Updated Information to Consider for SELECT Modeling

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Several Potential Discrepancies Brought to our Attention

- Animal fecal production rates over estimated
- # of OSSFs potentially over estimated
Fecal Production

- Initially estimated using Manure production rates

- Definition of Manure:
  - Feces and urine as excreted from the animal
    - ASAE Standard

- Potentially over estimates bacteria production by counting the weight of urine as part of fecal production

- Definition of Feces:
  - Waste matter discharged from the intestines through the anus; excrement
    - Dictionary.com

- Feces includes dry matter and moisture

- Feces is typically in the range of 70 to 90% moisture; varies widely though
Feces Characteristics

• Highly dependent upon many factors
  ▫ **Species of animal**
  ▫ **Animal age**
  ▫ **Sex of the animal**
  ▫ **Diet**
  ▫ **Digestibility of Diet**
    • High digestibility diets yield less waste
    • Fed cattle produce less waste than grazed cattle
# Fecal Production (Dry Weight)

<table>
<thead>
<tr>
<th>As % of Body Weight (Dry Matter)</th>
<th>Total Solids in Feces (lbs/day) per AU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef Cattle: 0.86 – 1.1</td>
<td>Beef Cattle: 7.56 – 12</td>
</tr>
<tr>
<td>Horse: 0.76</td>
<td>Horse: 7.6 – 15</td>
</tr>
<tr>
<td>Goats: 1.6</td>
<td>Goats: 16</td>
</tr>
<tr>
<td>Sheep: 1.5</td>
<td>Sheep: 10 – 14.5</td>
</tr>
<tr>
<td>Hogs: 0.4</td>
<td>Hogs: 1.85 – 9.7</td>
</tr>
<tr>
<td>Poultry: 2.34</td>
<td>Poultry: 14.1 – 25.2</td>
</tr>
<tr>
<td>Deer: not found</td>
<td>Deer: not found</td>
</tr>
</tbody>
</table>
Fecal Production (Wet Weight)

**Wet Weight Calculations**

- = Total Solids weight/ (1 - % moisture)
- Standardized to AUs (1,000 lbs of animal weight)
- Calculated for low and high moisture % across the Total Solids range

**Daily Feces Wet Weight (lbs/day/AU)**

- Beef Cattle: 25.3 – 120
- Horse: 25.3 – 150
- Goats: 53.3 – 150
- Sheep: 33.3 – 145
- Hogs: 6.16 – 97
- Poultry: 47 – 252
- Deer: not found
### Fecal Production Rates for Use in SELECT Modeling

<table>
<thead>
<tr>
<th>New Recommendations</th>
<th>Old Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef Cattle: 40 lbs/AU/day</td>
<td>Beef Cattle: 82 lbs/AU/day</td>
</tr>
<tr>
<td>Hogs: 10 lbs/AU/day</td>
<td>Hogs: 65 lbs/AU/day</td>
</tr>
<tr>
<td>Horse: 30 lbs/AU/day</td>
<td>Horse: 51 lbs/AU/day</td>
</tr>
<tr>
<td>Deer: keep at 15 lbs/AU/day</td>
<td>Deer: 15 lbs/AU/day</td>
</tr>
<tr>
<td>Poultry: use TSSWCB litter production data</td>
<td></td>
</tr>
</tbody>
</table>
OSSFs Number Estimates

Prior Selected Info

- 911 address data used to estimate number of households in watershed
- Total of 6,638 houses in watershed, of these 6,624 estimated to be on an OSSF (others were in the City of Garrison)

Revised Approach

- Validated 911 addresses with 2010 Census block data and removed houses in Garrison
  - 6,085 structures with potential OSSF
- 9 residences within 100ft of stream
- 322 residences within 100 to 500ft of stream
- 691 residences within 500 to 1000ft of stream
Poultry Litter *E. coli* Content

- Litter is essentially dry by the time of land application
- *E. coli* have yet to be quantified in dry litter
- 100 cfu/g is the limit of detection for *E. coli* in litter
- Microbiologist recommends using 100 cfu/g of litter for modeling purposes
  - Represents a potential ‘worst-case scenario’
Any Questions?

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