

# Isolation of Airborne, Antimicrobial-resistant Bacteria Associated With Livestock

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## ABSTRACT

Antimicrobial-resistant gram-negative bacteria in agricultural settings are well documented and continue to be a growing public health concern, especially extended-spectrum  $\beta$ -lactamase (ESBL)-producing and carbapenem-resistant *Enterobacteriaceae* (CRE).

To sample potential airborne bacteria associated with livestock, we constructed and placed adhesive airstrips in a local stockyard. Eight airstrips were recovered following environmental exposure yielding 16 samples. After collection, each sample was placed in enteric enrichment broth and incubated, of which 7 tubes turned yellow, indicating fermentation. Of the 7 positive tubes, 5 isolates grew on ESBL- and CRE-screening media, with only 1 isolate displaying pigmentation suggestive of an ESBL-producing organism. Colonies that grew on screening media were

transferred onto MacConkey and sheep blood agars for identification testing and antimicrobial susceptibility determination. The isolate displaying pigmentation was identified as *Escherichia coli*, and the production of extended spectrum  $\beta$ -lactamase was confirmed with disk diffusion and Etest methods.

Further research will address the intersection between agricultural, environmental, and communal health under similar settings to evaluate the potential occupational risk associated with airborne exposure to multidrug-resistant bacteria.

**ABBREVIATIONS:** CRE - carbapenem-resistant *Enterobacteriaceae*, ESBL - extended-spectrum  $\beta$ -lactamase.

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