

SALMONELLA

INACTIVATION OF ZONOTIC PATHOGENS DURING STATIC COMPOSTING OF CHICKEN LITTER AND PEANUT HULLS

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During aerobic composting, the primary factor responsible for inactivation of fecal pathogens is heat generated from the metabolic activity of thermophilic microorganisms. Moreover, to ensure inactivation of pathogens at the surface of static compost piles, it is recommended that compost be turned periodically during the first weeks of composting. This safeguard practice, however, is not often implemented in situations where labor and resources are limited. To develop alternative management strategies for these situations, baseline data is needed to determine inactivation profiles of zoonotic pathogens at surface and interior sites of static piles. The fate of zoonotic pathogens [gfp-labeled *Escherichia coli* O157:H7 (Shiga toxin-negative) and *Listeria innocua* and rifampicin-resistant *Salmonella* Typhimurium (vaccine strain)] in the field was monitored at both interior and surface sites of static composting piles composed of chicken litter and peanut hulls. Zoonotic pathogen populations declined by 4-8 log CFU/g within 4 days of composting but were still detectable by enrichment culture. Despite exposures to elevated temperatures, *Salmonella* continued to be detected in interior samples by enrichment for up to 14 days after composting was initiated. In surface samples, the fate of pathogens was dependent on the season and ambient temperature conditions in which composting was conducted. During the summer, *S. Typhimurium*, *E. coli* O157:H7 and *L. innocua* were detected by enrichment only in 3-day, 3-day, and 7-day compost surface samples, respectively. In contrast, 28, 56, and 56 days of composting in the late fall/early winter were required to reduce *S. Typhimurium*, *E. coli* O157:H7, and *L. innocua* populations, respectively, to levels detectable only by enrichment. In conclusion, zoonotic pathogens survived on the surface of unturned static composting piles containing chicken litter for up to 2 months.

