

will result in sustainable procedures for the safe disposal of dead stock.

Commenters are also asked to consider the costs associated with any such solutions, and any trade-offs that might result by requiring particularly stringent disposal methods to protect against BSE, when easier disposal methods might be adequate protection against other animal diseases. Such comments could also address whether moving to a disposal system designed with BSE in mind might reduce the availability of other types of disposal services which might be needed in situations where it is necessary to dispose of large quantities of carcasses that do not present a BSE risk (*e.g.*, an FMD or pseudorabies outbreak).

Commenters should bear in mind that our current BSE surveillance includes collecting samples from cattle that die on-farm. We would like commenters to address how APHIS could continue to obtain and increase our samples for testing from dead stock.

When dead stock are disposed of unsafely, it is because safe disposal is unavailable, expensive, or inconvenient. One approach to dead stock disposal could be to require certain methods of disposal (*e.g.*, incineration, landfill burial, digestion, or composting, at licensed facilities) under Federal or State laws. But requiring certain disposal methods does not automatically make them available, inexpensive, or convenient. Also, some disposal methods have been very useful for disposing of small numbers of animal carcasses, but their use for the disposal of large numbers of carcasses may result in an increased disease risk to other livestock producers in an area. The short term savings from these methods can easily result in an increased cost later on, which could have been reduced or eliminated if the right techniques had been used initially.

As discussed above, different disposal methods result in different levels and types of risk that cattle could contract BSE from a disposed animal. There are very effective and usually expensive disposal methods that reliably inactivate any infectious agent, including BSE, in a destroyed cadaver. These methods include incineration (on-farm or at a remote incinerator) and tissue digestion. Other disposal methods are known to be partially effective in deactivating the BSE agent, thus reducing but not eliminating risk. These methods include rendering (known to reduce BSE infectivity, with the extent of reduction related to the process used) and composting (apparently reduces infectivity, but to what degree is not well characterized). In both of these

methods, an important element may be diversion of the end-product to uses that will not bring it into contact with animal feed. Other methods such as open burning, burial, and landfill disposal have great variations in their effectiveness due to the great variations in how they are implemented at different times and places.

An important aspect of disposal methods is that they can achieve the desired end either by deactivating the BSE agent or by isolating it. The BSE agent in dead stock need not be inactivated if it is reliably kept from contact with animals that it might infect. Another aspect to consider regarding disposal methods is the extent to which they create further disposal problems downstream. Incineration reduces animals to a small volume of ash, but the ash must be spread somewhere. Tissue digesters produce innocuous liquid waste and some calcium phosphate. Burial and landfill disposal do not immediately reduce the volume of the animal and create enduring concerns about scavengers and leaching into the water table. Rendering greatly reduces the volume of the processed product by removing water content and places the end-product in containers, but it has labeling and use concerns because the product may still be infectious.

We are seeking comments to help us balance these considerations in developing good dead stock disposal practices. We have better information on the issues associated with rendering, compared to other disposal methods, because rendering businesses are few in number and uniform in operation compared to the great variety of businesses operating landfills, incinerators, and composting services. While the following discussion directly addresses some issues associated with rendering, we hope commenters will help us develop similar data regarding other disposal methods.

Here are some of the questions regarding whether rendering is a useful disposal method for dead stock that could harbor TSE's: Since rendering does not completely destroy TSE agents, can we be sure rendered products from possibly-infected dead stock would all be used in ways that would not spread TSE's? Given the capacity and distribution of rendering plants, is rendering of dead stock a viable option nationwide, or are there areas where it is practically unavailable? If rendering is a desirable disposal method, what sorts of requirements, partnerships, or incentives could increase its use?

There are approximately 100 million cattle in the United States, including

beef, dairy, and other categories. Over a million post-weaning calves and adult cattle die or are killed each year before being sent to slaughter. The National Renderers Association estimates that about 44 percent of these carcasses were sent for rendering last year but notes that this percentage is declining, as the profitability of rendering dead stock declines. North American renderers process more than 50 billion pounds of animal and poultry material each year, including dead stock, offal, and waste from slaughter and packing plants, and animal waste from food processing, supermarket, and restaurant industries. Rendering reduces the volume of this material by 64 percent, mostly by reducing the water content, which makes the resultant products much easier to package and transport—whether for sale, or for disposal. The value of rendered products in the United States in 1998 was approximately \$3.2 billion, and consisted of 9 billion pounds of protein concentrate (largely meat and bone meal, or MBM) and 9 billion pounds of animal fat such as tallow.

Historically, the bulk of rendered products has been used by the feed industry, which adds MBM and high-energy fats to feed mixes for cattle, swine, poultry, and pets. MBM is an attractive feed supplement because it is high in protein, calcium, and phosphorus. The chief supplements that compete with MBM are soybean meal and corn gluten meal. Neither of these plant-based supplements has significant levels of calcium or phosphorus, although corn gluten meal has a higher crude protein content than MBM (60 percent compared to 50 percent). Wholesale prices for MBM and soybean meal have traditionally tracked each other closely, but with MBM commanding a slight premium presumably due to its better mineral content. From January 1988 through February 1996, ruminant MBM sold for an average of \$16.05 per ton above the price of soybean meal, but since March 1996, the average price of ruminant MBM has been \$1.20 below the price of soybean meal. This price reduction probably results largely from the FDA feed ban, although greater production of soy and corn may also be a factor.

Steady decreases in the price brought by MBM, coupled with increases in transportation and processing costs, act to reduce renderers' traditional role as the primary means for producers to dispose of dead stock. In the past, renderers paid farmers for their dead stock, but recovered that cost by selling the byproducts at a profit. Farmers got rid of their dead animals without cost or