Supplemental Information File S1

Source tracking swine fecal waste in surface water proximal to swine concentrated animal feeding operations

Christopher D. Heaney1,2\*, Kevin Myers3, Steve Wing4, Devon Hall5, Dothula Baron5, Jill R. Stewart3

1Department of Environmental Health Sciences, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland, USA.

2Department of Epidemiology, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland, USA.

3Department of Environmental Sciences and Engineering, University of North Carolina, Chapel Hill, North Carolina, USA.

4Department of Epidemiology, University of North Carolina, Chapel Hill, North Carolina, USA.

5Rural Empowerment Association for Community Help (REACH), Warsaw, North Carolina, USA.

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**Table S1.** Description of primers and probes tested in this study.

|  |  |  |  |
| --- | --- | --- | --- |
| Primer/Probe | Primer and probe sequence (5’→ 3’)a | Target | Reference |
| P23-2f | TCTGCGACACCGGTAGCCATTGGA | *mcrA* gene of methanogens | Ufnar, 2007 |
| P23-2r | ATACACTGGCGACATTCTTGAGGATTAC |  |  |
| Pig-1-Bac32Fm | AACGCTAGCTACAGGCTTAAC | Pig-specific *Bacteriodales* | Mieszkin, 2009 |
| Pig-1-Bac108R | CGGGCTATTCCTGACTATGGG |  |  |
| Pig-1-Bac44P | (FAM)ATCGAAGCTTGCTTTGATAGATGGCG(BHQ-1) | |  |
| Pig-2-Bac41F | GCATGAATTTAGCTTGCTAAATTTGAT | Pig-specific *Bacteriodales* | Mieszkin, 2009 |
| Pig-2-Bac163Rm | ACCTCATACGGTATTAATCCGC |  |  |
| Pig-2-Bac113MGB | (VIC)TCCACGGGATAGCC(NFQ-MGB) |  |  |
| Pig-Bac-2 qBac41F | TACAGGCTTAACACATGCAAGTCG | Pig-specific *Bacteriodales* | Okabe, 2007 |
| Pig-Bac-2 qPS183R | CTCATACGGTATTAATCCGCCTTT |  |  |
| SketaF2 | GGTTTCCGCAGCTGGG | Salmon sperm | Haugland, 2005 |
| SketaR3 | CCGAGCCGTCCTGGTCTA |  |  |
| SketaP2 | (FAM)AGTCGCAGGCGGCCACCGT(TAMRA) |  |  |

*a* FAM, 6-carboxyfluorescein; BHQ-1, black hole quencher 1; NFQ-MGB, nonfluorescent quencher group-minor groove binder.

**Table S2.** Cumulative rainfall 24 hours and 48 hours before surface water sample collection.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | N | Min | Median | Q3 | Mean | Max |
| Individual sample analysisa |  |  |  |  |  |  |
| Cumulative 24 hour antecedent rainfall | 187 | 0 | 0 | 0.02 | 0.073 | 0.92 |
| Cumulative 48 hour antecedent rainfall | 187 | 0 | 0 | 0.26 | 0.248 | 2.94 |
| Pair-wise sample analysisb |  |  |  |  |  |  |
| Cumulative 24 hour antecedent rainfall | 76 | 0 | 0 | 0.02 | 0.081 | 0.92 |
| Cumulative 48 hour antecedent rainfall | 76 | 0 | 0 | 0.26 | 0.257 | 2.94 |
| aDistribtion of rainfall data in analyses involving the 187 individual water samples. | | | | | | | |
| bDistribution of rainfall data in analyses involving the 76 pair-wise water samples. | | | | | | | |

**Table S3.** Relationship between rainfall and fecal indicator bacteria concentrations (log10 CFU/100 ml) in surface water samples at sites proximal to swine concentrated animal feeding operation spray fields in North Carolina.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Fecal coliforms (log10 CFU/100 ml) | | |  | *E. coli* (log10 CFU/100 ml) | | | | |  | *Enterococcus* (log10 CFU/100 ml) | | |
|  | N | Betaa | 95% CI |  | N | Betaa | | 95% CI | |  | N | Betaa | 95% CI |
| All sites |  |  |  |  |  |  | |  | |  |  |  |  |
| Cum. 28 hr. rainfall | 185 | 0.95 | 0.37, 1.54 |  | 185 | 1.22 | | 0.76, 1.68 | |  | 183 | 1.51 | 1.37, 1.66 |
| Cum. 48 hr. rainfall | 185 | 0.29 | 0.09, 0.49 |  | 185 | 0.43 | | 0.27, 0.59 | |  | 183 | 0.5 | 0.31, 0.69 |
| aThe beta coefficient is the increase in fecal indicator bacteria concentration (log10 CFU/100 ml) for every 1 inch increase in | | | | | | | | | | | | | |
| cumulative rainfall in the 24 or 48 hours before sample collection. Coefficients are derived from conditional fixed effects linear | | | | | | | | | | | | | |
| regression models adjusted for season. CI=confidence interval. | | | | | | |  | |  |  |  |  |  |