



## Bioremediation Questionnaire

1. Farm type
  - Sheep
  - Cattle
  - Pigs
  - Poultry
  - Other (Please specify)
2. Size of flock/herd (numbers)
3. Annual numbers of fallen stock?
4. How do you dispose of fallen stock?
  - Hunt
  - Incinerated
  - Knacker man
  - Other (Please specify)
5. Estimated annual cost of disposal
  - £
6. Are you happy with your current means of disposal
  - Yes
  - No
7. What are your considerations when choosing a means of disposal (1-3, 1-not important, 2- indifferent 3-very important)
  - 1 2 3 Price
  - 1 2 3 Ease of use
  - 1 2 3 Convenience
  - 1 2 3 Speed of disposal
  - 1 2 3 Other (please specify)

Bioreduction is the aerobic degradation of livestock carcasses in a partially-sealed vessel containing water. An incision is made into the abdomen of the carcasses to release internal bacteria and enzymes before the carcasses are placed inside the vessel. The contents of the vessel are heated to 40 °C and aerated.

Rapid biodegradation occurs, with current studies showing that sheep carcasses take approximately three months to decompose and pigs approximately two months. 1,600 sheep can be bioreduced in one vessel, with the vessel being emptied once during the year.

All waste removed from the vessels must be incinerated or rendered. Results indicate that any pathogens were contained within the system.

**Table 1.** Estimates of costs for the installation (one-off) and use (over twelve months)

Cost Type	Item	Cost (£)
Set-up	1 vessel	3290
	Importing from Spain	1300
	Installation	3560
Running	Water	5
	Electricity*	2190
Waste disposal	Liquor disposal	250
Total		10,595

\* Based on the vessels being switched on continuously (unnecessary under most scenarios)

It is envisaged that the cost of the vessels will be reduced significantly if the technology were to be approved under EU legislation and the vessels could be manufactured in the UK.

It should be remembered that bioreduction is still not an approved method for the storage of fallen stock or animal by-products prior to disposal and that the work conducted thus far has been for research purposes only.

8. Have you heard about aerobic bioremediation as a method of storage for fallen livestock?
- Yes  
 No
8. What is your view on this system of storage (1-3, 1-effective, 2-don't have an opinion 3-not practical)
- 1    2    3
9. Would you be happy to use this means of storage
- Yes  
 No
10. Any other comments?

Please email responses to [Emily.phelps@adas.co.uk](mailto:Emily.phelps@adas.co.uk)