Broiler Management

BELIZE Poultry Production School 2014

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Why Broilers?

- Genetic Improvement
- Pedigree Selection
- GGP
- Grandparent Stock
- Parent Stock
- Broilers
- Processing
- Consumers

Aviagen
Broiler Performance Variance

Range in 42 day Live weights

Worst

Best

Std 42 Days A/H 2637 Gms

840 Gms
## LA Comparison

<table>
<thead>
<tr>
<th></th>
<th>Actual LA</th>
<th>Aviagen Std</th>
<th>Actual New Zealand</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kill Weight (Gms)</strong></td>
<td>1600</td>
<td>1600</td>
<td>1600</td>
</tr>
<tr>
<td><strong>FCR</strong></td>
<td>1.86</td>
<td>1.48</td>
<td>1.42</td>
</tr>
<tr>
<td><strong>Kill Age (Days)</strong>*</td>
<td>34.5</td>
<td>29.5</td>
<td>27.5</td>
</tr>
<tr>
<td><strong>ADWG</strong></td>
<td>46.4</td>
<td>54.2</td>
<td>58.2</td>
</tr>
</tbody>
</table>

**50 million broilers per annum**
Approx 2 million dollar saving PA
$575 USD/Tonne Broiler feed
Hygiene
- Cleanout
- Bio security

Nutrition
- Feed specification
- Physical texture
- Water

Environment
- Temperature
- Humidity

Management

Disease control
- Vaccine administration
- Vaccine response
- Coccidiostats
Management Topics

- Chick Start/Brooding
- Brooding Layout
- Light Program & Intensity
- Water & Drinking
- Feed & Feeding
- Temperature/Humidity/Ventilation
- Stocking Density
Brooding/Chick Start

✓ Brooding Phase - first 10 days

✓ Brooding - establish feeding behaviour & drinking behaviour
Brooding - % of flocks’ life

Genetic gains in growth rate means broilers will reach killing age sooner. Brooding period is steadily increasing proportion of the total life of the flock.
36 Day Broiler

Growing Period

46%

Incubation and Brooding

54%

Incubation and Brooding
Brooding/Chick Start
“Get It Right!”

• Good brooding is critical to good performance

• Plan before the chicks arrive and follow the plan

• Brooding management affects uniformity

• Don’t Leave Anything to Luck
Brooding Layout
“Setting the Table”

✓ Even distribution of temperature and humidity
✓ Enough feed space and accessibility – **1 Metre rule**
✓ Enough drinker space and accessibility
✓ Supplementary feeders and drinkers
✓ Proper litter coverage on floor – min 5cm
✓ Light Intensity & Spread
✓ Bird Density
✓ Paper
Brooding Layout – Spot Brooding

- Automatic Feeder
- 6 Bell Drinkers
- 6 Mini Drinkers
- 12 Feed Trays
- 25% - 35% Paper Cover

Dimensions:
- 2m
- 2m
- 5m
7 Day Bodyweights

• Breed Target: Approx 182gms
  – Aim for 4.5 X chick weight
  – 40 Gm chick = 180 Gms at Day 7

• Potential: >210 Gms

• Field: ~125-200 Gms
Factors which influence 7-day bodyweight:

- Parent stock age
- Hatch window
- Chick Temperature – Hatchery (>104.5F/40.5C)
- Delivery times
- Brooding temperature
- Light Intensity
- Access to feed and water
- Disease challenge / vaccination
- Litter temperature
- Feed quality
Early feed consumption and its effect in BW at 7 days

Feed intake (g) at 7 d

BW at 7 d
Higher BW and its effect in CV at 7 days

The name of the game = UNIFORMITY
Day 7 Vs Final Kill Weight Correlation

Weight Gain

7 days + 10 g

42 days + 50-70 g
Day 7 Vs Final Kill Weight Correlation

Effect of 7 Day weight on Average Daily Gain (Pooled Across Breed and Sex)

1g of 7 day weight is worth 6g at 43 days
Management Tip

“Follow the Broiler Manual Specifications for Brooding Layout”

“Develop Standard Operating Procedures SOP’s for Brooding”

Remember – Stew Ritchie talked about a “checklist”
Brooding Setup - Pre-Heating

- Preheat far ahead of chick arrival to warm the floor and the litter as well as the air
- 24 hrs in normal climates
- 48 hrs in cooler times
- 72 hours in cold winters
Basic Light Intensity and Photoperiod Recommendations to optimise Live Performance

<table>
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<tr>
<th>Live Weight at Slaughter</th>
<th>Age (days)</th>
<th>Intensity (lux)</th>
<th>Day Length (hours)</th>
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<td>Less than 2.5 kg</td>
<td>0-7</td>
<td>30-40</td>
<td>23 light 1 dark</td>
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Initial Light intensity

40-60 lux

- Allow chicks to find feed, water and source of heat
### Basic Light Intensity and Photoperiod Recommendations to optimise Live Performance

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</tr>
<tr>
<td></td>
<td>8 - 3 days before slaughter*</td>
<td>5-10</td>
<td>20 light 4 dark**</td>
</tr>
</tbody>
</table>
Dark Barns

✓ > Bird density
✓ < Bird activity
✓ < Energy cost
✓ < FCR
**LIGHT**

Basic Light Intensity and Photoperiod Recommendations to optimise Live Performance

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<td>8 - 3 days before slaughter+</td>
<td>5-10</td>
<td>18 light 6 dark</td>
</tr>
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**NOTES**

+ For at least the last three days before slaughter, 23 hours' light: one hour darkness should be provided.

++ The EU Broiler Welfare Directive requires a total of six hours darkness, with at least one uninterrupted period of darkness of at least four hours.
Water

- Water is considered to be the most important nutrient
- Chicks need immediate source of clean, fresh water at placement
- Plenty of drinker space at an appropriate height
- Supplementary drinkers for the first 4 days

- 1 week old chick = 85% water

- Reduced water availability reduces body weight (~15%) and increases FCR drastically (Lott 2004)
Water availability
Water Flow Rates

- Reduction in flow rate from 75 ml/min to 25 ml/min decreased final Bodyweight by -225 grams and reduced breast meat yield by 14%  
  – Miles et al, 2003
Water consumption over years

- 2007
- 1984
- 1965

Key:
- Patrick and Ferrise (1962)
- Keller up et al. (1965)
- Lynn (1984)
- Ross 2007
Nipple Drinkers

• **Brooding period:**
  – Extra drinkers
  – See drips hanging

• **Sufficient numbers**
  – Recommend maximum 12 bird/nipple

• **Adjust to average bird height**
  – Non-uniform flock, one line lower
  – Drip cups keep litter dry
Keep the cups clean
Open water surfaces rapidly become contaminated with bacteria from the environment.
Water Quality

• Protect against bacterial growth by both:
  – Chlorinating the water (3ppm to 5ppm recommended)
  – Cleaning once a day with chlorinated sponge
  – Change water once every 4 hours for 1st 3 days

• Control of bacterial load in drinking water – improved leg health & fewer factory downgrades

• Susan Watkins – Slats/Staph in water/leg problems
Feed

• Immediate access to good quality feed together with water is essential

• Supplementary feeders (pans or paper) are needed to get started. Refill for 4-5 days until the chicks are able to use the main feeding system

• Make sure that the main feeding system is available from Day 1
When there is feed in the digestive tract:

✓ Residual yolk will be used more quickly
✓ Digestive tract develops faster
✓ Gut immunity develops faster
✓ The supply systems develop faster
e.g. circulatory

Outcome:
✓ Faster growth, increased robustness
✓ Improved breast meat yield (4-10%)
Feed Type – Starter Feed

- Sieved Crumb 2-3mm
  Low dust levels
• Feed Availability
  – Don’t let chicks run out of feed

• Feed Accessibility
  – Make sure plenty of feed or supplemental feeders spread throughout the area
  – Make sure the feed available is accessible!
  – Weak chicks or chicks from young breeder flocks will not travel far for feed or water

The “1 metre rule”
Empty trays
Feed availability
Feed availability
Good Practices
FEEL IF THE CHICKS FEET ARE COLD
Temperature

- **Too Cold**: the chicks will huddle, and so will not start well - ascites

- **Too hot**: chicks will not eat as they should (depressed appetite), they may dehydrate and feathering will be delayed

- Variation from target temperature will decrease uniformity & FCR

- After 21 days - Aim to have temperatures on or slightly below target to develop appetite and stimulate activity
What Happens When Chicks Get Cold?

- Blood Temperature Decreases
- Chicks Get Colder
- Metabolism Increased to Compensate – Energy Use
- Activity Decreased

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>23.9°C</td>
</tr>
<tr>
<td>24°C</td>
</tr>
<tr>
<td>25.2°C</td>
</tr>
<tr>
<td>26°C</td>
</tr>
<tr>
<td>27°C</td>
</tr>
<tr>
<td>28°C</td>
</tr>
<tr>
<td>29°C</td>
</tr>
<tr>
<td>30°C</td>
</tr>
<tr>
<td>31°C</td>
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<tr>
<td>32°C</td>
</tr>
<tr>
<td>33°C</td>
</tr>
<tr>
<td>34°C</td>
</tr>
<tr>
<td>35°C</td>
</tr>
<tr>
<td>36°C</td>
</tr>
<tr>
<td>37.8°C</td>
</tr>
</tbody>
</table>
Too Cold
Correct temperature
Crop fill at 24 hrs after placement
### The First 24 Hours

<table>
<thead>
<tr>
<th>Before Chick Arrival</th>
<th>Chick Arrival</th>
<th>Environmental Targets</th>
<th>Measures of Success</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Graph showing temperature and crop fill" /></td>
<td><img src="image" alt="Image of chick" /></td>
<td><img src="image" alt="Image of chicks" /></td>
<td><img src="image" alt="Image of chick" /></td>
</tr>
</tbody>
</table>

**Before Chick Arrival**
- Provide chicks with biosecure, clean housing.
- Arrange equipment to enable the chicks to access water and feed easily upon arrival.
- Food should be a sieved crumb with no dust.
- Chicks should not have to move more than 1m to find water or feed in the first 24 hours.
- Position supplementary feeders and drinkers near the main feeding and drinking systems.
- Pre-heat the house and stabilise temperature and humidity prior to chick arrival - achieve a floor temperature of 28-30°C.

**Unload and place chicks quickly.**
- Ensure feed and water is available immediately.
- Light intensity should be >20lux to stimulate chick activity.
- Allow chicks to settle for 1-2 hours than check behaviour.

**Chick placement targets:**
- Air temperature of 30°C (at chick height)
- Litter temperature of 26-30°C
- Relative humidity of 60% - 70%
- Use chick behaviour to determine if temperature is correct.
- Ventilation (without draughts) is required to provide fresh air and remove waste gas, access moisture and heat.
- Chicks are susceptible to wind chill effects, therefore the air speed should be less than 0.15 m/s.

**Crop fill**
- When chicks start to feed, they tend to eat a good meal. If chicks are feeding and drinking properly the crop fills with a mixture of feed and water. Gentle handling within the first 24 hours can indicate the chick’s progress.
- Check a sample of birds 2 hours after arrival to ensure all chicks have found feed and water.
- Gently sample the crops of 30-40 chicks from 3 or 4 different places in the house.
- **Chick crop fill assessment:**
  - **Time of crop fill check after placement**
  - **Target crop fill (% of chicks with full crops)**
  - 2 hours: 75%
  - 12 hours: >85%
  - 24 hours: >95%

*May 2009*
## Downtime and Productivity

<table>
<thead>
<tr>
<th>Downtime</th>
<th>Kill age (days)</th>
<th>Mortality (%)</th>
<th>Avg BW (K)</th>
<th>FCR</th>
<th>Production Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 a 5 días</td>
<td>47,72</td>
<td>6,30%</td>
<td>2,664</td>
<td>1,980</td>
<td>2,642</td>
</tr>
<tr>
<td>6 a 10 días</td>
<td>47,22</td>
<td>5,93%</td>
<td>2,684</td>
<td>1,962</td>
<td>2,725</td>
</tr>
<tr>
<td>&gt; 10 días</td>
<td>47,06</td>
<td>5,87%</td>
<td>2,716</td>
<td>1,946</td>
<td>2,791</td>
</tr>
</tbody>
</table>

*Fuente: Francisco X. Berch (Brasil)*
Growing Successful Broilers

Quote

“Successful broiler growing is about what you can’t see rather than what you can see. Controlling the environment (thermal neutral zone) is the key to success. More important than lighting or feed program etc”
Temperature
Humidity
Ventilation
Key Points – FCR Focus

1. Perceived Temperature – what the bird feels
2. Temperature Fluctuations
3. Temperature Control – Actual Examples
4. Ventilation Strategies
5. Summary
Perceived Temperature

What the Bird feels

The temperature on your Controller is **NOT** always the temperature the bird feels.
The temperature the bird feels is a combination of:

- Air Temperature
- Humidity
- Wind-chill

OK – so how do we adjust for Humidity and Wind-chill?
Perceived Temperature

What the Bird feels

Adjusting Temperature for Humidity

Effect of RH% on Air Temperature

40% RH 60% RH 80% RH 100% RH

Perceived Temperature

What the Bird feels

+/- 5%RH change +/- 1 C*

*On a fully feathered bird – greater on a young chick
Perceived Temperature

What the Bird feels

Adjusting Temperature for Wind-chill

+/- 0.5m/s = +/- 1 C

*On a fully feathered bird – greater on a young chick
Managing Temperature Fluctuations

- Temperature Fluctuations cause the bird to constantly re-adjust and regulate its body temperature
- This burns energy and has a negative impact on FCR
- The greater the Fluctuations, the more the bird has to regulate its temperature
- At its extremes – Fluctuations will cause the birds to sit and huddle to keep warm or pant to cool down, limiting growth potential as well
Objective Temperatures vs. Age

Sólo ejemplo: La curva exacta de la temperatura óptima varía dependiendo del alimento, la estirpe y el sexo.
Managing Temperature Fluctuations

FCR Difference between profiles = ? >5pts FCR

Good Control +/- 1°C

Poorer Control +/- 3°C
OK - Let’s add Humidity..........
Temperature Control

And what about Wind-chill............?
And what about Wind-chill..............?
Temperature Control

The Final Perceived Temperature...........

And we thought our Temperature Control was OK?
So – how can we minimise these temperature fluctuations?
Short Minimum Ventilation Cycles

Air Movement = Wind-chill
Short Minimum Ventilation Cycles
Short Minimum Ventilation Cycles
Short Minimum Ventilation Cycles
What happens if I run my fans on longer Cycles?
Long Ventilation Cycles
Long Ventilation Cycles
# Minimum Ventilation

<table>
<thead>
<tr>
<th></th>
<th>Short Cycles</th>
<th>Long Cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Temperatures</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Stable Humidity</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Heating Requirements</td>
<td>Less</td>
<td>More</td>
</tr>
<tr>
<td>Meets min. air requirement</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Gives a good FCR result?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Ventilation Summary

- There is no single “Best” temperature Profile

- Think “Bird Comfort” not “Temperature Profile”

- Spend time in your barns – Learn to “read the birds”. They will tell you what temperature they want

- Comfortable birds do not huddle up or pant – react, react!

- Minimise Temperature and Humidity Fluctuations

- Always re-check your barns 20 minutes after any temperature or ventilation adjustment........

- did you get it right?
The Genetic has changed!

1957
1977
2005
Stocking Density

- 1990 = 5.65 lbs./sq ft (27.6 kgs/m2)
- 2002 = 6.28 lbs./sq ft (30.7 kgs/m2)
- 2010 = 6.95 to 7.77 lbs/sq ft (34 to 38 kgs/m2)

Considerations:
- Climate
- Product demand
- Water availability
- Feed availability
- Litter quality
- House type
- Ventilation capacity
Conclusions

• Better brooding management will improve growth, uniformity and breast yield

• Successful broiler management is achieved by matching environment with bird requirements
Gracias