Supplementary Material

**Supplementary Table 1.** General characteristics of the farms

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| **Question** | **Answer** |
| Cows in milk 0-49  50-99  100-299  300-1,000  >1,000  | 394 (Range 14-1,880)8 (22.2%)2 (5.6%)10 (27.8%)14 (38.9%)2 (5.6%) |
| Calving system Seasonal Continuous Bi-seasonal | 11 (30.6%)8 (22.2%)17 (47.2%) |
| Production system Grazing Confined Mixed | 30 (83.3%%)1 (2.8%)5 (13.9%) |
| Annual milk production (kg) <500,000 500,000-1,500,000 >1,500,000 | 10 (27.8%)10 (27.8%)16 (44.4%) |
| Bulk tank SCC average (cells/mL ×103) | 279 (61-1,540) |

**Supplementary Table 2.** Characterization of calves management

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| **Question** | **Answer** |
| Numbers of calves at the visit | 114 (Range 4-700) |
| Type of calf housing (individual pens, group pens, etc.): Individual Collective Mixed | 0 (0%)28 (77.8%)8 (22.2%) |
| What is the source of colostrum? Dam Colostrum bank Mixed | 26 (72.2%)8 (22.2%)2 (5.6%) |
| If you feed calves WM, what treatment do you use? Pasteurization Acidification No treatment | 1 (2.8%)6 (16.7%)29 (80.5%) |
| If you feed calves WM, to which age groups do you feed it? 0-2 weeks 2-4 weeks >4 weeks No age difference | 5 (13.9%)3 (8.3%)2 (5.6%)26 (72.2%) |
| If you feed calves WM, to which groups do you feed it? Males Females All | 8 (22.2%)1 (2.8%)27 (75.0%) |
| What feeding system do you use for calves? Bucket Automatic feeder | 33 (91.7%)3 (8.3%) |
| How often do you clean the feeding equipment?  After each use Once a day Less than once a day | 34 (94.4%)1 (2.8%)1 (2.8%) |
| Are sick calves separated from healthy calves? No Yes | 12 (33.3%)24 (64.7%) |
| Who mainly diagnoses calf diseases?  Veterinarian Calf raiser Manager Other | 9 (25.0%)16 (44.4%)9 (25%)2 (5.6%) |
| Who mainly administers the antimicrobials to calves? Veterinarian Calf raiser Manager Other | 4 (11.1%)20 (55.6%)9 (25.0%)3 (8.3%) |

**Supplementary Table 3.** Management of antimicrobial drugs

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| **Question** | **Answer** |
| Does the farm record antimicrobial purchases? No Yes | 7 (19.4%)29 (80.6%) |
| Does the farm record antimicrobial treatments in calves? No Yes | 7 (19.4%)29 (80.6%) |
| Do you have protocols for antimicrobial use in calves? No Yes | 15 (41.7%)21 (58.3%) |
| What antimicrobials do you use to treat resp infections in calves?\* Tetracyclines Fluoroquinolones Florfenicol Macrolides Penicillin/Streptomycine Betalactam Aminoglycoside | 19 (52.8%)14 (38.9%)8 (22.2%)6 (16.7%)2 (5.6%)1 (2.8%)1 (2.8%) |
| What antimicrobials do you use to treat diarrhea?\* Sulfonamide Fluoroquinolones Tetracyclines Macrolides | 25 (69.4%)14(38.9%)8(22.2%)1(2.8%) |
| What antimicrobials do you use to treat clinical mastitis?\* Cephalosporin Betalactam Tetracycline Aminoglycoside Fluoroquinolone Sulfa Macrolydes Lincosamide | 23 (63.9%)16 (44.4%)7 (19.4%)4 (11.1%)1 (2.8%)2 (5.6%)3 (8.3%)2 (5.6%) |
| What antimicrobials do you use for dry cow therapy?\* Betalactam x aminoglycoside Cephalosporin Betalactam Rifamicin | 14 (38.9%) 10 (27.8%) 10 (27.8%)2 (5.6%) |

\*More than one group of antimicrobials can be used on each farm.