

Comparison of Random and Cohort Sampling to Evaluate the Effect of Antimicrobial Use on Resistance

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Antimicrobial use in food-animals is currently under great scrutiny for allegedly being a major source for antimicrobial resistance in human pathogens. Few studies exist on the effect of antimicrobial use on antimicrobial resistance of isolates collected from treated animals. Different sampling strategies need to be evaluated to more effectively study the effect of antimicrobial use on antimicrobial resistance.

Fecal samples were obtained from 100 cows and 100 calves repeatedly over a period of 12 months at intervals of 8 weeks. Animals were included in one of 2 groups; treated with an antimicrobial within the 30 days prior to the first sampling occasion (n=50) and controls (not treated within 30 days, n=50). At each sampling occasion, another 50 animals were randomly selected to obtain fecal samples. Among isolates obtained from calves, random sampling yielded similar results in prevalence of resistance to samples from the cohort groups, both for *Salmonella* spp. and *E.coli*. However, in cows, random sampling yielded higher prevalence of *Salmonella* spp. isolates than cohort sampling (7.8% in random vs. 4.5% in controls and 0.8% in treated). Distribution of resistance patterns was very similar for isolates obtained from cohorts and random samples, both in calves and cows. As for the effect of antimicrobial use on antimicrobial resistance, in general, with fewer days between last antimicrobial treatment and sampling, isolates showed resistance to more antimicrobials.