

# Comparison of two methods for collecting antimicrobial usage in large dairy farms in Ohio and California

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## Introduction

Quantification of on-farm antimicrobial use (AMU) is critical to correlate with patterns of antimicrobial resistance, surveillance programs and formulate interventions to optimize its use. Prior studies have used the empty drug container (EDC) method to quantify AMU; however, the method is labor-intensive and time-consuming. Therefore, this study aimed to compare it against farm treatment records (FTR) as a reliable method to collect on-farm AMU. We hypothesized a low level of agreement in on-farm treatment incidence (TI) obtained between these 2 different collection methods.

## Materials and methods

The study was conducted as a part of a quasi-experimental field trial that included 13 conventional dairy farms located in Ohio and California. On-farm AMU was quantified for 6 months by assessing the on-farm treatment records and by counting the number of used antibiotic packages discarded in containers provided by the research team. TI was calculated using animal daily doses (ADD) and expressed by 1,000 cow-days. Wilcoxon signed-rank test and Pearson correlation were calculated to analyze the TI data.

## Results

The mean TI of systemic, intramammary lactating, and intrauterine antimicrobial therapies obtained from FTR was 10.4 ADD/1,000 cow-days and not significantly different compared to the mean TI of 13.3 ADD/1,000 cow-days obtained from the EDC inventory ( $P = 0.95$ ). Similarly, the mean TI of dry-cow therapy obtained from FTR was 1.6 ADD/1,000, and not significantly different from the mean TI of 1.5 ADD/1,000 cow-days obtained from the EDC inventory ( $P = 0.48$ ). The Pearson test showed a strong positive significant correlation between FTR and EDC inventory (Rho = 0.80,  $P = 0.001$ ) as well as, for the dry-cow therapy (Rho = 0.62,  $P = 0.02$ ).

## Significance

Regardless of the collection method used, AMU varied significantly among the enrolled dairy farms. Additionally, both methods exhibited significant consistency in collecting on-farm AMU for systemic, intramammary, and intrauterine antimicrobial therapies. However, future efforts should be oriented to standardize on-farm antimicrobials collection methods to facilitate their application and improve data accuracy.

