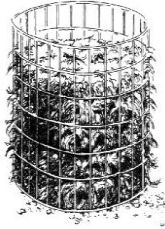
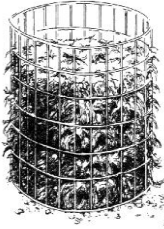
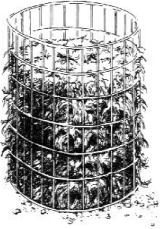


## Does composting kill Aleutian disease virus in mink manure?

**Compost characteristics:** We prepared three compost bins by mixing mink manure with wood shavings and chopped hay. We were particularly interested in making compost which would reach temperatures over 65°C for as long as possible. This is the temperature that kills the Aleutian disease (AD) virus in the laboratory. Temperature probes were inserted in the top, middle and bottom of each bin to electronically record daily temperatures. Number of days that the temperature of each layer remained above 65°C (# days) and the maximum temperature reached for each bin is shown below:

	<b><u>Bin 1</u></b>	<b><u>Bin 2</u></b>	<b><u>Bin 3</u></b>
<b>Top</b>			
# days	9 days	5 days	3 days
Max	(68.8°C)	(65.7°C)	(65.1°C)
<b>Middle</b>			
# days	5 days	0 day	0 day
Max	(66.1°C)	(64.3°C)	(64.1°C)
<b>Bottom</b>			
# days	0 days	0 days	0 days
Max	(63.2°C)	(62.4°C)	(60.8°C)

The top layer became the hottest, and remained over 65°C for the longest. The bottom layer was the coolest and did not reach 65°C (see our previous article on composting for more information).

**Testing for AD virus inactivation:** Splens of several infected mink were homogenized and used as the source of the live AD virus. This homogenate was tested and proved to infect mink (see our previous article for more detail). A known amount of the homogenate was put into special porous nylon pouches. Three pouches were inserted in the bottom, three in the center and three in the top of each compost bin. Temperature probes were inserted next to the pouches in all layers.

The experiment continued for 78 days, until the temperatures of the bins fell below 25-30°C. At this time, the pouches were removed. The content of each pouch was collected and kept frozen at -80°C.

Contents of one of the pouches from each layer of the three bins were combined, producing one composite sample from the top, one from the middle and one from the bottom of the bins. The AD virus was separated using the method that we found worked best in our laboratory. Virus samples from each layer were injected into the abdominal cavity of 5 mink. Mink were sedated prior to injection, and antibiotics were used to prevent bacterial infection.

Three mink were injected with the original spleen homogenate and three mink were injected with the virus that was extracted from un-composted manure. These were the positive controls. Four mink were kept as negative controls (no virus injection). All mink were killed 20 days after injection. Antibody production was tested by counterimmunoelectrophoresis (CIEP) in duplicate blood samples and the presence of the virus was tested for in the blood and the mesenteric lymph nodes by the polymerase chain reaction (PCR).

## **Results**

- Samples from the top layer, which had the highest temperature, infected 40% of the injected mink (CIEP and PCR positive).
- Samples from the central layer, which had the second highest temperature, infected 80% of the injected mink.
- Samples from the bottom layer infected 100% of the mink.
- All positive control mink became CIEP and PCR positive (so the virus was alive and well in the manure).
- Negative control mink remained negative for CIEP and PCR.

## **Conclusions:**

- Composting did not completely kill the AD virus even at the hottest spots of the compost bins.
- A composting temperature above 65°C partially inactivated the AD virus.
- Since temperatures above 65°C were not reached in all sections of the compost bins, not all the AD viruses will have been exposed to a high enough temperature.
- This is the first experiment to investigate the inactivation of the AD virus by composting. Further work is needed to achieve enhanced and sustained thermal activity in all layers of a bin during composting and to determine if the AD virus can be killed.

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