

Chapter 1

Introduction

1.1 Background to the review

This review is a Value for Money (VFM) evaluation of the Bovine Tuberculosis Eradication Programme (BTEP), carried out in accordance with the procedures laid down under the terms of the government's Value for Money and Policy Review initiative (Dept. of Finance, 2006). The review was carried out by Mr. Joseph O'Flaherty, Superintending Veterinary Inspector, and overseen by a Steering Committee comprised of representatives from the Division with responsibility for the TB Programme (ERAD Division), senior veterinary management, the Economics and Planning Unit of the Department of Agriculture, Fisheries and Food¹, and the Department of Finance. The Committee was chaired by the Principal Officer with overall responsibility for ERAD Division [Table 1.1].

Table 1.1 Composition of Steering Committee

Name	Grade	Organisation
Mr. Richard Healy (Chairman)	Principal Officer (ERAD Admin.)	Dept. Agriculture, Fisheries & Food
Mr. Martin Blake	Deputy Chief Veterinary Officer	Dept. Agriculture, Fisheries & Food
Mr. Michael Sheridan	Deputy Chief Veterinary Officer	Dept. Agriculture, Fisheries & Food
Ms. Margaret Good	Senior Superintending Veterinary Inspector (ERAD TB)	Dept. Agriculture, Fisheries & Food
Ms. Angela Robinson	Assistant Principal (ERAD Admin.)	Dept. Agriculture, Fisheries & Food
Ms. Sharon Murphy	Assistant Principal (Economics and Planning Unit)	Dept. Agriculture, Fisheries & Food
Ms. Audrey Brown (Secretary to Committee)	Higher Executive Officer (ERAD Admin.)	Dept. Agriculture, Fisheries & Food
Mr. Terry Jennings	Assistant Principal	Dept. Finance

The VFM review of the Programme commenced in May 2007 and was completed in July 2008. Its relatively lengthy duration reflects the comprehensive and complex nature of the programme under review and the requirement to undertake significant primary research in order to address the evaluative questions arising in the Terms of Reference (see below).

The selection of the BTEP for review as part of the VFM review process conforms to Department of Finance criteria regarding the minimum scope and scale of programmes subject to review. Gross programme expenditure on the BTEP in 2006 was approximately €36m, equivalent to 41% of Department expenditure under the heading of ‘Livestock Improvement and Eradication of Disease’ and to 4% of the Department’s Gross Expenditure, excluding administrative costs (Dept. of Agriculture and Food, 2006). Staff costs relating exclusively to the operation of the TB eradication programme accounted for further expenditure of the order of €34m, bringing the total cost of the Programme to approximately €70m in that year.

A number of factors influenced the choice of reference period (1996-2006) for this review. Firstly, 1996 was considered to represent a suitable starting point for the analysis, as this was the year in which payment for the majority of the surveillance testing carried out under the programme shifted from the Exchequer to the farming community under the terms of an agreement with the Department [Appendix H]. This change in policy in relation to payment for tuberculin testing was accompanied by a reduction in the rate of Bovine Disease Levies payable [5.4.1]. Secondly, a significant modification of the disease compensation arrangements – the replacement of the Reactor Grant Scheme by On-Farm Market Valuation – occurred approximately halfway through the period, allowing for a comparison of the two policies over two separate periods of approximately five years. Finally, in view of the cyclical nature of the bovine TB, it was considered that the eleven-year period over which the Programme’s performance was evaluated was of sufficient duration to permit meaningful conclusions to be reached in relation to the review’s Terms of Reference (see below).

1.1.1 Terms of Reference

The terms of reference, which closely follow the template recommended by the Department of Finance for VFM reviews, are as follows:

1. Identify the programme objectives and examine their compatibility with the overall strategy of the Department of Agriculture, Fisheries and Food.

2. Evaluate the degree to which the objectives warrant the allocation of public funding on a current and ongoing basis and hence comment on the current validity of the Programme.
3. Define the outputs associated with the programme activity and identify the level and trend of those outputs.
4. Identify the level and trend of costs and staffing resources associated with the TB Eradication programme and thus comment on the efficiency with which it has achieved its objectives.
5. Examine the extent to which the programme's objectives have been achieved, and comment on the effectiveness with which they have been achieved.
6. Specify potential future performance indicators that might be used to better monitor the performance of the TB Eradication programme.
7. Examine the scope for alternative policy or organisational approaches to achieving these objectives on a more efficient and/or effective basis (e.g. through international comparison.)

1.1.2 Methodology

The principal methodological issues that arose in the preparation of the report are as follows:

Firstly, because the Department accounts for tuberculosis and brucellosis eradication programmes on an aggregate basis, one of the principal tasks of this review was to provide, for the first time, disaggregated expenditure data for the BTEP as a separate entity [Appendix A].

Secondly, in order to provide answers to certain of the questions posed in the Terms of Reference, it was necessary to carry out primary research, as follows:

- The Programme's administrative overhead was estimated from returns provided in response to two separate self-completion questionnaires and from central records [Appendix A]. The sample frame included all grades based in the 28 District Veterinary Offices, staff in the relevant central Divisions, the agricultural technical Unit implementing the valuation aspects of the On-Farm Market Valuation Scheme and seven individual respondents in the veterinary and technical staff streams².

- A series of semi-structured interviews was carried out with twenty-one individual stakeholders [Appendix G]. Thirteen of these are senior managers in the Department with responsibility for various aspects of the delivery of the BTEP. The other eight represented the Irish Farmers' Association, the Irish Creamery Milk Suppliers' Association, Macra na Feirme, the Irish Co-operative Organisation Society³, Badger Watch Ireland, Veterinary Ireland, and academia.

- A benchmarking exercise was carried out, based on meetings and correspondence with the relevant authorities in Northern Ireland, Great Britain and Spain.

An advanced draft of the present document, including the methodology [Appendix A], literature review [Appendix B] and other appendices underwent quality assessment by an independent evaluator prior to the finalisation of the report.

1.2 The Department of Agriculture, Fisheries and Food

The Mission Statement of the Department of Agriculture, Fisheries and Food is as follows:

To lead the sustainable development of a competitive, consumer-focused agri-food sector and to contribute to a vibrant rural economy and society.
(Dept. of Agriculture & Food, 2004)

The Department's mandate is set out in five goals, each underpinned by a set of detailed strategic actions and performance indicators. Of greatest relevance in the context of the present review is Goal 2, which is to

Ensure the highest standards of food safety and consumer protection, animal health and welfare and plant health.

(ibid.)

In justifying its support for this Goal, the Department states that

The maintenance of high standards in these areas is essential for public health and to ensure that we continue to have an effective base from which to further develop a successful agri-food industry. The production of safe food must be underpinned by effective control systems. Maintaining a high standard of animal health and welfare is an important issue in its own right and is also a critical requirement for the development of trade.

(ibid.)

The resources at the disposal of the Department in its pursuit of this and the other Goals that comprise its Mandate are considerable; it oversees an annual expenditure in the region of €3 billion and a staff complement of approximately 4,300, including administrative staff, agronomists, technical, veterinary, research, and laboratory personnel.

1.3 Agriculture and the Irish economy

Agriculture plays an important role in the national economy. The Gross Value-Added at factor cost of primary agriculture is 2.3%, rising to 8.0% when the basis for the calculation is the wider agri-food sector⁴. The contributions of primary agriculture and the agri-food sector to employment stand at 5.4% and 8.1%, respectively, and their contributions to exports at 5.8% and 10.0%, respectively. Cattle-rearing plays a vital role in the agricultural economy, as evidenced by the fact that, in 2006, more than 6.5 million head⁵ of cattle were farmed in the country and beef and milk production accounted for approximately 54% of agricultural goods output at producer prices (Dept. of Agriculture and Food, 2007).

1.4 Bovine tuberculosis

Bovine tuberculosis is an infectious disease caused by the bacterium *Mycobacterium bovis*, which is a member of a grouping of organisms known as the *Mycobacterium tuberculosis* complex. While *M. bovis* normally affects cattle, it can also infect other animals and humans. Human cases of *M. bovis* are rare nowadays in developed countries, however, because of the existence of a range of measures that minimise the opportunity for contact between the organism and man. These include the pasteurisation of milk and dairy products, veterinary public health controls at meat processing and slaughter premises, and the operation of programmes for the eradication of the disease from national herds.

Despite these measures, *M. bovis* continues to cause human disease, albeit at very low levels compared to the principal causative agent, *M. tuberculosis*, and predominantly in the developing world where the combination of a high burden of tuberculosis in animals and increased exposure to Human Immunodeficiency Virus (HIV) reduces human resistance to the bovine form of the disease. In modern, industrialised economies, cases of human *M. bovis* are mainly associated with: infection carried by immigrants from regions where bovine TB is prevalent; reactivation or primary infection in HIV-infected patients; epizootics in domesticated and wild mammals with the potential to transmit infection to man; and airborne-acquired *M. bovis* infection in animal keepers and meat industry workers (Thoen et al.).

In Ireland, clinical symptoms of tuberculosis in cattle, such as respiratory disease, tubercular mastitis and emaciation, are now seldom seen in the national herd. Bovine TB has become a sub-clinical disease, thanks largely to the comprehensive programme of TB testing, in which the cattle population of over six and a half million animals is subjected to some nine million tests per annum. Infected cattle are removed from the herd as part of the eradication programme and slaughtered in the early stages of the disease process, with the result that clinical disease no longer has a significant economic impact on the national herd and animal productivity losses due to TB are held at a very low level.

1.5 The Bovine Tuberculosis Eradication Programme (BTEP)⁶

1.5.1 Origins of the Programme

Once the role of *M. bovis* in human tuberculosis had been established at the beginning of the Twentieth Century, it was inevitable that the development of a test capable of detecting the disease in cattle would lead to a campaign to eradicate it from the bovine population. In fact, knowledge of tests capable of diagnosing pre-clinical infection in man and animals is roughly contemporaneous with that linking infection in man and cattle. They are known collectively as tuberculin tests and are based on their ability to detect a specific immunological response to *Mycobacterium* infection. One variant of these tests – the Single Intradermal Comparative Tuberculin Test (SICTT) – has been used in national eradication programmes since 1910⁷, and it remains one of the two primary diagnostic tests approved for use by the European Union (Council Directive 64/432). A programme for the eradication of bovine tuberculosis in Great Britain, using the same technique, has been in existence since 1935, and it was the progress made under this Scheme that led to pressure for the adoption of a similar programme in Ireland in the 1950s.

The Bovine Tuberculosis Eradication Programme has been operative in Ireland, in some form, since 1950, when it commenced on a pilot basis. It was later extended across the country on a regional and voluntary basis and, by 1962, had become both national in scope and compulsory in nature. With the exception of a three-year period at the end of the 1980s and beginning of the 1990s⁸, the Programme has been directly managed by the Department from its inception to the present day.

The Programme set out: (i) to preserve the valuable trade in store cattle with Great Britain; (ii) to address concerns regarding the threat to human health; and (iii) to mitigate tuberculosis-related animal production losses. Substantial progress was made in the early years of the programme's operation, the animal incidence⁹ being driven down from an initial level of approximately 17% in cows to an average across all animal categories of just 0.44% by 1965, the year in which the government declared the country to be attested (close to eradication)¹⁰. From that point forward, however, little further progress has been made in eradicating the disease, animal incidence remaining in or about 0.5%. The

factors constraining progress are discussed more fully in this [1.5.5] and other chapters in the body of the report, as well as in the accompanying literature review [Appendix B].

1.5.2 Programme Objectives

The objectives of the Programme are dealt with comprehensively in the following chapter. Here, it is sufficient to state that, since the inception of a national programme of eradication, the long-term objective has been to bring about the eradication of bovine tuberculosis. The current interim objective, which is aimed at creating the necessary conditions for achievement of the long-term objective, is to control bovine tuberculosis at least cost to the Exchequer, while investing in research and technology in order to overcome those constraints that continue to impede progress towards eradication.

1.5.3 Programme measures

Principal programme measures

The programme measures will be dealt with in greater detail elsewhere in this report but it is useful to present them in summary form at this point. The principal programme measures, which are summarised below in order of expenditure, correspond closely to the expenditure categories used throughout this report [Appendix F].

Compensation [see also 4.2 and Appendix I]

The Department operates compensation schemes that address both the direct and indirect losses arising as a result of the disclosure of tuberculosis in cattle herds. Compensation for direct losses, which are those associated with the economic depreciation of animals disposed of as reactors, is provided via the On-Farm Market Valuation Scheme (OFMVS). Under this scheme, affected herdowners are paid the market value for reactors, which are valued live by independent valuers approved by the Department. Indirect losses, which arise as a result of the removal of production animals, such as cows, or the premature disposal of other cattle, are partially offset by Income Supplement and by the Depopulation Grant, while the Hardship Grant Scheme is designed to alleviate the additional feed costs of farmers whose herds are restricted during the winter period.

Animal testing and movement control [4.3]

A comprehensive programme of animal testing based on the SICTT is in place. The surveillance element of this programme consists principally of an annual herd testing programme (round test), under which all eligible animals in every herd are subject to a test every year. Each herd test requires two visits to the herd by the testing veterinary surgeon and a high level of cooperation from the herdowner. In addition to surveillance testing, a range of control tests, aimed at the resolution and containment of identified disease, is also in place. In 2006, delivery of the programme of surveillance and control tests involved the performance of some 9 million animal tests on the cattle population of over six and a half million animals, dispersed over approximately 119,00 herds. Cattle which react positively to the TB test are removed as reactors for slaughter and the herd is restricted until all remaining animals over 6 weeks of age in the herd have had two consecutive clear TB tests, the first conducted a minimum of 60 days and the second a minimum of four months after the removal of the last reactor.

The processing of test reports in relation to the 9 million animal tests carried out per annum continues to require considerable input from Department staff, despite the improved efficiencies resulting from the adoption of new computer technology (see below). The level of input required of Department staff is largely the same, irrespective of whether the tuberculin testing is carried out at the expense of the farmer or of the Department [5.14.7]. In addition to the resource requirement associated with clear herds, considerable additional Department resources are invested in the management of the approximately 6,000 herds per annum in which reactors are disclosed.

A supplementary blood-based test (Interferon-gamma) is used in conjunction with the intradermal tuberculin test in order to improve diagnostic outcomes in certain situations [see also 4.5.3 and Appendix B].

Wildlife control [4.4]

The assessment of badger activity and the removal of badgers where they are implicated in a disease breakdown is a critical component of the Department's interim control and eradication strategy. The national badger capturing effort is applied more intensively in those areas where tuberculosis in cattle herds is both persistent and chronic, subject to

the overall constraint that capturing will not exceed an area greater than 30% of overall agricultural land.

Research programme [4.5 and Appendix J]

The Department funds and directs a three-stranded programme of TB research, comprising:

- A data analysis, epidemiology and support function, carried out by the *Centre for Veterinary Epidemiology and Risk Analysis (CVERA)*;
- A Badger Vaccine Development Programme; and
- A diagnostics function, carried out by the TB Diagnostics and Immunology Research Centre.

A key element of the Department's overall eradication strategy is the development and implementation of a programme for the vaccination of badgers. The current phase of the badger TB vaccination programme is a 10-year research programme that commenced in 2001. A field vaccination trial, which is a critical component of the overall vaccination programme, is about to commence. This trial will involve the introduction of a vaccine into a population of badgers over a large area for a period of at least 3 years with the objective of providing information as to the efficacy of an oral vaccine in reducing the level of TB infection in the badger population under study. The aim, subject to the successful completion of the vaccination trial, is to incorporate the field vaccination of badgers into the eradication programme.

Reactor collection service [4.6]

The reactor collection service, which provides for the transport of reactors from farms to the slaughterhouse free of charge, ensures a fast, secure and effective disposal system for reactor animals. Reactor animals are generally removed within one week of agreement on the valuation of the animals paid for by the Department.

Veterinary post-mortem inspection [4.8]

All cattle presented for slaughter undergo a routine veterinary post-mortem examination which is primarily for the purpose of determining fitness for human consumption, but which incorporates an inspection for evidence of tuberculosis. Because suspect tuberculous lesions generally cannot be distinguished on gross inspection from non-tuberculous granulomas, suspect lesions from attested animals (those with a clear TB status) are submitted to the laboratory for detailed examination. Where these laboratory examinations give rise to a positive result, the holding from which the animal originated must undergo a regime of tuberculin tests in order to regain its Officially Tuberculosis Free (OTF)¹¹ status.

Horizontal programme measures

Quality control measures

Strong quality control elements are incorporated into a number of the programme measures, including disease compensation [5.6.3], tuberculin testing [5.7.2], and the Wildlife Unit [5.8].

Management Support Tools

A wide range of support tools is available to management, including:

- A mandatory herd registration system under which individual identifying numbers are allocated to every herd on the basis that these are single epidemiological units compliant with disease control regulations.
- Ireland has operated an animal identification and tracing system for cattle since the 1950's based on individual ear tags and accompanying cattle identity cards. In compliance with EU legislation,¹² Ireland developed the Cattle Movement Monitoring System (CMMS), a computerised database containing animal identity and location information, which has been operational since September 1998. A major ongoing ICT project – AIM – will replace and enhance a number of existing animal identification systems, including CMMS, to provide a generic identification and movement system capable of recording the births, movements and disposals of a number of animal species [4.7.2]. AIM is currently on-line in the majority of livestock marts across the country and is also being introduced into export assembly points and export-approved slaughter plants.

- An Animal Health Computer System (AHCS) linked to the animal identification system, which records extensive information relating to the tuberculin testing programme and the location and disease status of individual animals and herds [4.7.1 and Appendix K].
- Further computer systems, including a Reactor Herd Management System (RHMS), a Trace-Onward and Epidemiological Investigation Tracking System (TOTS) and *HerdFinder*, a tool that facilitates the management of the spatial aspects of disease [4.7.3].

Publicity

Awareness campaigns relating to the TB programme, involving the distribution of leaflets and the use of media outlets, are carried out periodically.

1.5.4 Human resources

Headquarters

The implementation of the disease eradication schemes is co-ordinated and controlled centrally by the ERAD Division of the Department. Monitoring of the disease testing programmes and general policy matters are dealt with by a management committee comprised of senior members of the veterinary, technical and administrative staff streams. The Assistant Secretary General with responsibility for the area chairs the committee which meets on a monthly basis. The programmes are also monitored through a series of quarterly regional meetings involving senior veterinary staff from local offices and the central ERAD Division. Analysis of staff numbers carried out for this report [5.13] indicates that the operation of the Programme currently absorbs some 33 full-time equivalent (FTE) headquarter staff.

District Veterinary Offices

At field level, the TB programme is implemented by the Department's 28 District Veterinary Offices (DVOs). The jurisdiction of the DVO generally corresponds to the boundaries of the county, although certain counties are administered by more than one DVO and certain DVOs administer more than one county. As estimated for this report, the total staff complement based in DVOs required for the delivery of the BTEP is 342

full-time equivalents. These staff members are spread across a number of grades in the administrative, technical and veterinary staff streams.

Veterinary Laboratory Services

The Veterinary Laboratory Services (VLS) comprises the Central Veterinary Research Laboratory (CVRL) and the Regional Veterinary Laboratory at Backweston in Co. Kildare, the Brucellosis Laboratory, Cork and five Regional Veterinary Laboratories located in Athlone, Cork, Kilkenny, Limerick and Sligo. The Bacteriology/Parasitology Division of the VLS provides a number of services to the BTEP, including:

- Culture and histopathological examination of diagnostic samples;
- Potency assays on the tuberculin protein purified derivative used in the TB test;
- DNA ‘fingerprinting’ of *M. bovis* isolates;
- Evaluation of new methods for the identification and typing of *M. bovis*;
- Serological tests to aid diagnosis in problem herds.

Veterinary Public Health Service

The Veterinary Public Health Inspection Service (VPHIS) of the Department is responsible for ensuring food safety in meat plants, including slaughtering premises, cutting premises, cold stores, meat products premises, minced meat and meat preparations premises and poultry slaughtering establishments. It has a permanent staff complement of 310 veterinary inspectors and technical staff and employs some 700 private veterinarians on a part-time basis. All cattle presented for slaughter in the state undergo a post-mortem inspection under the control and supervision of VPHIS staff in one of some 30 plants in which cattle are slaughtered, or, in the case of abattoirs, under the control and supervision of the veterinary staff of the various Local Authorities.

Wholetime Temporary Veterinary Inspectors (wTVIs)

The Department employs Temporary Veterinary Inspectors (wTVIs), who carry out testing under the TB and brucellosis eradication schemes on a full-time basis. The current complement of wTVIs is approximately 20.

1.5.5 Factors constraining eradication

Over time, as knowledge of the factors driving bovine tuberculosis in this country has improved, the view that the national test and slaughter programme would inevitably result in eradication came to be replaced by one that recognised that a range of factors were restricting progress towards that goal. In 1986, twenty years after Ireland had declared itself attested, the lack of progress made over that period in eradicating the disease was the subject of a review carried by Robert O'Connor (1986) and published by the Economic and Social Research Institute (ESRI). The review attributed the lack of progress to two sets of factors:

- Inadequate programme management and funding; and
- Inadequate implementation of the technical measures aimed at the control and eradication of TB.

Programme management and funding

The creation, in 1988, of ERAD – an executive agency charged with the eradication of bovine tuberculosis¹³ – marked the beginning of a concerted effort to address the inadequacies in funding and management identified by O'Connor. The commitment by government, upon the creation of ERAD, to adequately fund the Programme has been maintained since the agency's dissolution, and progress towards eradication has not been subject to financial constraint since that time. The identified weaknesses in the Programme's management were addressed by the creation under ERAD of a robust and responsive organisational structure, endowed with a strong strategic purpose. Although the Agency was dissolved in 1991, the management systems which it created have proven to be both effective and durable, and continue to form the basis of the Programme's organisational infrastructure to this day.

Technical impediments

The principal technical impediments to disease eradication identified by O'Connor in 1986 were:

- Inadequate monitoring and control of the movement of cattle;
- Inadequate measures to prevent disease spread between neighbouring farms;
- Inadequate animal identification;
- Nomination of the testing veterinarian by the farmer client;
- Deficiencies in the diagnostic test;
- Lack of commitment on the part of all stakeholders; and
- Inadequate cleansing and disinfection of transport and restricted premises.

When ERAD came into being two years later, it set about achieving its overall objective – the halving of prevailing disease levels – by addressing the then known constraints to eradication in three phases [2.3]. The second phase of this programme, which began in March 1990 and which was directed at reducing the sources of residual infection, involved the implementation of a battery of control measures that addressed many of the constraints identified by O'Connor and others (ERAD, 1992).

Despite having addressed many of the factors then considered to be constraining progress to eradication, ERAD failed to make measurable progress in reducing disease levels. Reflecting on the failure of the intensive eradication programme undertaken in the period 1988-1991 to curtail bovine tuberculosis, the then National Director of ERAD (Downey, 1991) identified further constraints to eradication and concluded that significant progress could not be made in the absence of the development of:

- A vaccine for TB in badgers and/or cattle;

- A laboratory-based diagnostic test for bovine TB; and

- A computerised movement permit system.

In the intervening period, research and advances in technology have delivered partial solutions to the second and third of these perceived constraints and considerable progress has been made in relation to the first [4.5.2]. Thus, the present-day Programme incorporates a Computerised Movement Monitoring System (CMMS), which has many of the features of a movement permit system, and a supplementary blood-based diagnostic test (interferon- γ), recognised under the terms of Directive 64/432/EEC, which has been found to play a useful role in the resolution of certain TB breakdowns. The importance of the badger in maintaining bovine disease in this country has been unequivocally demonstrated [6.4 and Appendix B] and research into the development of a vaccine for badgers has also advanced considerably (see below).

The experience of national eradication programmes in other jurisdictions would suggest that not all of the factors identified by ERAD are of equal significance in constraining eradication. Thus, for example, less refined intradermal tuberculin tests and programmes of far less sophistication than that used in Ireland have proven themselves to be adequate to permit the eradication of bovine tuberculosis in a number of Continental European countries. By contrast, in those jurisdictions in which bovine tuberculosis exists concurrently in bovine and wild animal reservoirs, and in particular where the latter are both widely distributed and legally protected, progress towards eradication has either been very slow, or has only been achieved by recourse to the widespread and systematic destruction of the wildlife reservoir. Furthermore, in Ireland, the fact that other domestic animal health programmes have been successful in eradicating the target disease (e.g. Warble Fly and Enzootic Bovine Leucosis), or in reducing it to the point of eradication (e.g. brucellosis, BSE), suggests that the failure thus far to eradicate tuberculosis is attributable to a constraint extraneous to the Programme, rather than to any inherent deficiency in its management.

If the remaining constraints to eradication, as identified by ERAD, are not all of equal significance, it follows that the solutions developed to address them will not be equally beneficial for the Irish eradication programme. The pre-eminent constraint is the existence of a significant reservoir of infection in the badger, and the development of a vaccine to address this problem is therefore the most pressing objective of the research programme. Much work has already been completed in this area and the Department is presently on the point of commencing a large-scale field trial of the BCG vaccine in badgers. In parallel with the field trial, which is scheduled to run for three years, research will continue in a number of related areas with a view to enabling the deployment of an effective badger vaccination strategy in the national eradication programme. In the meantime, in recognition of the long lead-in time to the development of an efficacious vaccine for badgers, the Department has been mandated under the terms of the Social Partnership arrangements of 2000 (Programme for Prosperity and Fairness) to augment existing badger control measures by adopting a medium-term strategy in relation to wildlife policy. This strategy, which is predicated on the assumption that badger vaccination will form an integral part of the eventual move to eradication of bovine TB, has a number of objectives: to reduce the opportunity for contact between infected badgers and cattle; to ensure that the business of farming can continue in the period leading up to the incorporation of badger vaccination into the national programme; and to ensure the conservation of a healthy badger population nationally.

1.5.6 Expenditure on TB eradication

Exchequer expenditure on bovine TB eradication is dealt with comprehensively in Chapter 5 of this review. The analysis presented therein shows that gross programme expenditure on the Bovine Tuberculosis Eradication Programme in 2006 was €36.1m. Over the entire period under review, expenditure ranged between €35.7m (2004) and €65.2m (1999)¹⁴. It has been on a generally downward path since the latter year, due to a reduction in TB levels since that time. Net expenditure on TB eradication, following the deduction of receipts from Bovine Disease Levies, stood at €25.8m in 2006. The principal items of programme expenditure are compensation for reactors (ca. 60% of gross expenditure) and tuberculin testing (ca. 30%). The balance of expenditure is accounted for under the headings of: wildlife control; research; reactor collection;

supplies/miscellaneous expenditure; and information and communication technology (ICT).

Employment costs of the permanent staff involved in delivering the BTEP were estimated from a survey carried out for this review to be of the order of €29m in 2006, spread across administrative, technical and veterinary staff streams. Incidental costs associated with this employment, in the form of Travel and Subsistence payments, amounted to a further €2.6m in 2006. In addition to its permanent staff complement, the Department also employs temporary veterinary inspectors, who were paid an estimated €1.9m in respect of testing duties relating to the TB eradication programme over the same period. The total cost of staff, both permanent and temporary, and associated incidental costs, thus amounted to some €34m in 2006.

1.5.7 Legislative basis

The Bovine TB Eradication Programme, which began in the 1950s as a voluntary Scheme, had become compulsory across the national territory by 1962. This change in legal character reflected the increasing recognition that – for reasons that will be explored in Chapter 3 – the disease could not be eradicated on a voluntary basis. The Diseases of Animals (Bovine Tuberculosis) Act, 1957, provided statutory authority for the compulsory eradication of bovine tuberculosis, clearly differentiating the type of control measures required to combat this disease from those, which, under previous Diseases of Animals Acts, had provided for the control of more virulent and fast-spreading diseases than bovine TB. This Act was replaced by the 1966 Diseases of Animals Act, which empowered the Minister for Agriculture to make Orders for the progressive eradication of bovine TB and to pay compensation for reactors.

Following Ireland's accession to the (then) European Economic Community in 1973, exports of live cattle to the Community became subject to Council Directive 64/432/EEC. The primary objective of this Directive is to establish the conditions governing intra-community trade in bovine animals and the measures that member states must undertake in order to comply with these conditions. While it is evident that this Directive does not, and never was, intended to constitute an eradication programme, it contains provisions relating to matters such as the procedures to be followed for the identification of *Mycobacterium bovis*, for the detection of disease in the live animal and

for the designation of officially tuberculosis free herds (those eligible to participate in intra-community trade). These provisions are consistent with the basic elements of the TB eradication programme as operated in Ireland. In member states (such as Ireland) in which the herd incidence of TB exceeds 1% of the national herd, the retention of OTF status requires *inter alia* that all herds be subject to testing at yearly intervals. The achievement and maintenance of OTF status at individual herd level is important because it is only cattle originating from such herds that may be exported. The national eradication programme enabled Ireland to achieve standards of disease control equivalent to those required under the terms of the Directive governing trade (64/432/EEC) at the time of its accession to the EEC in 1973, and it continues to ensure that the presence of TB in Ireland does not impede access by Irish cattle to EU markets. As will be seen later, the contemporary Irish eradication programme goes beyond the requirements of the Directive in many respects, imposing a number of additional control measures that reflect the fact that the objective of Ireland's programme is not merely to ensure access to trade, but to eradicate the disease.

In addition to its role within the European Union, the Bovine TB Eradication Programme also meets the requirements of the World Organisation for Animal Health (OIE), as set out in the bovine tuberculosis chapter of the Organisation's *Terrestrial Animal Health Code*. The Programme is thus instrumental in ensuring that the export of bovine animals and their products to countries party to this Code is unimpeded by the continuing presence of bovine tuberculosis in Ireland.

1.5.8 Previous Programme reviews

The BTEP has been subject to extensive review since 1965 when the first formal account of its operation was published (Watchorn). Reports such as those by O'Connor (1986), Downey (1990, 1991, 1992), Morris and Pfeiffer (1990), and Sheehy and Christiansen (1991) have been particularly influential in shaping the present strategic direction of the Programme; these and others are discussed in the accompanying literature review (Appendix B). In addition to those reports instigated domestically, the Programme is subject to regular and ongoing review by the European Commission and by the Commission's Food and Veterinary Office.

1.6 Format of the report

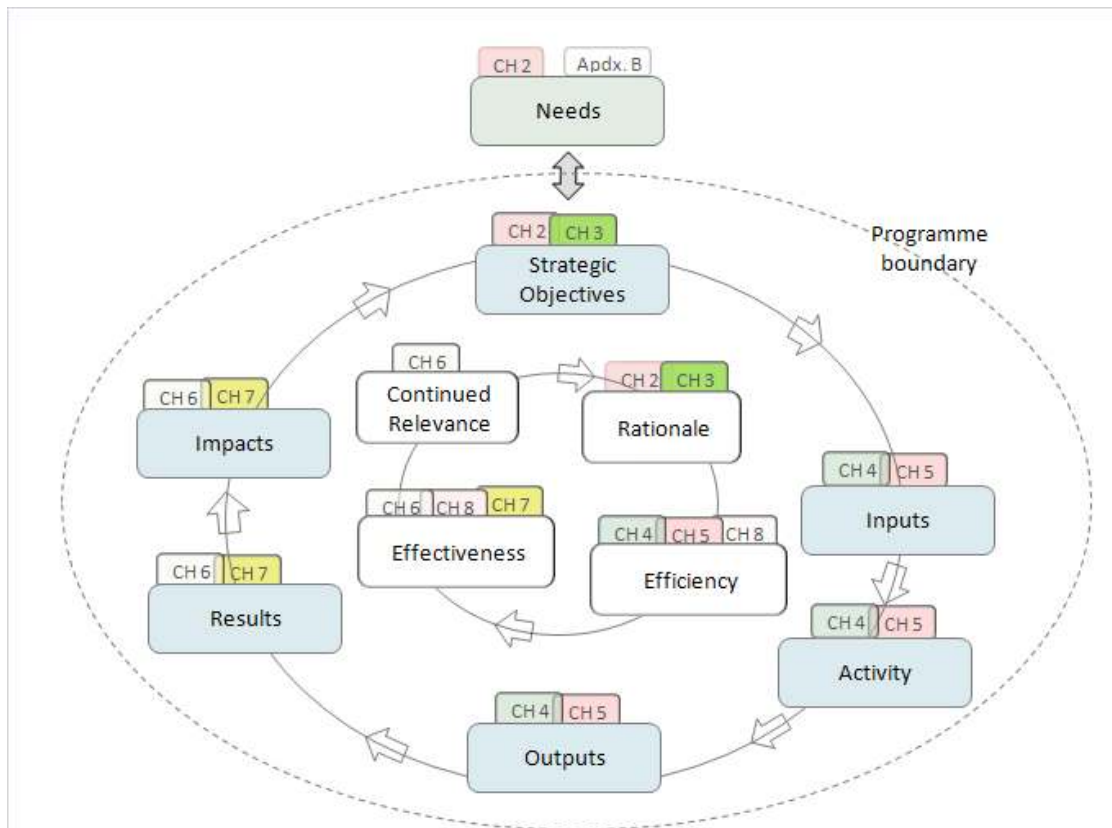
The review will address the Terms of Reference (ToR) as follows:

- Chapters 2 and 3 address ToR (1) and (2), which are concerned with the Programme's objectives and the rationale for its existence;
- Chapters 4 and 5 address ToR (3) and (4), dealing with various aspects of efficiency;
- Chapter 6 addresses ToR (5) on the question of programme effectiveness;
- Chapter 7 addresses ToR (6), analysing the programme's existing performance measurement capacity and the potential for the incorporation of additional performance indicators; and
- Chapter 8 addresses ToR (7), presenting options for alternative organisational practices and policy aimed at improving both efficiency and effectiveness.
- Chapter 9 summarises the report's conclusions and recommendations by reference to the four principal evaluative questions.
- Appendices to the report include the Methodology [Appendix A], Literature Review [Appendix B] and other background material [Appendices C-L].

A schematic representation of the layout of chapters and their relationship to the Programme Logic Model and the principal evaluation questions is provided in Figure 1.1.

Fig. 1.1

Programme Logic Model, evaluation questions and chapter layout



Source: Adapted from Dept. of Finance, 2007

NOTES

¹ Henceforth in this review, the abbreviation ‘The Department’ will be taken to refer to the Department of Agriculture, Fisheries and Food (and all its previous denominations). Where any other government Departments are referred to their full title will be used.

² The relevant central Divisions referred to are ERAD (TB & CVERA) and ERAD (Administration). The seven individuals comprised four Senior Superintending Veterinary Inspector grades and three Area Superintendent grades.

³ These four organisations participate in national social partnership negotiations.

⁴ Agri-food includes primary agriculture, food, drinks and tobacco.

⁵ The median value of end of month totals taken from the Cattle Movement Monitoring System (CMMS) statistic report of 2006 is 6.8 million head.

⁶ Henceforth in this review the abbreviation ‘The Programme’ will be taken to refer to the Bovine Tuberculosis Eradication Programme. Where other Programmes are referred to their full title will be used.

⁷ The SICCT has been the official test for bovine TB in Finland since 1910 (Good et al.).

⁸ The Eradication of Animal Disease Board (ERAD) managed the Programme between 1988 and 1991. See also note 14.

⁹ Animal test reactor incidence

¹⁰ Declaration of attestation requires not only that a low level of disease has been achieved, but also that the disease status of all herds is known.

¹¹ Directive 64/432/EEC defines an animal as being tuberculosis-free if it shows no clinical signs of tuberculosis nor a reaction to an intradermal tuberculin test carried out in accordance with Annex B not more than thirty days before loading, nor any specific reaction, and when it is from an officially tuberculosis-free bovine herd.

A bovine herd is considered to be officially tuberculosis-free under the Directive if: (a) all the animals are free from clinical signs of tuberculosis; (b) all the animals over six weeks old have reacted negatively to at least two official intradermal tuberculin tests carried out in accordance with Annex B, the first one six months after completion of disinfection of the stock, the second one six months later and the remainder at one- or two-yearly intervals in the case of Member States whose entire bovine herd is under official

veterinary supervision and has a rate of tubercular infection lower than 1 %; and (c) no bovine animal has been introduced without a certificate from an official veterinarian showing that the animal has reacted negatively to an intradermal tuberculin test assessed according to the criteria set out in Annex B 21 (a) and that it comes from an officially tuberculosis-free herd.

¹² Regulation (EC) 1760/2000 of the European Parliament and of the Council

¹³ The Eradication of Animal Disease Board (ERAD) was established by government in April 1988 with the objective of planning and implementing a vigorous four-year programme to accelerate the eradication of bovine TB and brucellosis. The National Director of ERAD was delegated authority by the Minister for the overall management of the programme, including staff engaged in the operational aspects of the schemes and research. Upon its establishment the Board comprised the Chairman and nine members, representing the Irish Farmers Association, the Irish Creamery Milk Suppliers Association, the Irish Cooperative Organisation Society, the Irish Veterinary Union, the Irish Veterinary Association, the Department of Agriculture and Food and the Department of Finance.

¹⁴ All expenditure data, unless otherwise stated, are in constant (2006) prices.