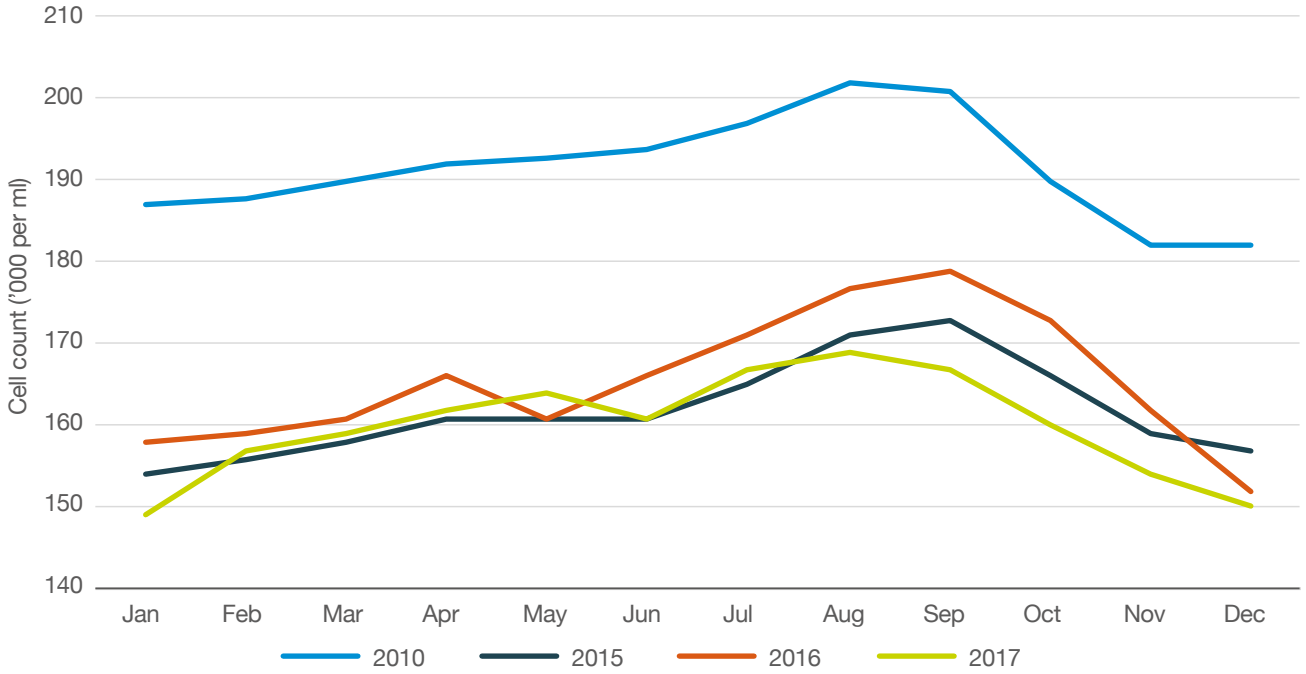


Figure 11. Mean herd bulk milk somatic cell counts 2010 and 2015–2017

Source: AHDB

Results from farm surveys conducted by Kite Consulting and Kingshay also show a year-on-year decline in the herd average incidence rate of clinical mastitis, with current cases ranging from 31 to 41 per 100 cows per year.

Table 10. Mastitis incidence data, cases per 100 cows per year

Year ending	Kite	Kingshay* (March)
2017	31+	41
2016	30*	49
2015	36*	50
2014	42*	52
2013	43*	58

Source: The Kite Health Monitor and Kingshay Dairy Costings Focus Annual Reports

Note: + Data calculated January to December. *Data calculated April to March.

Clinical mastitis

AHDB funding has supported the collation and analysis of udder health data from 218 'Sentinel' herds, which will be followed to assess changes in udder health parameters over time. All of these herds have reliable clinical mastitis data with a wide range of performance. A summary is presented in Table 11. Farm-specific estimates of the cost of clinical and subclinical mastitis are illustrated in Figure 12. Sentinel herds will be an ongoing project.

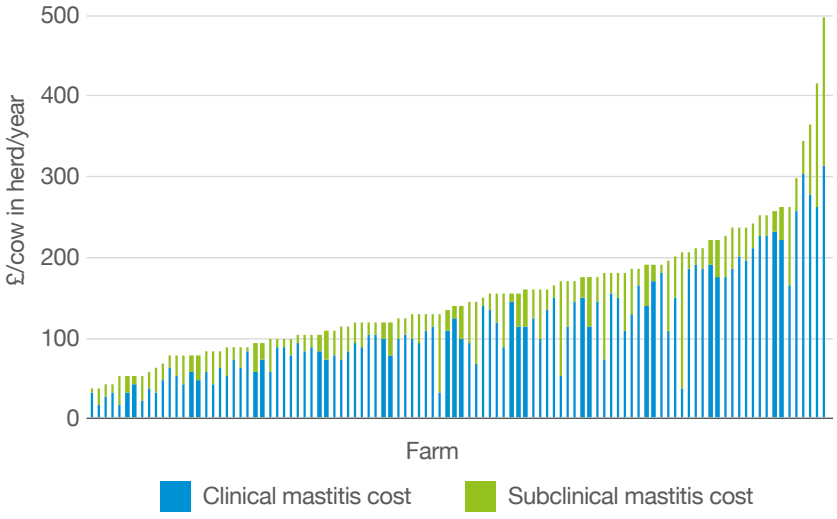
Table 11. Key farm indices and udder health indicators in 218 sentinel herds

Variable	Number of farms	Mean	Median	Percentile		Min	Max
				25th	75th		
Herd size	118	316	252	162	345	63	1492
Annual rolling 305-day yield (litres)	110	8,668	8,806	7,794	9,946	4,323	11,872
Calculated bulk milk SCC ('000/ml)	112	156	138	110	187	39	391
Clinical mastitis (CM) rate (cows affected/ 100 cows/year)	117	38.5	35	22	50	2	123
Quarter CM rate (100 cows/year)	117	42.9	38	24	53	5	128
Dry period origin CM rate (cows in 12)	117	0.87	0.8	0.51	1.17	0	2.86
Lactation origin CM rate (cows in 12)	117	2.2	2.07	1.44	2.8	0.36	6.18
Lactation new infection rate (%)	112	7.9	7.4	5.8	9.4	2.4	23.2
Dry period new infection rate (%)	109	15.9	15.1	10.9	18.9	0	35.7
Dry period cure rate (%)	109	76.9	78	70.6	85.7	0	100
Fresh calver infection rate (%)	109	17.6	16.7	12.5	21.9	0	36.5
% chronically infected	112	9.9	9.4	6.9	12.6	0.8	25.8
% > 200,000 cells/ml	112	17.6	16.9	13.8	21.6	5.4	38.3

Source: AHDB

Note: Data are rolling 12-month figures as of 31 Dec 2016

Key: CM = Clinical Mastitis; Dry period origin CM rate target: ≤ 1 in 12 cows get clinical mastitis in first 30 days of lactation (< 1/cow year at risk); Lactation origin CM rate target: ≤ 2 in 12 cows get clinical mastitis in lactation (approx. < 0.167/month of risk)



Assumptions

Milk price: 30 ppl

BMSCC penalty: 0.6ppl above 300,000 cells/ml

Severe mastitis cases (%): 5

Cows culled for SCC (%): 25

Feed and fertiliser cost: 1ppl/1000L

Source: AHDB

Figure 12. Costs of mastitis for sentinel herds

Industry initiative: AHDB Dairy Mastitis Control Plan and beyond

The AHDB Dairy Mastitis Control Plan (DMCP), developed in GB, is an effective, evidence-based, nationwide plan for mastitis control that has been shown to have excellent clinical efficacy[28]. In 2017, the operation of the AHDB Dairy Mastitis Control Plan moved towards a more self-supporting model, with reduced funding from AHDB, enhanced by payment of annual subscriptions by Plan Deliverers (vets and consultants qualified to deliver the DMCP). Some 57 veterinary practices and three consultancy businesses subscribed to the scheme, with a total of 86 active Plan Deliverers between them, providing a well-distributed network of support for farms across the country. Training of new Plan Deliverers continued, with 15 new recruits during 2017.

A survey of Plan Deliverers suggests that the principles of the DMCP have been used in practices/ businesses that work with approximately 45 per cent of the national dairy herd.

Industry support to improve udder health

In February 2018, an industry-wide stakeholder meeting, led by the DMCP management group and supported by AHDB Dairy, was convened. The aim was to discuss a concerted cross-industry campaign to improve udder health. This was stimulated by the large emphasis on mastitis control in the antibiotic reduction targets that were published by the Targets Task Force, facilitated by the Responsible Use of Medicines in Agriculture (RUMA) Alliance in October 2017[29].

Of the six targets for the dairy sector, four are directly linked to mastitis control, and the remaining two – HP-CIA injectable usage and total usage – are heavily influenced by mastitis treatment choices.

Thirty-eight organisations were represented at this meeting, all of which were prepared to support an industry-wide campaign to improve mastitis control in British dairy herds. The DMCP was perceived as a ‘gold standard’ approach to mastitis control. It was recognised that any campaign should also promote a lower tier of activity, which would be easily accessible to all dairy farms. There is undoubtedly a clear appetite, under the banner of reducing the risk of antimicrobial resistance, for a concerted activity to improve udder health. The details of the initiative are still to be finalised, with the aim of a campaign launch in late 2018.

Industry initiative: Mastitis index

In 2017, the dairy industry launched a new Mastitis index[30] to bolster herd resistance. Farmers can use this information to influence breeding decisions and improve the udder health of their herd.

Since the 1990s, farmers have been able to select bulls with favourable genetics for SCC and have made substantial progress in reducing SCC, which is evident by the falling national SCC figures. Despite this favourable trend, there are still bulls on the market that breed daughters with a low SCC but whose daughters still have an increased susceptibility to clinical mastitis.

To address this concern, the new Mastitis index will complement the existing SCC index and will allow farmers to identify and use bulls on their herd, which will both reduce cases of mastitis and reduce SCC. To achieve this, AHDB Dairy has used extensive national records from all of the UK’s milk recording organisations to assess the degree to which each bull’s daughters are able to resist mastitis and, from that information, has established a breeding pattern for every bull.

[28] Mastitis Control Plan **www.mastitiscontrolplan.co.uk**, Green et al, 2007
[29] RUMA Targets Task Force report **www.ruma.org.uk/wp-content/uploads/2017/10/RUMA-Targets-Task-Force-Report-2017-FINAL.pdf**
[30] AHDB Mastitis factsheet **dairy.ahdb.org.uk/mastitis-fact-sheet**

i. Fertility and breeding

Dairy overview

Data from a number of sources suggest that average reproductive performance in British dairy herds has improved over the past five years. For example, median '100-day in calf' rate in 500 herds recorded with NMR increased from 27 per cent to 35 per cent from 2012 to 2017[31].

A slightly larger benchmarking dataset of herds analysed with the TotalVet software package had a marginally lower median but, again, showed recent improvement (29 per cent, up from 25 per cent in 2015)[32]. Both datasets suggest this improvement has largely been driven by better/earlier submission for insemination (especially for first service), while conception rate has remained relatively static.

However, the likely selection bias in such data sources should be borne in mind while interpreting this information. Relatively good quality fertility records are required to calculate most performance indicators, and it is likely these sources represent performance in better-recorded herds only. It is plausible that these herds may be better managed generally or have more focus on reproduction than the general population of UK herds.

Table 12. A selection of key performance indicators (KPIs) for the UK national dairy herd 2017 (Holstein Friesians)

Parameter	Target 'Best 25%'				Median			
	2017	2016	2015	2010	2017	2016	2015	2010
Percentage conceived 100 days after calving	41	41	39	33	35	33	32	26
Calving to first service interval (days)	69	71	71	87	81	82	80	105
Calving interval (days)	389	393	396	409	402	407	410	424
Age at first calving (years)	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.4
Conception rate (%)	41	40	39	40	34	34	32	32
Percentage eligible for service that were served	49	49	41	37	38	38	33	27
Percentage eligible for service that conceived	18	17	15	13	14	13	11	9

Source: NMR/VEERU

[31] Key Performance Indicators for the UK national dairy herd (Hanks & Kossaibati, University of Reading, 2017) **www.nmr.co.uk/software/interherd-kpi-study-2017**

[32] TotalVet user benchmarking **www.total-vet.co.uk**

Dairy calving interval and age at first calving

Both calving interval and age at first calving are steadily reducing in the UK pedigree Holstein population. The mean calving interval for UK bred pedigree Holstein females has fallen since peaking at 432 days in 2009 and was down to 405 days in 2017 (Figure 13). The aspiration of the Dairy Cattle Welfare Strategy is to move positively towards a calving interval of 400 days. Over the same period, the mean 305-day lactation milk yield has increased by 6 per cent (Table 13). Mean calving interval among the pedigree Holstein population is now back down to levels last seen in the year 2001.

In recent years, age at first calving has also decreased. Pedigree Holstein females born in 2012 calved, on average, 1.3 months earlier than those born five years earlier in 2007 (Table 14). While the majority (76 per cent) of females have their first calf from 24 to 34 months of age, a considerable number (10 per cent) do not calve before three years of age (Figure 15). In 2007, the most common age at first calving was 29 months but, by 2012, this was 28 months (Table 14).

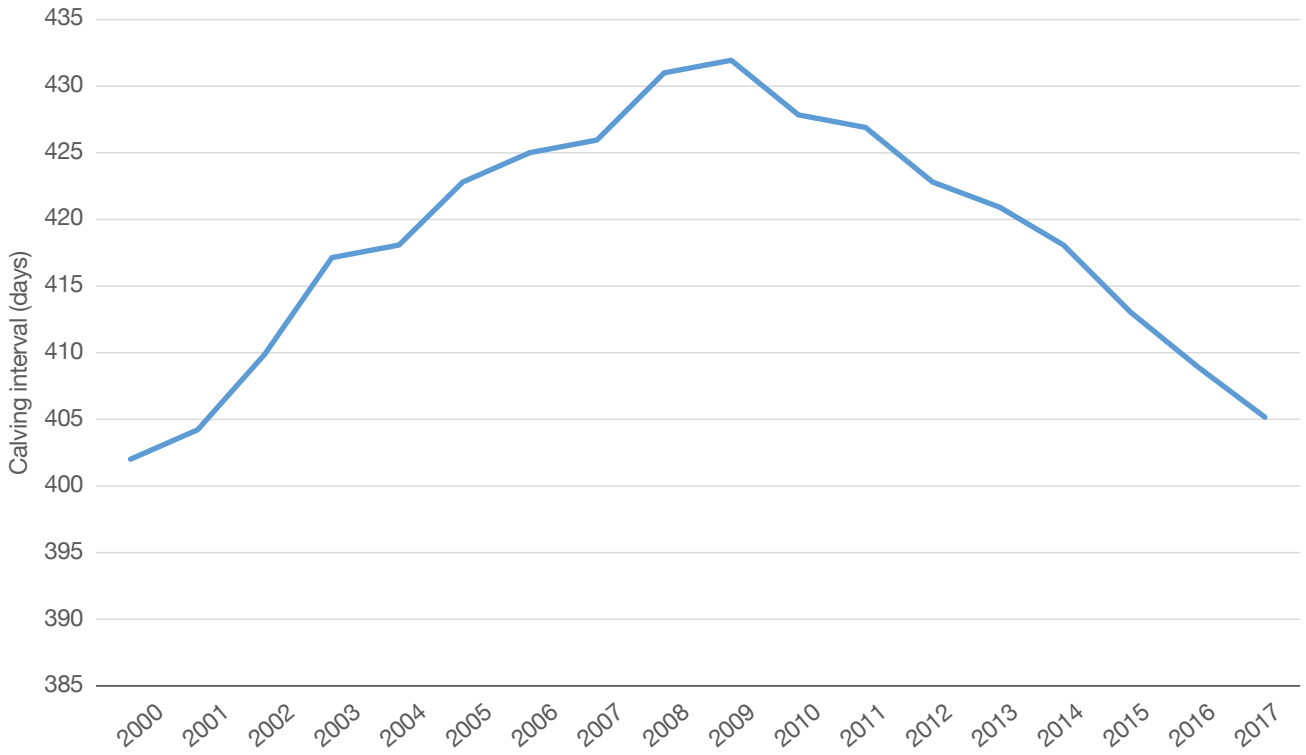


Figure 13. Mean calving interval for Holstein females that have had a minimum of two calves and completed at least 305 days in each lactation within the year stated

Source: National Bovine Data Centre (**nbdc.uk**)

Table 13. Mean calving interval and mean 305-day lactation milk yield of Holstein females that have had a minimum of two calves and completed at least 305 days in each lactation.

Year	Number of lactations	Milk yield (Kg)	Calving interval (Days)
2000	476,525	7,637	402
2001	451,686	7,851	404
2002	446,434	8,200	410
2003	459,245	8,379	417
2004	447,862	8,563	418
2005	440,457	8,651	423
2006	424,495	8,719	425
2007	484,073	8,705	426
2008	487,610	8,765	431
2009	443,740	8,733	432
2010	404,620	8,868	428
2011	419,120	9,080	427
2012	453,237	9,091	423
2013	458,819	8,864	421
2014	465,754	9,239	418
2015	477,006	9,267	413
2016	462,322	9,312	409
2017	446,037	9,256	405

Source: National Bovine Data Centre (**nbdc.uk**)

Table 14. Mean age at first calving of pedigree Holstein females by year of birth

Year of birth	Mean age at first calving (days)	Mean age at first calving (months)
2007	890	29.2
2008	877	28.8
2009	868	28.5
2010	858	28.2
2011	862	28.3
2012	849	27.9

Source: National Bovine Data Centre (**nbdc.uk**)

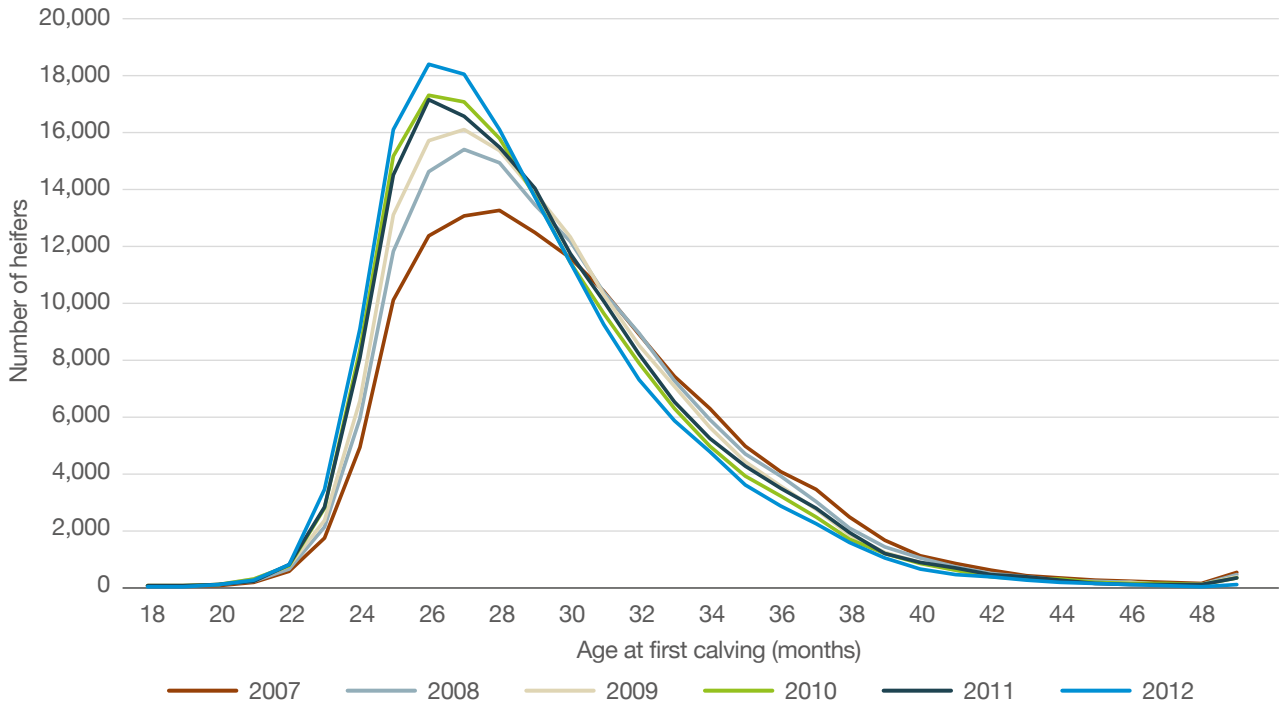


Figure 14. Age at first calving for pedigree Holstein females born from 2007–2012 inclusive

Source: National Bovine Data Centre (**nbdc.uk**)

Industry initiative: Dairy fertility index

Figure 15 shows a positive trend in fertility, specifically calving interval, seen in the UK dairy herd since 2008. This trend can be attributed to a combination of both improved genetics and management. In 2005, AHDB Dairy introduced genetic evaluations for the daughter fertility index. The introduction of the fertility index[33], calculated using fertility data captured through milk recording (NMR, CIS, Dale Farm), has been successful in reversing the decline in fertility observed prior to this information being available to farmers. Alongside this, the industry has seen significant improvement of management practices for fertility, summarised in Table 15.

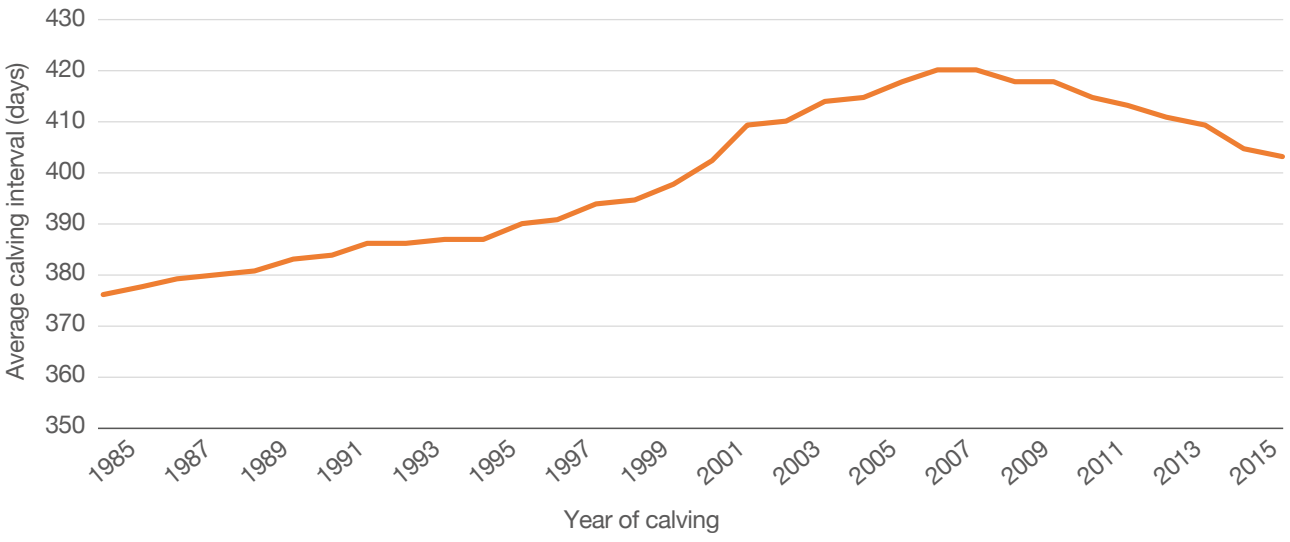


Figure 15. Combined calving interval data

Source: NMR, CIS and Dale Farm

[33] Fertility index factsheet **dairy.ahdb.org.uk/fertility-index-fact-sheet**

Table 15. Advances that have improved fertility

Genetic advances	Improved management practices adopted by industry
Bulls with a better calving interval index have been used by British farmers since its introduction in 2005	Heat detection
	Fertility management
	Genotyping youngstock
	Better decision-making for both farmers and breeding companies through availability of the Fertility Index

Source: AHDB

Industry initiative: Dairy fertility research

Ongoing research funded by AHDB at the University of Nottingham is focused on developing a simulation model for fertility[34]. It aims to allow producers and advisers to evaluate the likely change in a herd's performance resulting from possible alternative strategies to enhance fertility performance. For example, this would allow a farmer to compare the likely net economic benefit of adopting activity monitoring technology for heat detection with that of measures to minimise early lactation negative energy balance, based on existing research evidence. The overall aim is to put the vast body of research knowledge about factors affecting dairy cow fertility more easily within the reach of dairy farmers and their advisers.

Beef overview

Suckler fertility metrics are monitored as part of the AHDB Farmbench[35] (and formerly as part of Stocktake) costings survey work. Farmbench is a new benchmarking system that has been designed to help farmers measure and manage multi-enterprises on a single platform. The transition from Stocktake to Farmbench has disrupted dataflows during 2017, resulting in the data for combined breeding/finishing and breeding/stores enterprises not being reported for that year.

Beef fertility metrics

In general, the performance of suckler herds is very similar in terms of fertility to that in previous years, but there has been a consistent trend to more compact calving periods in non-Severely Disadvantaged Area (non-SDA) herds and in spring calving herds. This is mirrored by a steady increase in the number of cows and heifers calving in the first three weeks of the calving period.

[34] Simulation model for fertility **dairy.ahdb.org.uk/dairy-cow-fertility-project**
[35] Farmbench **farmbench.ahdb.org.uk**

Table 16. Comparison of fertility performance in English beef suckler herds

	2017	2016	2015
Non-SDA			
Cows/heifers scanned in calf (%)	92	91	91
Calves born alive per 100 cows/heifers to bull	88	88	89
Calving period (first to last calf – weeks)	13	15.2	18.2
Cows/heifers calving in first 3 weeks (%)	41	35.1	33.4
Empty cows/heifers (%)	5.6	9.7	7.8
SDA			
Cows/heifers scanned in calf (%)	90	94	86
Calves born alive per 100 cows/heifers to bull	87	90	86
Calving period (first to last calf – weeks)	18	14.1	17.6
Cows/heifers calving in first 3 weeks (%)	37	32.1	31.9
Empty cows/heifers (%)	9.7	7.8	12
Spring calving			
Cows/heifers scanned in calf (%)	91	91	90
Calves born alive per 100 cows/heifers to bull	87	88	88
Calving period (first to last calf – weeks)	14.2	15.3	18.6
Cows/heifers calving in first 3 weeks	39	36.6	35.3
Empty cows/heifers (%)	7.0	10.4	8.7
Autumn calving			
Cows/heifers scanned in calf (%)	89	90	95
Calves born alive per 100 cows/heifers to bull	86	89	92
Calving period (first to last calf – weeks)	15	11.9	14.3
Cows/heifers calving in first 3 weeks (%)	41	33.2	34.6
Empty cows/heifers (%)	11	9.1	5
Combined breeding/finishing			
Cows/heifers scanned in calf (%)	n/a	92	92
Calves born alive per 100 cows/heifers to bull	n/a	90	88
Calving period (first to last calf – weeks)	n/a	15.6	14.4
Cows/heifers calving in first 3 weeks (%)	n/a	33.3	35.3
Empty cows/heifers (%)	n/a	8.5	9.8
Combined breeding/stores			
Cows/heifers scanned in calf (%)	n/a	68	96
Calves born alive per 100 cows/heifers to bull	n/a	86	89
Calving period (first to last calf – weeks)	n/a	11.2	24.5
Cows/heifers calving in first 3 weeks (%)	n/a	36.2	23.6
Empty cows/heifers (%)	n/a	11.2	7.7

Source: AHDB Beef & Lamb Stocktake reports, 2016 and 2017

Note: Data for combined breeding/finishing and breeding/stores enterprises is not available for 2017 due to the transition from Stocktake to Farmbench

Key: SDA = Severely Disadvantaged Area

Table 17. Comparison of fertility performance in Scottish beef suckler herds

	2017	2016	2015	2014
Lowground (Non LFA) suckler herds				
Calves born alive per 100 cows/heifers to bull	90	88	91	86
Empty cows/heifers (%)			7	10
LFA extensive hill suckler herds				
Calves born alive per 100 cows/heifers to bull	91	90	90	92
Empty cows/heifers (%)			5	5
LFA upland suckler producing yearling calves				
Calves born alive per 100 cows/heifers to bull	91	92	90	88
Empty cows/heifers (%)			6	9
Rearer finisher herds				
Calves born alive per 100 cows/heifers to bull	90	89	90	89
Empty cows/heifers (%)			6	8

Source: Quality Meat Scotland

Key: LFA = Less favoured area

National suckler herd fertility metrics, on average, age at first calving and calving interval in England and Wales have been provided by BCMS, and are based on calf birth registration dates. This dataset does not capture calvings where calves die before they are registered, but it provides a useful guide to trends in suckler herd fertility, which is showing a gradual shift towards younger age at first calving for heifers.

Table 18. Average age at first calving and calving interval, England and Wales

Year of first calving	Average age (months)	
	England	Wales
2017	32.8	33.2
2016	32.6	33.5
2015	33.4	33.6
Year of last calving	**Average calving interval (days)**	
	England	Wales
2017	420	426
2016	422	428
2015	424	428

Source: BCMS

j. Mobility

Dairy cattle mobility

Lameness prevalence in dairy cattle still shows wide ranges, as illustrated in the summary in Table 19 from AHDB Dairy. Lame cows are not inevitable, and the problem can be controlled and prevented. Reducing the prevalence of lameness on farm is a priority area in the 2018 Dairy Cattle Welfare Strategy and is a long-term objective of the Dairy Cattle Mobility Steering Group.

Table 19. Estimates of lameness prevalence

Year	Lameness prevalence (%)		Numbers		Location	Reference
	Average (Min–Max)		Dairy herds	Dairy cows		
1989–91	20.6	(2–53.9)	37	11,399	NW & SW England, Wales	Clarkson et al., 1996
2000–01	22.1	(0–50)	53	7,407	SW & Midlands England	Whay et al., 2003
2000–03	15–39		37	2,724	Scotland, England, Wales	Haskell et al., 2006
2002–04	24.2	(6.8–74.2)	28	n/a	SW England	Huxley et al., 2004
2004–06	18	(4–42)	80	28,698	Scotland, England, Wales	Rutherford et al., 2009
2006–07	36.8	(0–79)	205	28,277	SW & Midlands England, Wales	Barker et al., 2010
2010–14	26.7	(3–77)	207	26,289	SW England	Shepherd 2016
2011	18.2	(0–53.5)	92	n/a	England, Wales	Heath et al., 2014
2012–13	32	(0–50)	44	11,800	NW England	RDPE Report 2013*
2013–14	22	(7–42)	51	10,899	South & Midlands England	Collins 2016
2014	30	(7–61)	42	5,620	Midlands England	Remnant et al., 2017
2015–16	31.6	(6–65)	61	14,700	England and Wales	Griffiths et al., 2018

Source: Compiled by AHDB Dairy, based on various sources

Key: n/a = Not available

*Note: Part of a lameness intervention study and lameness prevalences reported are prior to intervention on farm

Industry initiative: Dairy Cattle Mobility Steering Group

The Dairy Cattle Mobility Steering Group[36] endeavours to engage all parts of the dairy industry in achievable, affordable and effective measures to eradicate severe lameness, minimise moderate lameness and maximise mobility on British dairy herds. The group encourages organisations and individuals to develop and implement a structured approach to lameness that allows dairy farmers and their staff to measure, manage and monitor lameness in their herds. The group is actively involved in all of the initiatives described below.

[36] Dairy Cattle Mobility Steering Group **dairy.ahdb.org.uk/dairy-cattle-mobility-steering-group**

Industry initiative: Healthy Feet Programme

The AHDB Healthy Feet Programme[37] is the industry's main vehicle through which a targeted and planned approach to lameness reduction can be applied on individual farms, with the support of experienced and qualified advisers or mobility mentors.

An independent research project (RDPE Report 2013[38]) indicated the value of this approach to farms but uptake has been low since grant-funded support for this intervention was withdrawn from farmers. There is a clear need to re-invigorate a network of current and new mobility mentors and raise awareness of the programme among farmers for the benefits to be more widely shared.

Industry initiative: Registers of Cattle Foot Trimmers

The Cattle Hoofcare Standards Board (CHCSB)[39] was established in 2016 to establish a quality assurance mechanism for a group of trimmers working to industry-leading standards. The register is accessible to all hoof trimmers committed to a set of best-practice standards. To be eligible for registration, trimmers must hold a recognised qualification (City and Guilds NPTC[40] Level 3 Certificate of Competence in cattle foot trimming or Dutch Diploma). Every 18 months, registered trimmers undergo an unannounced inspection on a farm during a trimming session, with assessment of cows trimmed prior to the arrival of an auditor. Several aspects of professionalism are audited, including trimming competency, safety, recording and client communication. An anonymous interview with a client is also conducted.

In 2017, the Register of Cattle Foot Trimmers (ROCFT)[41] was established. Its purpose is to maintain a register of fully licenced cattle foot trimmers for the benefit of cattle owners and related professionals. All fully licenced cattle foot trimmers must take an industry-recognised Check Day exam every two years to remain fully qualified.

The overall aim of the ROCFT and CHCSB is to set a benchmark of quality on which farmers, welfare organisations and other interested parties can rely.

Industry initiative: Register of Mobility Scorers

There have been many initiatives to improve the mobility of the British dairy herd but the lack of reliable and consistent scoring has hampered progress. AHDB Dairy developed the mobility score, which is now accepted as the industry standard for monitoring lameness on farm. In 2017, the Register of Mobility Scorers (RoMS)[42] was set up. This is an independent, self-regulated body, which encourages the widespread use of standardised, independent mobility scoring conducted by trained and accredited scorers on British dairy farms. With over 200 members, RoMS aims to improve the mobility of the British national dairy herd by improving the quality and accuracy of mobility score data provided to producers and their advisers.

[37] AHDB Healthy Feet **dairy.ahdb.org.uk/healthyfeet**
[38] RDPE Report, 2013. **www.reaseheath.ac.uk/wp-content/uploads/2014/02/Cattle-Mobility-Final-report-December-2013.pdf**
[39] Hoof Care Register **www.hoofcareregister.co.uk**
[40] NPTC from City and Guilds **www.hptc.org.uk**
[41] Register of Cattle Foot Trimmers **www.rocft.co.uk**
[42] Register of Mobility Scorers **www.roms.org.uk**

Industry initiative: Lameness advantage index

Farmers can now select bulls whose daughters are less susceptible to lameness by using the lameness advantage index[43]. This genetic index has been available from AHDB Dairy since April 2018 and has been created using data collected by the National Bovine Data Centre (NBDC) for locomotion, feet and legs, bone quality and Digital Dermatitis, along with direct lameness records available through the milk-recording companies NMR and CIS.

The index ranges from -5 per cent (bad) to +5 per cent (good), meaning that 10 per cent fewer daughters that could become lame per lactation can be achieved by picking the +5 per cent lameness advantage bull over the -5 per cent lameness advantage bull. Although heavy selection for improved locomotion and feet and leg conformation has been beneficial thus far, only a moderate genetic correlation exists between these traits and lameness. Lameness advantage has a stronger correlation, therefore using the lameness advantage index on bulls with UK daughters, or genomically evaluated Holsteins, will assist in reducing the lameness situation on UK dairy farms in coming years.

k. Calves and youngstock

Dairy bull calves

The Dairy Cattle Welfare Strategy for GB highlights calf and youngstock survival as a priority. The dairy industry's aspiration is to increase the percentage of dairy bull calves that are used in the food chain, to reduce the number of calves euthanised on farm and the number of calves exported.

The number of dairy bull calves retained in the British beef chain rose from 245,586 in 2006 to 392,473 in 2015 – a rise of 59 per cent[44]. Official estimates indicate that 78 per cent of all male calves born to the GB dairy herd in 2016 were reared for beef in GB (Figures 16 and 17, Table 20). The number of dairy bull calves unregistered and likely to have been euthanised on farm reduced from 84,817 in 2006 to 64,883 in 2013, a reduction of 23 per cent. In this seven-year period, the numbers of dairy calves euthanised on farm as a percentage of those born declined from 21 per cent to 14 per cent. However, in 2014 and 2015, this figure rose to 19 per cent and in 2016, to 22 per cent (Figure 18).

Examining the possible factors behind this, show that grain prices rose simultaneously, making it more difficult to generate margins from cereal-based bull finishing systems. This indicates the challenges farmers face with market volatility, which can very quickly turn a viable enterprise into a loss-making one.

However, the reduction in live exports of calves has been the most noticeable success. The number of calves exported has reduced from 80,700 to less than 2,000, a reduction of 98 per cent from 2006 to 2014. In 2014, less than 0.5 per cent of dairy calves born were exported abroad. The live export trade is negligible compared with 20 years ago and traditional overseas markets have closed down. The 2,000 calves that went to other countries in 2014, compared with the pre-BSE days when 500,000 dairy calves went abroad, shows the progress made.

A number of retailers now ban the euthanising and exporting of dairy bull calves as part of their contract with dairy farmers. Some of these retailers protect their farmers from market volatility by providing a pricing mechanism that is decoupled from the calf market.

There are other positive examples of how the supply chain is trying to develop markets for dairy bull calves. Retailers including the Co-operative, Waitrose and Morrisons now have calf schemes in place to help ensure best practice in the supply chain. Morrisons, for instance, is currently working with Buitelaar[45] as part of its sustainable dairy bull calf scheme, and both the Co-operative[46] and Waitrose[47] have launched

[43] Lameness advantage, AHDB **dairy.ahdb.org.uk/lameness-advantage**
[44] Update on dairy bull calves, CHAWG **beefandlamb.ahdb.org.uk/wp-content/uploads/2018/03/CHAWG-update-on-Dairy-bull-calves-March-2018.pdf**
[45] Buitelaar **www.buit.ie**
[46] Co-operative **www.co-operativefood.co.uk/food-matters/farming-food/animal-welfare**
[47] Waitrose **www.waitrose.com/content/waitrose/en/home/inspiration/about_waitrose/the_waitrose_way/waitrose_animal_welfarecommitments.html**

initiatives that aim to connect their dairy and beef producers to ensure dairy calves are retained in their supply chains for either veal or beef. This aids transparency and traceability and, potentially, allows information on animal performance to be fed back to the farmer.

While the aim of these schemes is to reduce wastage and improve welfare by making use of animals that might otherwise be euthanised at birth, there is recognition of the limited market for certain breeds of dairy bull calves (eg Channel Island) or for farms that are under TB restrictions.

Increased usage of sexed semen is one way of reducing the numbers of bull calves born in the dairy herd. The NFU reported the number of farmers using sexed semen increased from 60 per cent in 2016 to 67 per cent in 2017[48]. Data collected by AHDB Dairy also indicates a steady increase in purchases of Holstein sexed semen over the past six years, from 12.6 per cent to 17.9 per cent of semen sales (Table 21). Sexed semen usage will continue to rise as confidence in the technology grows, more semen is sexed, and the premium over unsexed semen reduces.

TB continues to be the most significant animal health problem facing cattle farmers in England and Wales. The marketing options for calves on TB-restricted dairy herds are limited as they can only be moved to an Approved Finishing Unit (AFU) or to an isolation unit. Calf buying groups such as Blade, Buitelaar and Meadow Quality have relieved some pressure. However, they can only deal with limited numbers, and are usually full to capacity and unable to take on any new herds with a TB breakdown. This is one of the main reasons why some dairy bull calves are euthanised on TB restricted farms as there is a limited market for their sale and, even when sold, the price achieved barely covers the cost of rearing them to that age.

Substantial progress has been made but there is still room for improvement. However, there is optimism over the rise of sexed semen, and farmers will continue to be encouraged to make use of this technology to reduce the number of pure-bred dairy bull calves born.

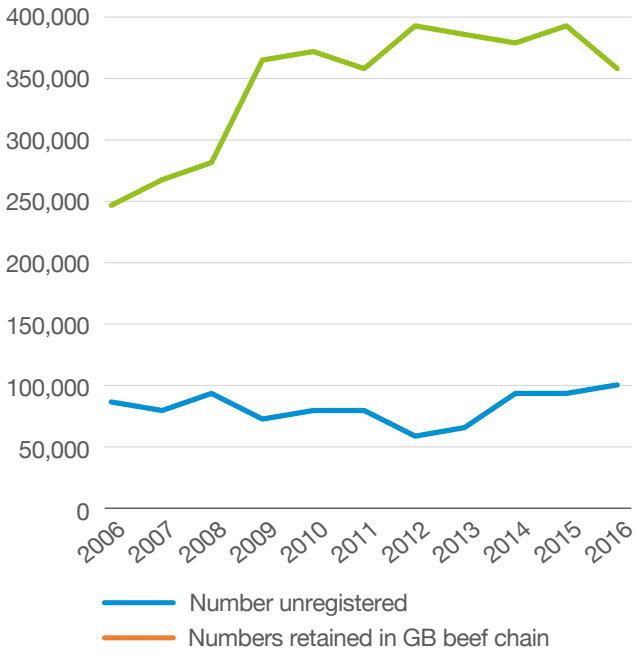


Figure 16. Destination of pure-bred British dairy bull calves 2006–2016

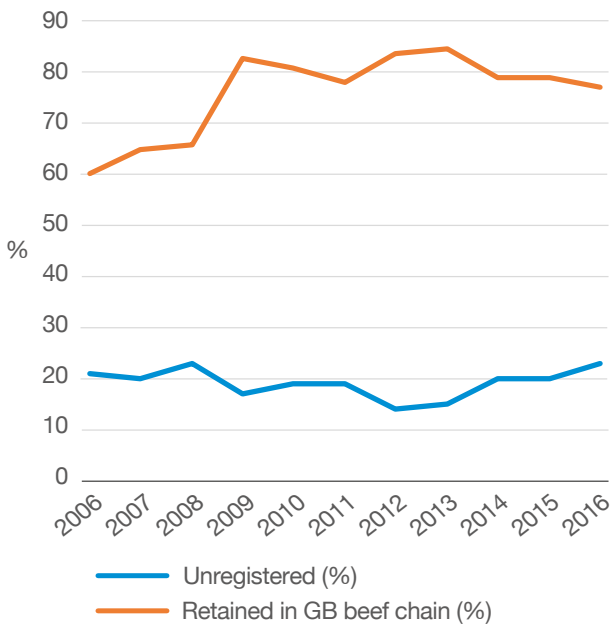


Figure 17. Destination of pure-bred British dairy bull calves 2006–16 as a percentage of total bull calves born in GB

Source: AHDB/BCMS

Note: The number of unregistered dairy bull calves is an estimate

[48] NFU. Dairy Bull Calves Survey. British Farmer & Grower, November 2017: 49

Table 20. Uptake of pure-bred dairy bull calves in the food chain

Year	Number of bull calves retained	Bull calves retained from number born (%)
2006	245,586	60
2007	266,282	65
2008	283,695	66
2009	369,273	84
2010	369,593	82
2011	359,187	79
2012	391,309	86
2013	390,260	85
2014	381,162	80
2015	392,473	81
2016	361,492	78

Source: AHDB/BCMS

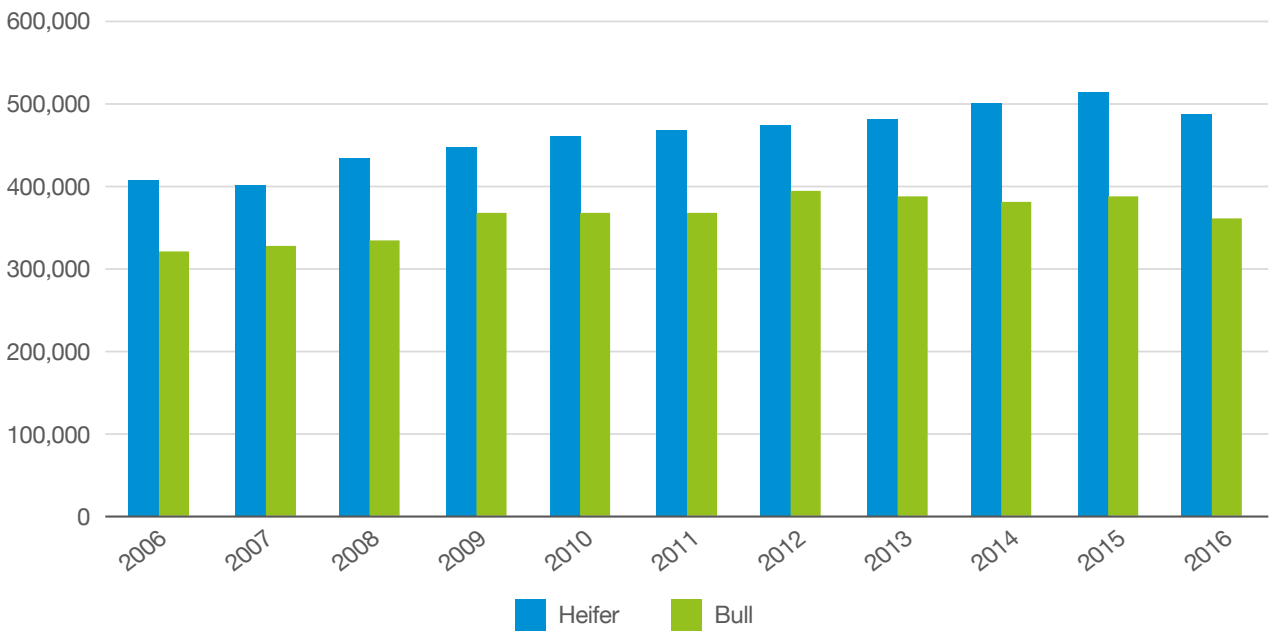


Figure 18. Trends in all dairy calf registrations since 2006

Source: AHDB/BCMS

Table 21. Sexed semen sales as a percentage of total national semen sales

Year	Sexed semen sales as national total (%)
2012	12.3
2013	14.4
2014	15.4
2015	16.6
2016	15.9
2017	17.9

Source: AHDB

Industry initiative: Dairy Bull Calf Forum

It is five years since the Beyond Calf Export Forum published its final report documenting the progress the industry has made on domestically rearing and finishing male dairy calves[49]. In July 2018, CHAWG convened an interactive one-day workshop to discuss the progress industry has made since 2013. The workshop brought together important stakeholders involved in the British beef and dairy supply chain to discuss viable solutions to increase the number of male dairy calves being reared for British beef. CHAWG will report on progress against actions and deliverables.

Industry initiative: Dairy calf survival

A genetic index for calf survival was launched by AHDB Dairy in April 2018. Developed using close to 3 million calf records from the British Cattle Movement Service (BCMS), this new index will allow farmers to select bulls whose progeny have a greater chance of surviving from tagging to 10 months of age. Calf survival is published in addition to the lifespan index, which predicts the survival of animals once they are in the milking herd, and is one of only a few such dairy indexes in the world. The index ranges from -5 per cent (bad) to +5 per cent (good), giving a full 10 per cent difference in survival probability between the worst and best bulls.

Industry initiative: Calf to Calving

In response to a decline in survival and growth rates of youngstock, AHDB Dairy launched Calf to Calving (C2C)[50] in 2016. C2C is designed to help dairy farmers achieve a measured improvement in survival, health and growth of their youngstock. Nearly 70 per cent of participating farmers invested in a device to measure colostrum quality (eg colostrometer or refractometer) or weighing equipment to monitor the growth rates of their calves. One of the key messages to farmers was that regular weighing of young calves is essential. Over the two years of the initiative, there was a threefold increase in farmers measuring growth rate of their calves. Nine out of 10 farmers said that their calf management and performance improved as result of C2C.

[49] Beyond Calf Export Forum **beefandlamb.ahdb.org.uk/wp-content/uploads/2018/05/Beyond-calf-export-forum-report-2013.pdf**

[50] Calf to Calving **dairy.ahdb.org.uk/c2c**

Industry research into dairy calf rearing

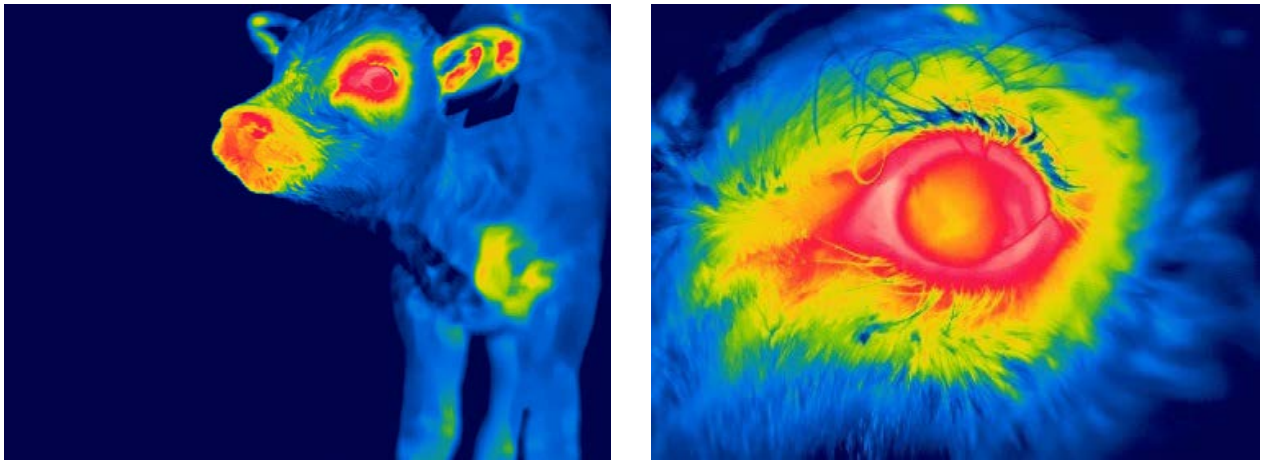
Funded by AHDB, Scotland's Rural College (SRUC) is conducting a project investigating the use of a range of monitoring tools to aid early disease detection in calves and inform the development of alternative health management options[51].

So far, the project has tested a number of monitoring techniques that target different physiological functions including core body temperature, activity, feeding behaviour and feed intake. In each case the equipment has been assessed against stockman's assessment of visual symptoms and a full health score taken daily by trained technicians. The most promising techniques have been selected for use in commercial trials in partnership with Blade Farming Ltd/ABP Food Group. Calves from the commercial trials will be followed through to slaughter to assess the implications of disease in early life on lifelong production efficiency.

The technologies being tested include:

- Automatic calf feeders to provide data on total milk intake per day and feeding behaviour
- Activity data from individual calves using leg-mounted sensors
- Thermal imagery to measure temperature at the inner corner of the eye in order to predict deep body temperature (Figure 19)
- Temperature-sensing ear tags fitted to each calf on entry to the group pens and removed at the start of weaning

Figure 19. Thermal image captured during the project



Source: Scotland's Rural College (SRUC)

During the project huge amounts of data from each calf will be collected with the aim of finding the best early indicators of deteriorating calf health.

Industry initiative: Improved diagnostics of youngstock health problems

AHDB has funded a number of projects to investigate the potential for improved diagnostic tools for calf health problems such as scour and liver fluke infection. Projects at the Universities of Kingston and Liverpool, aim to improve the speed, accuracy and robustness of the diagnostic tests available in order to speed up the timeliness of appropriate treatments being given and consequently reduce overall medicine use. Work is also on-going at the Moredun Research Institute to better understand the options for control of Cryptosporidiosis for which there are currently limited treatment options.

[51] Monitoring calf health, AHDB **beefandlamb.ahdb.org.uk/research/animal-health-and-welfare-beef/monitoring-calf-health/**

Suckler calf mortality

Data from Farm Post Mortems Ltd in County Durham provides details of post-mortem examinations on many of the fallen stock collected from around 8,000 farms in southern Scotland and northern England. The following figures provide a summary of the factors identified behind on-farm mortalities in 2017.

In 2017 there were 180 suckler calf submissions, with a total of 190 carcases examined. The most common diagnoses are shown below.

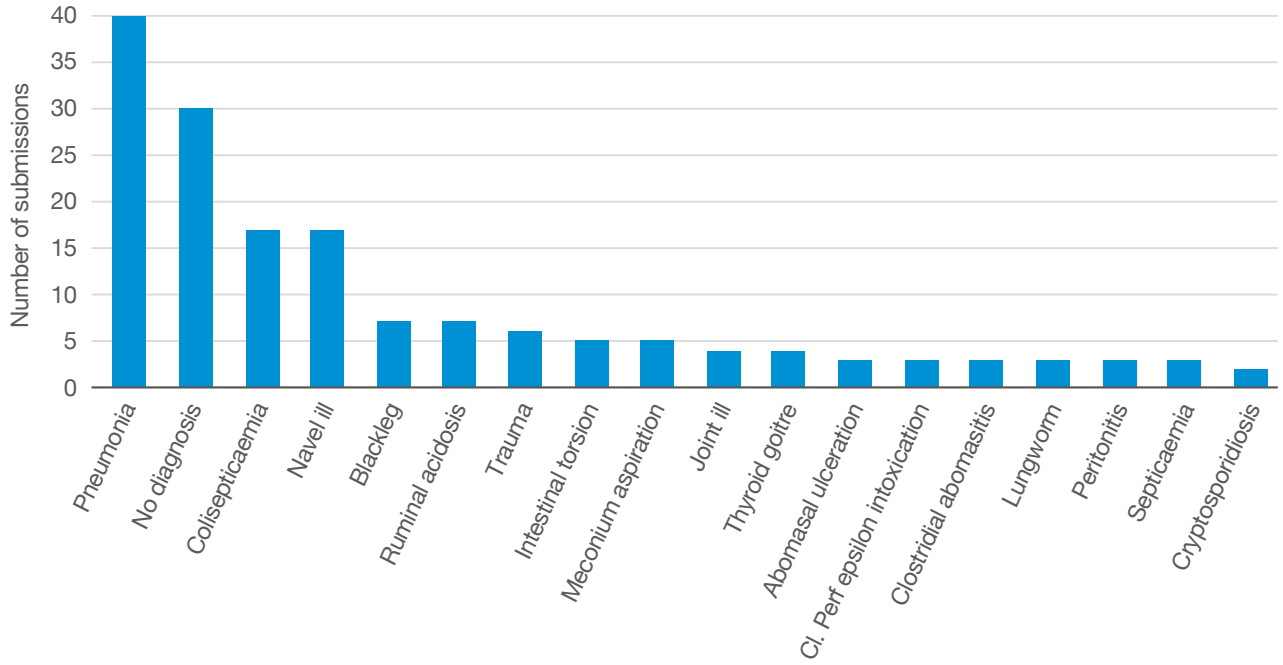


Figure 20. The most common diagnoses in suckler calves (2017)

Source: Farm Post Mortems Ltd

Note: In five submissions where pneumonia was diagnosed, the calves also had copper and selenium deficiency. Trauma cases include fractured limbs and wounds with fatal haemorrhage.

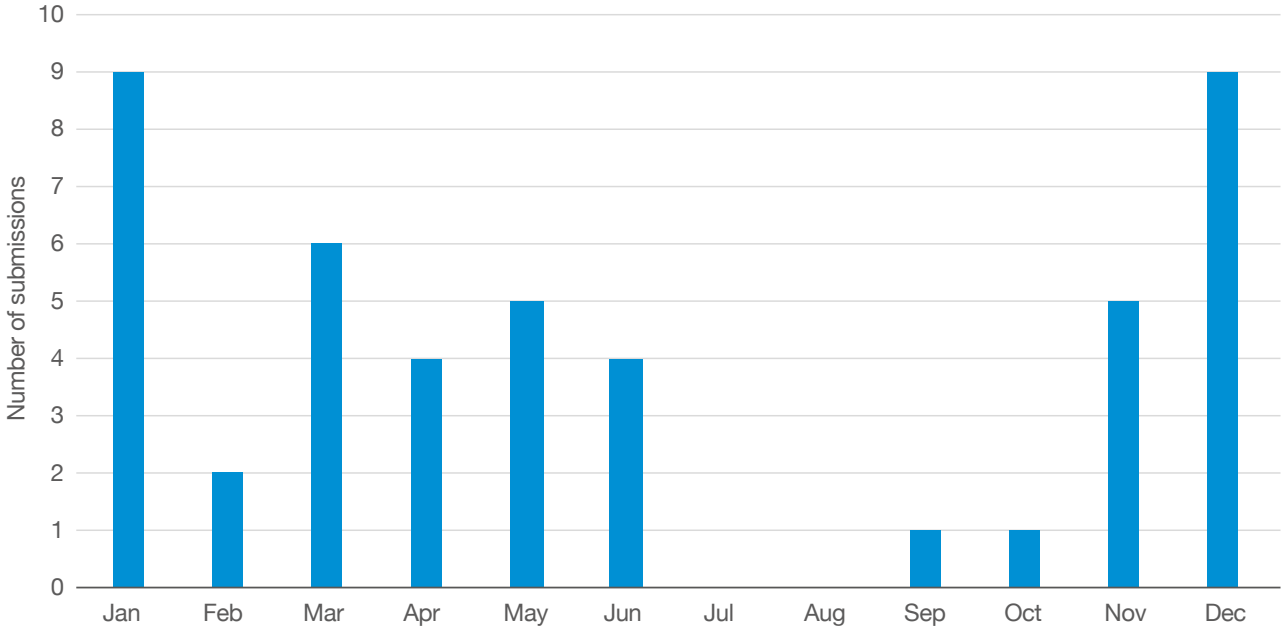


Figure 21. Seasonal distribution of pneumonia in 40 suckler calves (2017)

Source: Farm Post Mortems Ltd

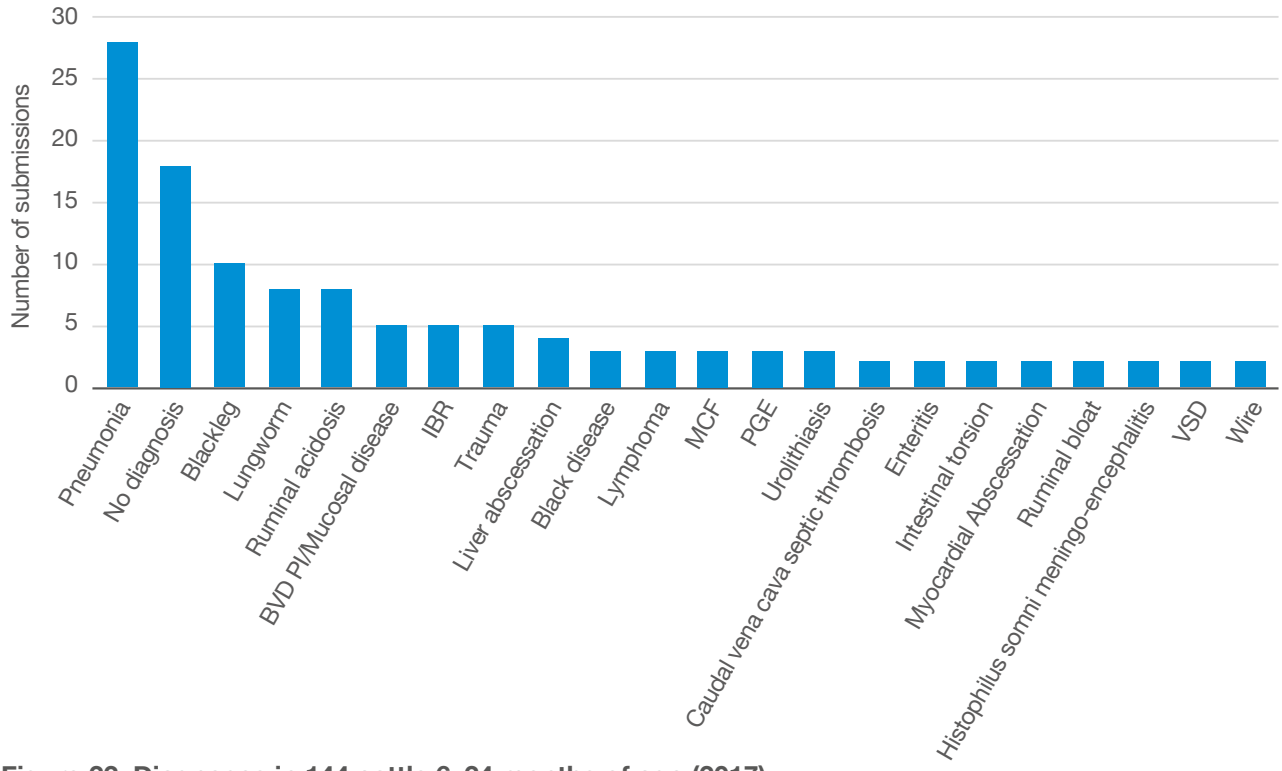


Figure 22. Diagnoses in 144 cattle 6–24 months of age (2017)

Source: Farm Post Mortems Ltd

Key: BVD PI=Bovine Viral Diarrhoea Persistently Infected animal; IBR = Infectious Bovine Rhinotracheitis; MCF = Malignant Catarrhal Fever; PGE = Parasitic gastroenteritis; VSD = Ventricular Septal Defect.

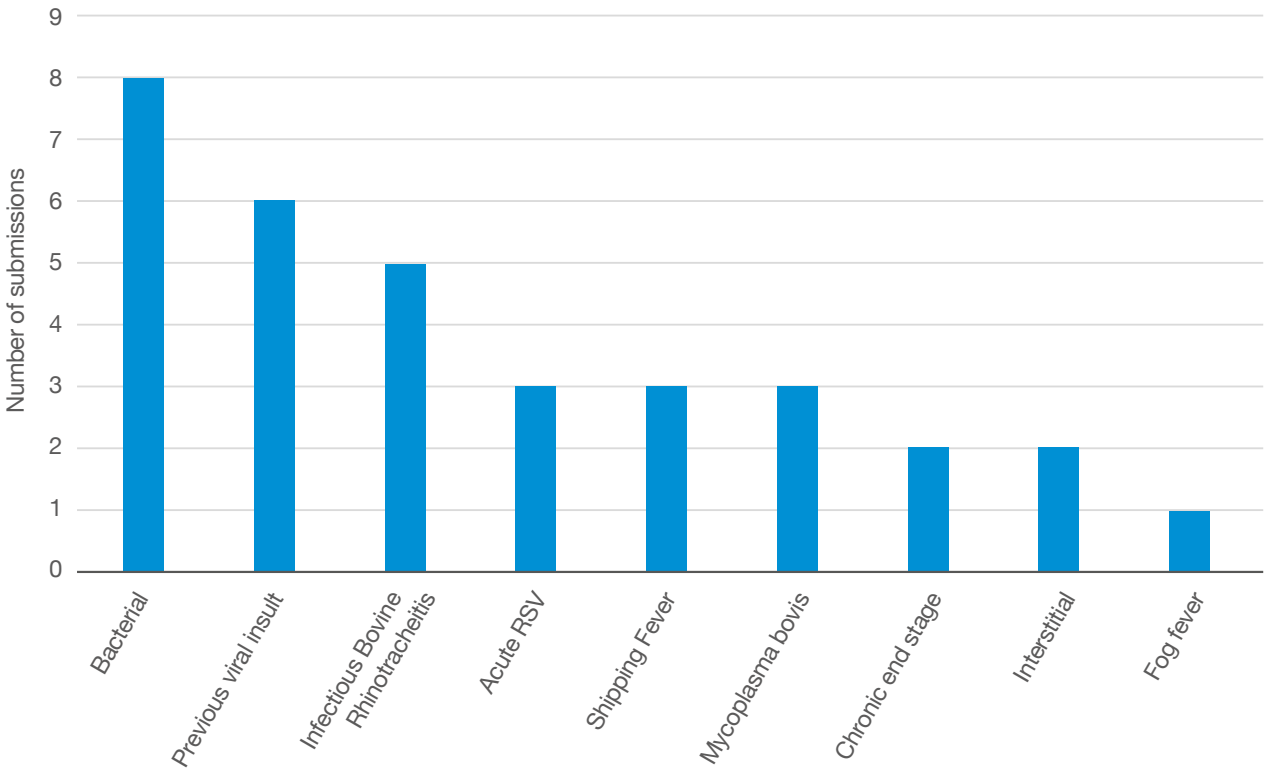


Figure 23. Distribution of causes of pneumonia in 33 cattle 6–24 months (2017)

Source: Farm Post Mortems Ltd

I. Breeding and genetics

Industry initiative: TB Advantage for dairy herds

January 2016 saw a milestone in the UK dairy industry with the publication of the TB Advantage[52], initially for Holstein proven and genomically-tested bulls as well as genomically-tested females, but since 2017, available to all breeds. This genetic index, developed by AHDB Dairy and research partners Edinburgh University, Roslin and Scotland's Rural College (SRUC), was created to help UK farmers breed dairy cows with an improved resistance to bovine TB. TB Advantage, based on data supplied by BCMS and APHA, is the first genetic index of its kind in the world and allows farmers to select for improved genetic resistance to TB in their herd, in addition to their current breeding objectives. This index has a small but favourable relationship with all traits currently in the UK breeding indexes, £PLI (profitable lifetime index) and £SCI (spring calving index), so by selecting bulls with positive TB Advantage there will not be a negative effect on other key traits.

Beef estimated breeding values

Beef producers continue to have access to a range of Estimated Breeding Values (EBVs) for traits of commercial importance, many of which touch upon issues affecting health and welfare.

These genetic evaluations are administered by the beef breed societies and delivered through Breedplan, SRUC and Signet Breeding Services to provide the latest genetic information to commercial bull buyers and users of semen.

Table 22. EBVs linked to different breeding objectives

Breeding objective	Estimated breeding value
Ease of calving	Birth weight Calving ease (both direct and maternal) Gestation length
Growth and carcase	200, 400 and 600 day weights Muscle depth/area Fat depth
Maternal care	200 day milk
Fertility and health	Age at first calving, calving interval, lifespan, scrotal circumference
Cow efficiency	Cow mature size and body condition score
Behaviour	Docility

Source: AHDB

[52] TB Advantage **dairy.ahdb.org.uk/tb-advantage**

Genomic approaches for beef animals

In 2018 the Limousin Cattle Society launched an updated analysis of female fertility traits[53], adopting a genomic approach to the production of EBVs for age at first calving, calving interval and lifespan.

This work is an excellent example of the power of genomics, as these traits tend to have a high economic value but a low heritability, and often very low accuracy values for young animals as these are traits expressed later in life. The use of genomic approaches enables a considerable increase in accuracy when selecting young cattle for breeding, and thus faster potential genetic gain.

The British Limousin Cattle Society has also recently launched the first genomic breeding value for calf survival to weaning[54]. This breeding value is the first of its kind in the UK beef sector and enables producers to distinguish the bloodlines that leave higher proportions of live calves at weaning.

Records from all Limousin-bred calves in Britain are taken from the BCMS database to create genomic estimated breeding values for calf survival from 20 days to 10 months of age. The work was carried out in partnership with Scotland's Rural College and funded jointly by Innovate UK and the Biotechnology and Biological Sciences Research Council (BBSRC). With gross margins reducing by around 6-8 per cent for each one per cent of calves lost in a herd, this trait could make a major difference to the way cattle are bred in the UK.

m. Endemic diseases

Bovine Viral Diarrhoea

BVDFree England

The national voluntary programme to eliminate Bovine Viral Diarrhoea (BVD) virus from all cattle herds in England, BVDFree, was launched on July 1, 2016. At the end of June 2018, after its first 2 full years of operation, BVDFree was working with 1,242 registered cattle holdings in England and 175,537 cattle were covered by the scheme (over nine per cent of the English breeding herd). More than 97,500 individual BVD statuses were online as of this point, all of which are searchable by UK tag number. There were also 369 CHeCS-accredited BVD herd statuses which had been uploaded to the database.

BVDFree launched a 'BVDFree Test Negative' herd status in March 2018. To complement this, a farmer login function will go live later in 2018, allowing farmers to access the BVDFree database and track their herds' progress towards BVD elimination. The aim is to add further value for those farmers who have joined and are participating in the voluntary scheme.

The BVDFree database saw over 15,000 sample results submitted as part of its free upload service. As more BVD test results are reported to the database, BVDFree will be able to create a national picture of BVD prevalence, providing the industry with the data required to help drive market forces and allow cattle keepers to buy with valuable information on BVD status.

Pivotal to the success of the voluntary phase is industry engagement. The backing of vets and vet practices has been key to improving participation in the Scheme. Towcester Farm Vets, Northamptonshire, was awarded 'BVDFree Vet Practice of the Year' at the 2017 British Cattle Veterinary Association Congress. Its proactive approach to BVD as part of the annual herd health planning process resulted in over 60 of its clients registered and tested under the scheme in the first year. The impact of key individual stakeholders on registrations is suggested in Figure 24, which shows the spatial distribution, by county, of BVDFree-registered holdings as of 31 August 2017.

[53] Limousin Cattle Society female fertility traits **limousin.co.uk/gebvs-explained**
[54] Limousin Cattle Society calf survival **limousin.co.uk/gebvs-explained/#1509973846651-0e4808db-bf48**

The success of the BVDFree Scheme in England will depend on two key factors. Firstly, a sufficiently high level of holdings will need to be registered with the scheme and free of BVD to justify making BVD elimination compulsory to protect their investment. Secondly, identification and prompt removal of animals persistently infected with BVD is critical.

At individual farm level, a growing number of herds exist where BVD elimination and/or accreditation has been undertaken, but as many of these are yet to join BVDFree, determining numbers and realising the full benefits offered by a co-ordinated approach remains a challenge. The longer term aim is that with more widespread industry engagement and promotion, BVDFree can make information on BVD status more easily available to buyers and develop market demand for animals free of BVD, thus providing value and tangible benefits for participants.

In June 2018 DEFRA made £5.7 million of funding available to in England through the Rural Development Programme for England (RDPE) for the 'Stamp out BVD' programme. The programme, delivered by SAC Consulting, will pull together 'clusters' of cattle keepers to work together against BVD, by sharing best practice and tackling BVD as a group who share the goal of eradicating the virus from their herds. The funding will also enable farmers to apply for one-to-one farm advisory visits by a veterinary practitioner to investigate BVD at farm level, to carry out appropriate testing and to propose action plans to control and eliminate BVD from their farms.

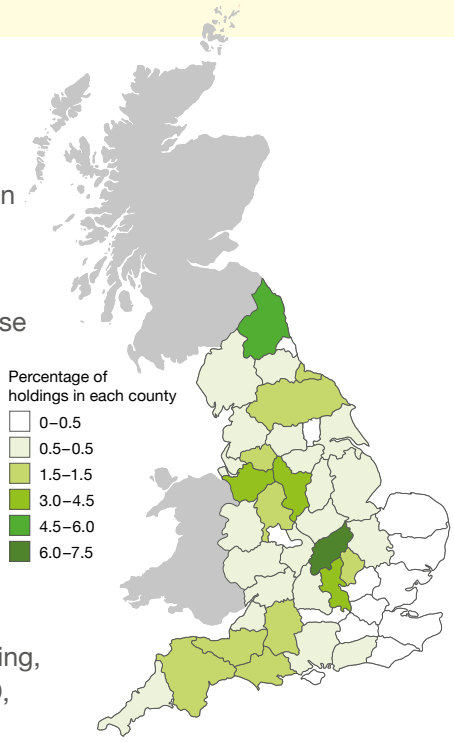


Figure 24. Spatial distribution of BVDFree holdings

Source: BVDFree

The aim of the 'Stamp out BVD' programme is to engage 50 per cent of breeding herd in England (dairy and beef) in BVD control by 2021.

BVD eradication in Scotland

The Scottish Government has, since 2010, supported an ambitious industry-led scheme which aims to eradicate BVD from Scotland[55]. Since the introduction of the BVD eradication scheme, the level of exposure to the disease has reduced from 40 per cent to around 10 per cent of breeding herds having a 'not negative' status. The continual decrease in levels is a strong indication that farmers are taking steps to eliminate the disease where found.

Around 5,200 Persistently Infected (PI) animals have been identified so far since the scheme started, and the vast majority of these animals have now been culled. The results have provided a strong platform to continue, in partnership, to control BVD, and the Scottish Government has congratulated farmers and vets for their participation in the on-going fight against this economically important disease.

There are large regional differences in the levels of exposure to the disease. The map (Figure 25) shows BVD exposure levels by county on the basis of the percentage of breeding herds that have tested 'not-negative'. Those counties with darker areas have a greater level of exposure to the disease, with South West Scotland currently showing the highest levels.

The national eradication plan in Scotland has advanced through four stages, to date. Stage Four, enhanced testing and further movement restrictions, introduced new controls from 1 June 2015 and has been fully implemented from 3 April 2018. This rewards keepers who buy cattle responsibly, and requires anyone bringing in risky animals to test them for BVD or lose their BVD 'negative' herd status. The risky animals are:

- Calves born on Scottish non-breeding holdings that have not been individually tested for BVD
- Cattle moving off a Scottish 'not negative' herd that do not have an individual negative status (either BVD test result or assumed negative from having a calf)
- Cattle without individual BVD test results coming from herds outside Scotland

The full implementation of Phase 4 means an increase in BVD sampling for Scottish keepers who buy risky animals.

[55] BVD eradication in Scotland **gov.scot/Topics/farmingrural/Agriculture/animal-welfare/Diseases/disease/bvd/eradication**

The Scottish Government held a public consultation on Phase 5 of the eradication scheme in autumn 2017. The proposals being considered, developed by the BVD advisory group, target farmers with BVD virus in their herds by increasing mandatory BVD testing and restricting trade, as well as requiring further movement restrictions and increased biosecurity controls. The proposed measures should reduce disease spread within the herd and to neighbouring herds.

The progress to date is due to significant efforts on the part of cattle keepers and their vets to test the Scottish breeding herd, identify sources of BVD infection, and remove them. The phased approach aims to protect their investment of time, effort and expense and is building towards a national cattle herd in Scotland free of BVD.

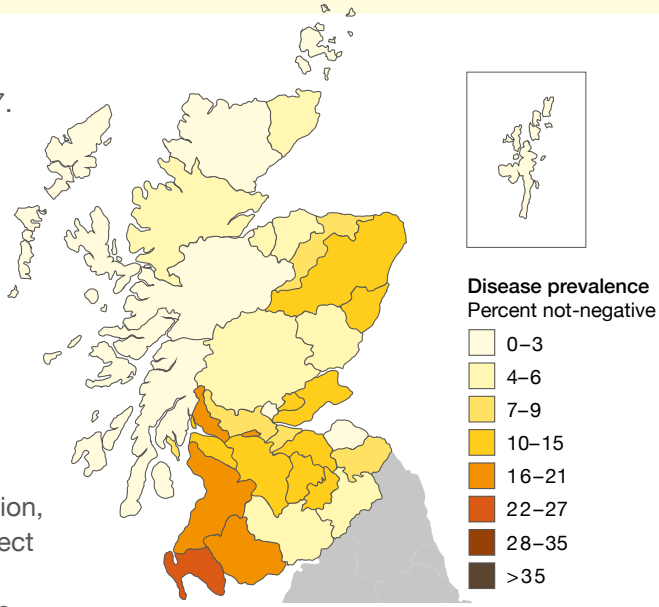


Figure 25. Map of BVD prevalence in Scotland

Source: Scottish Government

Gwaredu BVD

Gwaredu BVD (Eradicating BVD) was launched in September 2017 and is an industry-led programme to eradicate BVD from the Welsh national herd[56].

The voluntary scheme, funded by the Welsh Government's Rural Development Programme, is managed by Coleg Sir Gâr's Agriculture Research Centre in partnership with the Royal Veterinary College (RVC). It delivers on one of the main priorities in the Wales Animal and Health and Welfare Framework Group.

The key approach of Gwaredu BVD is the blood sampling of five youngstock in each management group within the herd. This can be done at any visit by the farm vet but typically happens during the annual TB test. Samples are sent to a laboratory and the results are ready with the reading of the TB test. By testing youngstock, the programme aims to identify herds that have BVD antibodies present on the farm. If the herd test is positive, the farmer can access further support through Gwaredu BVD to find the persistently infected (PI) animals in the herd.

Gwaredu BVD is available to all 11,500 farms in Wales for three years. In the first nine months, over 5,000 herds were tested. Approximately 70 per cent of these herds had negative BVD test results, a strong platform from which to build a national BVD-free herd in Wales.

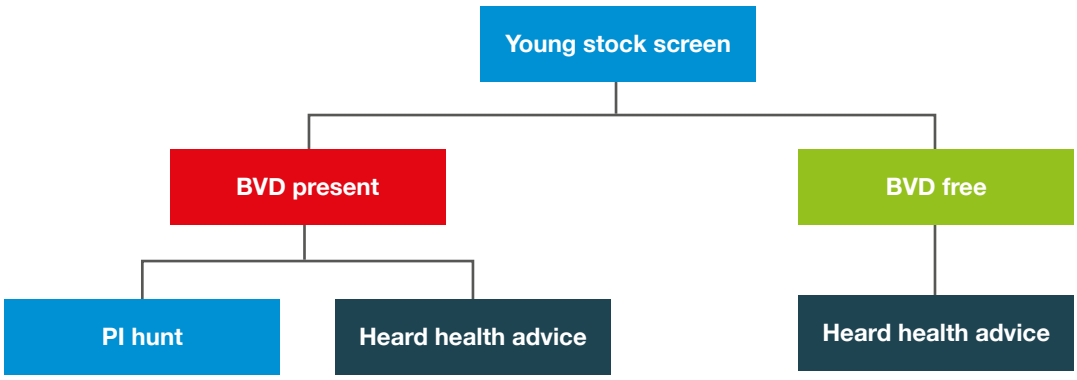


Figure 26. The Gwaredu BVD approach

Source: Gwaredu BVD

[56] Gwaredu BVD **businesswales.gov.wales/farmingconnect/bvd-eradication-plan-wales**

Industry initiative: Action Johne's

The Action Johne's initiative represents the implementation of the National Johne's Management Plan (NJMP) developed by the Action Group on Johne's[57]. The NJMP was developed to help manage and then reduce incidence of Johne's Disease in dairy cattle, as a coordinated initiative for the benefit of the industry.

The Action Group on Johne's has retained focus on engaging farmers rather than on surveillance, encouraged a strategic approach, and developed and endorsed six Johne's Disease control strategies. In addition, the Action Group on Johne's has provided education of vets and farmers with common messages.

In conjunction with BCVA, the Action Group has developed online training and an accreditation process, where vets can gain the status of BCVA Accredited Johne's Veterinary Advisor (BAJVA); over 700 vets have gained this status thus far.

Phase I of the NJMP formally started in April 2015 and primarily focused on education and engagement with industry stakeholders.At the end of Phase I in September 2016, a milk purchaser survey[58] of 16 companies supporting the NJMP was carried out. It indicated that 86 per cent of respondents were testing for the presence of Johne's Disease on farm, with 83 per cent employing a Johne's Disease control strategy.

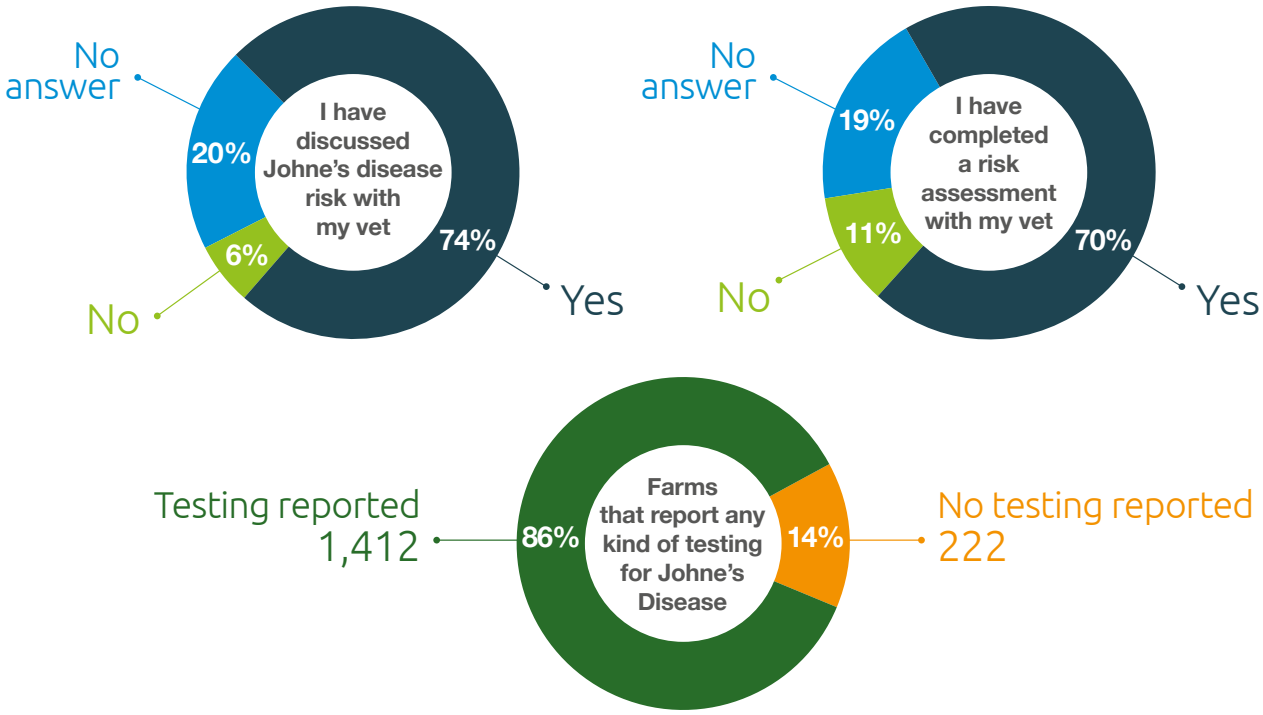


Figure 27. Results of survey conducted by SAC Consulting and collated by SRUC for the Action Group on Johne's

Source: SAC Consulting for Action Group on Johne's

Note: 'No test reported' may imply that no testing is performed, or simply that no answer was provided. The Phase II questionnaire has been designed such that these two options can be distinguished from one another.

[57] Action Group on Johne's **www.actionjohnesuk.org**
[58] Action Group on Johne's Stage One Results Report **www.actionjohnesuk.org/wp-content/uploads/2016/08/Stage-One-Results-and-Learning.pdf**

Table 23. Control strategies report in survey conducted by SAC Consulting and collated by SRUC for the Action Group on Johne's

Strategy	Number	Percent
No current control strategy	300	18
Any current control strategy (at least one of the following)	1,334	82
Specific strategies*		
Biosecurity: protect and monitor	626	38
Improved farm management	227	14
Improved farm management and strategic testing	449	27
Improved farm management, test and cull	377	23
Breed to terminal sire	167	10
Firebreak vaccination	13	1

Source: SAC Consulting for Action Group on Johne's

Key: * These values reflect more than the total number of farm records (more than 100 per cent of all farm records) as some farms reported using more than one strategy.

Phase II was launched in February 2017, and seeks to have 95 per cent of the dairy supply in GB brought into the NJMP by December 2019. To date, 26 milk processor companies are supporting the NJMP, representing 82 per cent of GB milk production. These milk processors require their associated farmers to obtain a signed declaration by a BAJVA annually over three years to confirm the farm has:

- Undertaken to assess their risks and clarify herd status
- Developed a written control plan with the BAJVA, and will be implementing one of the six control strategies specified by the NJMP

By 31 October 2018, participating farmers have to obtain a declaration signed by a BCVA trained Johne's veterinary advisor that they have assessed their risks and herd status and put in place a written Johne's disease management plan.

The Action Group on Johne's is continuing to engage with milk processors, veterinary surgeons, farmer groups and milk recording companies throughout Phase II, and there are deadlines throughout for milk processors to provide information on the number of farmers obtaining veterinary declarations annually. To ensure the NJMP plan is ongoing and for the plan to work and be effective, the risks, status and control plan should be adapted by farmers and their BAJVA.

n. Health at slaughter

Table 24 provides a summary of health issues recorded for beef and dairy cattle ante-mortem and their carcases post-mortem at abattoirs across England and Wales during 2017. Cattle conditions are recorded by Food Standards Agency (FSA) meat inspectors before and after slaughter. Legislation requires the official veterinarian (OV) to carry out an ante-mortem inspection of all animals before slaughter to determine whether there is any sign that welfare has been compromised or of any condition that might adversely affect human or animal health. Similarly, post-mortem inspections are made to minimise any possible risk to public health, animal health or animal welfare.

Table 24. Health issues recorded for cattle ante-mortem and carcases post-mortem at abattoirs across England and Wales during 2017

	Number of carcases	Throughput (%)
Ante-mortem		
Lameness	18,975	1.12
Emaciation/poor condition	7,410	0.44
Mastitis	7,031	0.41
Abnormal respiratory signs	6,226	0.37
Abnormal/localised swelling	3,568	0.21
Diarrhoea	3,029	0.18
Eye conditions	2,086	0.12
Ringworm	1,564	0.09
Dermatitis	1,426	0.08
Trauma	1,069	0.06
Dead on arrival/slaughtered in lairage	805	0.05
Ectoparasites	292	0.02
Post-mortem		
Liver fluke	242,848	14.27
Hepatic damage (scarring and abscesses)	109,773	6.45
Pneumonia/pleurisy	94,681	5.56
Bruising/trauma	22,446	1.32
Abscesses	13,000	0.76
Septicaemia	1,639	0.10
Cysticercus bovis	289	0.02
Total throughput	**1,701,616**	

Source: Food Standard Agency

In May 2016, the FSA carried out a survey[59] on CCTV in abattoirs in England and Wales with all 278 operating abattoirs voluntarily taking part. From this survey, it is estimated that, in England and Wales, 92 per cent of cattle, 96 per cent of pigs, 88 per cent of sheep and 99 per cent poultry throughput comes from premises with some form of CCTV in use.

As of 4 May 2018, it is mandatory for all abattoirs in England to install and operate a CCTV system, in all areas where there are live animals, and to provide unrestricted access to the footage by official veterinarians. Footage must be kept for a minimum of 90 days after the date taken and be available to FSA inspectors.

Although a high percentage of abattoirs in Scotland already have CCTV, there are no rules governing how the footage is used or kept.

In March 2018, the Scottish Government consulted on compulsory CCTV in Scottish abattoirs. In March 2018, the Welsh Government announced a £1.1 million food business investment of grant aid will be made available for small and medium-sized slaughterhouses to install CCTV cameras in Welsh abattoirs.

[59] FSA animal welfare survey **http://webarchive.nationalarchives.gov.uk/20171207164502/www.food.gov.uk/enforcement/sectorrules/animal-welfare/animal-welfare-survey**

7. Responsible use of medicines

a. Minimising disease

The Responsible Use of Medicines in Agriculture (RUMA) Alliance, with the support of the British Cattle Veterinary Association (BCVA), updated its guidelines for cattle in August 2015 and these can be downloaded from the RUMA website[60]. In 2017, RUMA launched the website **www.farmantibiotics.org** as a resource of information about antibiotics and UK farming, providing news, facts, statistics, science and reports. The site also contains best practice case studies and inspiration for farmers who want to work with their vets to ensure they are using antibiotics responsibly.

The key guiding principles for disease control were published in the 2016 CHAWG report, but are reproduced here for ease of reference.

Table 25. Disease control: four guiding principles

Disease control: four guiding principles		
Rule 1	Review biosecurity of new cattle introduced into a herd	Disease spreads around and between farms by contact with other cattle. Screening and monitoring will help to limit the spread of disease. REMEMBER contact can also be INDIRECT by a needle, surgical instrument, manure or people.
Rule 2	Stress is a killer	Stressed animals are far more likely to become diseased. This includes not only obvious physical stress factors, such as overcrowding or management procedures; but also exposure to microorganisms, which cause major stress to the immune system, eg BVD. THINK – if a procedure causes the cattle to become stressed, ask 'can this be done in a less stressful manner?' eg castration, introduction of heifers to the dairy herd.
Rule 3	Good management and hygiene	There is no substitute for good management, hygiene and biosecurity measures. Cleaning buildings and equipment, coupled with good hygiene, will all make a difference. Don't spread disease by poor management and hygiene.
Rule 4	Good nutrition	Good intakes of colostrum provide essential antibodies to protect calves as their immune system is developing. Balanced diets with adequate levels of trace elements, vitamins and antioxidants are essential if the immune system of cattle is to work properly in tackling diseases.

Source: RUMA

b. Antibiotic use in the cattle sector

Tackling antibiotic resistance

Following the publication of the O'Neill Review on Antimicrobial Resistance[61] in May 2016, RUMA announced its intention to set up a Targets Task Force to identify species-specific targets for antibiotic use, in recognition that each livestock sector had different structures and challenges, with a range of starting points for both antibiotic usage and level of stewardship.

When the UK Government issued its official response[62] to the O'Neill report in September 2016, its commitment to reducing the use of antibiotics in farm animals without adverse effects on health and welfare was underpinned by a cross-sector target for antibiotic use in the UK of 50mg/ PCU[63] by 2018, and the need for species-specific targets.

The Targets Task Force became the mechanism by which species-specific targets could be identified, and reduction, refinement and replacement of antibiotics towards the target of 50mg/PCU facilitated.

[60] RUMA guidelines for cattle **www.ruma.org.uk/cattle/responsible-use-antimicrobials-dairy-beef-cattle-production/**
[61] Review on Antimicrobial Resistance **http://amr-review.org/Publications**
[62] Government response to the Review on Antimicrobial Resistance **https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/553471/Gov_response_AMR_Review.pdf**
[63] Population Correction Unit **https://www.gov.uk/government/publications/understanding-the-mgpcu-calculation-used-for-antibiotic-monitoring-in-food-producing-animals**

Industry initiative: RUMA's Targets Task Force

RUMA's Targets Task Force comprised a leading veterinary and farming expert from all main livestock sectors including dairy and beef. The group was announced in May 2016, agreed in October and met for the first time in December that year.

Throughout 2017, the task force members met every two months to report progress and challenge each other, with the intervening time spent discussing the proposals with their sector leaders. The Veterinary Medicines Directorate (VMD), Food Standards Agency (FSA), National Office for Animal Health (NOAH) and Red Tractor observed and supported the process, helping to identify supporting information and validate the approaches taken.

The targets needed to challenge each sector, be underpinned by sound methodology, and be supported by activity plans outlining the necessary steps to deliver the targets. The final Targets Task Force report was published in October 2017 with official recognition from the VMD and Chief Veterinary Officer.

The work of the RUMA Targets Task Force continues. The group oversees the activities within their sector, which are coordinated by the sector subgroups delivering grass-roots projects and farmer engagement to encourage changes in behaviour. RUMA will publish a one-year-on progress report in November 2018.

The work of the Targets Task Force was officially recognised in a GB One Health (ie animal, medical and environmental) capacity when it won the 'Prescribing and Stewardship' category in Public Health England's Antibiotic Guardian Awards 2018.

Antibiotic use targets

The beef and dairy sector targets published in October 2017 are summarised in the following tables.

Table 26. Summary of Beef Sector Targets as set by the RUMA Targets Task Force[64]

Focus 1: Reducing use of antibiotics in the beef sector
1. To reduce national beef sector antibiotic use by 10 per cent or to 10mg/PCU, whichever is lower, by 2020 (accurate baseline data unavailable at time of publishing).
2. Halve use of the highest critically important antibiotics, by 2020 (accurate baseline data unavailable at time of publishing).
3. Monitor use of cattle vaccinations with the aim of a year-on-year increase 2017–2020.
4. Monitor national beef herd health and welfare metrics to ensure any reductions do not impact health and welfare.
Focus 2: Data collection and protocols at farm level
5. Standardise methodology for farm-level benchmarking of antibiotic use by 2020.
Focus 3: Promoting best practice and knowledge exchange
6. Promotion of training at farm and vet level.
7. Dissemination of responsible use of medicine messages.

Source: RUMA

[64] A full copy of the RUMA Targets Task Force report can be found at **www.ruma.org.uk/wp-content/uploads/2017/10/RUMA-Targets-Task-Force-Report-2017-FINAL.pdf**

Table 27. Summary of Dairy Sector Targets as set by the RUMA Targets Task Force

Proposed targets	Baseline figure	Targets 2020	Change (%)
1. HP-CIA injectables (mg/PCU)	1.075*	0.538	-50
2. HP-CIA intramammary use (DCDVet)	0.332*	0.166	-50
3. Intramammary tubes – dry cow (DCDVet)	0.842*	0.674	-20
4. Intramammary tubes – lactating cow (DCDVet)	0.808*	0.727	-10
5. Sealant tube usage (courses)	0.5*	0.7	+40
6. Total usage (mg/PCU)	26.2**	21.0	-20

Source: RUMA

Key: DCDvet=Defined Course Dose for animals, the assumed average dose per kg animal per species per treatment; DDDvet=Defined Dairy Dose for animals, the assumed average dose per kg animal per species per day. *Measured using 2015 UK sales data **Measured using FarmVet Systems survey

Pilot study to collect cattle antimicrobial use data

CHAWG – through its Antimicrobial Use Steering Group – carried out a review of data collection methods in use or development within the industry[65] and then undertook a pilot study with AHDB, the University of Bristol and FarmVet Systems to collect vet sales data that would provide an insight into antibiotic sales within the dairy and beef industry.

The project aimed to collect data from across the UK industry on an unprecedented scale. It highlighted the practical challenges of sourcing and cleaning useable data on any significant scale. The data collected from beef farms in particular highlighted the issue of mixed livestock enterprises and veterinary medicines licensed for mixed use in other species, leading to difficulties allocating the use of prescribed products to specific enterprises.

For this reason, only the dairy data were subsequently published in the 2016 Veterinary Antimicrobial Resistance and Sales Surveillance (VARSS) report[66]. While it was only a sample dataset, it still accounted for 33 per cent of UK dairy cows and highlighted some important trends for the dairy industry.

For example, significant efforts by the cattle industries and the veterinary profession to work towards reducing the use of the highest-priority Critically Important Antibiotics (HP-CIAs) could be seen, such as adopting the approach that they should remove be used where they have been demonstrated by sensitivity testing to be the only suitable choice to avoid unnecessary suffering. These efforts are also consistent with new Red Tractor Assurance scheme standards for beef, dairy and sheep, which state that 'HP-CIAs are used as a last resort under veterinary direction'.

A summary of the project results shows that the data for 2015 and 2016 represented just over 3,000 farms. The average herd size per farm (based on the average number of dairy cows over two years of age, with or without offspring) is 212 dairy cows. In terms of location, the farms are split across the UK, although, in terms of number of dairy cattle, England and Northern Ireland are slightly over-represented, and Wales and Scotland slightly under-represented.

[65] Reported in the CHAWG report 2016 **beefandlamb.ahdb.org.uk/wp-content/uploads/2016/12/CHAWG-Third-Report-2016-051216.pdf**

[66] Veterinary Antimicrobial Resistance and Sales Surveillance 2016 **gov.uk/government/publications/veterinary-antimicrobial-resistance-and-sales-surveillance-2016**

Table 28. Pilot study to collect cattle antimicrobial data (combining 2015 and 2016 data)

	Distribution of cattle in sample (%)	Distribution of all cattle in UK (%)
England	65	60
Northern Ireland	22	16
Wales	9	13
Scotland	4	11

Source: Veterinary Antimicrobial Resistance and Sales Surveillance 2016

The overall results show that the average usage for these dairy farms was 24.01mg/kg and 26.22mg/kg in 2015 and 2016, respectively. However, this headline figure hides a complicated picture of changing industry practices, which shows an overall decline in HP-CIA use in the sector.

Pilot study to collect antibiotic use data via a cattle electronic medicine book

In 2016, an electronic medicine book (eMB) was launched by AHDB Pork to allow the pig sector to accurately record on-farm antibiotic usage data to benchmark against national targets and other farms. A similar resource for cattle is now being developed by AHDB and is undergoing testing during 2018.

The pilot 'eMB – Cattle', for use by both dairy and beef farmers, will allow centralised capture of antibiotic use data in a standardised method, to provide:

- National cattle sector-level reporting of antibiotic usage in line with European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) methodologies
- Farm-level data for identification of usage trends and benchmarking within and between farms

Users will be given the option to record antibiotic use at a group level or for individual cattle. It can also be used as a full medicine book for recording all veterinary treatments.

The pilot project in 2018 will develop a software programme that has the potential to accept medicine and cattle population records from a range of sources, including data that is both manually entered and imported from farm management software to avoid double-entering data that is already recorded on farm in another format. The initial focus is on recording antibiotic use.

The software will report usage in a number of different ways to help identify trends and peaks of antibiotic use that need to be addressed on farm. Use of HP-CIAs will be highlighted throughout software reports.

Following this pilot project, a decision will be made by the relevant AHDB sector boards about deploying a fully functional cattle eMB along the same lines as is available for pigs.

Benchmarking medicine use on beef farms

Parallel AHDB-funded work led by the University of Bristol is focusing on the development of metrics that can be adopted by beef producers to accurately assess, record and benchmark farm medicine use. The aim is that these metrics will be useful as key performance indicators for individual enterprises as well as the industry as a whole.

Working with its nine collaborators from academia, veterinary practice and the processing sector, this project will investigate the use of both veterinary prescription records and on-farm records from a number of beef farms for medicine benchmarking. The output of this work will inform the reporting methodology and features of the eMB – Cattle.

Industry initiative: Selective dry cow therapy

Drying off is a key time for mastitis control and decisions made at this point can influence the herd's mastitis performance for the next six to 12 months. Many cows do not have an udder infection at drying off and treatment with antibiotic dry cow therapy may even be detrimental. In fact, 75 per cent of cows may only need teat sealant at drying off. Therefore, correct and effective use of selective dry cow therapy and teat sealants can have a significant impact on udder health.

AHDB Dairy has produced a practical guide and two short films[67] to provide information and recommendations on drying off, along with a pictorial protocol on clean infusion technique at dry-off. This encourages farmers to work together with their vets to decide on the most effective dry cow management strategy to prevent and treat the development of mastitis. Furthermore, to decrease new cases of mastitis, farmers are encouraged to implement the AHDB Dairy Mastitis Control Plan[68] on their herd.

Since 2015, Arlagården standards[69] for milk producers supplying Arla Foods (numbering some 3,500) have required a commitment to review the practices on farm to move to a selective approach to drying off in due time, if not already implemented. If antibiotic dry cow therapy is required, it must be prescribed by the practicing vet, based on an individual animal requirement, and supported by an appropriate diagnostic test.

Since October 2017, a review of overall use of dry cow therapy and protocols and, where appropriate, to make recommendations for selective antibiotic use, are part of the dairy standard for an annual review of antibiotics used, which must be undertaken by the vet.

Industry initiative: Colostrum is Gold campaign

#ColostrumIsGold

The **#ColostrumIsGold** campaign[70] run by RUMA in February 2018 aimed to raise awareness that feeding the right quantity of colostrum, of the right quality, quickly enough after birth, reduces the chances of newborn animals needing antibiotic treatments at any point in their lives. The campaign was supported by a number of key industry organisations and a library of tools, tips, case studies and videos to give farmers everything they need to get colostrum management right.

With Twitter acting as a key part of the campaign, almost 2,000 tweets containing the #ColostrumIsGold hashtag potentially reached over 818,000 people. Furthermore, the campaign won the 'Community Communications' category at Public Health England's Antibiotic Guardian Awards 2018.

Industry initiative: Animal medicines best practice (AMBP) training

Training has an important role in achieving antibiotic reduction targets. NOAH, in partnership with RUMA and stakeholders, is improving coordination and standardisation of training available to farmers in the responsible use of antibiotics. Training materials have been developed for the dairy and beef sectors that can be integrated into existing or newly developed training platforms. The training includes core modules that address the fundamentals of antibiotics, antibiotic resistance and responsible use, along with beef- and dairy-specific topics.

[67] AHDB dry cow management resources **dairy.ahdb.org.uk/dry-cow-management**
[68] AHDB Mastitis Control Plan **mastitiscontrolplan.co.uk**
[69] Arla Foods Arlagaarden **www.arlafoods.co.uk/4a3b63/globalassets/arla-global/company---overview/responsibility/pdf/quality-assurance-programme/standards---updated-from-1-january-2017.pdf**
[70] Colostrum Is Gold resources at **colostrumisgold.org.uk** and **farmantibiotics.org/ideas-hub/colostrumisgold/**

8. Surveillance

a. Livestock demographic data groups

One of the key lessons learned from previous Foot and Mouth Disease outbreaks was the need to better understand our livestock populations, their movements and behaviours, in order to be as fully prepared as possible for any new and re-emerging exotic disease threat. This need was raised to the UK Veterinary Risk Group for evaluation.

As a result, the Livestock Demographic Data Groups (LDDG) were formed in January 2014. They are multidisciplinary groups, one for each of the major farmed livestock species (cattle, sheep, pigs, poultry and goats) and comprise APHA data scientists, epidemiologists, the relevant Animal and Plant Health Agency (APHA) Species Expert Group veterinary lead, and mapping work groups. The aim of the LDDGs is to enhance understanding of livestock demographics and associated data in GB. This has been addressed initially in two ways:

- Production of population density mapping (Figure 28)
- The development of demographic risk indicators that may be used to monitor changes in the risk of disease introduction or transmission to and between livestock

These indicators consider population characteristics such as movement, age distribution, mortality, etc. They are specific to the livestock species concerned, and have been developed mainly to address the livestock population knowledge gaps regarding the potential for incursion of new and re-emerging exotic disease, but also to support livestock population data requirements of the livestock industry. For each indicator, they identify the most appropriate data sources and standardise the way the data are extracted, maximising accuracy and ensuring repeatability.

The LDDGs also aim to provide expertise on livestock demographic data for ad-hoc consultancy requests.

The LDDG cattle population report was published online in November 2017[71]. It reports on the cattle (ie beef and dairy) population density and holding distribution at a point in time in July 2015 (Figure 28) with clearly defined parameters and limitations.

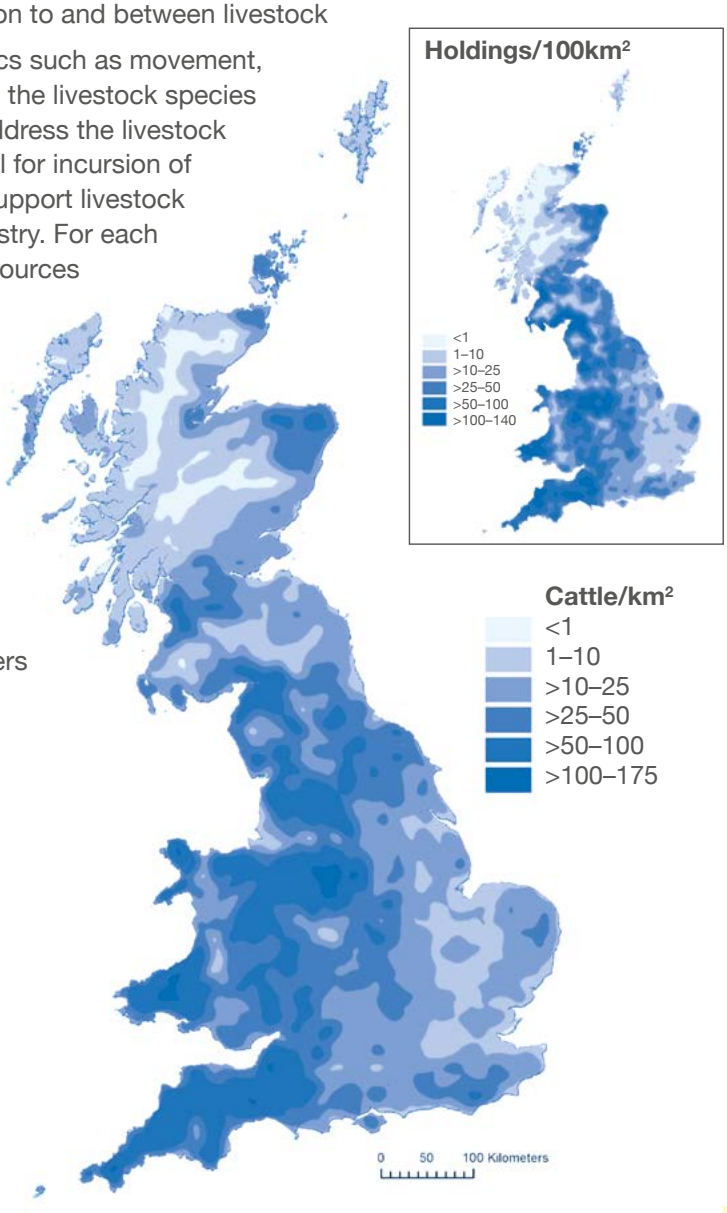


Figure 28. Cattle population density, July 2015

Source: APHA

[71] Livestock Demographic Data Group: Cattle population report
apha.defra.gov.uk/documents/surveillance/diseases/lddg-pop-report-cattle1117.pdf

b. APHA Vet Gateway

The APHA Vet Gateway[72] provides a portal for vets to access APHA's services, systems, operating instructions, guidance, news and intelligence on new and re-emerging animal health threats. It was redeveloped in 2017 to be a one-stop shopfront that now includes news information and links to the APHA's Species Expert Groups, the new Livestock Disease Surveillance Dashboards, changes to the GB surveillance network, diagnostic services, and information for Official Veterinarians.

c. Launch of APHA's GB Livestock Disease Surveillance Dashboards

The GB disease surveillance dashboards were developed and launched in 2017 as part of the APHA's Scanning Surveillance Development Programme, to share online the diagnostic information gathered from submissions to the GB veterinary surveillance network. This includes:

- APHA's Veterinary Investigation Centres in England and Wales
- Scotland's Rural College Disease Surveillance Centres in Scotland operated by SAC Consulting Veterinary Services
- APHA's network of universities and other partners (see Figure 29), who provide post-mortem examination services under contract
- APHA Lasswade (for poultry only)

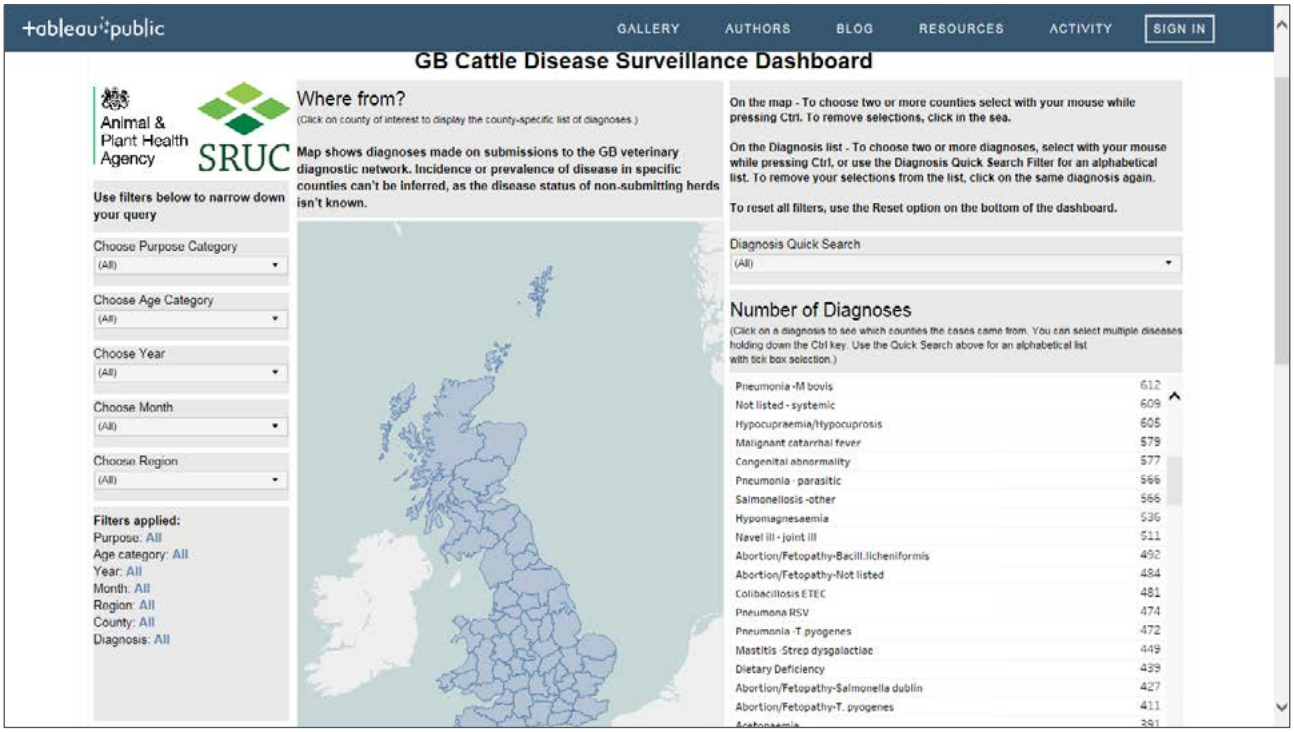


Figure 29. Screenshot of the APHA's GB Cattle Disease Surveillance Dashboard

Source: APHA

[72] APHA Vet Gateway **http://apha.defra.gov.uk/vet-gateway/index.htm**

The dashboards are freely available to farmers and vets and can be found on the APHA's Vet Gateway website[73]. They enable the user to view the diagnoses recorded in the GB diagnostic surveillance database, known as VIDA (Veterinary Investigation Diagnosis Analysis).

The dashboards are also interactive and allow the user to choose a geographic area, a time period and an age group of interest. Having selected the choice of filters, the dashboard can be used to answer questions such as:

- What diagnoses have been made by the GB surveillance network in cattle from my local area?
- What is the GB surveillance network's most common diagnosis in adult cattle?
- Where in the country have specific diagnoses (eg Johne's Disease) been made in cattle by the GB surveillance network?
- How many diagnoses were made of a specific disease (eg Bovine Viral Diarrhoea) in a particular year by the GB surveillance network?

It is important to note that the data presented on the dashboards can only tell the user what diagnoses have been made within the GB diagnostic network described. The dashboards do not currently include diagnoses made by other veterinary laboratories. The maps show the count of VIDA diagnoses made in each county. A higher count of diagnoses in a county may occur for several reasons, including: more submissions due to a larger number of livestock or livestock holdings in a county; increased vigilance among the local farmers and vets in response to a threat; diagnostic investigations as part of disease control initiatives being implemented; or regional increased use of the GB diagnostic network, rather than commercial or veterinary practice laboratories. Diseases not requiring a laboratory diagnosis or in herds whose veterinary practice has its own diagnostic facilities may be under-represented in the data.

Note also that a submission may represent more than one individual animal, and that there may be more than one diagnosis allocated for a submission.

d. Centre of Expertise in Extensively-Managed Livestock

A Centre of Expertise in Extensively-Managed Livestock has been set up in recognition of the challenges of managing health and welfare in extensively-managed animals. Extensively-managed livestock are defined as those animals (primarily cattle and sheep) that are kept in such a way that it is less easy for them to be regularly and closely inspected for signs of ill health or significantly altered production, for example in extensively grazed areas such as common land or moorland.

The Centre of Expertise is based at APHA Carmarthen Veterinary Investigation Centre. Although it is based in Wales, the centre is a GB-wide resource with aims, to:

- Develop efficient ways of sourcing surveillance data and information on extensively-managed livestock to improve surveillance
- Investigate and develop how data and information can be translated into actionable intelligence and disseminated to farmers and vets
- Develop a virtual hub of expertise in surveillance in extensively managed livestock to complement the APHA Species Expert Groups

The development of this Centre of Expertise follows engagement with a cross-section of stakeholders from Government, industry, veterinary practice, retail and academia who contributed initial ideas at a conference held in July 2016, followed by a second conference and workshop during November 2017. Reports describing both of these events are available online on the APHA Vet Gateway[74].

[73] APHA's cattle disease-surveillance dashboard **https://public.tableau.com/profile/siu.apha#!/vizhome/CattleDashboard/CattleDashboard**

[74] Centre of Expertise in Extensively-Managed Livestock **apha.defra.gov.uk/vet-gateway/surveillance/experts/exten-man-livestock.htm**

e. Veterinary surveillance update from Scotland

Scotland's Rural College (SRUC) provides a scanning surveillance programme through its network of eight Disease Surveillance Centres (DSCs) funded by the Scottish Government. Diagnostic figures are reported under the GB data. To improve access to DSCs from more remote areas of Scotland, a carcase collection service was piloted from November 2017 to May 2018 in Dumfries and Galloway. This increased the number of submissions, particularly of adult cattle from more remote areas, and future options for the provision of this service are being considered.

Psoroptic mange

An outbreak of Psoroptic mange was diagnosed in a large suckler herd, with affected cattle showing severe pruritus and body condition loss. This is a very rare diagnosis in Scotland, particularly in multiple cattle, and has been reported more commonly in Wales and also in Northern Europe, with spread due to animal movement. The effectiveness of treatments and lack of a licenced treatment in milking cows are concerns for the industry. Vets and farmers were updated on the clinical signs and risks of disease spread with this condition. No other outbreaks were identified.

Schmallenberg virus (SBV) bulk milk survey

A bulk milk survey was carried out in the summer/autumn of 2017 to consider the risk of ongoing spread of SBV in Scotland, following a cluster of cases of foetal deformity associated with in utero SBV infection in spring 2017. Evidence of virus spread was detected in Dumfries and Galloway during the study period, with bulk tank serology from sentinel herds going from negative to positive in the absence of any cattle movements (Figure 30). This surveillance project was funded by the industry body Livestock Health Scotland and the Scottish Government. It is of note that, in spite of serological evidence of virus spread, no clinical cases of SBV in utero infection were recorded in spring 2018.

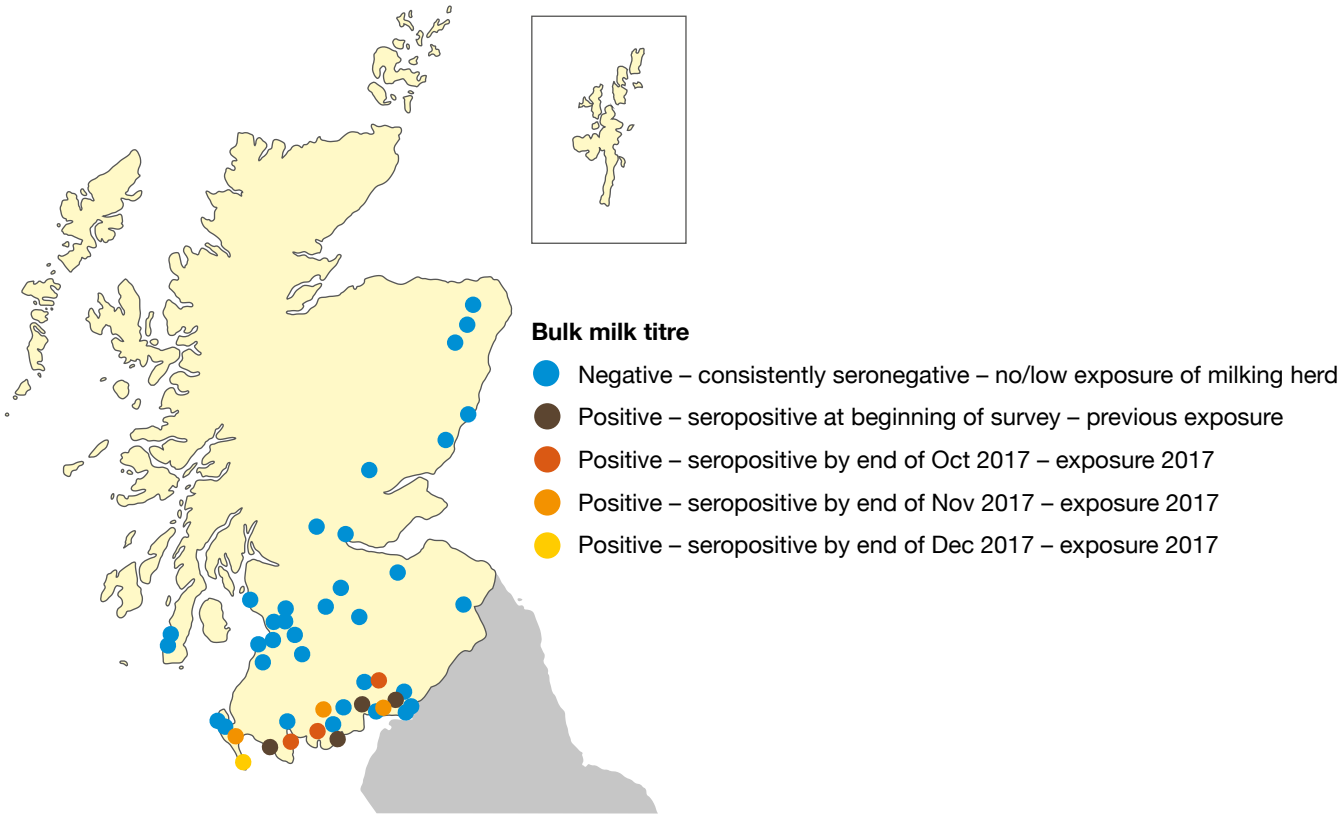


Figure 30. Schmallenberg virus monitoring in Scottish dairy herds – results to end of 2017

Source: SRUC

Examining the effectiveness of triclabendazole to treat liver fluke in dairy cattle

Triclabendazole-resistant liver fluke infection is regularly diagnosed in sheep flocks but is less well recognised in cattle herds. Since 2013, flukicides containing triclabendazole have been the only products with activity against immature Fasciola hepatica licenced for use in dairy cows. A pilot study on six farms was carried out to examine triclabendazole efficacy using the faecal coproantigen test which detects proteins produced by the liver fluke. It is considered that a reduction in test, result figures of more than 90 per cent is consistent with effective flukicide activity. Reductions of 32 per cent to 83 per cent were noted on the test farms, suggesting a reduction in efficacy.

Abortion due to Bacillus licheniformis

Although many farmers have not heard of Bacillus licheniformis, it is the most commonly diagnosed cause of abortion in Scottish cattle. Scottish surveillance data shows that during the last 10 years it has accounted for one-third of all infectious abortion diagnoses. The infection has also been recorded in stillborn calves. Bacillus licheniformis abortions are most common in housed beef cows, being fed on pit silage. Spring calving herds in the last two months of pregnancy are most at risk.

Bacillus licheniformis is present on most farms – in the environment, slurry, silage and water troughs. A recent study looked at management factors and examined silage and water samples from farms that had experienced problems with abortions due to Bacillus licheniformis and from farms that were not experiencing abortions.

Testing on a relatively small number of farms showed that big bale silage often contains lower numbers of Bacillus licheniformis than pit silage. A sample of slimy silage from the edge of the pit contained huge numbers of Bacillus licheniformis. Samples taken from the debris at the bottom of water troughs were also heavily contaminated.

f. Veterinary surveillance update from England and Wales

APHA retains its six Veterinary Investigation Centres at Starcross, Bury St Edmunds, Carmarthen, Shrewsbury, Thirsk and Penrith, and 'partner' post-mortem facilities continue to be provided from Aberystwyth (Wales Veterinary Science Centre), Langford (University of Bristol Farm Animal Pathology Service), Potters Bar (Royal Veterinary College), Guildford (University of Surrey) and St Boswells (SAC CVS).

A 'free-to-farmer' carcase collection service is now provided across the entire geography of England and Wales. Please note this service is only intended for use following thorough triage of cases to ensure optimal case material to achieve a diagnosis.

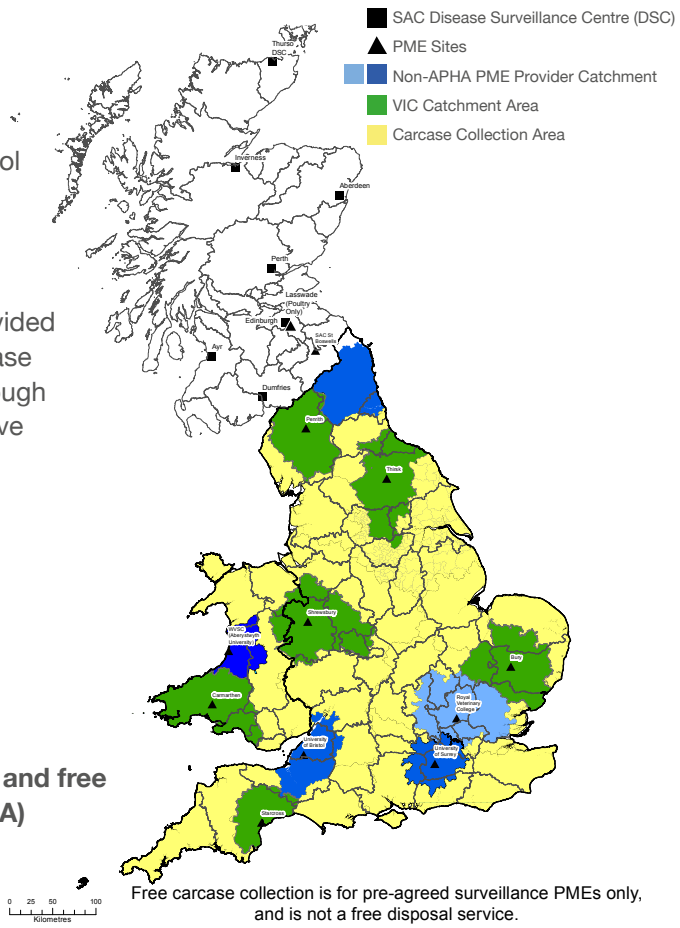


Figure 31. APHA VICs, partner post-mortem centres and free carcase collection areas in England and Wales (APHA)

http://apha.defra.gov.uk/documents/surveillance/maps/england-wales-map17.pdf

g. Diagnostic cattle submissions

Cattle carcase submissions to the GB surveillance network have remained relatively unchanged since 2014. Submissions of foetuses increased slightly in 2017 compared with 2016. These submission trends are monitored by APHA Cattle Expert Group[75].

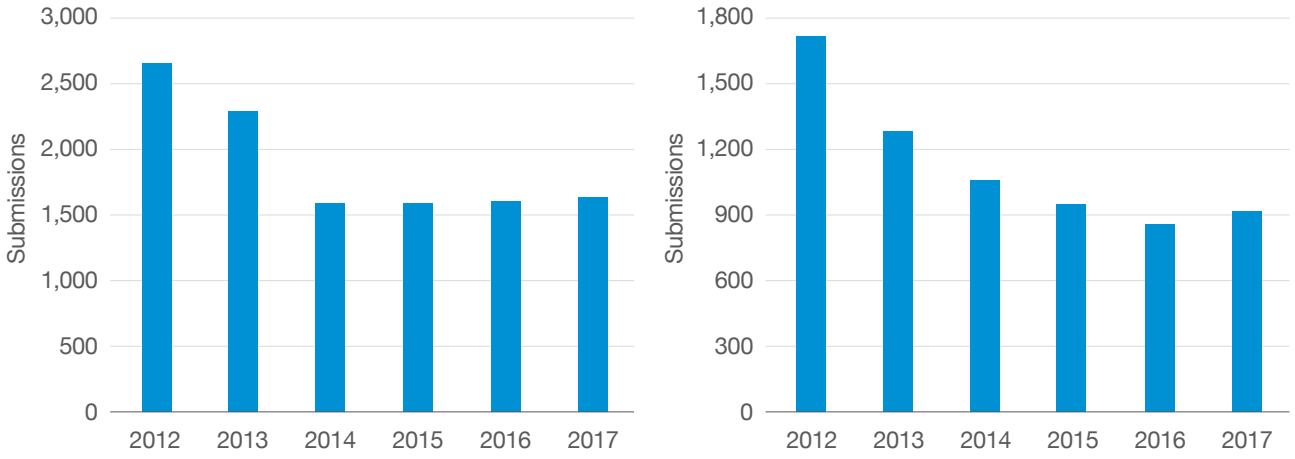


Figure 32. Annual cattle carcase (left) and foetus (right) submissions to the GB surveillance network

Source: APHA

h. Highlights of health challenges detected by veterinary surveillance 2016/17

The APHA's GB Cattle Disease Surveillance Dashboard has been used to generate the data displayed in Figure 33. This illustrates the top 10 abortion diagnoses recorded in VIDA from the GB surveillance network in the years 2016 and 2017.

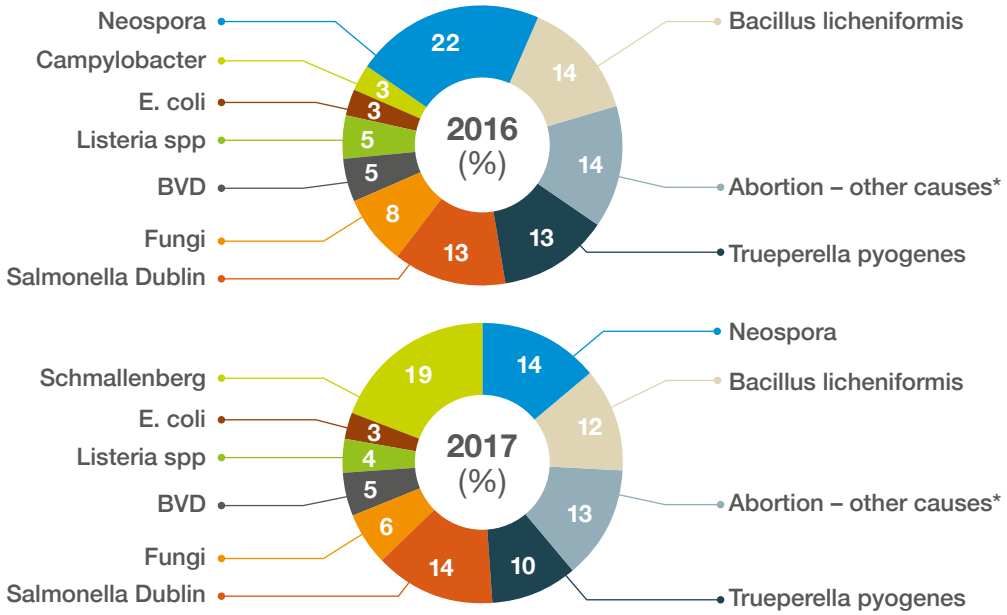


Figure 33. Top 10 abortion diagnoses in GB, for 2016 and 2017

Source: VIDA, from APHA

Key: *Other causes refer to abortion diagnoses recorded in VIDA that do not have a specific named cause.

[75] APHA Cattle Expert Group **apha.defra.gov.uk/vet-gateway/surveillance/seg/cattle.htm**

Schmallenberg Virus

The commonest cause of abortion in cattle diagnosed during 2017 was Schmallenberg Virus (SBV), reflecting a wave of infection that spread across parts of GB in 2017. SBV was identified in the UK as a new and emerging pathogen of cattle and sheep in 2012, as part of the Europe-wide spread of this midge-borne Orthobunyavirus. Since then, detection of SBV declined in GB as in Europe, with few or no cases in cattle and sheep 2014 and 2015. SBV is considered endemic and is not a notifiable disease. However, reports from mainland Europe of recrudescence during 2016 were followed by reports from GB of congenital deformities in lambs and calves (Figure 34), and subsequent investigation detected SBV by 'PCR' or serological evidence suggested its involvement.

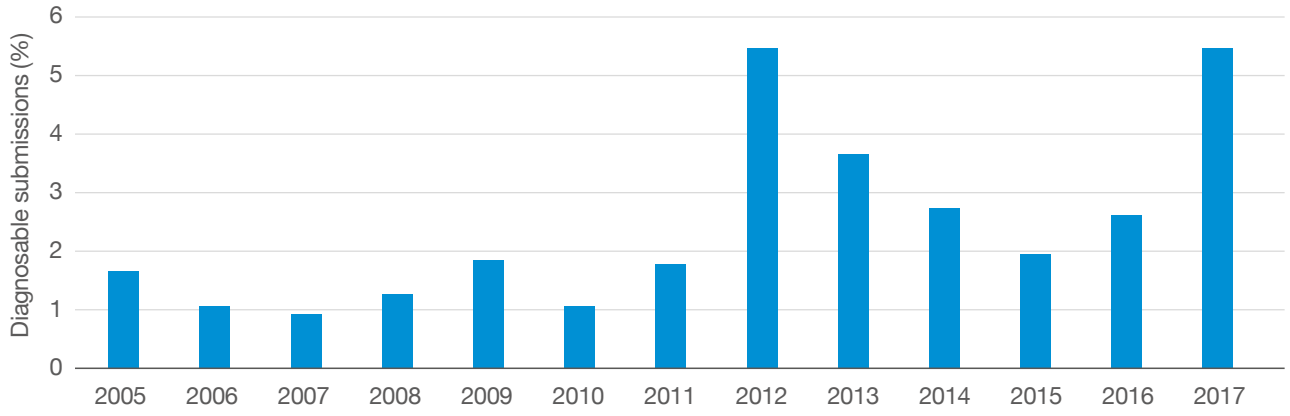


Figure 34. GB incidents of congenital abnormalities in cattle as a percentage of diagnosable submissions in the second quarter for the years 2005–2017

Source: VIDA, from APHA

There was a peak of incidents of congenital abnormalities in cattle recorded in VIDA that mirrored a similar peak when SBV was first seen in 2012. The screenshot of the cattle dashboard (Figure 35) shows the distribution of diagnoses of SBV abortion in the second quarter of 2017.

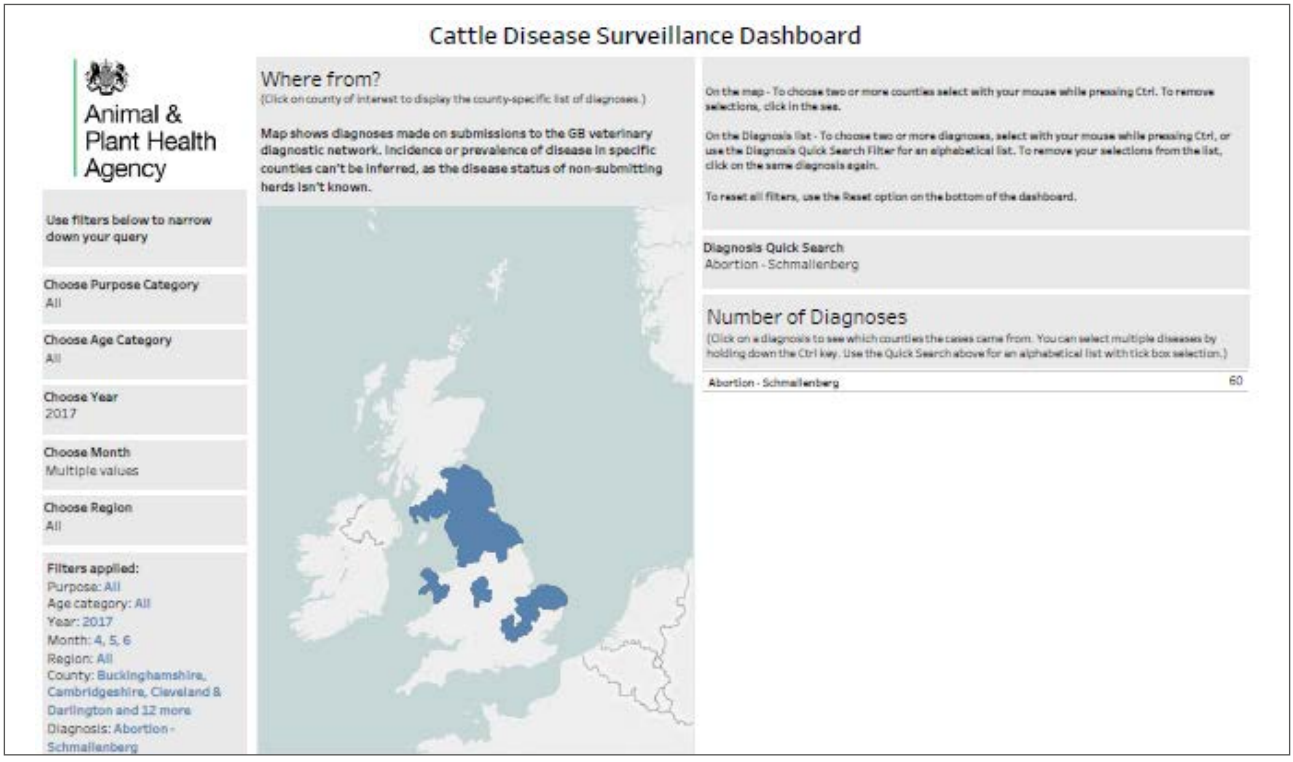


Figure 35. Distribution of SBV diagnoses, Q2 2017

Source: APHA

Alimentary Ulcerative Syndrome

The GB disease surveillance network, including the non-APHA Partner PME providers, identified a potential novel syndrome of ill-thrift, scour and alimentary ulceration, with similarities to both 'Summer Scour Syndrome' described by SAC in Scotland and 'Upper Alimentary Ulcerative Syndrome', described recently in Australia. Work is ongoing to characterise this condition.

Forage shortage

The value of the surveillance network was further illustrated by identification of a potential forage shortage[76] in the west and north of the UK. The rapid production and dissemination of information notes about this and an associated potential bedding shortage enabled farmers and their vets to receive early warning and to take appropriate informed action.

Bluetongue Virus

The UK's Chief Veterinary Officer urged farmers to remain vigilant for signs of Bluetongue Virus (BTV) after the disease was identified in a number of cattle imported from France through GB's robust post-import testing regime in October 2017.

The APHA identified the disease in cattle after they were brought to Preston and Kendal in England and two locations in Scotland. A total of 32 animals came from the same assembly centre in France, located in an area where multiple cases of Bluetongue have been confirmed since September 2017. Action was taken to ensure there was no spread of the disease in the UK. The affected animals were dealt with under the Trade in Animals and Related Products regulations. Cattle with a high risk of being infected with the BTV-8 strain of BTV, or which had not been vaccinated before being exported, were humanely culled. Farmers had the option to send those animals without fully compliant paperwork back to France or to cull them to reduce the risk of disease spreading to susceptible UK livestock.

Movement restrictions were in place on the premises for several weeks until official testing ruled out spread via local midges.

Strict rules on the movement of livestock from regions affected by BTV are already in place. Farmers are reminded that animals from these regions must be accompanied by the relevant paperwork to clearly show they meet certain conditions designed to reduce disease risk, such as correct vaccination. The use of vaccine should be based on a discussion between farmers and their veterinarians. More information on the BTV situation can be found on the **gov.uk** website[77].

[76] Forage shortage **ahvla.defra.gov.uk/documents/surveillance/diseases/winter17-forage-shortage.pdf**
[77] Bluetongue Virus information **gov.uk/government/publications/bluetongue-virus-in-europe**

9. The changing role of the farm vet

Species specialisation among vets has been occurring increasingly over the past 30 years. Furthermore, a growing number of (mostly privately owned) practices serve only farm clients. This consolidation in the veterinary sector is far from complete, however, with over 800 practices and 3,000 individual vets throughout UK still providing some veterinary services to cattle-owning clients.

Economies of scale, including medicine purchasing power, will ensure consolidation continues. Corporatisation of veterinary practices may accelerate this trend. Consolidation and collaborations (eg the XLVets network) could bring potential advantages to the cattle industry by providing more diverse and cost-effective services, including foot trimming, laboratory and diagnostic resources, training, lay-person pregnancy testing and other ancillary solutions such as vaccinations, disbudding and data collection. Larger cattle practices are already offering some of these services and employ farm technicians to do so.

Veterinary businesses generally rely on medicine sales to complement professional fees. This is almost inevitable if 24-hour clinical care is to be provided to individual livestock at a cost-effective rate to the farmer. Alternative models could include livestock health insurance, government subsidy or acceptance that 24-hour and individual veterinary care for most farm animals is simply not economic (as is already the case in the pig/poultry sectors).

Most modern cattle vets purport to pursue preventive herd health planning. However, analysis of veterinary spend by cattle farmers suggests supplying medicines, treating individual animals (including at routine fertility visits) and providing emergency care far outstrips the demand for preventive herd health planning, training and diagnostic services.

There could be several different reasons for this, for example:

- Vets are not marketing or providing preventive services well enough
- Farmers are less willing or able to pay for this type of intervention
- Farmers do not perceive the value
- Cattle farms are generally too small for veterinary fees incurred delivering health planning to be cost-effective
- Farmers and vets do not prioritise the necessary time for preventive health planning

In the near future, there are several potential threats to the sustainability of cattle veterinary work:

- Leaving the EU, negatively affecting livestock trade and farm profitability
- Restrictions on selling veterinary medicines (eg the Danish model where farm vets may prescribe but not sell medicines)
- Declining cattle numbers due to changes in consumer eating habits, cheaper imports, increasing environmental constraints, and reduction in farm subsidies
- Losing TB testing income (eg outsourced to other vets or lay testers)
- Difficulty recruiting and retaining farm veterinary surgeons

However, there are potentially some excellent opportunities, too:

- Expanding the range of services and greater use of non-veterinarians in vet-led teams
- Greater consolidation, ie fewer ‘mixed vet’ practices stimulating further growth of specialist farm practices
- Greater farm profitability after leaving the EU (eg higher cost of food imports, strong internal markets and/or new export markets)
- ‘Telemedicine’ – providing services over greater distances
- Increased technology giving enhanced data collection and management
- Increasing role in food safety (eg medicine residue avoidance, antibiotic monitoring)
- Larger farms and increased vertical integration of milk and beef industries (eg retailer supply chains) leading to greater professionalism, with increased demand for veterinary expertise and training

10. Brexit

Brexit is a pivotal time for agricultural policy and will pose significant challenge and opportunity to the agricultural industry with new policy, trade deals and a new relationship with the EU.

A well-managed Brexit must herald an agricultural revolution and enable UK farmers to continue to deliver high-quality, safe, affordable and responsibly produced food for all UK consumers, whatever their income. The UK farming and food sector has some of the best standards of food safety, animal welfare and traceability in the world. Brexit should celebrate these standards and new third country trade agreements must not undermine them.

With the right policy, the UK's farms can be more profitable, productive and progressive.

The government is focused on establishing an agricultural policy on the foundation of delivering public goods. Maintaining a robust and resilient domestic food production sector is in the nation's interest and therefore future agricultural policy must support farmers in their role as food producers. In particular, by maintaining a strong and profitable primary production centre in the UK, the public benefits from:

- A high degree of self-sufficiency
- A safe and traceable supply of domestic food
- Support for jobs, investment and growth
- High standards of welfare and environmental goods

There are additional aspirations for animal health and welfare from some parties, but it is important that these are based on scientific evidence and actually benefit the farmed animals and the businesses charged with managing them. Farming is a commercial enterprise, and innovation and improvements to systems must go hand in hand with a farmer's ability to compete in the marketplace and be rewarded for 'above and beyond' production standards.

The UK will continue to compete with farmers around the world who, by and large, receive financial public support; therefore the policy aims for domestic production standards must be squared with international trade policy. It is imperative that UK farmers are not undercut by imports produced to lower standards than those imposed on UK farmers.

Leaving the EU presents industry and Government with a unique once-in-a-generation opportunity to develop effective working partnerships to drive long-term sustainable improvements in cattle health, welfare and productivity. The aims of this approach are to:

- Support cattle farmers in delivering their objectives for continual improvements in cattle health and cattle welfare
- Promote and encourage responsible and appropriate use of antimicrobials
- Eliminate or control significant enzootic cattle diseases locally, regionally and nationally, eg BVD, Johne's, mastitis, lameness, pneumonia
- Promote the open exchange of information on the disease status for herds and regions
- Transform the collection, sharing, analysis and interpretation of data and metadata from cattle farms to provide farmers with useful decision support tools to improve health and welfare
- Move from a focus on testing and treating disease to a focus on cattle health and managing risk to predict and prevent health and welfare issues arising
- Maintain freedom from exotic and emerging diseases of cattle
- Eliminate or control significant infections of food safety and public health concern (eg E. coli O157, Salmonella, TB)
- Develop, promote and implement new knowledge on the assessment of welfare outcomes to support continuous improvement in cattle welfare

The overall objective should be a cattle sector that is resilient, sustainable and internationally competitive, with returns that result in businesses that have the confidence to invest in their future. This can only be achieved if the cattle industry seizes the opportunity to deliver an integrated approach to improving cattle health and welfare, involving all stakeholders, allied support industries, retailers, foodservice and Government.

11. Conclusions: A vision for CHAWG

Agriculture faces a considerable challenge over the next five to ten years as the UK government negotiates its way out of the European Union, deals with the transition period and goes out into the world to forge new trade agreements with countries outside the EU, upon which our prosperity in this country will depend. We don't know as yet what our future relationship with the EU will be, but it is certainly going to be different.

As the cattle sector, we need to improve our productivity and competitiveness to survive the changes and then thrive in this new world, whatever form that may take. Farmers accept there is going to be change and that things are likely to be tougher in the short to medium term. However, there is a will among leading farmers to embrace change.

As part of this change, there is a need to tackle endemic disease to meet a growing demand for continuous welfare improvement and to continue work in the area of parasite control; all of this needs to be underpinned by accurate shared data, effective surveillance, risk-based trading and so on.

There is change everywhere. Defra and industry are looking at the Livestock Information Service, and the Animal Health and Welfare Board for England (AHWBE) is looking at how a 'pathway' to better health and welfare can be developed as we move away from the Common Agricultural Policy (CAP) and the current payment system. The Red Tractor assurance scheme has a new business plan that will raise the bar and secure higher standards, and RUMA is pushing on with the responsible use and reduction in antibiotic use, forging links with the human health sector, setting up a companion animal group and getting heavily involved with the new retail and food industry AMR group.

It is therefore both necessary and timely to look afresh at CHAWG and consider what can be done to incorporate all species into the new structure. The solution, we believe, is the creation of a new 'Ruminant Health' group and which then becomes a delivery body, where all the issues mentioned earlier can be dealt with in an efficient and pragmatic way and the focus is on disease, health and welfare and not on sectors.

The Ruminant Health group will consist of representatives/members/experts from the cattle, sheep and goat sectors, tackling disease, welfare and parasites with the obvious overlaps, learning from each other and forging policy. There will be an inner core of a very small number of people who will work on policy, targets, timelines and expectations for the groups operating under the Ruminant Health banner.

There are groups currently dealing with various issues in the industry, doing a good job in most cases, but not always connected and sometimes without the necessary support. The new groups will be setting targets, timelines and expectations by the Ruminant Health Group and results will be monitored and reported. The groups will, however, be supported where necessary and given resources where needed to deliver on their areas of expertise. The groups should be made up of a small number of representatives/experts in each of the subjects as we look to find more efficient ways of working.

Disease, farming and trade cross over borders and while we have devolved governments in Wales, Scotland and Northern Ireland, it is imperative that we all agree on the core principles of disease control and welfare improvement. The Chief Veterinary Officers for the UK, Wales and Scotland have therefore agreed to sit on the Ruminant Health group, using their immense experience and knowledge to help establish this country as truly world class in this field.

Gwyn Jones
AHDB Board member and Dairy Sector Chair

Adam Quinney
AHDB Board member and Beef & Lamb Sector Chair

Glossary of abbreviations

AFU	Approved finishing unit (for cattle under TB restrictions)
AHDA	Animal Health Distributors' Association
AHDB	Agriculture and Horticulture Development Board (AHDB) – a Levy Board that represents cattle, sheep, pigs, milk, potatoes, cereals, oilseeds and horticulture
AHWBE	Animal Health and Welfare Board England
AIMS	Association of Independent Meat Suppliers
AMR	Antimicrobial resistance
AMU	Antimicrobial use
Antibiotic	A medicine used to prevent and treat bacterial infections specifically. This report is primarily focused on the use of antibiotics, as a subset of wider antimicrobials
Antimicrobial	A product that kills or slows the spread of a range of microorganisms including bacteria, viruses, protozoans, and fungi. Antibiotics are antimicrobials
APHA	Animal and Plant Health Agency, formerly AHVLA
ARAMS	Animal Reporting and Movement Service for details on movement reporting for sheep, goats and deer within England
AssureWel	The initiative undertaken by University of Bristol, RSPCA and the Soil Association to establish farm animal welfare outcomes measures
BAJVA	BCVA Accredited Johne's Veterinary Advisor
BCMS	British Cattle Movement Service
BCVA	British Cattle Veterinary Association
BMPA	British Meat Processors' Association
BVA	British Veterinary Association
BVD	Bovine Viral Diarrhoea
CHAWG	Cattle Health and Welfare Group of Great Britain
BBSRC	Biotechnology and Biological Sciences Research Council, the lead funding agency for academic research and training in the biosciences at universities and institutes throughout the UK
BMSCC	Bulk milk somatic cell count
Breedplan	An Australian genetic evaluation system for beef cattle breeders that supplies services to some breed societies in GB
BTV	Bluetongue virus
CDI	The Centre for Dairy Information
CHeCS	The Cattle Health Certification Standards, a non-trading organisation established by the cattle industry in UK and Ireland for the control and eradication of non-statutory diseases
CHCSB	Cattle Hoofcare Standards Board

CIS	The Cattle Information Service
COWS	Control of Worms Sustainably, an industry stakeholder group that aims to promote best practice in the control of cattle parasites
CTS	Cattle Tracing System
CVO	Chief Veterinary Officer
Dairy UK	The trade association for the British dairy supply chain
Defra	The UK Government's Department for Environment, Food and Rural Affairs
DCDvet	Defined Course Dose for animals, the assumed average dose per kg animal per species per treatment
DDDvet	Defined Dairy Dose for animals, the assumed average dose per kg animal per species per day
DMCP	Dairy Mastitis Control Plan
DSC	Disease Surveillance Centres
eAML2	The electronic version of the pig movement licence (AML2) that combines the AML2 and Food Chain Information (FCI) paper forms required when moving pigs to slaughter
EBV	Estimated breeding value
EFSA	European Food Safety Authority
EMA	European Medicines Agency
EMA AMEG	European Medicines Agency's Antimicrobial Expert Group
eMB	The electronic Medicine Book, designed by AHDB to electronically collate antibiotic usage data from the UK pig sector
ESVAC	European Surveillance of Veterinary Antimicrobial Consumption
FSA	Food Standards Agency
FAWL	Farm Assured Welsh Lamb
FUW	Farmers Union of Wales
HCC	Hybu Cig Cymru, responsible for the development, promotion and marketing of Welsh red meat
HP-CIA	Highest Priority Critically Important Antibiotic (for human medical purposes), as defined by the EMA
IAAS	Institute of Auctioneers and Appraisers for Scotland
IBR	Infectious Bovine Rhinotracheitis
LAA	Livestock Auctioneers Association
LDA	Left Displaced Abomasum
LDDG	Livestock Demographic Data Groups
LFA and non-LFA	Referring to land that is classified as Less Favoured Area and non-Less Favoured Area according to its inherent challenges to productivity and the subsidy support for which it may be eligible. Also refers to herds kept on one area or the other

mg/PCU	Milligrams per PCU, the unit of measurement developed by the EMA to monitor antibiotic use and sales across Europe, which has also been adopted by the UK in its national reports
NBA	National Beef Association
NBDC	National Bovine Data Centre
NFU	National Farmers' Union
NFU Cymru	The National Farmers' Union's Welsh arm
NFUS	National Farmers' Union of Scotland
NJMP	National Johne's Management Plan
NMR	National Milk Records
NPTC	City & Guilds land-based services, the UK's largest awarding body in the land-based sector, encompassing agriculture, horticulture, forestry, animal care, conservation and machinery
OV	Official Veterinarian, the term used to describe private practice veterinarians who perform work on behalf of an EU member state
PCR	Polymerase Chain Reaction or PCR is a test that reproduces (amplifies) selected sections of DNA or RNA for analysis
PCU	Population Correction Unit, which is used to help measure antibiotic use. PCU takes into account the animal population as well as the estimated weight of each animal at the time of treatment with antibiotics
PI	Persistently infected (with BVD)
QMS	Quality Meat Scotland, the levy board representing the red meat industry in Scotland
RABDF	Royal Association of British Dairy Farmers
RADAR	Rapid Analysis and Detection of Animal-related Risks – captures and processes data from a range of sources including the BCMS Cattle Tracing System (CTS)
RDA	Right displaced abomasum
RFM	Retained foetal membranes
RDPE	Rural Development Programme for England
Red Tractor	A food assurance scheme that covers production standards on safety, hygiene, animal welfare and environment
ROCFT	Register of Cattle Foot Trimmers
RoMS	Register of Mobility Scorers
RUMA	Responsible Use of Medicines in Agriculture Alliance
SAC Consulting	Part of SRUC
SARS	Suspected Adverse Reaction Surveillance Scheme
SBV	Schmallenberg Virus
Signet	Signet Breeding Services provides genetic evaluations to sheep and cattle breeders, and is funded by AHDB Beef & Lamb, HCC in Wales and QMS in Scotland

SRUC	Scotland's Rural University
TMR	Total Mixed Ration, a method of feeding cattle that combines all forages, grains, protein feeds, minerals, vitamins and feed additives into a feed
VARSS	Veterinary Antimicrobial Resistance and Sales Surveillance, a collection of reports from the VMD, providing the details of UK veterinary antibiotic resistance and sales surveillance
VEERU	Veterinary Epidemiology and Economics Research Unit, University of Reading
VIDA	Veterinary Investigation Diagnosis Analysis
VIO	Veterinary Investigation Officer
VMD	Veterinary Medicines Directorate
WLBP	Welsh Lamb & Beef Producers Ltd
WHO	World Health Organisation

Appendix

The GB Dairy Cattle Welfare Strategy 2018–2020

Aspiration	Actions	Evidence source	Coordinated by	By when
Priority: Lameness				
Reduce the prevalence of lameness, leading to improved welfare	Improve prevention, recognition, treatment and control Continue to implement mobility scoring as the industry-recognised lameness indicator Identify and communicate the availability of relevant support 'programmes' and encourage uptake Support the activities of the National Association of Cattle Foot Trimmers (NACFT), Register of Cattle Foot Trimmers (ROCFT), the Cattle Hoof Care Standards Board and the Register of Mobility Scorers (ROMS) Promote anti-inflammatory (pain relief) treatment in cases of lameness	AHDB Dairy Healthy Feet programme Foot trimming organisations (NACFT, ROCFT, Cattle Hoof Care Standards Board) Register of Mobility Scorers Milk recording organisations Farm assurance schemes Milk buyers and retailers Veterinary practices	Dairy Cattle Mobility Steering Group	Short-term deliverable (1–2 years)
Priority: Calves and youngstock				
Improve the survival and growth rate of youngstock and increase % of calves that make it into the milking herd **Increase the % of dairy bull calves retained in the industry**	Raise awareness to farmers for the need to improve calf management through joined-up KE activity Ensure all calves are managed across the supply chain to meet agreed industry practices and standards Promote enhanced feeding programmes of youngstock All farmers to record – Stillborn calves – Reasons for death/culling of youngstock Encourage regular monitoring of growth rates Encourage selection of polled sires to replace disbudding Encourage uptake of appropriate use of sexed semen to reduce the number of male calves Encourage the use of pain relief (analgesics) during castration and disbudding Encourage development of markets for dairy bull calves such as bull beef and rose veal Encourage proactive calf health planning	AHDB Dairy Calf to Calving Initiative Breeding organisations British Cattle Movement Scheme (BCMS) Calf rearing companies Milk recording organisations Farm assurance schemes Milk buyers and retailers	AHDB	Short-term deliverable (1–2 years)
Priority: Welfare outcomes				
Evaluate animal-based welfare outcome measures on farm	Support the activities of assurance schemes that observe and record welfare outcome measures Encourage farmers and vets to discuss welfare outcome measures as part of the herd health plan review	Support the activities of assurance schemes that observe and record welfare outcome measures Encourage farmers and vets to discuss welfare outcome measures as part of the herd health plan review	Red Tractor Assurance for Farms Dairy Scheme	Short-term deliverable (1–2 years)

Aspiration	Actions	Evidence source	Coordinated by	By when
Priority: Cow's environment				
Ensure the comfort of the environment is appropriate to meet the needs of the cow	Assess the extent of implementation of key 'comfort' indicators in practice and further promote as necessary Analyse gaps on resources currently available; develop and promote resources, as appropriate Develop clear and consistent messages on cow flow, feeder design, stock densities and the importance of hygienic and comfortable lying areas Demonstrate continuous improvement in cow comfort	AHDB Dairy Farm assurance schemes Farm consultancies Milk buyers and retailers Veterinary practices	RSPCA	Medium-term deliverable (2–4 years)
Priority: Continuous welfare improvement				
Demonstrate a positive 'welfare trend' and provide a basis for future investment and activity	Demonstrate current high levels of welfare and continually strive for improvement Regularly review and publicly report progress towards aspirations Raise awareness of dairy cow welfare as a relevant issue for dairy farmers' businesses Encourage investment in projects dedicated to advancing dairy cattle welfare practices Support research and activities in promoting welfare Promote the current high levels of welfare to consumers through education and awareness-raising activities	AHDB Dairy Milk buyers and retailers Farm assurance schemes	NFU	Medium-term deliverable (2–4 years)
Priority: Mastitis				
Improve udder health, leading to a reduction in mastitis and improved welfare	Encourage and promote active prevention, recognition and control of mastitis Incorporate mastitis control in herd health plans Publish year-on-year udder health data Publish numbers of farms and cows that have received mastitis control through an industry mastitis improvement programme Communicate and encourage uptake of best practice dry cow management	AHDB Dairy Mastitis Control Plan Farm consultancies Milk buyers and retailers Milk recording organisations Farm assurance schemes Veterinary practices	Mastitis Control Steering Group	Medium-term deliverable (2–4 years)
Priority: Body condition				
Cows at an appropriate body condition for stage of lactation	Provide greater access for farmers, farm staff and advisers to cow nutritional information Continue to encourage farmers to appreciate the importance of body condition score (BCS) management as a driver for dairy cow nutrition Evaluate, coordinate, promote knowledge and effective protocols for improving nutrition on farm Continue to promote best practice transition cow management Increase the number of professionally registered nutritionists	AIC Dedicated supply chain data Feed adviser register Farm assurance schemes	aic agricultural industries confederation	Medium-term deliverable (2–4 years)

Aspiration	Actions	Evidence source	Coordinated by	By when
Priority: Fertility and breeding				
Move positively towards a calving interval of 400 days	Liaise with industry to access fertility data that can be aggregated and reported annually Promote genetic indices and tools that support informed breeding decisions via the industry Evaluate, coordinate, promote knowledge and effective protocols for improving fertility on farm	Breed societies Farm consultancies Milk recording organisations National bovine data centre Veterinary practices	NBDC NATIONAL BOVINE DATA CENTRE	Long-term deliverable (3–5 years)

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Cattle Health & Welfare Group