



BSE AND SHEEP THE FSA'S CONTINGENCY POLICY

Issue

1. To provide comment and peer review on two reports which examine the possibility that if BSE were found in sheep (a) what the estimated maximum prevalence of BSE-in-sheep could be, given recent developments of the testing programme to differentiate scrapie from BSE; (b) advise on the scientific assumptions and approach to estimate the likely impact of various risk reduction strategies.

Background

2. There is a theoretical risk of BSE being present in sheep. Historically, sheep consumed the same feed thought to give rise to BSE in cattle and it has been shown that sheep can be artificially infected with BSE. Retrospective and prospective testing of sheep brain samples from the UK passive and active TSE surveillance programme has been carried out since 1999. All field cases of scrapie in the UK are currently tested for the presence of BSE. To date, over 2,300 sheep have been tested and a BSE-like pattern has not been detected using current methodology.
3. If BSE was confirmed in sheep, a EU & UK contingency plan could be activated to protect public and animal health. The FSA Board last reviewed their contingency policy on BSE and sheep in 2002. The agreed FSA position at that time, was that,

“At the current state of knowledge, if BSE were shown to be present in the national flock, then the Agency's advice would be that only sheep which could be clearly demonstrated to be free of BSE could be allowed to remain in the food chain. This would mean that UK sheep could no longer enter the food chain unless identifiable as genetically resistant.”

4. However, in practical terms, it was noted that a mechanism was not in place to allow an audit trail or a cost effective test method to establish the genotype (hence resistance) for individual sheep but would be when a certified flock scheme or equivalent is in operation. In the absence of a practical mechanism, the effective conclusion from the FSA Board was that, in the event of finding BSE in sheep, it would not be possible to continue to allow sheep from the national flock into the food chain.
5. The FSA Board agreed that in the future, a more flexible contingency policy could be adopted in light of progress on testing and/or genotyping. This position could also be amended if enough animals were tested and found negative for BSE to be confident that prevalence of BSE in sheep was sufficiently low to consider the food-borne risk acceptable. It was acknowledged that policy has to remain proportionate in relation to the developing knowledge, and the potential in the medium to longer term for TSE resistance to be built into the national flock through the national scrapie plan or the certified flock scheme.

FSA review of BSE in Sheep contingency policy

6. The FSA Board will review their 2002 contingency policy later this year. Part of the review will examine if scientific developments over the last two years impact on the FSA's 2002 position on BSE in sheep, i.e., if it remains proportionate, or if there is sufficient evidence to consider moving to an alternative strategy.
7. To help in this consideration, a study to estimate the prevalence of BSE in UK sheep has been commissioned. The modelling is based on a statistical analysis of the GB program of testing for BSE in sheep. The FSA have also commissioned research to estimate the likely impact of different risk reduction strategies, should BSE be found in sheep. The FSA have asked SEAC to advise on the underlying scientific assumptions and approach adopted in both studies, taking any uncertainties into account.
8. Please note, SEAC's remit is risk assessment, not risk management therefore the committee's remit is to advise on the scientific content rather than on risk management aspects of the research.

New data for SEAC to consider

Study on estimates of possible maximum BSE prevalence

9. A paper prepared by Simon Gubbins from the VLA, examines the likelihood that BSE exists in the national flock (Annex 1). The work is based on the statistical analysis of the results, to date, from the GB program of testing for BSE in sheep. None of the sheep TSE cases yet tested have yielded a BSE-like result. The possibility that BSE exists in the sheep population cannot yet be ruled out. An epidemiological interpretation of the analysis is presented in the report and a maximum for the likely prevalence of BSE within the TSE positive population has been calculated.
10. These estimates are used to estimate the maximum number of BSE cases, or BSE affected farms, that could be present in GB. A main point for SEAC discussion is whether it is appropriate to base this calculation either on the number of individual animals tested or on the number of flocks tested. These results, and the associated uncertainties, will inform the FSA Board discussion as to the proportionality of any risk management measures.
11. The committee will be invited to comment on the scientific validity of the assumptions made within the report as well as comment on the epidemiological interpretation. Specific questions are outlined in paragraph 20 of this cover paper. A major assumption in this report is that the discriminatory diagnostic tests are valid. Any conclusions will need to reflect the uncertainties around this issue (see paragraphs 14-18 of this cover sheet for further discussion).

Please note that Annexes 1-3 have not been circulated outside the committee as these annexes contain new scientific data that have not yet been published in a scientific or medical journal. As premature release of unpublished data may prejudice publication, the authors have requested that the annexes are not released in hard copy prior to publication. However, the authors are content for the committee to discuss these data in the public meeting.

BSE in Sheep – a comparison of risk reduction strategies

12. Dr Angela McLean from the University of Oxford has prepared a report that examines the potential risk to the GB population from consumption of sheep meat if BSE were found in sheep (Annex 2). Dr McLean will present these data to the committee at the meeting. The model considers the potential spread of BSE within a number of different types of individual flocks. Estimates of risk

are based on the development of infection in the sheep by age and genotype, and the tissues consumed. The modelling then estimates the effect of a number of risk management strategies on the foodborne risk. The total risk to the GB population is then estimated to give the maximum number of flocks potentially infected with BSE.

13. This work takes account of all available data but is inevitably based on a number of assumptions. The paper acknowledges important gaps in the understanding of the epidemiology and pathogenesis of BSE in sheep. Nonetheless, it concludes that strategies based on genotyping and increasing the number of tissues removed as specified risk material (SRM) performs the best. The committee will be invited to comment on the scientific validity and the level of uncertainty of the assumptions. Specific questions are outlined in paragraph 20 of this paper. Taking into account the level of uncertainty in these risk assessments, as advised by SEAC, the FSA Board will consider the level of risk reduction provided by these strategies.

The diagnostic tests used to discriminate between BSE & Scrapie

14. The search for BSE in sheep is being progressed on two fronts, via a strain-typing approach by mouse bioassay as well as development of “more rapid” molecular discriminatory tests. The development of the “rapid tests” was deemed necessary for the search for BSE in sheep, as the mouse bioassay technique is time-consuming and expensive.
15. In 2002 the EC asked VLA as the Community Reference Laboratory to advise how the putative molecular discriminatory tests could be introduced into surveillance programmes. This led to the establishment of a blind ring trial, which is currently evaluating a panel of molecular tests. This ring-trial is still underway. The VLA has prepared a detailed report outlining the work carried out on the use of discriminatory test methods and their evaluation (Annex 3). This report also highlights the scientific uncertainties and issues surrounding the diagnostic testing for BSE in sheep (for quick reference see page 14 of Annex 3).
16. In the UK samples from all reported scrapie suspects and sheep selected for surveillance are tested using standard TSE diagnostic tests. Those giving a positive result in the “standard” panel are then tested further, using the rapid molecular discriminatory tests to examine if the TSE might be BSE. To date a BSE-type fingerprint or pattern has not been detected in any of the samples tested

either by mouse bioassay or in the rapid molecular tests. That said there remains significant scientific uncertainty surrounding the ability and accuracy of these tests to differentiate between scrapie and BSE and also in the interpretation of the results from these tests.

17. The issue around the validity and sensitivity of the rapid molecular diagnostic tests is an overarching issue that impacts on both the Gubbins and McLean reports. Both studies make the central assumption that the molecular discriminatory diagnostic tests are valid, sensitive and reliable. Therefore a key uncertainty is the level of confidence that would be associated with any potential discovery of a BSE-positive finding.
18. Inevitably, this provides a somewhat incomplete snapshot as the CRL ring trials are still underway and the debate on the suitability of the discriminatory molecular test methods, developed over recent years has yet to be concluded. However it is necessary to address this issue now to allow the FSA board to commence its review in December 2004. Nonetheless, it is perhaps noteworthy that using this battery of tests but primarily the VLA modified Prionics Check Western Blot, and support by immunohistochemistry, the characteristic fingerprint of BSE in sheep, to date, has not been found in test results from 2368 confirmed sheep TSE cases. In addition, the VLA reports on the examination of brains from a much smaller number of sheep that have been orally exposed to ovine-BSE. This provides a degree of reassurance that, at least at second passage, the molecular phenotype of BSE in sheep remains unchanged and distinct from scrapie.

Previous SEAC Advice on the UK Contingency plan for BSE in Sheep

19. SEAC have previously advised, in general terms, on the scientific validity of various risk reduction strategies for the UK Contingency plan for BSE in Sheep (The FSA contingency plan is specific to the "operation" of this plan). SEAC first carried out a risk assessment in 2001 and recommended that if BSE were found in sheep then the risk to public health would be minimised if only sheep of a most resistant genotype (ARR homozygous) or of a semi resistant genotype (ARR heterozygous) if under 12 months went into the food chain. This recommendation has been reviewed and reaffirmed a number of times since 2001, with the most recent review in June 2003.

Advice sought from the Committee

20. Members are invited to comment on the research being presented with particular reference to:

Annex 1 Gubbins report (VLA)

- Which of the given estimates for an upper limit of BSE is the most statistically appropriate for the FSA to use in formulating their contingency policy for BSE in sheep?
- The uncertainties associated with this estimate.

Annex 2 McLean report (University of Oxford)

- The data and assumptions used to calculate the risk to the consumer if BSE were to be found in sheep.
- The validity of the estimated absolute risk to the consumer, from consuming sheep meat, if BSE were to be found in the national flock.
- The validity of the estimates of the risk reduction that would be achieved by the given strategies.

Please note that Annexes 1-3 of paper 84/2 have not been circulated outside the committee as these annexes contain new scientific data that have not yet been published in a scientific or medical journal. As premature release of unpublished data may prejudice publication, the authors have requested that the annexes are not released in hard copy prior to publication. However, the authors are content for the committee to discuss these data in the public meeting.