Comparison of 1950s to the 2012 High Yielding Broiler

K.E. Collins, B.H. Kiepper, C.W. Ritz, B.L. McLendon, and J.L. Wilson
The University of Georgia
Poultry Science Department

Objective

Gain a new understanding of the history and changes in the birds you process

Changes since the 1950s

• Genetics: High yielding broiler
• ~6 weeks to market age
• 1950s: 12 weeks—double the time!

Unique Tool to see the 1950 meat-type chicken:
The Athens Canadian Random Bred (ACRB) Control Population

The Athens Canadian Random Bred

• Ottawa Meat Control Strain
• Developed in 1955
• White Cornish, Wyandotte
• Single, pea, rose, walnut combs

The Athens Canadian Random Bred

• Southern Regional Poultry Breeding Project started in 1947
• Athens-central testing station
• Southern Regional Poultry Genetics Laboratory in 1955
• Population arrived in Athens in 1958

Today’s ACRB
Parent Stock

Comparison

Methods

• Reared birds
• Processed birds at 6, 8, and 10 weeks

• Weighed everything!
  – Live birds, after bleedout, New York Dress
  – Parts
  – Organs (heart, liver, gizzard, lungs, all other viscera)
ACRB  Cobb 500

Very Different Mentalities

1 Week

2 Weeks

4 Weeks

5 Weeks

9/26/2012
Mortality by Week of Growout

- Total 10 Week Mortality
  - 9.3% Cobb
  - 0% ACRB

- 6 Week Mortality
  - 4.1% Cobb

Processing Details

- Bird electrically stunned (25V DC, 25V AC)
- Neck cut
- Bleed out for 120 seconds
- Carcass scalded at 60°C Hard Scald for 120 seconds
- Defeathered in picker
- Eviscerated by hand-parts weighed
- Static chiller for 3 hours
- Hung for 10 minutes before cutup
Weeks                        | Cobb Always Outweighed ACRB
--|----------------------------------
10                         | **Cobb Live Wt/ACRB Live Wt**
                           | **Week** | **Males** | **Females**
6                          | 4.8 x’s  | 4.7 x’s   |
8                          | 3.9 x’s  | 4.2 x’s   |
10                         | 3.6 x’s  | 3.8 x’s   |

Take Percentage  
(Part Weight/Live Fasted Weight) * 100

Compared within each week/age
Breast Muscle p values <.0001 at all ages

<table>
<thead>
<tr>
<th></th>
<th>ACRB</th>
<th>Cobb</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. Major</td>
<td>9.6%</td>
<td>20.7%</td>
</tr>
<tr>
<td>P. Minor</td>
<td>2.9%</td>
<td>4.3%</td>
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</tbody>
</table>

Cobb had larger leg muscles

<table>
<thead>
<tr>
<th></th>
<th>ACRB</th>
<th>Cobb</th>
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</thead>
<tbody>
<tr>
<td>Thigh</td>
<td>12.0%</td>
<td>13.0%</td>
</tr>
<tr>
<td>Deboned Thigh</td>
<td>9.2%</td>
<td>11.4%</td>
</tr>
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</table>

Consistent ACRB Advantages

<table>
<thead>
<tr>
<th>% of Body Weight</th>
<th>ACRB</th>
<th>Cobb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet</td>
<td>4.3%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Head</td>
<td>4.3%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Preen Gland</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Liver</td>
<td>1.7%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Gizzard</td>
<td>4.3%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Viscera</td>
<td>5.8%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Wings</td>
<td>9.7%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Feathers</td>
<td>8.0%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Water Uptake</td>
<td>3.5%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Fat Pad p values <.0001 at all ages

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<tr>
<td>0.7%</td>
<td>1.6%</td>
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Lung Difference

Differences were highly significant with p values <.0001 at all ages
Blood

No difference in blood until 10 weeks

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<tr>
<td>1.6%</td>
<td>2.3%</td>
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p value 0.0498

Reason for differential mortality

Summary

- Modern High-yielding broilers weigh 3.6-4.8 times as much as broilers of 55+ years ago
- Modern broilers have much more muscle—especially breast meat
- Despite the increase in muscle, supply organs (heart and lungs) are actually smaller

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Katie Collins
Brian Kiepper
Casey Ritz
Beverly McLendon
Jeanna Wilson