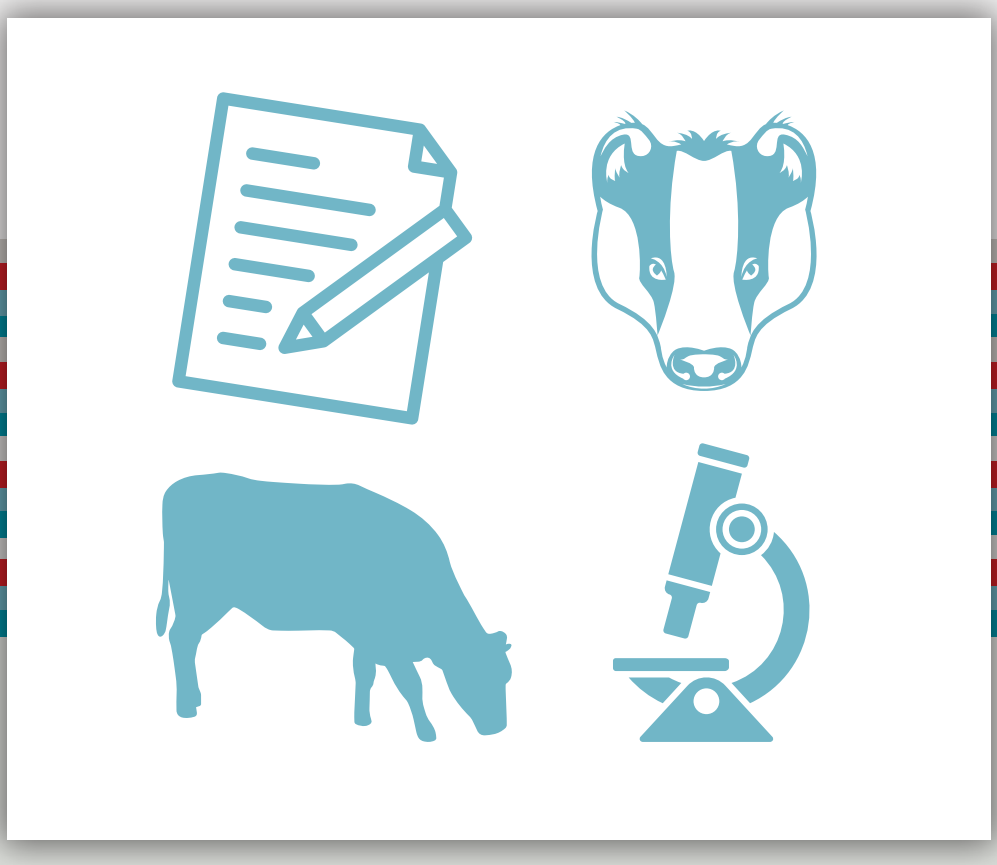
Farmers Guardian

INTELLIGENCE GUIDE:

Bovine TB



Your guide to:

Bovine TB and the approach being taken to tackle the disease, with a focus on new developments in science and research

Introduction

Bovine TB (bTB) has plagued UK farming for decades and, despite huge efforts by industry and Government to control it, the disease has continued to spread.

It is a threat to farmers' livelihoods and the health and welfare of livestock and wildlife, but also destroys breeding lines, impacts trade and, in some cases, tears families apart.

Once a disease isolated to small pockets of the country (the percentage of cattle reacting to the TB skin test in Britain reached its lowest from 1977-1987), it has now spread extensively through the west of England and Wales and is seen as the enemy at the gates in Scotland.

Since 2001, more than 650,000 bTB-infected cattle have been slaughtered, costing the industry and taxpayers more than £500 million.

Since 2013, more than 34,000 badgers have been culled as part of efforts to stem the spread of the disease.

But with uncertainty surrounding the EU's €30m (£26.2m) contribution towards tackling bTB and the unpredictable political situation in the UK, question marks loom over the Government's 25-year strategy and its tools to fight the disease.

NFU president Minette Batters, who has had first-hand experience of the disease on her farm in Wiltshire, said any strategy must be underpinned by a 'strong political will to deal with the disease in the round'.

What is certain is the sector's determination to stamp out bTB.

Tighter cattle controls, enhanced biosecurity measures, stricter surveillance and badger cull areas have produced some positive results.

But while the industry has made some headway in getting the disease under control, there is no doubt there is still a long road ahead.

Olivia Midgley
Head of news and business

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Background

The 25-year strategy: is it working?

While ridding the UK of bovine TB may seem like a pipedream when faced with the day-to-day reality of living and working with the disease, the industry remains confident in the Government's 25-year strategy.

A recent report assessing the first two years of industry-led badger culling in England on the incidence of bTB in cattle (2013-2015) found a 58 per cent reduction in the number of herd breakdowns after two years in the Gloucestershire cull zone. This was compared with 10 equivalent areas around the outside of the cull zone.

The study also showed a 21 per cent drop in TB in herds in Somerset, and found all 19 licensed intensive badger control operations achieved the badger population reductions needed to get on top of the disease.

The report, led by the Royal Veterinary College's Lucy Brunton (previously department of epidemiological sciences, APHA) drew similar conclusions to that of the Randomised Badger Culling Trial (RBCT) conducted in England between 1998 and 2005. This showed proactive badger culling was effective in reducing bTB in cattle and convinced Government of the case for culling badgers.

Science

Industry stakeholders said it was vital the Government 'listens to the science' and badger culling remained a key part of any strategy.

Waning support for the Conservatives and the prospect of another General Election have weighed on the sector, with the Labour party adamant it would stop the cull if it came into power.

NFU president Minette Batters said:"My greatest fear is if we lose or downsize the wildlife policy, we have walked our farmers into far tighter movement restrictions, disease control, testing and biosecurity, and it is paramount every part of the scheme is delivered on."

The NFU's Catherine McLaughlin said the strategy was based around looking at bTB as 'a disease with multiple reservoirs'.

She said: "As with any infectious disease, you cannot look at half of the problem. When we look at the transmission potential of all reservoirs, cattle to cattle, badger to cattle, cattle to badger and badger to badger, and how they interact with each other, we can start to control it.

Control

"There have been various times in the past – 2001, for instance – when we stopped culling or reduced our control policies. These times set us back, throwing the balance of power back to the disease. We cannot afford to lose momentum again."

Ms Batters, who has spent time overseas looking at other countries' approaches to TB, said the UK was in an 'extremely unique position', because the badger was classed as a protected species.

She said: "We are the only country in the world dealing with wildlife which is protected. New Zealand farmers are given a bullet. They take the possum's tail into the police station and they get another bullet.

"In Michigan with the white tail deer, they took out the white tail deer.

"We deal with this very challenging legal situation around the status of the badger, which is what makes our situation so unique.

"Risk of a legal challenge is always there, so scrutiny remains high."

Gloucestershire vet Roger Blowey, who spent 50 years TB testing cattle, pointed to Defra assessments on badger densities which showed populations had sharply increased since the species received protected status from the Badger Act in 1973 and the Badger Protection Act in 1992.

A report led by Johanna Judge, published in *Nature,* showed badger social groups since 1985-1988 had increased by 88 per cent across England and Wales.

Mr Blowey said: "We were talking about one badger per hectare in 1949. Now we are talking about 20/ha.

"We are still struggling in England at the moment because TB infected badgers are spreading across the country into the edge areas and so on. I think we have done well within the cull areas, but until we get a bigger cull area and get to grips with things in the edge area, I doubt you will see a huge amount of progress.

"If you look at the number of infected herds in the Gloucestershire and Somerset cull areas before the cull started and the number of infected herds after the four years of culling has ended, the visual reduction is absolutely dramatic."

Mr Blowey said while these results were encouraging, the reduction could not solely be attributed to culling, highlighting improvements in TB testing, additional herd restrictions and the gradual reduction in the number of herds and cattle numbers.

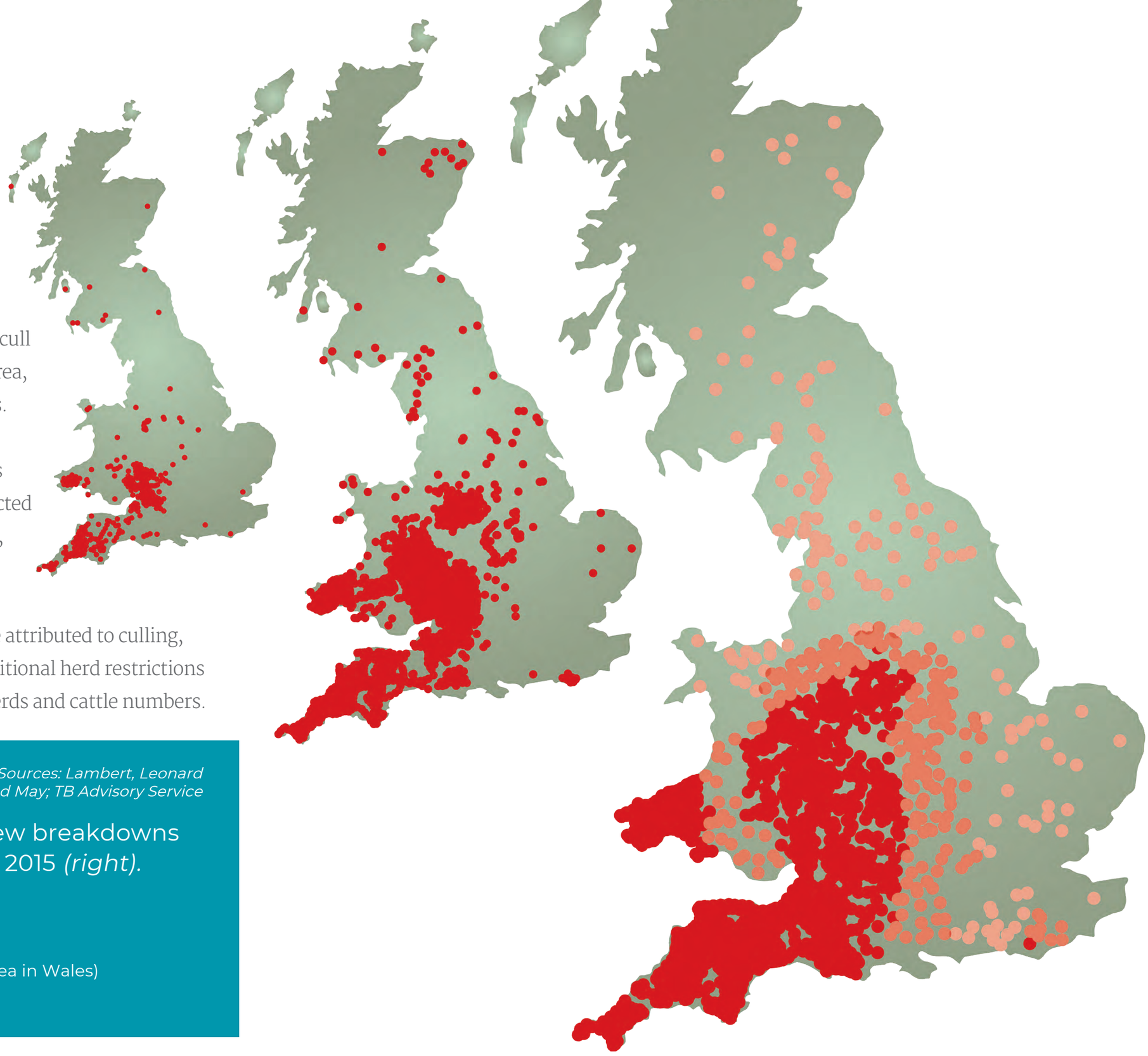
THE MAPS

Sources: Lambert, Leonard and May; TB Advisory Service

Geographical distribution of new breakdowns in 1992 *(left)*, 2004 *(centre)* and 2015 *(right)*.

On the 2015 map:

- Low risk area breakdown
- Edge area breakdown (intermediate area in Wales)
- High risk area breakdown



Latest figures on cattle slaughterings

32,359
The number of cattle slaughtered in England in the first 10 months of 2017

10,187
The number of cattle slaughtered in Wales, up 3 per cent on the year

9%
Increase in English cattle slaughterings compared to same period in 2016

26%
Scotland slaughtered 139 cattle in 2017, 26 per cent fewer cattle than in 2016

10
Average number of bTB breakdowns in Scotland each year

Financial cost

£500m
The estimated cost of bTB testing, compensation and research in the last decade

£1bn
The estimated cost of taking no action to stop the spread of bTB in the next decade

Case study

Gloucestershire beef producer David Barton *(pictured left)* has grappled with the disease on his farm for many years, but believes the industry is making ground.

Mr Barton, who farms in the high risk area, hit national news headlines in 2012 when he highlighted the human impact of being forced to cull cows which had tested positive for bTB.

Last year, Mr Barton's farm had its third consecutive clear test and was declared TB-free.

He said: "I think we are in a better position than we have been in for the last 30 years, because we have an eradication policy which is working.

"The issue is deeply politicised, but at the moment, we have a Government which is supporting an eradication policy and, while we have this opportunity, we have to do everything we can to make it work.

"As farmers, it is our responsibility to keep TB out of our farms and deal with it as we would any other disease. If we have done everything we can on-farm, then if a badger cull does take place, we will see results. The wrong attitude is to sit and wait or do nothing until we start culling."

> As farmers, it is our responsibility to keep TB out of our farms and deal with it as we would any other disease
>
> David Barton

The compensation conundrum

Compensation for affected herds has long been a bone of contention for those with farms hit by the disease, with the financial strain making some businesses untenable.

Defra said its policy for determining compensation was 'clear and well established', but many farmers believe it is not proportionate and does not take into account the value of the animal and its future earning potential, especially in regards to pedigree stock.

Warwickshire farmer Robert Leach, Warmington Beef Shorthorns, was forced to send a pedigree bull he bought from the 2017 Great Yorkshire Show to slaughter after it tested positive.

Status

The bull was from a high health status herd which had been TB-free for 25 years. The rest of Mr Leach's herd went clear and he has enjoyed a 20-year TB-free record.

He said: "I paid £8,000 for the bull and was offered £2,400 under the compensation scheme. It is an unfair system.

"I think pedigree cattle should be different and, in any case, farmers should be allowed to have an independent valuation as they have in Wales."

In 2016, the Welsh Government decided against switching to a tabular valuation system similar to the one used in England, but announced new stricter measures to penalise farmers, reducing compensation by up to 95 per cent for 'risky practices which can contribute to the spread of TB'.

Cheshire dairy farmer Phil Latham, whose herd went down with TB five years ago, said tweaking the compensation regime could help stop so-called 'risky trading'.

He said: "Surely we should have a system where for every risk you go up, the equivalent percentage comes down. For example, if you are

in a low risk area and buy cattle from a high risk area, you do not get any compensation, because you should not do that.

"People are doing it selfishly because these are cheap, disadvantaged cattle. You have people in Wales buying high risk animals from Cheshire on the cheap because they are high risk, taking them into Wales and getting an individual animal valuation and trading up in value if they go down with the disease.

"It is not an incentive to manage disease, it is a perverse incentive to keep the disease. It becomes an earner and this is ridiculous.

"You are not saying people cannot trade, but if there is a market disadvantage for trading riskily, people will become risk averse."

> I paid £8,000 for the bull and was offered £2,400 under the compensation scheme. It is an unfair system
>
> Robert Leach

Risk-based trading

Britain's livestock trade is reliant on stock moving round the country and industry chiefs say a balance is needed between minimising risk and maintaining a competitive marketplace.

Richard Findlay, North York Moors mixed farmer, said it was important 'not to interfere with trade', but to do everything in the industry's power to make cattle as safe as possible.

"We did have a problem before post-movement testing came in, where cattle were coming from the high risk area [HRA] to the low risk area [LRA], spending a week on a farm under the six-day standstill, then being sold as being from the LRA," he said.

"Farmers in our region were buying those cattle thinking they were from the LRA, but if they had known they were from Devon or Somerset, they would not have touched them with a bargepole. It was misleading and we had a lot of complaints from those in our TB-free area.

"This was stopped with the 60-day post-movement test."

Mr Findlay said his region supported post-movement testing, with farmers bearing the cost, about £10-£15 per animal, as it could prevent a TB breakdown which would cost tens of thousands of pounds.

Between April 1, 2016, and August 28, 2017, 14 reactors were disclosed in post-movement tests on 11 holdings in England's LRA.

Risky

"Vets and farmers on my patch in the North East will say we should build a wall and stop risky cattle coming here, but we cannot stop them, as we have finishers turning over more than

> We have to clean up our act, on the cattle movement side as well as with the badgers
>
> Richard Findlay

100 cattle a week who need them," said Mr Findlay. "All the TB in the LRA turns up on a wagon and a lot of it is the failure of the accuracy of the test, but it is difficult to defend moving TB round the country by cattle movements.

"We have to clean up our act, on the cattle movement side as well as with the badgers. If we say no to these cattle, some of them will come anyway and it will not be through the proper channels.

Finishers

"My view is we cannot stop the cattle and we do not want to stop them. The finishers need them so we need to make them safer, and this is where we are with Approved Finishing Units."

Chris Dodds, executive secretary of the Livestock Auctioneers' Association, agreed it was crucial to keep the need for a viable cattle industry at the heart of any TB eradication policy.

He said it was also crucial not to castigate those in hotspot areas.

"Those big feeding guys are doing a tremendous job and are vital to the sustainability of our industry which needs this supply of cattle," said Mr Dodds.

"We cannot have a situation where cattle in one part of the country are worth one price and another in a different part of the country.

"We have to remember about half the farms in the HRA have not had TB for at least 10 years. At present we are massively tarnishing those guys. Is this fair?"

Mr Dodds said orange markets, which provided farmers with a trading option for clear tested animals from TB restricted herds, had helped create a level marketplace.

"Before orange markets, some farmers were getting 50-60 per cent of their livestock value and they are now getting as much as other cattle are making at green markets," he said.

"We need to make sure those marketplaces are maintained to allow the feeding people to buy cattle at competitive prices, allowing them to stay in business and sell at competitive deadweight prices."

Red sales

Auction marts run dedicated 'red' sales, but animals sold there must go straight to the abattoir.

"The only issue is when supply is above demand and those cattle cannot go home, they have to go for slaughter, which puts those red markets in a weaker position," he added.

Livestock Information Programme

The Livestock Auctioneers' Association (LAA) has been involved in forming the Livestock Information Programme, a joint initiative between industry and Defra.

The new system aims to improve transparency between buyers and vendors, making passport or new cattle electronic identification information, such as the disease status of animals, available on the auction mart board.

LAA executive secretary Chris Dodds said while he was 'excited' about the desire from Government for this project to materialise, the system relied on an efficient and up-to-date database in Defra.

He said farmers often reported the data was incorrect or lacking detail, especially when a farm had more than one holding. For example, it could confuse which holding had seen a TB breakdown.

As well as making information sharing more transparent, the programme would take some pressure off farmers, freeing them of having to remember the dates of TB tests and take the relevant paperwork with the animal, for example.

It would also provide buyers with assurances the information had come from a controlled Government database.

Efficient

Mr Dodds said: "Defra will not get an efficient, worthwhile, risk-based trading system implemented until there is a database to provide it.

"In order to drive vendors to provide information at the point of sale, the buyers need to want it.

"We cannot have a situation where markets are told by the LAA to do this if people do not want to announce it, as they will sell cattle privately and marts will lose their customers, commissions and, at the end of the day, the ability to survive.

"There has to be a level playing field throughout and the only way to do this is for Government to give us a database which provides us with accurate and timely TB testing data results. We cannot develop schemes without it.

Determined

"As auctioneers, we are determined to be at the forefront of the rollout of schemes where our buyers and sellers become more informed."

North York Moors mixed farmer Richard Findlay said the new system would allow farmers to look at the history and health status of an animal, make an informed decision and buy with much more confidence.

Mr Findlay said: "In the future, for herds which have just come out of restriction, it may be worth considering forcing cattle sold off those holdings to go into an Assured Finishing Unit, rather than onto the open market, until the farmer has had some more successive tests.

"A trade-off might be other farms which have been clearer for longer might not have as many restrictions.

"With more up-to-date information on all holdings it offers the potential to have more accurate targeting of restrictions.

"This has not been possible before, as the technology has not been quick or modern enough," he said.

What is an Approved Finishing Unit?

Approved Finishing Units (AFUs) provide a route for rearing, fattening or finishing cattle from TB restricted and unrestricted farms. AFUs must be approved and licensed by the Animal and Plant Health Agency. Licenses can be granted for grazing or non-grazing depending on the area.

MORE INFORMATION

tbhub.co.uk/guidance/trading-and-movement

Outbreaks in the field: Shap, Cumbria

Vets had been struggling to tackle a recurring outbreak of bTB at farms in Shap, Cumbria, since 2014, before finding the disease in badgers last year.

Animal and Plant Health Agency officers tested roadkill badgers and uncovered the same strain of bTB which had been found in cattle affected on the Cumbrian farms going back to 2014.

It is believed an infected bull was taken in to the area from Northern Ireland, transmitting the disease to local wildlife, which consequently spread it to more cattle.

Cheshire dairy farmer Ian McGrath, who works with Defra to disseminate TB information to farmers, said: "I see Shap similar to how Cheshire was 10 years ago – a micro hotspot of disease of maybe only clusters of three or four breakdowns, but they recur, even without cattle movements.

Inaction

"What I do not want to see is inaction to this emerging threat and Shap ending up like Cheshire has, where the micro hotspots have merged and now east Cheshire loses as many reactors per sq.km as anywhere in the South West."

He said while the Shap case highlighted the risks associated with cattle movements, it also gave weight to evidence about transmission from badgers to cattle.

"Badgers tested in Prof Malcolm Bennett's roadkill study, Nottingham University, found the same strain in my cattle," added Mr McGrath.

"My herd first went down with TB in 2002, when Cheshire had 12 breakdowns. Now we have about 200. No-one took me seriously for 10 years. I knew my cattle were being reinfected."

ASSESSING THE RISK

Ian McGrath urged farmers to assess risk when buying and moving stock.

He added: "I always said if TB came into the low risk area, it would come in on the back of a lorry and this is what happened with Shap.

"Look at the four risk factors to your herd: bought-in cattle; lingering TB which is not picked up by the test; wildlife; and neighbouring cattle.

"You can assess these on any herd in the country and see where your most likely risk is."

> No-one took me seriously for 10 years. I knew my cattle were being reinfected
>
> Ian McGrath

Genetics: bTB has ‘regional accents’

A surveillance report by the Animal and Plant Health Agency (APHA) in 2013 found the gentotypes of M.bovis in wild and domestic animals other than cattle were, in general, identical to those found in the neighbouring cattle herds.

M.bovis gentotyping has been used to prove specific breakdowns in cattle and other species were linked by the same genotype.

Specific genoptypes are geographically localised in Britain, leading to the development of the ‘home-range’ concept, which applies to 97 per cent of M.bovis isolates from all cattle breakdowns. APHA said this geographical clustering of M.bovis genotypes was incompatible with a cattle-only transmission model for bTB in the UK, or the cattle movement patterns.

“This suggests an environmental [wildlife] reservoir of the bacterium,” the report said.

In an article for the Tackling Bovine TB blog, Defra’s chief scientific adviser Prof Ian Boyd said: “Put simply, if bTB could talk, it would probably have regional accents. This implies, for example, bTB from Somerset does not mix much with bTB from Cornwall.

Encouraging

“It is also an encouraging signal cattle movement controls to prevent the spread of bTB are working, as otherwise we would probably see a lot more mingling of bTB strains and an eventual blurring of regional distinctions.

“That there are still such thick ‘accents’ between regional variations suggests some success in containing them within their regions.”

Has use of maize silage contributed?

Increasing use of maize silage has been attributed to the increase in TB levels as badgers are attracted to the crop.

Maize was first grown in the South West in the early 1980s and spread up through the country.

Badger territory sizes are governed by their ability to support the population and sizes will reduce when there is a large food source.

Populations

Smaller territories allow for more badger groups in one area, leading to larger overall populations.

Warmer winters have also provided more food and allowed more badger cubs to survive.

Bovine TB myths

TB in Wales

Though TB in Wales is still a big problem, with thousands of farmers suffering the emotional turmoil and financial hardship which accompanies the disease, there are reasons to be optimistic about the future.

Since 2009, the number of new TB herd incidents reported in Wales has followed a broad downward trend, with the number of monthly cases dropping from about 100 to just more than 60.

It is hoped the establishment of low, intermediate and high TB areas across Wales, which came into effect in April last year, will continue to push incidence levels down by allowing the disease to be tackled in a more targeted way.

But this new regionalised programme could only be introduced on the back of an eight-year-old policy to annually test all herds for TB.

Dr Nick Fenwick, head of policy at the Farmers Union of Wales, said: "Annual testing changed everything and placed a marker in the sand."

As well as helping farmers by providing information about the status of cattle up for sale, it also gave Government an accurate picture of the disease across Wales.

Chief Veterinary Officer for Wales, Prof Christianne Glossop, said: "We have two parts of Wales which are high TB incidence, but the disease picture in those areas, Pembrokeshire and the borders, looks very different.

"In south west Wales, there is a lot of dairy farming and a lot of long-term herd breakdowns. There are big, complicated dairy herds with several sites and a lot of movement of animals between those.

"Down the border, although we have some long-term

breakdowns and there are some significant dairy herds, the key feature is not long-term breakdowns, it is recurring ones.

"Beef herds go down with TB, they get two clear tests, then they go down again. It is a different picture."

The different policy responses to this complex disease picture are played out on-farm, with every farmer responding to a TB breakdown in his or her own unique way.

"We find people who are used to it are emotionally better equipped to cope," Dr Fenwick said.

Suffering

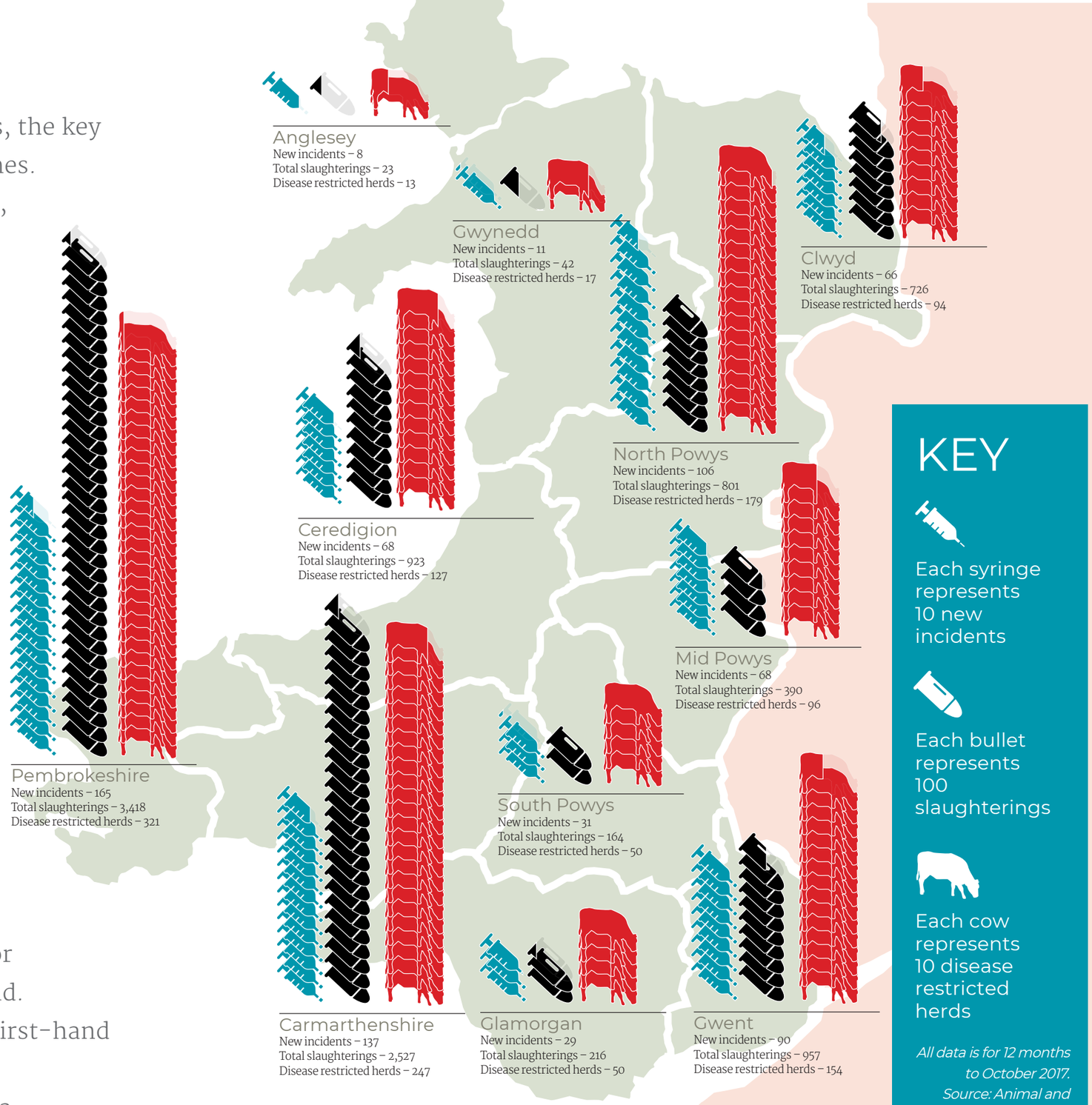
"Sometimes people feel like pulling their hair out after many years, but you get others who have never had the problem and they do not believe their cattle have TB. You know the chances are they have it, and they feel they are suffering something no-one else has ever suffered."

Powys farmer and Nuffield scholar Dafydd Saunders-Jones had similar experiences speaking to others about the emotional toll TB takes.

"The thing which had the biggest impact on me was being sat at a table with four farmers, big men, built for rugby, and having them in tears in front of me," he said.

NFU Cymru Pembrokeshire chairman Jeff Evans has first-hand experience of the disease's effects.

He was forced to dispose of a suckler herd because of a three-year breakdown and has since taken a ruthless approach to inconclusive reactors, actively removing them from his farm.



Jeff Evans said: "There is an inability to plan ahead. You think you are going to do something, but then suddenly you get TB and you have to change tack as you cannot sell your stores.

"We do not plan. We assume we will get TB again at some point."

A changing picture

9,906
The number of cattle slaughtered in 2016, up by a factor of 10 on 1996

711
The number of new TB incidents in 2016, compared to only 215 in 1996

2 million
More than two million cattle were tested in 2016, up from 306,382 in 1996

8,718
Only 653 reactors were slaughtered in 1996, compared to 8,718 in 2016

577
The number of herds not officially TB-free in Wales in 2016. There were only 83 in 1996

17,982
The number of tests on Welsh herds in 2016. Only 6,056 were tested 20 years earlier

Wales' badger cull debate

Nowhere are divergent views on TB more clearly displayed than in the controversial debate around badger culling.

Dafydd Saunders-Jones said: "The thing which frustrates me most about TB is people getting obsessed with badgers.

"If you go to the Royal Welsh Show, the media will always be saying 'farmers want a badger cull'. I have never met a farmer who wants a badger cull. I have met farmers who want to eradicate TB, but not cull badgers. The message is totally wrong."

So why is the issue so emotive?

"You have kids' stories and wildlife programmes; people go to watch wildlife and have a connection to it," Mr Saunders-Jones said.

"But part of it is on us. We have not explained the effects of TB correctly and we are not getting our message across."

Dr Fenwick disagreed.

"It is not about a lack of explaining the issue," he said.

"People are detached from nature. They get their impression of the countryside from the internet or through *Wind in the Willows.*

"We are quite unique in Europe in the history of our industrial revolution. We have a hugely urbanised population which is embedded and has been for 200 years now, so we are more detached from the countryside as a population than Ireland or France. They still have those links."

This divide between rural areas and urban areas, where politicians can hoover up the most votes, has led to accusations the Welsh Government has used the badger cull as a political football.

The 2007-2011 Labour-Plaid Cymru coalition agreed to carry out a cull in West Wales, but the position was reversed in 2012 when Labour decided to govern alone.

In 2017, five years later, Rural Cabinet Secretary Lesley Griffiths announced a return to the policy.

Prof Glossop insists she always believed a targeted cull was worth trialling and had presented the same evidence to successive administrations.

Current cull policy

Explaining the rationale behind the political U-turn, Prof Christianne Glossop said: "Using the improved understanding we have of the TB picture across Wales, we identified a small number of farms which were having long-term breakdowns.

"Out of about 600 live TB breakdowns at any one time, about 10 per cent come under this heading. We recognise the regime is not tackling the problem for those farms.

"In those breakdowns, we know one driver could be wildlife.

"If you are going to tackle all the other elements, you have to look at anything which is residual on-farm, and badgers are potentially one of those components," she said.

Though this policy has ostracised Prof Glossop in some circles, the FUW and NFU Cymru believe it is the only way to get farmers onside.

Mr Evans said: "Farmers were becoming frustrated as they felt the policy was one-sided. They will buy into it a little bit better now."

Dr Fenwick added: "The move is welcome, but it is frustrating we have taken eight years to go back to a culling policy. Now it has to be seen to be being implemented."

Prof Glossop has said there will not be an announcement on how many badgers are culled as part of the policy, deeming such a declaration 'inappropriate'.

Vaccination

For some, a policy of badger vaccination would be more preferable, and this is something the Welsh Government pursued vigorously in the area where the dropped cull was planned.

Prof Glossop said: "We knew where the badgers were. We had surveyed the land and engaged with farmers.

"We vaccinated for four years. The plan was to go for five years, but there was an interruption in vaccine supply, so we did some modelling based on the work we had done.

"The modelling suggested the bulk of the benefit you might derive from vaccination could be achieved with a four-year programme."

Although the programme was not part of a controlled trial, comparisons show TB in the vaccination area has been falling at least at the same rate as the rest of Wales.

The programme has also come in for criticism because of its cost.

To find the setts, lay and pre-bait the traps, then encourage badgers into them, is a time consuming, labour-intensive process.

It is estimated to cost about £600 to vaccinate one badger, with the process having to be repeated annually for at least five years, but Prof Glossop said it would be just as expensive to humanely euthanise a badger after trapping and testing it.

Scotland's enemy at the gates

NFU Scotland policy manager for animal health and welfare Penny Middleton is used to summing up the national attitude to bovine TB.

"We are in a fortunate position, but things could be very different," she said, as she highlighted the importance of Scotland's official TB-free status.

"We have to respect our TB-free status and do everything we can to protect it. We are definitely not in the business of finger-pointing and we appreciate the position we are in.

"We do have the occasional breakdown, but when we do, it does not become contiguous in the neighbourhood. This suggests there is not a reservoir of infection in the wildlife."

Individual cases

Furthermore, when there have been individual cases, the type has always been identifiable as, for example, a strain found in Ireland or the west of England.

NFUS is continually keeping up its guard against the disease and lobbies Government accordingly.

"Routine cattle testing is not perfect," she said.

"There will be some mistakes, but it is as good as we have got. We keep an eye on the risk-based matrix.

"Instead of automatic four-year tests, many herds are not tested at all if the risk is deemed to be low according to the matrix. Annual testing is still appropriate on some farms, for example those with higher risk on movement."

Compensation for reactors is paid on a different basis to England, with individual valuations made rather than using average or standard values.

NFUS defends this measure and regards it as fair, although there is a strong belief farmers should not expose herds to risk by importing cattle from high risk areas.

Post-movement testing is at the farmer's cost, but imported animals do not have to be kept separate unless they have come from the Republic of Ireland.

Scottish Government has consulted on proposals to introduce changes to the requirements for post-movement testing and to the way compensation is paid. A response will be published in the coming months.

Ms Middleton warned of the dangers of keeping bought-in stock isolated on outlying fields or rented grazing away from the main herd.

This could protect their cattle, but selfishly put neighbours' animals at risk.

In short, the battle to keep bovine TB at bay in Scotland is not just a matter for Government or representative organisations such as NFUS.

Every farmer in Scotland has to be a member of the 'home guard'.

What next for bTB in Republic of Ireland?

Tom Levitt details how a slight fall in bTB in the Republic of Ireland has not done enough to end criticisms of a badger cull there...

The situation in Northern Ireland

While bovine TB prevalence in Northern Ireland was relatively low in 2010, it has risen at an 'alarming' rate over the last few years and is now 'almost out of control', according to Ulster Farmers' Union deputy president Victor Chestnutt.

An unstable political backdrop and increasing mistrust between farmers and policymakers has exacerbated the problem, with NI farmers losing confidence in the country's strategy.

A Department of Agriculture, Environment and Rural Affairs (Daera) consultation proposed to cut bTB compensation levels to 75 per cent of the current rate, a move which could force many farmers out of business.

Small systems

Mr Chestnutt said: "Small, family farming systems would not be able to withstand that.

"We fear these cost cutting measures will not free up cash to be spent on tackling the disease, but go straight into Government coffers."

Mr Chestnutt said Daera proposals to implement targeted badger culls in Aghadowey and Omagh had been welcomed.

However, the political situation meant there was no Farming Minister to sign it off.

"Culling could commence this year," added Mr Chestnutt.

"We see how culling reduced disease incidence across the border, so we are hopeful.

"Our systems are mainly grass-based, so it would be impossible to keep cattle and badgers apart.

"We need healthy cattle alongside a healthy badger population."

The union has proposed a new levy based on average cattle numbers, charging £1-£3 a head.

Initially, this would be used to focus on tackling TB in the wildlife reservoir. Farmers or contractors would be trained to implement the cull and monitored by Government.

For it to be agreed however, Mr Chestnutt said Daera's other cost cutting measures would have to be 'taken of the table'.

> Small, family farming systems would not be able to withstand [a compensation cut to 75 per cent of the current rate]. We fear these cost cutting measures will not free up cash to be spent on tackling the disease, but go straight into Government coffers
>
> Victor Chestnutt

TB in other countries

Seeing the impact of bovine TB on individuals, families and communities led Welsh farmer Dafydd Saunders-Jones to embark on a Nuffield scholarship to look at TB eradication programmes being used in other countries.

Here he rounds up the approaches being used in six of the countries he studied:

France

France is officially TB-free, but has about 100 bTB cases each year. France's challenge is raising stakeholder engagement while the level of disease is still low.

An investigation into the role of cattle movements in bovine TB spread in France between 2005 and 2014 (Palisson, Courcoul and Durand) highlighted cattle movements appeared to be crucial, with a statistical association between movements and the bTB infection status of cattle herds.

Known reservoirs

Deer, wild boar and badgers are known reservoirs of the disease and capable of spreading TB.

In 2006, TB prevalence in the Forest of Brotonne, Normandy, reached 24 per cent in deer and 42 per cent in boars.

Once TB infection is found in badgers, they are culled from infected farms and fields within a 1km radius. To date, about 2,000 badgers have been removed in France due to TB.

Italy

Italy is a good example of how it is possible to eradicate bTB region by region, allowing for the concentration of resources, but also implementing different policies to achieve eradication of the disease.

In general, Italy is progressing with the eradication of TB, however Sicily is an ongoing issue.

There does not seem to be a significant influence of disease in wildlife.

This may be due to the fact many animals are housed indoors through the year to maximise land use for feed and fodder.

New Zealand

TB control in New Zealand is funded through a Government -industry partnership. The Government has committed NZ$100 million (£51.2m) from 2016-2020.

Additionally, farmers will contribute NZ$150m (£76.7m) over the same period through DairyNZ, Beef+Lamb New Zealand, Deer Industry NZ and livestock export industry levies.

To support and promote the programme, there are 15 TB-free committees.

Their role is to maintain effective links with the farming community and stakeholders at a regional level.

Spain

The whole of Spain has annual testing, with areas classed as low, medium and high prevalence.

In high prevalence areas, herds are tested every six months.

Spain identified issues with the quality of testing which was impacting on getting an accurate disease prevalence picture.

The Spanish Government then implemented a strict quality assurance scheme and the country now has an improved testing regime.

In the south of Spain, local infection prevalence in wildlife has been as high as 52 per cent in wild boar and 27 per cent in red deer, with sporadic disease also found in badgers.

The European Reference Laboratory on TB is VISAVET Health Surveillance Centre, Madrid.

It works with laboratories around the world on TB research, for example, by developing DNA sampling of TB reactor tissue samples, instead of culturing.

Sweden

Sweden has succeeded in implementing eradication plans for BVD and Johne's and has pride in the high health status of its national herds.

Farm working practices highlight the importance of disease prevention and biosecurity. For example, manure and waste is collected from one farm entrance and these vehicles do not enter the animal and feeding areas. Visitors must wash their hands and wear wellingtons supplied by the farm.

A key element of eradication is the involvement and commitment of all stakeholders. To be successful, a programme requires a long-term plan and financial security.

Political control of a programme can impact its viability and derail the enthusiasm of stakeholders.

Politicians must take responsible action which will consider farmers and taxpayers and commit to a long-term strategy which is not dependent on elections.

Switzerland

Switzerland has been officially TB-free (OTF) since 1960. However, in 2013, a severely lesioned cow was identified at a Swiss slaughterhouse.

The investigations which followed also traced other animals on other farms. The outbreak highlighted the importance of slaughterhouse surveillance to identify infected herds, especially in OTF regions or countries.

Following the outbreak, the Swiss Government increased training and education for slaughterhouse vets.

As Switzerland borders so many countries, it produces a monthly report detailing the situations and risks across its borders.

Science behind the tests

With confusion and misinformation often surrounding the two tests currently used in cattle, vet Den Leonard, of Lambert, Leonard and May, sets the record straight.

The two tests

Defra has two main tests to detect the presence of TB in a herd: the ‘skin test’ and the interferon-gamma blood test.

How do they work?

Tuberculin is a protein made by M. bovis bacteria, which causes a reaction in previously TB infected cattle when injected into the skin. The bottom injection is cattle tuberculin and the top injection is avian tuberculin.

The intensity of the reactions are measured at 72 hours after injection, and any lumps compared in size.

Some countries only use bovine tuberculin and kill anything which makes a lump. By using the avian injection, we can stop ourselves killing animals which are not truly infected with TB and are just cross-reactions to other mycobacteria.

Farmers, and indeed some vets, misunderstand the strengths and weaknesses of the skin test.

The skin test

In the UK we use the Single Intradermal Comparative Cervical Tuberculin (SICCT) test, known as the skin test, where we compare any reaction differences between two injections.

This test's weakness is its sensitivity. The sensitivity of the skin test under standard interpretation is about 80 per cent.

This means it will miss about one-in-five infected cows. However, as the skin test is used across farms and areas repeatedly, this issue is not poor enough to miss infected farms or areas in most situations.

It is also why testing is repeated several times on infected farms or areas, to ensure confidence the herd or area is clear of infection. However, as a test for a handful of animals, such as pre-movement tests, it is capable of being quite limited in finding infection.

The skin test can also find TB long before infected cattle have developed clinical signs which would be noticed by an experienced stockman or a vet.

Why do we use it?

It has extremely high specificity, at 99.98 per cent.

This means if you have a positive result to the test, there is only a one-in-5,000 chance the cow is not infected, also called a false positive.

This will surprise people as many cows, about 60 per cent annually, which are sent off as reactors do not show visible disease lesions or bacteria culture in them.

Misleading

This means the Government will tell you it has not found disease at that moment in time, which is quite misleading.

The take home message is, if she reacts, she is definitely infected, no matter what they fail to find in the slaughterhouse.

Interpreting results

The skin test can be taken at either 'standard' or 'severe' interpretation.

Standard interpretation is the default for all routine surveillance testing, while severe interpretation is used where TB is strongly suspected or confirmed, for example when testing TB breakdown herds.

The severe interpretation involves lowering the cut-off point for an animal to be classified as a reactor.

This means some inconclusive results at standard will become reactors under severe interpretation.

The system used in Wales can see some clear animals at standard interpretation become inconclusive reactors at severe interpretation.

A final failing of the skin test is 'anergic cows'. These are heavily lesioned cows which are so badly infected the immune system almost gives up and fails to react. These are often discovered at slaughter as they are full of lesions.

They are not common in areas which test regularly, but people often talk about them so they seem more common than they are.

The blood test/gamma test

The gamma test is much more sensitive than the skin test at about 90 per cent, but the specificity is lower, at about 97 per cent. It returns a result in just a few days.

This sounds good on paper, but specificity is more important than sensitivity where there is little disease.

In other words, if you gamma tested your herd of 200 cows, you might expect 3 per cent, six cows, to return a false positive.

This is why gamma is restricted to high risk cattle, such as inconclusives or occasionally in-contact animals where there is a high rate of reactors in a group and further infection is considered likely.

Positive testing animals do not necessarily show lesions at post-mortem meat inspection as they are often in the early stages of infection. Farmers can apply for animals to be gamma tested privately, as long as Government agrees.

The key message is the gamma test finds more infection, but also kills a few innocent cows doing it.

The Enferplex test

A new blood test is also being used called the Enferplex, or Phage test. This looks for a number of antigens, so the specificity and sensitivity varies depending on how many are found.

It is similar in some ways to the gamma test, although its specificity can be adjusted to be quite high, but this can compromise sensitivity.

It is finding animals which the skin test misses so may be useful in the future. It also does not test positive in vaccinated cows, so it could prove useful should vaccination ever be part of the UK's control programme.

While it is not being used widely at the moment, vets are watching with interest as the industry increases its understanding of how best to use it.

Where to go for help

The TB Advisory Service (TBAS) was set up to enable cattle keepers to access specialist advice on building resilience to bovine TB and has helped more than 2,000 farmers.

The service is fully-funded by Defra through the Rural Development Programme for England and is available to farmers in the high risk and edge areas of England.

The service is not available to farmers in the low risk area.

However, a Defra spokesman said: "Alongside the extensive advice and guidance available for farmers through the TB Hub, the Animal and Plant Health Agency offers local-level biosecurity advice to cattle farmers across the country."

The service is being delivered by trained consultants from ADAS, Kingshay and Westpoint Farm Vets, overseen by a technical board comprising bTB experts.

Project director Matt Dobbs, of Westpoint Farm Vets, said the service had a 'real impact' on farmers living with, or under threat from, bTB.

"While statutory TB controls are provided by Government, there are a number of things farmers can do to reduce the risk and impact of bTB," said Mr Dobbs.

"By bringing together experts in all relevant fields, including those with direct experience of the effects of bTB, we can ensure the advice given to farmers is bespoke, up-to-date, and proven to reduce the risk of spreading bTB.

"This service delivers tailored, practical advice based on the risks, giving farmers clear, economic, agreed upon interventions to help tackle this disease, all at no cost to the farmer."

Consultants give advice on all aspects of TB, including badger ecology, biosecurity, building design and trading options.

Where farmers are currently free of bTB, advice will focus on the steps available to protect against disease incursions.

For farms under TB restrictions, advice on trading options will be available, both on and off the holding, together with measures to prevent repeated reinfection of cattle.

REGISTER FOR TBAS

Farmers wishing to register for the service should call 01306 779 410, or email info@tbas.org.uk

Case study

Louise Smith, who has run a small pedigree herd in Staffordshire since 2009, has benefited from the TB Advisory Service (TBAS).

Ms Smith says: "We have Cattle Health Certification Standards [CHeCS] Elite health status, which is no mean feat, requiring annual testing and considerable time and expense to achieve.

"We can protect our animals against BVD, IBR, leptospirosis and Johne's by a combination of vaccination, having a closed herd, and carefully managing boundaries and watercourses. However, it is much harder to legally protect our herd against TB from wildlife.

"We are on the Staffordshire border, in a high risk area for TB. Badgers are plentiful here and there is a corresponding TB burden in the cattle population.

"As we are primarily producing animals for genetics, TB would be nothing short of disastrous.

"With no milk or beef to sell, income would be non-existent and the compensation offered is totally inadequate for a cow with eight years of hard work behind her.

"It seems imperative we should make every attempt to prevent our herd from succumbing to TB."

Louise Smith saw TBAS online and booked a free visit to see if her plans for badger fencing were suitable.

Discussion

Ms Smith was then able to discuss the areas of risk to her herd from TB.

"We share no boundaries with other cattle and we have a closed herd. Our cows are served by artificial insemination and are home-bred, so there is no risk from bought-in cattle," she added.

"The TBAS adviser identified our biggest risk as wildlife incursion, almost certainly from badgers.

"Although there are other wildlife sources, such as deer and alpacas, none of these can access our land.

"A quick tour of our buildings revealed plenty of cheap and easy solutions to lock wildlife out.

"We have no setts on our land and had intended to dig badger fences into the boundaries of all our fields, adding electric fences for extra security.

"We were advised digging fences was unnecessary, and the electric fence, correctly installed, would be perfectly adequate to ensure our black and white friends looked elsewhere for their playground."

Ms Smith said two hours of discussion over the kitchen table saved her installing 'costly' fencing and gave her 'new impetus to move the herd's health forward'.

"It has been greatly reassuring to be told it is possible to raise cattle in a high risk area with a massively reduced level of hazard and at a comparatively low cost," she added.

"We have been more fortunate than many. Our latest tests were clear, and with the TBAS advice on board, we intend to make sure it stays this way."

> The TBAS adviser identified our biggest risk as wildlife, almost certainly from badgers
>
> Louise Smith

WELSH GOV SUPPORT

The Welsh Government provides support and advice to farmers whose cattle have TB through its Cymorth TB programme.

To find out more about the programme, call the Animal and Plant Health Agency Wales office on 0300 303 8268 and ask to speak to Cymorth TB admin, or visit www.tbhub.co.uk

Charities on hand to help

The human impact of bovine TB (bTB) is often one which does not filter past the farm gate, yet the emotional toll of an outbreak can be hugely damaging to farmers and their families.

Rural charities say issues with bTB account for a large proportion of calls to their helplines, with many seeking a sympathetic ear, as well as advice and, in some cases, financial support.

Paul Burrows, chief executive of the Royal Agricultural Benevolent Institution, said the charity often saw the human fallout, with some outbreaks the catalyst for 'a downward spiral' in mental health.

Mr Burrows said: "Large numbers of cows are culled every year from suckler herds which have been built up over many generations. The financial and emotional costs are enormous.

"Discovering TB is a nightmare for those caught up in the middle of things. Having your farm effectively shut down is bad enough, but the uncertainty and worry can exacerbate things.

Outbreak

"We pay out thousands of pounds to families affected by TB every year, but an outbreak of the disease does not always force people to turn to us immediately for help.

"Often it is just the catalyst in a downward spiral which leaves people feeling increasingly isolated and financially exposed."

It was a situation echoed at the Farming Community Network (FCN), where about one-third of its cases related to bTB.

Stephen Dennis, bTB expert and FCN regional director for the South West, said: "When a farm is hit by bovine TB, it is not just the livestock which suffers.

"Our volunteers regularly encounter farming families experiencing immense financial hardship due to no longer being able to sell the livestock they intended to. Some have been forced to drastically alter their businesses as a result.

"Many farmers also suffer with their mental and physical health. They could be anxious about a forthcoming test, stressed about the increased workload which comes with testing, or depressed about seeing their livestock being slaughtered. This can even lead to a breakdown in family relationships and poor mental well-being among family members."

Stephen Dennis said it was no surprise some farmers quit the industry altogether. And some felt they had no choice than to take their own life.

"When they are ready to seek help, they are often more comfortable discussing their problems with a third party as they do not wish to be a burden to their friends or relatives. This is where the FCN can help.

"We can work with farmers to reduce the impact of bTB, help with cashflow issues, support those struggling emotionally and provide practical business and farming support."

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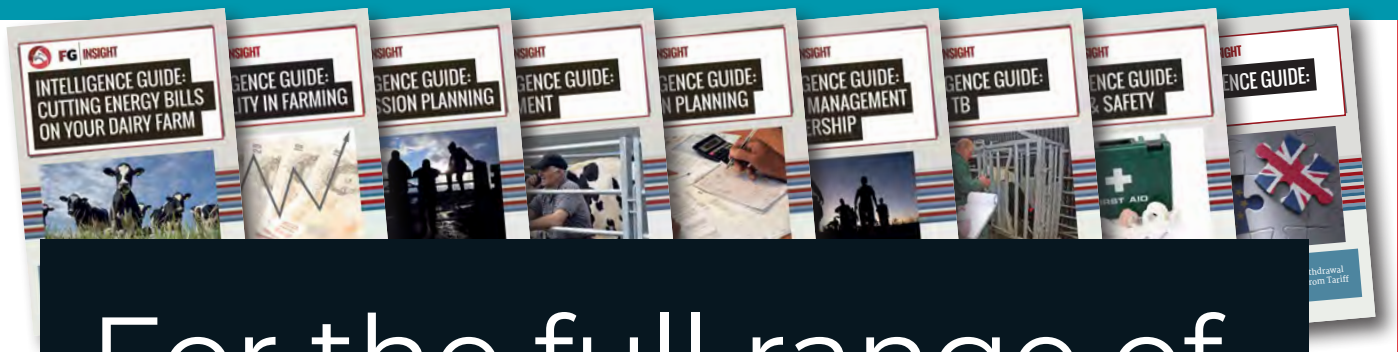

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