

Assessing antibiotic breakdown in manure

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Agricultural Research Service (ARS) scientist Scott Yates is studying how oxytetracycline (OTC), an antibiotic that is administered to animals, breaks down in cattle manure.

Livestock producers in the United States often use antibiotics to control disease in their animals, and confined U.S. livestock and poultry generate about 63.8 million tons of manure every year. The drugs are often only partially absorbed by the digestive tract, and the rest are excreted with their pharmaceutical activity intact.

Yates, who works at the ARS Contaminant Fate and Transport Research Unit in Riverside, Calif., found that in controlled laboratory conditions, OTC in cattle manure was degraded more quickly as temperatures increased and as the moisture content in the manure increased. But the OTC breakdown slowed as water saturation levels neared 100 percent. Yates concluded that this slowdown resulted when oxygen levels were not high enough to fuel the OTC [biodegradation](#).

Yates also noted that OTC breaks down more quickly in manure than in soil. Compared to soil, manure has higher levels of [organic material](#) and moisture, which support the microorganisms that break down this pharmaceutical.

This laboratory research may be useful in designing studies that evaluate the potential effects of lagoons, holding ponds and manure pits on bacteria and antimicrobial resistance.

Livestock producers also might use the results from this study to maximize the breakdown of organic materials and potential antibiotics in [manure](#) by designing storage environments with optimum temperatures and moisture levels.

Results from this study were published in the [Journal of Agricultural and Food Chemistry](#).

Provided by United States Department of Agriculture

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