

Integrating Biology, Psychology, and Ecology to Mitigate Antibiotic Resistance in Food Animal Production Systems. USDA-NIFA . 2015-68003-22998

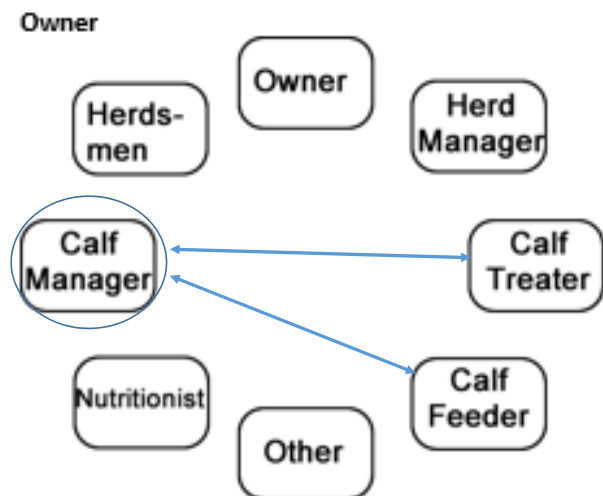
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Project Title	Description
Motivation, Reward and Feedback: Impact on Creating Change	Reduce antibiotic use by identifying and addressing worker decision strategies and motivations.
Managing Antibiotic Use by Improving Process Quality	Reduce metric/process variation by routinely providing process metrics feedback.
Qualities of milk to improve neonatal health	Describe the diversity, quantity, and consistency of oligosaccharides (OS) found in calf feeds and how they relate to calf health.
Mitigating Resistance	Evaluate efficacy of non-antibiotic resistance inducer molecule to reduce fecal shedding of MDR E.coli.
Dissemination Ecology of Resistance Traits and Bacteria in the Dairy Environment	Determine the influence of local epidemiological and ecological features on AMR diversity and transmission within the farm.

Ongoing Research

Who is Talking to Whom?

- Communication networks regarding calf care differ for daily work compared to goal setting
- Middle management important link between goal setting and work
- Language and education differences between management and workers



Survey of Calf feeds and OS as Prebiotic

- Smaller farms feed powdered calf replacer
- Larger farms tended to feed whole milk or non saleable pasteurized milk
- Powdered calf feeds had much greater quality variability across all parameters than milk
- Calves fed milk had greater quantities of fecal Bifidobacterium, a putative probiotic

Type of Calf Feed	Total Solids	Osmolality (mOsm/kg)	Total Bacteria (CFU/ml)	Bifidobacterium Recovered from Calf Fecals (CFU/ml)
Milk (N=9)	Max=12.8 Min=9.2 Median=11.5	Max=322 Min=222 Median=274	Max=32,400 Min=1 Median=285	Max= 761,400,000 Min=0 Median=34,830,000
Replacer (N=13)	Max=19 Min=7 Median=15.5	Max=534 Min=183 Median=384	Max=1,833,333 Min=18 Median=243	Max=639,900,000 Min=405 Median=7,614,000
Replacer Plus Milk (N=25)	Max=20.2 Min=8 Median=12.4	Max=701 Min=177 Median=290	Max=6,473,333 Min=0 Median=5,800	Max=388,800,000 Min=0 Median=3,645,000