

## Specific feedback:

### A. ACMSF response to the WRAP risk assessments on the use of source segregated composts in agriculture

- i. Comments on the over-precision within the risk assessments have been addressed in the AHVLA report (Doc 1, page 63).
- ii. To address the questions around ALARP and risk ratios when considering microbiological risks, full quantitative risk assessments for *E coli* O157, *Salmonella* spp., *Listeria monocytogenes*, *Campylobacter* spp. and *Cryptosporidium parvum* in composts have now been added to the Cranfield compost report (Doc 3, pp43-60). Full QRA for *Clostridium botulinum* has not been attempted for humans (primarily due to difficulties in estimating dose-response), although risks from this organism to livestock have been considered by AHVLA (Doc 1, pp130-133). The ADAS *Clostridium botulinum* project (Doc 5) has examined a small number of composts (and soils receiving composts) for loadings of *Clostridium botulinum* spores – with a view to informing any future risk assessment for this organism (although WRAP currently have no plans to undertake such an assessment).
- iii. In response to discussions with our contractors, WRAP has not widened the scope of the assessments to encompass spore-forming bacteria or fungi, or encysted parasites. The exception to this is the work on spore-forming *Clostridium botulinum* (Doc 5 and Doc 6). Reviews of the impacts of composting on a very wide range of biological hazards have previously been published (WRAP, 2003 and 2004).
- iv. The selection of scenarios for consideration has been based on a combination of semi-quantitative risk assessment and stakeholder requirements. In particular, the semi-quantitative approach (Doc 3, pp24-33) allowed particular exposure pathways to be prioritised, and these were then explored through a number of quantitative risk assessment scenarios.
- v. The risk ratio approach to assessing microbiological risks has now been replaced with an infectious-dose unit (IDU) approach (Doc 3, pp38-60 and Appendix 13).
- vi. The impacts of process by-pass for composts derived from catering wastes have been considered as part of a sensitivity analysis (Doc 1, pp112-117), but no empirical data have been obtained.
- vii. *Cryptosporidium* contamination has been examined in more detail than previously (Doc 3 pp57-58 and Appendix 13). Comparisons with sewage sludge have been removed from the human health risk assessment (Doc 3), but are retained within the livestock risk assessment (Doc 1), since there are statutory lay-off periods for composts derived from catering waste (and other animal by-products) which form the subject of this assessment. The purpose of the Renewable Fertiliser Matrix (Doc 7) is to establish industry good practice for the use of compost and digestate, and can include recommendations for harvest intervals (over and above those required by statute) where appropriate.

### B. ACMSF response to the Waste and Resources Action Programme reports on: Quality, safety and use of digestate in UK agriculture

- i. The report *Quality, safety and use of digestate in UK agriculture* has been dismembered as follows:
  - a. Sub-reports covering digestate data, taints, and digestate odour management have already been published by WRAP (2011a, 2011b and 2011c).
  - b. The sub-report on *Clostridium botulinum* will be made available on request alongside the two new reports on this organism (Doc 5 and Doc 6).

- c. The sub-report on persistent herbicides will be made available on request alongside a forthcoming report on the fate of these herbicides during bench-scale anaerobic digestion.
  - d. The sub-report on allergens will be made available on request, later this year.
  - e. The sub-report on risk-based guidance (Doc 4) will be made available on request – but the updated guidance itself will be widely circulated (Doc 7).
- ii. Comments on over-precision have been addressed in the AHVLA catering waste compost risk assessment (Doc 1), but not explicitly in the Cranfield digestate risk assessment (Doc 4). The text from AHVLA is reproduced here, for interest:

*One criticism of the quantitative approach to risk assessment used here has been that the inputs and hence the outputs are over precise, given the likely uncertainties, and this may give rise to over-interpretation of the outputs and a false confidence in the results. Indeed, reference has previously been made to the update of the log removal (by composting) from 4.7-log to 4.61-log in this revision of the risk assessment.*

*The change from 4.7-log (Table 5-1) to 4.61-log (Figure 14) represents an improvement in the design of the model, so that sensitivity in both the by-pass parameter (Section 9.5) and the parameter for inactivation in the hot part (Section 9.6) can be investigated. As with all quantitative models, the most accurate value for each parameter should be used within the model.*

*It should be remembered that the numerical final results, although precise in themselves, are only a guide to the magnitude of the risks. Clearly there is uncertainty associated with the final result, and that uncertainty is not defined in deterministic risk assessments.*

- iii. The committee are correct to identify the sampling strategy in the *anaerobic digestate quality for Welsh agriculture* section as opportunistic. This section has now been published (WRAP, 2011b).
- iv. Risks to livestock from scrapie have been re-calculated (Doc 4, pp61-64), but other TSEs have not been considered – following discussion with AHVLA.
- v. The pasteurisation requirements in PAS110 have been drawn from the Animal By-Products Regulations. These allow the pasteurisation phase to take place before or after the anaerobic digestion phase. The exemptions from pasteurisation in PAS110 are based on the current regulatory approach to certain materials. For example, livestock manures and slurries would normally be permitted to be spread to land without pasteurisation. Where the Animal By-Products Regulations require pasteurisation to be implemented for certain feedstocks, PAS110 provides no opt-out for these feedstocks. Consideration of the differential impacts of pre and post-AD pasteurisation on a range of common agricultural pests and diseases has formed the core of a further study (Doc 8). This has been attached for information only.
- vi. Two projects were procured by WRAP in response to the committee's comments on *Clostridium botulinum* (Doc 5 and Doc 6). The ADAS project (Doc 5) was intended to examine the prevalence of viable *Clostridium botulinum* spores in digestate (and a range of common soil amendments) and soils that had received these amendments. The FERA project was intended to examine the fate of *Clostridium botulinum* spores and toxins during anaerobic digestion – with and without a pasteurisation phase. The findings of these projects might best be described as equivocal, although they do seem to confirm the pre-existing literature.

vii. The committee's feedback regarding public acceptability of the proposal to use meats as a component of food plant fertiliser is noted. The Defra-funded project Attitudes to the use of organic waste resources to lands has previously considered such questions.

viii. Following discussion with AHVLA on the likely availability of suitable data, emerging risks from non-0157 VTEC organisms have not been considered.

ix. Actual rates of process compliance have not been investigated (this applies to both anaerobic digestion and composting systems).

x. The risk management recommendations have now been superseded by a combined compost/digestate 'Renewable Fertiliser Matrix' (Doc 7). The committee's views of this would be much appreciated.

