Science Societies

Removal of a common antibiotic from water by clay-coated diatoms

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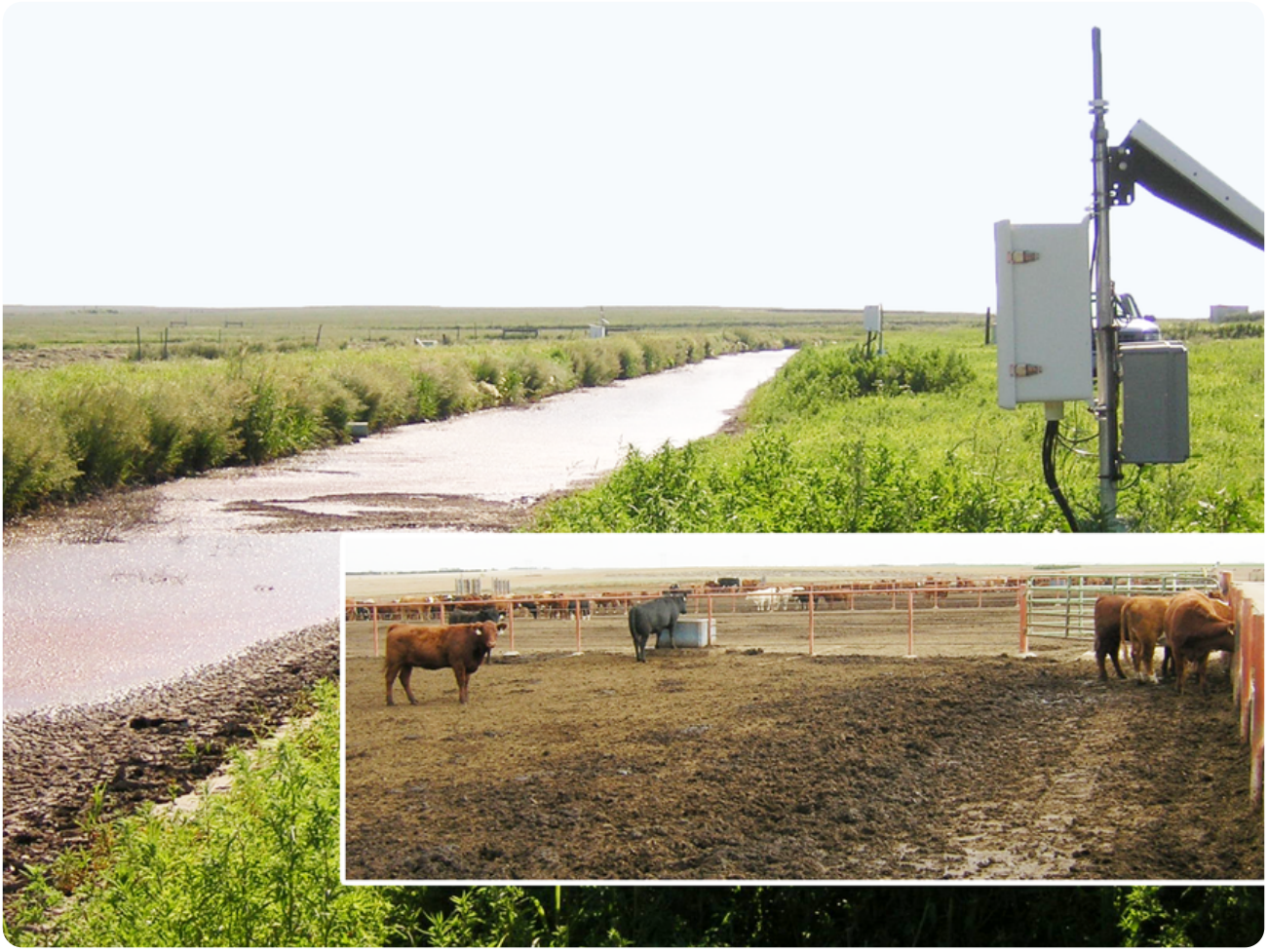

Backdrop: Example of beef feedlot runoff containing manure solids. Systems are designed to remove most of these solids prior to application to cropland. Inset: Example of feedlot pen surface with excreted manure solids containing unmetabolized and metabolized

antibiotics. Precipitation carries these solids to holding ponds for partial treatment before being applied to cropland. Photos by Dr. Bryan Woodbury.

Much of the antibiotics used during animal production end up in wastewater and are eventually applied to croplands as irrigation. Repeated application of wastewater-containing antibiotics to cropland may lead to increased antibiotic resistance in the environment. This increased resistance will reduce antibiotic effectiveness, which may impact human health.

In an article recently published in the *Journal of Environmental Quality*, researchers report the binding efficiency of three commercially available diatomaceous earth sources for removing a common antibiotic from wastewater. It was shown that the "raw" diatomaceous earth—bentonite clay and organic matter—was the most efficient binding agent of the three tested. Further processing of raw diatomaceous earth to remove the interference of the organic matter film improved the binding efficiency by 1.8 times. In addition, the removal of the organic matter improved separation properties of the material, resulting in a binding agent that could be incorporated into an efficient wastewater treatment process.

This research demonstrated that raw diatomaceous earth could be used as a binding agent for the removal of antibiotics from wastewater. These results are an important step towards the development of a robust and affordable method for removing antibiotics from agricultural wastewaters.

Dig Deeper

Stromer, B.S., Woodbury, B., and Williams, C.F. (2019). The efficacy of three diatomaceous earth sources for removing tylosin from aqueous systems. *Journal of Environmental Quality*, *48*, 1863–1871. **https://doi.org/10.2134/jeq2018.11.0409**

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