

ARD Committee Recommendations Update Report

Department	Agriculture & Rural Development
ARD Committee (NI Assembly)	Review of Bovine Tuberculosis in Northern Ireland
Date of Report / Hearing	26/11/2012
Date of DARD response to ARD Committee	29/01/2013
Report Criteria	Current Commitments
Date of Update Report	25/02/2016

ARD Committee Recommendations	Departmental Response as outlined in the DARD Formal Response	Subsequent Actions and Progress to Date	Status
<p><u>ARD Committee Recommendation No. 1</u> <i>It is of vital importance that bovine TB does not establish a firmer foothold in Northern Ireland, and from this perspective the recent and rapid increase is particularly worrying to the Committee. The Committee recommends that DARD comes forward immediately with the findings from its investigations into the recent 40% rapid increase in TB herd incidence rates and that DARD confirms that sufficient resources are devoted to ensuring the disease does not take a firmer hold in Northern Ireland.</i></p>	<p>The Department notes and accepts the Committee's recommendation. Given that the TB herd incidence here was down to 4.99% at 31 August 2011, which was the lowest since 1996/97, it is very disappointing that it has steadily increased since then to reach 7.46% at 31 October 2012.</p> <p>Officials have investigated a considerable number of possible factors for the general rise in TB levels that has been seen in the past 12 months, including:</p> <ul style="list-style-type: none"> • the reduction in the number of inconclusive reactors; • changes to the tuberculin being used in testing; • sourcing/buying in of cattle; • chronic herds with multiple breakdowns; • potential differences in testing results by DARD staff and PVPs; • concurrent diseases such as liver fluke, BVD or Johne's Disease; • unintended consequences of changes to Single Farm Payment rules leading to badger or deer disturbance, for example badger behaviour changes due to scrub removal; • changes in deer numbers and range; • weather impacts in both winter and summer on badger behaviour; and • crop pattern changes such as maize silage. 	<p>The Department continues to tackle the increased spread of disease through on-going implementation of the EU Commission approved TB eradication programme.</p> <p>To prevent the disease taking a firmer hold, the Department seeks to make additional resources available to meet the increased testing demands and compensation costs for the extra number of animals being compulsorily removed and slaughtered under the TB programme.</p> <p>The TB herd incidence for the 12 months ending 31 December 2015 is 7.15%, which compares with TB herd incidence of 6.03% for the 12 months ending 31 December 2014 (an 18.6% increase). The TB animal incidence for the 12 months ending 31 December 2015 was 0.661%, which compares with 0.550% at 31 December 2014 (a 20.2% increase). Reactor numbers in the 12 months ending 31 December 2015 were 10,996, which compares with 8,838 for the 12 months ending 31 December 2014 (a 24.4 % increase).</p> <p>Minister O'Neill announced on 17 September, 2013 her intention to develop a government/industry Strategic Partnership Group. This Group has been appointed and has been tasked with producing a longer-term strategy and implementation action plan</p>	

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	<p>Whilst we are still awaiting results of some analyses, after detailed consideration of these potential factors officials have concluded that, at this time, there is no single issue that can be identified as the cause of this TB herd and animal incidence rise. As the evidence presented to the Committee has demonstrated, TB is a very complex and multi-factorial disease with many unknowns but officials will continue to conduct investigations and monitor the situation closely to seek to understand what is driving this recent increase.</p> <p>While it may not be possible to identify the specific causes of this rise, it is important that the Department continues to tackle the increased spread of disease through on-going implementation of the TB eradication programme.</p> <p>To prevent the disease taking a firmer hold, the Department has made additional resources available to meet the increased testing demands and compensation costs for the extra number of animals being compulsorily removed and slaughtered under the TB programme. This has been achieved by re-allocation of monies within Veterinary Service budget lines and through successful in-year bidding to DFP for additional resource for TB. There has been an increased allocation of testing to PVPs, given the flexibility of service provision which exists within the private sector.</p> <p>The Committee will also be aware that there is a specific reference in the Programme for Government to the funding of around £4 million that has been allocated in the Department's budget to conduct TB and wildlife research and studies.</p>	<p>to eradicate bovine TB. It is intended that this Strategy will be all embracing and address all issues; including how the Strategy will be funded; who will lead on the implementation of the various elements of the strategy; improve disease detection; improve biosecurity; improving communications with farmers and vets; and developing our ability to address the wildlife factor. It is proposed that the strategy will re-energise relationships with all industry stakeholders; consider as appropriate the enhancement of primary and secondary legislation; compensation levels and consider other means to tackle and eradicate the disease. The Group presented their Interim Report to the ARD Committee on 30 June 2015 before engaging in a public consultation exercise until 4 September 2015.</p> <p>The Group hoped to produce their final report and recommendations by 31 December 2015. However, due to the complexity and variety of the issues involved and the need to carry out an independent cost/benefit analysis of the proposed recommendations, the TBSPG asked the DARD Minister to defer the target date to enable this work to be carried out. The recruitment of consultants is now underway, but owing to procurement rules it is unlikely that the consultants will report before late May/June 2016. The TBSPG are hopeful of completing their task by 30 June 2016. TBSPG will update the DARD Minister on progress before 31 March 2016.</p> <p>The TBSPG met the Deputy Chair of the ARD Committee on 1 February. Unfortunately the Chair was unable to attend but the Deputy Chair indicated he would feedback to the Committee</p>	

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<p><u>ARD Committee Recommendation No. 2</u> <i>The Committee recommends that DARD considers how the advice and expertise of local veterinary practices could be used in partnership with the farmer/herd keeper so that assistance and information is tailored to the specific situation of the farmer.</i></p>	<p>The Department notes and accepts the Committee's recommendation. The Department has on-going stakeholder involvement through its Animal Health and Welfare Stakeholder Forum and TB Stakeholder Working Group, which has farmer, environmental and veterinary organisation representation.</p> <p>The Department also works closely with the Private Veterinary Practitioners through its TB Testing Partnership Group, which comprises DARD officials and representatives of the NI veterinary profession. This Group continues to meet to discuss TB testing and communication related issues.</p> <p>The Department recognises the need for improved local communications around the area of TB and officials have developed a TB Delivery Programme Communications Plan, initially to cover the current business year. One of the central actions in the Plan is to take forward a project to improve knowledge transfer in relation to TB from the Department to private veterinarians (PVPs) and vice versa. This project, which is currently at a delivery pilot stage in Omagh and Ballymoney areas, seeks to realise the potential within the private veterinary sector to advise and influence farmers. It is hoped that the additional collaborative effort by the Department and the private vets will assist farmers to take sensible and tailored bio-security measures to keep disease out of their herds and also put PVPs in a better position to answer many of the questions posed by their farming clients in whose herds TB has been detected.</p> <p>Department veterinarians and scientists from the Agri-Food and Biosciences Institute (AFBI)</p>	<p>The Department recognises the need for improved local communications around the area of TB and officials developed a TB Delivery Programme Communications Plan, initially to cover the 2012/13 business year. One of the central actions in the Plan was to take forward a project to improve knowledge transfer in relation to TB between the Department and private veterinarians (PVPs) and to realise the potential within the private veterinary sector to advise and influence farmers.</p> <p>To provide a conduit for developing TB communications the TB Testing Group has been renamed the TB Testing Partnership Group by mutual consent of PVP stakeholder representatives and the Departmental officials.</p> <p>The 2012/13 TB Delivery Programme Communications Plan has since been reviewed and updated to include further development of the knowledge transfer pilot (PVP Communications).</p> <p>Other actions have been taken to promote the biosecurity message through various means such as the production and distribution of leaflets, advice on the DARD website, visits to farms and presentations delivered by PVPs.</p> <p>The Department funded knowledge transfer to farmers in relation to the industry led BVD programme through Axis 1 of the NIRDP. Opportunity was taken to draw farmers' attention in the presentations to the commonality of farm bio-security measures to all cattle diseases. Thus measures taken to prevent entry of BVD into a herd will also be effective in reducing many of the risk factors for TB. The BVD seminars were led initially by AHWNI and subsequently by PVPs, remunerated through the NIRDP. The sessions were very well attended and</p>	

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	<p>provided input to a TB information seminar on 1 February 2012 arranged by the local veterinary organisations, which was very well attended by PVPs and DARD veterinarians.</p> <p>The Department's stand at the recent Association of Veterinary Surgeons Practising in NI (AVSPNI) 2012 conference focused on TB. There was a similar presence at the Winter Dairy Fair 2012. Displays and information leaflets have been produced specifically for both events and for wider dissemination of key messages including a simplified TB bio-security message for farmers, developed in partnership with key industry stakeholders.</p>	<p>well over 3,000 farmers benefitted from the bio-security advice refresher.</p> <p>It is proposed that TB biosecurity training will be funded under the 2014-2020 Rural Development Programme (RDP). It is anticipated that this will be delivered by both DARD vets and PVPs to farmers participating in the Business Development Groups (~ 3,300) and under the Farm Family Key Skills measure of the RDP over a 5 year period.</p> <p>In addition to this farmers have on-line access to TB advice and TB breakdown farmers receive a printed copy of DARD's "TB in your herd" booklet and bespoke VO advice during the course of any breakdown. At the suggestion of PVPs, DARD developed and published a webinar in August 2015 to further assist the dissemination of targeted advice to PVPs and farmers regarding good preventative and biosecurity practices. See link below:</p> <p>https://www.dardni.gov.uk/articles/tb-bioexclusion-webinar</p> <p>The above aspects of biosecurity advice include mitigation of risks relating to animal movements. Divisional Veterinary Office staff have been trained to give bespoke advice to farmers in relation to identifying where badgers may have direct or indirect contact with cattle and the practical steps that can be taken to reduce the risk. At the DARD College of Agriculture Food and Rural Enterprise (CAFRE) TB biosecurity training is delivered by a DARD vet to students as part of the animal health modules of the relevant courses being delivered. DARD's 'TB & Biosecurity' information leaflet and its 'TB in Wildlife' leaflet are also disseminated at CAFRE - organised events at its Greenmount Campus.</p> <p>TB continues to be a key theme of the VS stand at the annual AVSPNI conference. It also continues to</p>	

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		<p>feature in the DARD display at the annual Balmoral Show and at the Winter Dairy Fair.</p> <p>Publication of the Bovine Tuberculosis in Northern Ireland Annual Reports and an updated TB Research in Northern Ireland leaflet are additional materials available to PVPs.</p> <p>“Heat maps” showing the relative levels of TB across NI were developed with PVP input and distributed to all PVP practices during 2014. Additional maps showing animal and herd densities and an aide memoire to help PVPs get information from the APHIS database, through ePVP were also issued. It is intended that this will further facilitate the provision of relevant information to farmers. The “Heat Maps” have been updated with 2015 data and will be sent to all TB testing practices,</p> <p>Advice and updates continue to be sent to all local practices through “PVP factsheets” and information letters.</p> <p>DARD has prepared a new contract for the provision of TB testing services by PVPs with a view to having this in place by 11 April 2016. The new arrangements will include training and updates for PVPs and potentially more PVP involvement in TB breakdowns. Thus they will be better informed and in a better position to give disease control advice to farmers.</p>	
<p><u>ARD Committee Recommendation No. 3</u> <i>The Committee noted and recommend to DARD that it undertakes further analysis taking account of herd size, ‘repeated’ herd tests, test reason and seasonality might be worth doing, assuming any analysis involving the pre-2011 data can also control for the impact of any policy or testing</i></p>	<p>The Department notes and accepts the Committee’s recommendation and agrees with the Committee’s view that all TB testing, whether by a private veterinarian or by one of its own employees, should be done to the same standard and with the same rigour and consistency.</p>	<p>The number of supervisions has been maintained. Through the TB Testing Partnership Group the process has been further enhanced by the introduction of a more rigorous TB testing approval process for new private veterinarians commencing TB testing duties.</p>	

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<p><i>methodology changes over time.</i></p>	<p>The Department continues to monitor the performance of all veterinarians in relation to TB testing and a number of actions have been taken to improve the quality of TB testing. The suggestions made in the recommendation above will be fully considered in relation to ongoing TB test comparisons between Departmental and private veterinarians.</p> <p>Communications with private practitioners have been improved through meetings and working groups. Disease detection statistics reports are provided to individual practices so that the practice principal is in a more informed position when considering the performance of the testing vets in his practice. Over the last year, more Departmental staff have been trained to supervise TB testing veterinarians within DARD and in the private veterinary sector and an increased number of supervisions is taking place. This approach is aimed at improving the rigour of the testing process. The TB Testing Partnership Group continues to meet in a spirit of partnership working and with the aim of promoting continuous improvement.</p> <p>The AVSPNI seminar on 1 February 2012 discussed TB test audits in detail. More recently a group has explored ways of developing better two way communications between Veterinary Service and the private veterinary sector and a pilot of the proposals is currently taking place, as is also referred to in the response to Recommendation 2.</p>	<p>Statistics continue to be provided to Practice Principals along with important information about the TB Programme.</p> <p>The model used for the comparison of test results has been reviewed. Veterinary Epidemiology Unit (VEU) and AFBI Biometrics finalised an updated comparison report on 2012 data in January 2014. It provided a comparison between private veterinary practitioners (PVPs) with DARD's veterinary officer testers comparing risk herd tests; restricted herd tests; check herd tests.</p> <p>The modified model took into account comments made by the NI Assembly statistician (as far as practically possible) in that it now incorporates season and herd size. Years are examined independently and TB reactors alone were counted as producing positive animals and positive tests (i.e. inconclusive TB reactors are considered negative).</p> <p>Results for 2012 are shown below. The table shows the odds ratios (with 95% confidence intervals) of DARD testing officers disclosing a positive test or positive animals compared with PVPs.</p> <table border="1" data-bbox="1310 1018 1883 1362"> <thead> <tr> <th>Herd Test Category</th> <th>Positive test (95% confidence interval)</th> <th>Positive animal (95% confidence interval)</th> </tr> </thead> <tbody> <tr> <td>Risk</td> <td>2.3 (1.7 – 3.0)</td> <td>0.9 (0.8 – 1.1)</td> </tr> <tr> <td>Restricted</td> <td>1.1 (1.0 – 1.3)</td> <td>1.0 (0.9 – 1.3)</td> </tr> <tr> <td>Check</td> <td>2.0 (1.3 – 3.1)</td> <td>1.6 (1.2 – 2.0)</td> </tr> </tbody> </table> <p>Results for 2013 are shown below.</p>	Herd Test Category	Positive test (95% confidence interval)	Positive animal (95% confidence interval)	Risk	2.3 (1.7 – 3.0)	0.9 (0.8 – 1.1)	Restricted	1.1 (1.0 – 1.3)	1.0 (0.9 – 1.3)	Check	2.0 (1.3 – 3.1)	1.6 (1.2 – 2.0)	
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<p>The report of the analysis of 2014 data has been completed. The results are tabulated below along with the reported summary conclusion.</p>																	

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		<p>framework, supported by a public service contract, which must be adhered to by both PVPs and DARD. Following the procurement exercise in England and Wales in May 2015, DARD needed to review its position to see that we are paying a fair price and demonstrate best value for money.</p> <p>The new PVP contract, should issue on 1 March 2016 and practices that wish to continue to test on behalf of DARD from the contract start date of 11 April must sign it ahead of that date.</p> <p>The PVP fees have been set by DARD based on the outcome of a bench marking exercise covering the fees paid in England, Wales, Scotland and the ROI. It is anticipated that the overall cost to DARD will be reduced by 9.6% (approx £600,000) based on the profile of PVP conducted herd tests in 2014-15. Additional services are also included in the new arrangements for no additional fee, including the application of DNA tags to TB reactor animals and the provision of biosecurity advice to farmers. There is a strong emphasis on testing quality, which the Department will continue to oversee, with responsibility placed on PVP businesses managers to ensure that testing is delivered by all their employees to the required standard. KPIs and penalties are included to assist DARD to manage the delivery of contractual requirements. The change over to the new contract will be carefully managed to minimise disruption to testing services and avoid any negative impact on farmers.</p>	
<p><u>ARD Committee Recommendation No. 4</u> <i>The Committee is concerned that awareness of the potential impact of liver fluke and Johne's Disease to the sensitivity of the testing for bovine TB, and anergic animals is not clearly understood and recommends</i></p>	<p>The Department notes and accepts the Committee's recommendation. The Department is aware of the potential for concurrent diseases, such as liver fluke and Johne's Disease, to affect the sensitivity of the TB skin test and agree that</p>	<p>AFBI submitted a Full Format Research Proposal (FFP) for a study lasting 30 months which will investigate "The role of endemic diseases and other factors in the occurrence of bovine Tuberculosis." This study was commissioned on 23 April 2013, but did not</p>	

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<p><i>that research into such issues is sustained by AFBI.</i></p>	<p>this is a priority evidence gap in relation to TB.</p> <p>On 6 November 2012, the Department commissioned proposals from AFBI for the 2013/14 Research Work Programme including one for a research project to investigate the role that endemic diseases (such as liver fluke, Bovine Viral Diarrhoea and Johne's Disease) and nutritional and vitamin deficiencies may have on TB occurrence and control.</p>	<p>start owing to vacancies in key posts. The project was re-commissioned as part of the 2015/16 Evidence & Innovation call process with a commencement date of 1 August 2015 and it is anticipated that the project will continue until 1 April 2017</p> <p>This project will attempt to identify if there are infectious and nutritional co-factors that influence the diagnosis and / or occurrence of bovine tuberculosis.</p> <p>In carrying out this work it is planned to identify if any of the conditions under study influence the diagnosis of bovine tuberculosis using the currently available tests and if there is evidence that these factors influence either the progression and / or transmission of bTB, e.g. factors that may be associated with increased rates of cattle to cattle TB transmission.</p>	
<p><u>ARD Committee Recommendation No. 5</u> <i>The Committee also recommend that DARD, through partnership with the industry and with other important stakeholders such as private veterinary practices make every effort to improve communication with farmers affected by bovine TB around the current testing regime and its limitation as well as raising awareness on the potential impact of liver fluke and Johne's Disease.</i></p>	<p>The Department notes and accepts the Committee's recommendation. The Department recognises the need for improved local communications around the area of TB. A group comprising Departmental and private veterinarians has recently been exploring ways of developing better two-way communications and arrangements to pilot its proposals have already commenced, as outlined in the above response to Recommendations 2 and 3.</p> <p>The Department's stand at the recent Association of Veterinary Surgeons Practising in NI (AVSPNI) 2012 conference focused on TB. There was a similar presence at the Winter Dairy Fair 2012. Displays and information leaflets have been produced specifically for both events. The Department has also been working with key industry stakeholders to produce a core TB message and bio-security advice. A simplified TB</p>	<p>Work on communications with PVPs is ongoing. TB was a subject in the DARD stand at the 2015 Balmoral Show, the 2015 Winter Dairy Fair and 2015 AVSPNI conference. An updated leaflet on the most recent TB research in NI has been produced and a biosecurity advice presentation has been produced and is on display on plasma screens in all DARD Direct Offices.</p> <p>DARD makes available to all herdkeepers the leaflet "Biosecurity measures which help protect your herd against TB". This leaflet discusses in very clear terms the risks from bought-in cattle; contact with cattle from other herds; contact with badgers and deer; contact with people and equipment; and slurry from other farms. DARD also provides the leaflet Wildlife Biosecurity, which discusses the risks from badgers and deer and how to mitigate these risks.</p> <p>Since July 2013, DARD staff have been providing</p>	

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	<p>bio-security message was launched at the Winter Fair and will be communicated more widely to farmers. The results of the TB Bio-security Study, which is being conducted by AFBI, may also help inform future bio-security advice to herdkeepers.</p> <p>Further AFBI research commissioned by the Department is underway in a TB high incidence area in Co. Down. Its objective is to establish the extent of cattle-cattle and badger-cattle interactions, at pasture and in and around farm buildings and it may also lead to more specific advice to herdkeepers in relation to further mitigation of the wildlife risk factors.</p> <p>The Department has also requested AFBI to put forward a research proposal to investigate why a greater number of reactor cattle come from chronic and repeat breakdown herds and what could be done to address this.</p> <p>The initiatives being developed by Animal Health and Welfare NI to deal with diseases, such as Bovine Viral Diarrhoea (BVD) and Johne's Disease, are also welcomed. The Department has facilitated a winter 2012/13 BVD awareness programme, which is being delivered in conjunction with Animal Health and Welfare NI through the Rural Development Programme. Meetings with private veterinarians and a series of county level farmers' meetings have already taken place. The Department recognises the potential which exists within the private veterinary sector to advise and influence farmers in the course of their daily interactions. Officials have been active in encouraging the veterinary associations to put themselves forward in this regard. This is also mentioned in the response to Recommendation 2. The involvement of local PVPs in the next stage of roll out of the BVD awareness programme</p>	<p>these leaflets to herdkeepers at annual or biannual biosecurity visits in accordance with a communications plan. This means that every herdkeeper should have received these leaflets at least once by mid 2016.</p> <p>In addition, when a TB breakdown occurs on a farm, the herdkeeper is visited by a Veterinary Officer, who provides the herdkeeper with copies of these leaflets. Face-to-face biosecurity advice is also given at these visits. The leaflets are also freely available at Divisional Veterinary Offices and on the DARD website, together with other DARD publications containing Biosecurity advice. DARD staff also meet herdkeepers at the Balmoral Show and the Winter Dairy Fair and discuss risk factors face-to-face.</p> <p>The research project to establish the extent of cattle-cattle and badger-cattle interactions at pasture and in and around farm buildings has concluded with the report of its findings published on the DARD website. A stakeholder meeting was held to discuss how the conclusions of this, and other recently published research work, could be applied here. The results of research projects have also been made available to the TB Strategic Partnership Group.</p> <p>Staff from all Divisional Veterinary Offices have been trained to give bespoke advice to farmers in relation to identifying where badgers may have direct or indirect contact with cattle and the practical steps that can be taken to reduce the risk</p> <p>DARD has prepared a new contract for the provision of TB testing services by PVPs with a view to having this in place by 11 April 2016. The new arrangements will include training and updates for PVPs and potentially more PVP involvement in TB breakdowns. Thus they will be better informed and in a better position to give disease control advice to</p>	

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	<p>provides an ideal opportunity to reinforce the BVD message with their farming clients at practice level and, as well as delivering the BVD message, these sessions will also cover the importance of on-farm bio-security in protecting animal health more generally.</p> <p>Animal Health and Welfare NI's disease initiatives should, over time, reduce the prevalence of these commercially detrimental diseases in our herds and hence their potential to have a negative impact in relation to bovine TB.</p>	<p>farmers.</p> <p>Work continues on the interrogation of the APHIS data to investigate why a greater number of reactor cattle come from chronic and repeat breakdown herds. See Recommendations No.11&12.</p> <p>Animal Health and Welfare NI (AHWNI) initiated a voluntary BVD eradication programme of "tag and testing" in January 2013 and approached the Department to introduce legislation here to make the testing for bovines for BVD compulsory. The Minister subsequently agreed to introduce legislation to make the testing of new born calves for BVD compulsory. The legislation has completed the legislative process to come into force on 1 March 2016. The programme will be implemented by AHWNI.</p> <p>Previously and in conjunction with AHWNI, the Department rolled out a programme through the Rural Development Programme (RDP) to raise awareness about BVD, how to tackle it, and the economic and welfare advantages of doing so. The sessions also covered the importance of biosecurity and the protection of animal health more generally.</p> <p>Going forward, it is anticipated that under the incoming RDP farmers, PVP's and industry groups could apply for funding to support training and awareness needs relating to good on farm biosecurity in relation to such diseases such as TB, BVD, etc. The details of the programme, the funding available and the conditions of such funding are currently being finalised. It is anticipated that the programme will open for applications later in 2016. Please refer to Recommendation 2 above regarding RDP funding available provision of biosecurity Training sessions for farmers and for assisting with funding of on-farm biosecurity improvement measures.</p>	

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<p><u>ARD Committee Recommendation No.6</u> <i>The Committee recommend that DARD reports back to the Committee on methods available to improve the performance and reduce the cost of the gamma interferon test.</i></p>	<p>The Department notes and accepts the Committee's recommendation. The interferon gamma blood test is the only EU Commission approved complementary test to the single intradermal comparative cervical tuberculin (skin) test. The gamma interferon test may be used in conjunction with the skin test to improve disclosure of TB infection in certain situations. However, it is expensive, complex to carry out and identifies more false positive animals than the skin test and, as a result, there are constraints on its use.</p> <p>The Department has commissioned AFBI to undertake an evaluation of the considerable gamma-interferon database with a view to establishing how best to use this test in the TB eradication programme. AFBI is also considering options for how best to achieve cost reductions, now that the patent of the existing gamma-interferon test kit test has expired.</p> <p>In addition, the Department has recently requested proposals from AFBI for the 2013/14 Research Work Programme to evaluate the range of commercial and near application serological tests for bovine TB that could ultimately be undertaken as alternatives to, or in conjunction with, existing tests as part of the TB eradication programme.</p>	<p>The AFBI gamma-interferon study suffered slippage due to vacancies in key posts. Progress with this complex analysis project restarted in April 2013 and AFBI's initial report of its analysis has been considered to determine if this has implications for the current TB programme, or whether further research is needed. The completion date of the full format proposal (FFP) "An Evaluation of interferon-gamma (IFN-g) testing for bovine TB in Northern Ireland" was May 2015. All FFP objectives were completed.</p> <p>The Final Report concluded that –</p> <ul style="list-style-type: none"> (i) SICTT is a good screening test method but with low sensitivity in this population; (ii) The SICTT and IFN-g used in parallel were able to detect the majority of truly infected animals; (iii) Raising the cut off for a positive test from the current cut off to that recommended by the manufacturer improved the specificity with a minimal loss of sensitivity. This change would be beneficial, reducing the number of false positives and saving on substantial expenditure in compensation costs; and (iv) IFN-g positive animals were more likely to become SICTT reactors compared with IFN-g negative animals in the same herd. Animals in dairy herds and herds in the south-east were of higher risk than animals from beef herds and other regions respectively; (v) Age, season, production type and region were risk factors that affected the probability of a test negative outcome in truly infected animals; (vi) The compulsory removal of positive animals to the IFN-g would be beneficial as it would decrease the burden of bTB; it would decrease the level of hidden infection and the time for clearance of the herd. <p>Following a review by the TB Strategic Partnership</p>	

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		<p>Group of the way in which the gamma interferon test is used here, and following consideration of recommendations by the EU Commission Food and Veterinary Office (FVO) audit of our TB programme, changes have been made to the way this test is used, with effect from 1 February 2016.</p> <p>Only groups of animals which have had direct contact with previous skin test reactors, or animals with TB-like lesions, will in future be tested with Gamma Interferon (not whole herds); fattening herds will be excluded from Gamma Interferon testing; and there have been some technical changes to this laboratory processes. These changes are designed to make gamma interferon more widely available and reduce the potential to remove false positives, without incurring any negative impact disease detection. These changes will be welcomed by farmers as the test will be available to benefit more herds.</p> <p>With further changes in mind, a proposal has been made (for inclusion in the DARD 2016 Evidence and Innovation programme) for a research proposal to assess the potential impact of extending sample transit times to 24 hours post sampling and of the effect of recent tuberculin injection on diagnostic IFNg testing.</p>	
<p><u>ARD Committee Recommendation No. 7</u> <i>The Committee recommends therefore that DARD bring to it as soon as possible proposals that explore how the comprehensive and detailed information currently available on strains can be better interrogated and used in the programme to eradicate bovine TB.</i></p>	<p>The Department notes and accepts the Committee's recommendation. AFBI is recognised internationally for pioneering work on the development of strain typing. The Department has commissioned AFBI to put forward a research proposal to review the potential application of molecular typing to the epidemiological understanding and field control of bovine TB in NI. This is intended to provide the Department with an understanding of what strain typing is able to</p>	<p>An improved system for the distribution of information on strain types to Veterinary Officers (VOs) has been introduced. Strain type data from all TB culture positive animals is now updated monthly on the intranet (previously only on request to AFBI and, more recently, on the intranet every 3 months). This is accessible to all DARD Veterinary Officers to assist them with local disease investigations. Maps showing the locations of different strain types are also provided so that VOs can see the areas in which particular strains are commonly found.</p>	

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	<p>contribute presently and where further research could help contribute to disease eradication.</p>	<p>A 4 month scoping review (of the potential application of molecular typing to the epidemiological understanding and field control of bovine TB in NI) was commissioned from AFBI on 8 February 2013. Progress was delayed due to staff vacancies but initial proposals have been considered by DARD and further clarification has been requested to establish how the study can best apply molecular typing to the epidemiological understanding and field control of bovine TB in NI. This is intended to provide the Department with an understanding of what strain typing is able to contribute presently and where further research could help contribute to disease eradication. AFBI produced a brief position paper in January 2014 but there has been no further progress due to other higher research priorities proposed in 2015/16. This will be kept under review.</p>	
<p><u>ARD Committee Recommendation No. 8</u> <i>The Committee note its continued disappointment that the Programme for Government had no specific target on the eradication of bovine TB and recommends that the Minister makes representation to the executive to rectify this omission.</i></p>	<p>The Department notes the Committee's recommendation. As the Committee has seen from the evidence presented to it during its Review, eradication of bovine TB is simply not something that could be achieved within the timeframe of this Programme for Government. Further, at present the Department could not realistically propose a date for the eradication of bovine TB, nor has one been sought by the EU Commission in relation to TB eradication programmes in these islands, as all the steps needed to achieve eradication and the tools that we would need to use are not yet known.</p> <p>In addition, the Committee has properly raised its concern in relation to the TB herd incidence rise since late 2011 and is aware that, to date, no specific cause for this upturn in disease has been identified.</p> <p>The Department's priorities are to address this</p>	<p>The Department has developed possible proposals for additional measures to strengthen the TB Eradication Programme.</p> <p>Minister O'Neill announced on 17 September, 2013 her intention to develop a government/ industry Strategic Partnership Group. This Group has been appointed and has been tasked with producing a longer-term strategy and implementation action plan to eradicate bovine TB. It is intended that this Strategy will be all embracing and address all issues; including how the Strategy will be funded; appropriate level of TB compensation; improving disease detection; improving biosecurity; improving communications with farmers and vets; and developing our ability to address the wildlife factor. It is proposed that the strategy will re-energise relationships with all industry stakeholders; consider as appropriate the enhancement of primary and secondary legislation; and consider other means to tackle and eradicate the disease. The Group</p>	

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	<p>rise in disease incidence, as well as taking forward the design and commissioning of the “test and vaccinate or remove (TVR)” wildlife intervention research announced by the Minister on 3 July 2012.</p> <p>The Department will therefore commit to consider in coming months what additional actions could be taken to deal with the TB incidence rise. It must, however, be understood that any additional controls will be likely to detect disease sooner than otherwise and may therefore initially lead to an increase in herd and animal incidence before the rates begin to decline.</p>	<p>presented their Interim Report to the ARD Committee on 30 June 2015 and engaged in a public consultation exercise until 4 September 2015.</p> <p>The Group hoped to produce their final report and recommendations by 31 December 2015. However, due to the complexity and variety of the issues involved and the need to carry out an independent cost/benefit analysis of the proposed recommendations, the TBSPG asked the DARD Minister to defer the target date to enable this work to be carried out. The recruitment of consultants is now underway, but owing to procurement rules it is unlikely that the consultants will report before late May/June 2016. The TBSPG are hopeful of completing their task by 30 June 2016. TBSPG will update the DARD Minister on progress before 31 March 2016.</p> <p>The TBSPG met the Deputy Chair of the ARD Committee on the 1st February 2016. Unfortunately the Chair was unable to attend but the Deputy Chair indicated he would feedback to the Committee.</p> <p>The Programme for Government 2016-2020 may contain a target reduction for bovine TB. However any additional actions proposed by the TB Strategic Partnership Group may lead to an increase in TB herd incidence before any sustained reaction is achieved.</p>	
<p><u>ARD committee Recommendation No. 9</u> <i>Members wish to commend Queens University Belfast on its research project on detecting infected badger setts through use of faeces. While acknowledging that it is at a very early stage and funded by DEFRA, The Committee recommend that DARD monitor its outworking, giving due consideration to practical use within Northern Ireland.</i></p>	<p>The Department notes and accepts the Committee’s recommendation. The Department is aware that QUB is currently undertaking Defra funded research to seek to develop a rapid diagnostic method using badger faeces to identify TB infection in badgers and/or identify setts which contain infected badgers. The Department understands that this research project is not due to be completed until late 2013. The Department will be interested to consider its outcome and evaluation of its potential application in field</p>	<p>Study findings of this Defra commissioned project were published in July 2015.</p> <p>The Lateral Flow Device (LFD) may represent a rapid, specific and relatively cheap method of detecting badgers shedding high numbers of <i>M. bovis</i> in their faeces. The test, however, may lack sensitivity, which means its potential use may be limited as not all <i>M. bovis</i> shedding badgers would therefore be detected.</p> <p>Presently other laboratory based tests provide greater</p>	

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	conditions.	sensitivity.	
<p><u>ARD Committee Recommendation No. 10</u> <i>The Committee recommends that DARD put in place appropriate efforts to ensure a time bound delivery of the scoping work, the development of a model and the obtaining of all necessary approvals for the Wildlife Intervention Research (test and vaccinate or remove) as soon as possible. The Committee also recommends that DARD focuses on and provide further information to it as soon as possible on addressing potential weaknesses in the model as currently proposed regarding the sett side test, the possibility of perturbation and the obtaining of licences.</i></p>	<p>The Department notes the broad welcome given by the Committee to the “test and vaccinate or remove (TVR)” wildlife intervention approach announced by the Minister on 3 July 2012 and accepts the Committee’s recommendation.</p> <p>TVR has also been welcomed by a broad spectrum of stakeholders. TVR should remove the most heavily infected badgers which present the greatest disease transmission risk to other badgers and to cattle and, by vaccinating test negative badgers, lead to a badger population with reduced levels of TB and with a reduced capacity to transmit TB to other badgers and to cattle.</p> <p>The preparatory steps for this wildlife intervention research are in progress. Computer based modelling work is underway to assist in the design of the study to ensure that it is scientifically robust. This modelling will help us to identify the most appropriate area(s) for the study, the optimum size of the area(s), and the appropriate duration of the intervention.</p> <p>It is planned, subject to economic appraisal, to commence badger sett surveying in 2013. This survey will provide detailed information on the numbers and location of badger setts in the selected study area(s).</p> <p>The project design will seek to maximise testing capacity and also mitigate any risk of perturbation. Use of the Brock Stat-Pak blood test will be considered for TVR as this is the only animal sett-side test that is currently available. It gives rapid results and can be completed quickly while a captured badger is anaesthetised. This test is</p>	<p>Badger sett surveying for the Test and Vaccinate or Remove (TVR) wildlife intervention research project began in February and March 2013 and progressed well.</p> <p>Badger sett surveying of the 2X100km² areas was completed in January 2014. Over 80% of each area was surveyed</p> <p>The badger sett surveying informed the TVR design. As TVR is cross cutting with DOE, DHSSPS and DFP it required reference to the NI Executive.</p> <p>The TVR project commenced on the ground on 27 May 2014 following the Minister’s Direction on 1 May 2014. TVR was conducted in a 100km² area near Banbridge, Co. Down. The TVR project will run for 5 years (2014-2018) and will cost up to £7.5 million over the 5-year period. An integral part of TVR is to undertake badger ecology studies, including the measuring and monitoring of badger movements within the TVR area, to seek to establish whether there is any potential for adverse perturbation.</p> <p>Fieldwork on Year 1 TVR was completed by 24 October 2014. Some 94% of farmers and landowners gave access permission to allow the Department staff to implement the TVR research project on their land. 280 unique badgers were captured, although there were a further 350 recapture events. In addition, GPS collars were placed on 39 badgers to establish a baseline of data on badger movements. These data can be compared to future movement data obtained following the removal of infected badgers.</p> <p>As TVR is a five year research project, during this period considerable data will be accumulated. We cannot commit to issue interim results as this could lead to premature and potentially inaccurate</p>	

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	<p>highly likely to identify the most highly infected and potentially infectious badgers that pose the greatest risk to other badgers and to cattle. Other tests require recapture of the badger or prolonged confinement of the animal until test results are available and are therefore expensive and impractical.</p> <p>We will require DFP approval for any TVR Outline Business Case and, as the badger is a protected species, the Environment Minister's approval will be necessary in relation to the necessary licences. AFBI will also require the necessary Animal and Scientific Procedures licences.</p> <p>The Department will continue to update the Committee in relation to the AFBI delivered TVR wildlife intervention research.</p>	<p>speculation about TVR and its effects. A final report will not be completed until after the data has been analysed, interpreted and understood. It is anticipated that a final report on the TVR research project could be available by late 2019</p> <p>Year 2 of TVR commenced on 15 June 2015. This year all captured badgers were tested at sett side for bovine TB using the Dual Path Platform (DPP) test. All DPP test positive badgers were euthanized and removed. Euthanised badgers were subject to post mortem. All test negative badgers were vaccinated, even if they were vaccinated during TVR the previous year, and released. Year 2 of TVR was completed by 23 October 2015 and resulted in 690 capture events of which 341 unique badgers were captured.</p>	
<p><u>ARD Committee Recommendation No. 11</u> <i>The Committee recommends that DARD complete its analysis of the available data on bovine TB and, in conjunction with the industry defines what is meant by chronic herd and/or large/sustained outbreak.</i></p>	<p>The Department notes and accepts the Committee's recommendation. This is an important area for consideration and the Department's veterinary epidemiologists have been working to establish criteria to define a chronic or repeat breakdown herd. The Department has commissioned AFBI to put forward research proposals to investigate the reasons why the greater number of reactor cattle come from chronic or repeat breakdown herds and what could be done to address this.</p>	<p>AFBI and DARD's Veterinary Service Epidemiology Unit (VEU) are cooperating on a project in relation to chronic herds. See Recommendations No.5&12.</p> <p>VEU have produced a descriptive study and a comprehensive database of all TB breakdowns. This will inform the study. VEU have a working definition of a chronic herd which is a herd that has been continuously restricted for a period of more than a year and has had TB infection confirmed at some time during that period.</p> <p>These data have been used to investigate the risk factors for TB breakdowns that are of long duration and also those herds that have multiple frequent breakdowns. This study has shown that risk factors for these types of breakdown included;</p> <ul style="list-style-type: none"> • being in an area with high TB levels • having a previous history of TB • number of reactors during the breakdown 	

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		<ul style="list-style-type: none"> • TB in an animal at routine slaughter for such breakdowns <p>In addition, for prolonged TB breakdowns, the number of associated cattle herds was also directly related to increased risk. For recurrent TB breakdowns, additional risk factors were;</p> <ul style="list-style-type: none"> • increasing herd size • increase in the number of recently purchased animals. <p>The TBSPG will be considering the outcomes of this and other work in reaching their conclusions in preparation for the long term TB Eradication Strategy and Implementation Action Plan.</p> <p>On 18 August 2015 AFBI was commissioned to undertake an evaluation of the role of multiple reactor and chronic breakdown herds in the epidemiology of bovine TB in NI. This work is expected to be completed by 31 August 2017.</p> <p>VEU has also prepared data edits in collaboration with disease modellers in Cambridge University, who are analysing the DARD data sets via their computer modelling tool. This may also help DARD address questions around chronic herds. A report from Cambridge University is awaited.</p>	
<p><u>ARD Committee Recommendation No. 12</u> <i>The Committee recommends that DARD commissions a detailed study into the epidemiology of farms with chronic herd and/or large/sustained outbreaks. The study should have a focus on understanding the factors involved and how the cycle of repeat breakdowns may be broken quicker than is currently the case.</i></p>	<p>The Department notes and accepts the Committee's recommendation. This is a priority issue and, as advised, the Department has commissioned AFBI to put forward research proposals to investigate the reasons why the greater number of reactor cattle come from chronic or repeat breakdown herds and what could be done to address this.</p>	<p>See Recommendations No.5&11.</p> <p>To avoid duplication it was agreed that VEU would supply AFBI with the comprehensive database of all TB breakdowns. VEU will take forward investigating abattoir condemnation data in relation to chronic herd breakdowns while AFBI will focus their research on strain typing information in such breakdowns.</p>	

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<p><u>ARD Committee Recommendation No. 13</u> <i>The Committee recommends that DARD investigate how biosecurity training and advice could be reinvigorated and delivered at a pace and in a setting that best suits the farmer and herd keeper.</i></p>	<p>The Department notes and accepts the Committee's recommendation. Good bio-security is important in disease control and can help reduce spread of all diseases. To encourage better bio-security, the Department publishes information and provides specific advice to herdkeepers who have a disease breakdown. The publications "TB in your Herd" and "Bio-security Code for NI Farms" are available on the Department's website.</p> <p>Each farmer with a TB breakdown herd receives a copy of the "TB in your herd" publication and an advice letter. Each TB breakdown herd has an assigned Departmental Veterinary Officer ensuring that advice is timely and relevant to each individual case. Veterinary Officers and Animal Health and Welfare Inspectors give on-farm advice to farmers in relation to specific bio-security issues. The results of the TB Bio-security Study, which focused on a TB high incidence area in Co Down, may add to our knowledge of TB risk factors and help inform bio-security advice for farmers.</p> <p>The initiatives being developed by Animal Health and Welfare NI to deal with diseases, such as Bovine Viral Diarrhoea (BVD) and Johne's Disease, are also welcomed. The Department has facilitated a winter 2012/13 BVD awareness programme delivered, in conjunction with Animal Health and Welfare NI, through the Rural Development Programme. Meetings with private veterinarians and a series of county level farmers' meetings have already taken place. The next stage of roll out of the awareness programme provides an ideal opportunity for the involvement of local private veterinarians who are ideally placed to reinforce the BVD message with their</p>	<p>TB biosecurity advice leaflets, which were developed in partnership with the Department's farming stakeholders, are available on the DARD internet site. Biosecurity advice was included in the BVD presentations. Biosecurity presentations are available for display on plasma screens in DARD Direct offices, a plan for distribution of leaflets is being implemented and face to face advice is given by inspectors or veterinary officers. Further biosecurity promotion possibilities are being explored.</p> <p>DARD published a webinar in August 2015 to further assist the dissemination of targeted advice to PVPs and farmers regarding good preventative and biosecurity practices. See link below: https://www.dardni.gov.uk/articles/tb-bioexclusion-webinar</p> <p>DARD has prepared a new contract for the provision of TB testing services by PVPs with a view to having this in place by 11 April 2016. The new arrangements will include training and updates for PVPs and potentially more PVP involvement in TB breakdowns. Thus they will be better informed and in a better position to give good disease control advice to farmers.</p> <p>Discussions are in progress with officials to have funding included within the next tranche of the RDP available to allow farmers to improve their on-farm biosecurity and to provide further bespoke biosecurity training of farmers, as detailed in the response to Recommendation 2 above.</p> <p>All relevant CAFRE courses include TB specific information. Arrangements have been made to ensure that the DARD/ Industry agreed TB Biosecurity leaflets referred to above will be distributed to all visitors to relevant CAFRE Greenmount events.</p>	

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	<p>farming clients at practice level. As well as delivering the BVD message, these sessions will also cover the importance of on-farm bio-security in protecting animal health more generally. The Department recognises the potential which exists within the private veterinary sector to advise and influence farmers in the course of their daily interactions. Officials have been active in encouraging the veterinary associations to put themselves forward in this regard.</p> <p>As advised, the Department's stand at the AVSPNI 2012 conference and the Winter Dairy Fair 2012 had displays and information leaflets produced specifically for both events. The Department has also worked closely with key industry stakeholders to produce a core TB message and bio-security advice which was launched at the Winter Fair and will be communicated more widely to farmers. Brucellosis statutory bio-security guidance will soon be issued to all cattle herdowners, and the advice in this will also be relevant to TB.</p> <p>The results of the TB Bio-security Study, which is being conducted by AFBI, may help inform future bio-security advice to herdkeepers.</p>	<p>Work is ongoing to develop an action plan to implement the recommendations from the study. A stakeholder workshop was also held during 2014 and the results of all relevant research have also been brought to the attention of the TB Strategic Partnership Group.</p>	
<p><u>ARD Committee Recommendation No. 14</u> <i>The Committee is aware that there have been delays in the publication of the TB Biosecurity study, and is keen to scrutinise the results and recommend its publication as soon as possible.</i></p>	<p>The Department notes and accepts the Committee's recommendation. The Department is similarly keen to receive and publish the results of the TB Bio-security Study. AFBI are endeavouring to conclude this work as soon as possible.</p>	<p>The TB Biosecurity Study Report was published on 20 November 2013. A copy of the Report was issued to the ARD Committee on 20 November 2013 and to the TB Stakeholder Working Group. It is also available on the DARD website.</p> <p>See Recommendation 2 above regarding possible RDP funding available for provision of biosecurity training sessions for farmers and for assisting with funding of on-farm biosecurity improvement measures</p> <p>Arrangements have been put in place with CAFRE to</p>	

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		<p>provide training on TB biosecurity to all their students and disseminate information leaflets to attendees at all events held at Greenmount Campus.</p> <p>A stakeholder workshop was also held during 2014 and the results of all relevant research have also been brought to the attention of the TB Strategic Partnership Group.</p>	
<p><u>ARD Committee Recommendation No. 15</u> <i>The Committee recommends that DARD conducts a similar research project in Northern Ireland as has been carried out by FERA to establish the extent of badger visits to farms and their “routines” or actions while visiting and/or entering farm buildings. While recognising that there may be practical and statistical difficulties, the Committee recommends that DARD makes efforts to design the study to see if there is any linkage between badger exclusion measures and bovine TB incidence rates. DARD should ensure that such research dovetails with existing research.</i></p>	<p>The Department notes and accepts the Committee’s recommendation. AFBI is already undertaking a DARD commissioned badger-cattle proximity study in Co. Down to establish the amount of interactions at pasture and within farm buildings. This is important research, which should be able to demonstrate whether, and to what degree, such interactions occur on farms here. The results of this AFBI research will inform further consideration of current badger exclusion bio-security advice.</p>	<p>The AFBI proximity study, “Interactions between badgers and cattle in the rural environment - implications for bovine tuberculosis transmission” was published in August 2014 with a copy issued to the ARD Committee, the TB Stakeholder Working Group and posted on the DARD website.</p> <p>The study provides information on the extent of interactions within and between badger and cattle populations and the ecology of badgers at farm and local level in an intensively farmed area that has a high incidence of TB and relatively high badger density.</p> <p>See Recommendation 2 above regarding possible RDP funding available for provision of biosecurity training sessions for farmers and for assisting with funding of on-farm biosecurity improvement measures. A stakeholder workshop was also held during 2014 and the results of all relevant research have also been brought to the attention of the TB Strategic Partnership Group for their consideration.</p>	
<p><u>ARD Committee Recommendation No. 16</u> <i>The Committee recommends that in addition to the DARD Wildlife Intervention Research Programme, DARD should consider introducing immediately a similar programme to support those farmers/Wildlife Trusts who wish to vaccinate badgers on their land in Northern</i></p>	<p>The Department notes the Committee’s recommendation. The Department’s priority is in relation to the design and commissioning of the “test and vaccinate or remove (TVR)” wildlife intervention research announced by the Minister on 3 July 2012.</p>	<p>See Recommendation No.10 regarding TVR, which has been DARD’s primary wildlife focus.</p> <p>Minister O’Neill announced on 17 September 2013 that she proposed changing secondary legislation to allow trained lay persons to vaccinate badgers for TB. This should allow, e.g., properly trained environmental</p>	

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<p><i>Ireland.</i></p>	<p>The Department does not at this stage have any plans to introduce any additional programme to support farmers or organisations who wish to vaccinate badgers on their land. It is important that farmers or organisations located in any TVR study area do not vaccinate badgers on their land as that could interfere with the study. Vaccination of badgers would require the necessary prior approvals and licences from the Environment Minister and vaccine could only be administered by a veterinary surgeon.</p> <p>Should local interests come forward, following the commencement of TVR, with proposals to undertake badger vaccination on their land holdings, the Department would work with such groups to develop appropriate protocols and would look at amending the legislation framework should they wish to train lay vaccinators to vaccinate badgers. It would be for local interests to self-fund such badger vaccination and to seek the appropriate licences from the Environment Minister.</p>	<p>organisations and/or interested farmers to vaccinate badgers, under licence, on their own land.</p> <p>Competing pressures, in relation to the work of the TB Strategic Partnership Group, has meant that industry consultation on this subject could not yet be taken forward. It should be noted that it is the UK Veterinary Surgery (Vaccination of Badgers Against Tuberculosis) Order 2010 that will have to be amended to allow lay vaccination here. The ARD Committee will be apprised of appropriate developments.</p>	
<p><u>ARD Committee Recommendation No. 17</u> <i>Given the resources and priority being given by DEFRA to the cattle vaccine, and the legislative hurdles it faces in Europe, the Committee recommend that the Minister and the Northern Ireland MEPs, in consultation with the industry, seek to do all they can to support the UK as it pursues legislative change to allow for cattle vaccination.</i></p>	<p>The Department notes and accepts the Committee's recommendation. The Department will keep in close contact as recommended in relation to ongoing research into the development of the DIVA test and any field trials in relation to TB cattle vaccination and will be supportive to initiatives to secure the flexibility to use cattle vaccination if it is considered appropriate.</p> <p>In addition, the Department should wish to be certain that any such vaccine developed would have international acceptance before considering its use here, given the value of our export dependent trade in livestock and livestock products which is worth over £1,000 million per year.</p>	<p>TB cattle vaccination is not seen as an early solution to the spread of TB in cattle. The EU Commission have outlined an intensive 10 year programme of vaccine and differentiation test development, test validation, etc, until 2023 before cattle vaccination could be considered for possible approval .</p> <p>DARD continues to maintain its links with this research project.</p> <p>This issue has also been brought to the attention of the TB Strategic Partnership Group for their consideration.</p>	

