

Emphasis on Biosecurity in development of composting methods for studies on degradation of abnormal scrapie prions in tissues from sheep and for disposal of poultry carcasses during an outbreak of avian influenza in Canada.

J. Lloyd Spencer, Hongsheng Huang, Jiewen Guan and Bryan Rennie

Ottawa Laboratory - Fallowfield , Canadian Food Inspection Agency, 3851 Fallowfield Road, Ottawa, Ontario, Canada K2H 8P9

Static pile passive aeration composting methods were developed for disposal of animal carcasses and manure under conditions intended to prevent the escape of pathogens into the environment. To provide insulation, compost bins were constructed with bales of hay that gave the walls a thickness of 45 or 90 cm. The interior height was 1.6 m, width was 2.5 m and length was up to 4.5 m. The ground or floor within the bins was covered with at least 0.3 m of hay. To contain liquids, the interior of bins were lined with heavy plastic. Aeration was provided by drainage pipes placed towards the bottom of the bins. The pipe was 10 cm in diameter; flexible and perforated and the ends were brought out over the top of the bins or through the wall to allow air to enter towards the bottom of the mass. Bins were loaded with cattle or sheep manure mixed with straw. Animal carcasses or tissue specimens were buried in the mass. The piles were covered with vapor barrier fabric and this was covered with a 30 cm layer of hay or straw. The top of outdoor bins were covered with plastic. The carcasses of two mature cows were degraded within 5 months in an outdoor bin. Based on Western blot techniques, abnormal prions in tissues from sheep affected with scrapie had undergone varying degrees of degradation within 4 months in two indoor bins (Haung *et al.*, Can. J. Vet. Res., 2006). For emergency composting of poultry carcasses and manure during the 2004 outbreak of avian influenza in Canada, bins consisted of two parallel rows of cement highway dividers that were 4.5 m apart. As above, the interior of the bins were lined with heavy plastic; aeration was with drainage pipes and piles were covered with plastic. A pile length of 76 m was sufficient for composting 65,000 market age broilers. Temperatures achieved in piles were considered sufficient to have killed influenza virus and carcasses were degraded within about 45 days.