The Incidence and Distribution of Campylobacteriosis and its Relationship to the Poultry Industry in Kentucky from 2006 to 2010

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Presentation Outline

- What is Campylobacter?
- Poultry and Campylobacter
- Poultry Industry in Kentucky
- Poultry and Non-Poultry Industry Counties
- Rates of Poultry and Non-Poultry Industry Counties
- Rates of Poultry Counties and all of Kentucky
- ANOVA Output for Poultry and Non-Poultry Industry Counties
- ANOVA Output for Poultry and all of Kentucky
- GIS Zip code map
Campylobacter the Curved Rod

- “Kampylos”
- Gram negative rods causes gastroenteritis
- Enteric and Extraintestinal illness
- C. jejuni
- Fewer than 500 organisms
- Under cooked poultry results in 50% - 70% of all illness.
- Symptoms
- Guillain – Barre syndrome
Campylobacter

- Poultry intestine

- 30% to 100% of poultry infected*

- Horizontal transmission

- Vertical transmission

- Campylobacteriosis is reportable in Kentucky

*American Academy of Pediatrics, 2006
Poultry Industry in Kentucky

7th-2009 Broiler

18th-2009 For all Chickens
Poultry Processing Plants

- Cal-Maine Foods Bremen KY
- Perdue Farms Leitchfield KY
- Perdue Farms Beaver Dam KY
- Tyson Foods Robards KY
- Pilgrim’s Pride Hickory KY
- Cal-Maine Foods Guthrie KY
- Equity Group Franklin KY
- Equity Group Albany KY
- Cobb-Vantress Monticello KY
Poultry counties : 32,429
Non-Poultry counties : 32,467
# Poultry and Non-Poultry Counties Average Rate


<table>
<thead>
<tr>
<th>Year</th>
<th>Poultry County</th>
<th>Non-Poultry County</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 Rate</td>
<td>7.95</td>
<td>3.11</td>
</tr>
<tr>
<td>2007 Rate</td>
<td>8.52</td>
<td>4.64</td>
</tr>
<tr>
<td>2008 Rate</td>
<td>10.38</td>
<td>6.16</td>
</tr>
<tr>
<td>2009 Rate</td>
<td>18.17</td>
<td>11.11</td>
</tr>
<tr>
<td>2010 Rate</td>
<td>13.84</td>
<td>9.50</td>
</tr>
<tr>
<td>Total Year Average Rate</td>
<td>11.77</td>
<td>6.90</td>
</tr>
</tbody>
</table>

**Graph:**
- **Crude Rate Poultry:**
  - 2006: 7.95
  - 2007: 8.52
  - 2008: 10.38
  - 2009: 18.17
  - 2010: 13.84

- **Crude Rate Non-Poultry:**
  - 2006: 3.11
  - 2007: 4.64
  - 2008: 6.16
  - 2009: 11.11
  - 2010: 9.5

<table>
<thead>
<tr>
<th>Year</th>
<th>Poultry County</th>
<th>All Ky</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 Rate</td>
<td>7.95</td>
<td>4.89</td>
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<tr>
<td>2007 Rate</td>
<td>8.52</td>
<td>5.31</td>
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<tr>
<td>2008 Rate</td>
<td>10.38</td>
<td>8.32</td>
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<tr>
<td>2009 Rate</td>
<td>18.17</td>
<td>10.56</td>
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<tr>
<td>2010 Rate</td>
<td>13.84</td>
<td>9.87</td>
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<tr>
<td>Total Year Average</td>
<td>11.77</td>
<td>7.81</td>
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</tbody>
</table>
Crude Rates of Campylobacteriosis Cases per 100,000 and Location of Poultry Processing Plants in Kentucky 2006-2010

Legend
- Poultry Plant Locations

Rate per 100,000
- 0.00 - 19.69
- 19.7 - 42.0
- 42.10 - 79.56
- 79.57 - 131.14
- 131.15 - 256.50
# ANOVA

**Poultry Compared to Non-Poultry Counties 2006-2010**

<table>
<thead>
<tr>
<th>Rate</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1778.838</td>
<td>1</td>
<td>1778.838</td>
<td>11.841</td>
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<tr>
<td>Within groups</td>
<td>44766.634</td>
<td>298</td>
<td>150.224</td>
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<tr>
<td>Total</td>
<td>46545.472</td>
<td>299</td>
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</tbody>
</table>
# ANOVA

**Poultry Counties Compared to All Kentucky Counties 2006 - 2010**

<table>
<thead>
<tr>
<th>Rate</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1768.394</td>
<td>1</td>
<td>1768.394</td>
<td>11.171</td>
<td>.001</td>
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<tr>
<td>Within groups</td>
<td>94663.888</td>
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<td>158.301</td>
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<td>Total</td>
<td>96432.282</td>
<td>599</td>
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</table>
Distribution of Campylobacteriosis Cases by Zip Code and Location of Poultry Processing Plants in Kentucky 2006-2010
Conclusion

- What do we know for certain?
- What can we conclude?
References


Questions

Thank you