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## **BOVINE TB – INTERIM PROGRAMME**

### **Background and current strategy:**

1. Historically, the incidence of bovine TB in Great Britain was reduced to low levels through testing of cattle and removal of reactors, but localised areas of infection remained and, since the late 1980's, the disease has been increasing both in incidence and in geographic distribution. The average annual increase in the number of new TB incidents recorded in the decade from 1990 to 2000 was 22% and the average annual increase in the number of cattle slaughtered as TB reactors or contacts was 27%.
2. Current strategy on bovine TB is centred around:
  - strengthening TB testing and cattle slaughter controls and piloting or trialing future policies,
  - protecting human health,
  - a badger culling trial,
  - research on how cattle TB spreads, and
  - developing a new TB vaccine.
3. Although the main reservoir and natural host of the virus (mycobacterium bovis) is cattle, human beings and a wide range of mammals are susceptible to the bacterium. which may pose impediments to eradicating the disease in cattle.
4. Infection by inhalation is considered to be the main route of infection of cattle, but infection by ingestion of contaminated material also occurs. The rate of progress of infection is dependent on a number of factors, including the infectious dose, genotype and immune status of the host, and stress but the symptoms in cattle only appear in advanced cases and are difficult to spot by non professionals.
5. After death, a preliminary diagnosis of TB can be made by the presence of typical lesions in various organs and their associated lymph nodes and the presumptive diagnosis of TB is checked by histopathological examination and microbiological culture at specialised laboratories.

### **Risks to cattle from TB in soil**

6. Research on the survival of Bovine TB in soil has suggested that the virus could survive in soil for up to 4 months in sufficient numbers to provide an infective dose. This is not a new finding, though the methodology needs to be validated. DEFRA has also commissioned work from the VLA in a related field, investigating virus in clinical samples and in faeces.

## **International comparisons**

7. Information on bovine TB and wildlife reservoirs in other countries is difficult to obtain. The incidence of TB breakdowns across Europe, Oceania and the Americas varies considerably. Comparable information from country to country is not readily available, as the prevalence of infection amongst wildlife is not known. However, it is clear that bovine TB is not a uniquely British problem and the Krebs Review is intended to draw upon the experience of other countries.

## **Human Health**

8. The virus is naturally transmissible between animals and people, with the consumption of infected milk and dairy products the most likely route. In GB, the risk to human health is considered low due to vaccination at childhood, the introduction of milk pasteurisation, routine meat inspection and the relatively low prevalence of infection in the national herd.

## **Existing Programmes**

### Testing and Controls

9. TB in cattle has been subject to a compulsory eradication programme since 1950. The programme has two main elements:
  - routine free tuberculin skin testing of cattle herds (except beef fattening units) by the State Veterinary Service (SVS) every 1 to 4 years, depending on the local incidence of TB. The minimum frequency of testing is governed by EU Directive
  - routine *post-mortem* meat inspection by the Meat Hygiene Service of all cattle carcasses, followed by tracing back to the farm of origin of those with TB lesions
10. Under the TB control programme, cattle failing the tuberculin test (reactors) and those considered to have been direct contacts exposed to TB are compulsorily slaughtered by the SVS. For a dairy herd, this entails suspension of its officially TB free status.

### Testing in Wales

11. Four years is the default TB testing interval applied in most cattle herds throughout Wales. There are clusters of parishes subject to biennial or annual testing in Monmouthshire, Radnor and Brecknockshire, Carmarthen, Pembrokeshire and the Gower Peninsula. This is a reflection of the

increased incidence of the disease in those areas. Even in four and two year testing areas, specific herds assessed as high public or animal health risk herds are tested annually. Full market value compensation is paid to farmers for any animals culled as reactors to the TB test or as potentially infected animals (direct contacts).

#### Bovine TB research programme – Developing vaccines

- There are currently 30 wide-ranging TB research programmes costing £7.3 million annually. This includes £1.4m on vaccine research. The recent sequencing of the M bovis genome will pave the way for the development of a vaccine though this remains a longer term objective. A sub-group of the Independent Scientific Group (the Krebs Trial group) has been set up to advise Government on the feasibility of pursuing a TB vaccination strategy for either cattle or wildlife.

#### Badger Trials

- The current badger culling trial recommended in the Krebs Report is designed to determine the role that badgers may play in TB and the contribution of culling to tackling the disease. The trial is overseen by the Independent Scientific Group (ISG) on cattle TB and has been designed to provide a range of epidemiological data on both badger TB and bovine TB. Started in 1998, it consists of 30 trial areas of 100 square kilometres grouped into triplets randomly assigned to one of three treatments (proactive culling, reactive culling or no culling). It is expected to report to the original time frame of 2004-05.

#### Incidence of TB

- Difficulties in dealing with TB have emerged in recent years. The distribution and makeup of herds has changed over time; total herd numbers have decreased but the number of cattle in individual herds has increased. In addition, individual herds are situated on more than one premise which increases the length of time to complete a single herd test. The current position in Wales is shown below:

**Table 1. The incidence of TB testing in Wales**

	<b>Jan – March 2000</b>	<b>Jan – March 2002</b>	<b>Percentage change</b>
Number of herds tested	1,947	2,281	17%
Number of cattle tested	141,986	175,276	23%
Overdue 6 and 12 month check tests	(a)	171	-

Total TB tests overdue	(a)	4,937	-
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- a. Detailed statistics on both the overdue check tests and total overdue tests were not collated until November 2001

**Table 2. TB statistics for Wales for the first quarter, 1999 to 2002**

	<b>Total New Herd Incidents</b>	<b>Number of Reactors slaughtered</b>	<b>Number of Dangerous Contacts slaughtered</b>	<b>Total animals slaughtered</b>
<b>January to March</b>				
1999	82	277	79	356
2000	81	246	61	307
2001 (a)	75	518	255	773
2002	127	772	157	929

(a) Includes a single herd slaughter of 324 animals.

15. These data indicate:

- a significant increase in the incidence of TB during the first quarter of 2002 against previous years. However, it is difficult to assess how much is due to disease incidence, an increase in testing or the effects of the FMD outbreak.
- over the first three months of 2002 23% more animals were tested than during the first quarter of 2000.
- a 50% increase in new herd incidents during the first quarter of 2002 over the same period 2000, but testing has been prioritised to high risk herds.

### **Interim Programme of action:**

16. From the available evidence of rising incidence, the argument for further mitigating action in Wales is evident. The range of potentially effective actions needs to take into account issues of practicality, resourcing and consistency as well as the longer term dimensions connected with the various research programmes. Measures need to reflect that GB is a single epidemiological unit,

that trade movements across national boundaries need to be protected, that the main delivery mechanism for additional activity is the unified SVS and that wildlife movements are independent of administrative boundaries.

17. In the long term, successful approaches will depend on the outcome of the Krebs Trials and the research programmes. A successful vaccine, whether for cattle or susceptible wildlife, is still some way off and the results of the Krebs Trials will not be available until 2004-05. In the interim, therefore, the focus has to be on intensifying the current approach i.e. to identify and remove TB reactor cattle as fast as possible. In Wales a programme focused on the following strands is intended:

- an enhanced testing programme prioritising herds at greatest risk, primarily herds with overdue 6mth and 12mth check tests, and herds contiguous to new confirmed breakdowns. This intensified programme will speed up the elimination of the current back log of tests and also give priority to herds and areas where new confirmed breakdowns threaten to spread the disease more widely within Wales. Because of the number of new incidents of disease being identified and the extra tests that have to be carried out as a consequence, the current testing programme in Wales is only reducing the backlog slowly. An objective would be to reduce the backlog much more quickly and return the testing programme back to a state of equilibrium. The implementation and timing will be reliant upon recruiting additional veterinary and support staff and the level of funding available. On both, discussions are on-going.
- the use of the Gamma Interferon blood test in pilot areas in conjunction with the skin test and in compliance with the Office International des Epizooties (OIE) manual. On its own the Gamma Interferon Test is of limited use; currently the test may be only about 70% specific. This means that, on average, for every 10 animals that reacted to the test only 7 would be genuine positives; the rest would be negatives. To use these results on their own would therefore give a false picture of the disease pattern in the herd. However, used in conjunction with the skin test, which has a much higher sensitivity and specificity, the combination will give a much more accurate picture of the disease pattern in the herd. In practice the benefits of the GI trials might facilitate earlier detection (by 2 – 4 weeks) speed the clear up of herd infection, reduce the risk of between and within herd spread without incurring false negatives. In this context, pilot areas are defined as new emerging hotspots. Pilots will focus on areas of emerging disease with the objective of reducing the period a herd remains under restriction, reducing the opportunity for the disease to spread and making more effective use of veterinary and other resources. The number of pilots and the speed of introduction will need to take into account laboratory capacity and operational requirements; in particular the requirement to get samples to the laboratory in controlled conditions without deterioration. The results of the trials will be used to help define future policy and the wider use of the GI test in particular circumstances.
- employing a wider application of the "severe interpretation" of skin test results in high risk herds and in check tests of herds contiguous to new confirmed breakdowns. All cattle in the country are regularly tested for TB using the single comparative intradermal tuberculin test (skin test). The test involves injecting a small amount of tuberculin into the skin of the animal. In most cattle

infected with TB, this will cause the animal's immune system to react to the tuberculin and cause a swelling around the injection. But cattle may be infected with other types of mycobacteria which also produce a reaction to the test. To distinguish between those animals infected with *M. bovis* and those infected by other mycobacteria, animals are also injected with tuberculin produced from *Mycobacterium avium* (*M. avium*). The reaction to the 2 tests is compared. Under the current 'Standard Interpretation' if the reaction to *M. bovis* is more than 4mm greater than the reaction to *M. avium* the animal is considered to be infected with TB and defined as a 'reactor' if the reaction to *M. bovis* is between 1 and 4mm greater, the animal is considered a 'inconclusive reactor' and is retested after 42 days or at 60 days if they are part of a herd check test. Employing a 'severe interpretation' more widely in the herds proposed would involve classifying animals with *M. bovis*'s swelling more than 2mm greater than the *M. avium* swelling as reactors and culling them immediately. An effect of this approach would be that some uninfected animals would also be culled. In implementing this, account would need to be taken of the epidemiological and financial implications including levels of identified disease and costs both to exchequer and industry in pursuing this policy;

- an essential element of this programme to combat the spread of bovine TB is the co-operation of farmers. A programme of advice and encouragement to farmers to co-operate in combating the disease will be a key underpinning component.

18. In addition, programmes will continue to :

- maintain measures to minimise the risk of bovine TB spreading to consumers through meat and milk and via contact with live cattle in association with the Food Standard Agency, Department of Health and the Health and Safety Executive;
- keep under review, and amend as necessary, existing controls on TB in cattle;
- improve the accessibility and use of information to inform the development of policy;
- learn from the experience of other countries;
- review the application of disease control measures to reduce their impact on the area / herd affected where this is supported by veterinary advice;
- support the role of the ISG and other contributors of scientific and veterinary advice.

19. To be effective, the programme of intensified action outlined in paragraphs 17 and 18 will need to operate jointly with DEFRA / SVS and to have access to additional resources, both financial and staffing. Discussions on these are ongoing with UK Government with a view to speeding up implementation and identifying additional resources.

20. The Committee is invited to note the background set out in the paper, the further work underway

across Agriculture Departments and the Interim programme in Wales to address current increases in incidents.