

## Basic principles of broilers

Broiler management training, DIFS-Live Indonesia

31 May, 1 or 2 June 2016, Rick van Emous



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DIFSLIVE  
INDONESIAN - DUTCH PROGRAM ON  
FOOD SECURITY, POLICY & MARKETING

## Outline of the presentation

- The origin of broilers
- Broilers
- Parameters
- Data collection

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## The origin of broilers



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## Domestic fowl (1)

- Red jungle fowl (*Gallus gallus*)
  - South-east Asia (South and East India, Burma, Malaysia, Thailand)
- Domestication between 6000-8000 years ago:
  - Cockfighting or sacrificial or religious bird
- Romans (500 BC):
  - Agricultural animal
  - Specialized breeds (heavy breeds, dual-purpose, native Roman breed)
  - Rearing, disease control, costing, marketing, etc.

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## Domestication



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## Domestic fowl (2)

- 19<sup>th</sup> century: explosion of poultry breeding:
  - Asiatic: Brahma, Cochin
  - USA: Plymouth Rocks, Wyandottes
- The last 50-60 years:
  - Commercial hybrid
  - Strains and lines rather than breeds
  - Two types: egg laying and meat: selected for efficiency (max. output for min. food intake)

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### Egg laying and meat bird



### Egg laying and meat chicken

- Egg laying:
  - Light hybrids: White Leghorn (1.5 kg mature)
  - Heavy hybrids: Rhode Island Reds (2.0 kg mature)
- Meat:
  - Cornish and White Plymouth Rock

### Different breeds

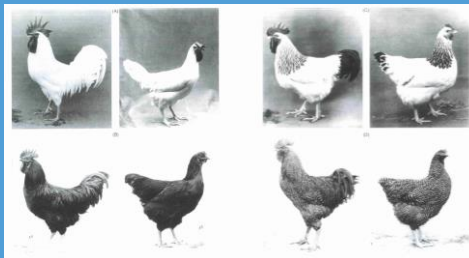


Fig. 1.2 Four important breeds of beef from which most of our modern breeds have been derived are shown. The first three are heavy. The last is a small breed from which broiler strains were selected. (A) White Leghorn; (B) White Game; (C) Black Game; (D) Light Game; (E) Plymouth Rock; (F) and (G) Gamebirds; (H) is a small breed from which broiler strains were selected.

### Breeding companies

- Cobb-Vantress
  - USA
  - Cobb 500, 700
- Aviagen Group
  - USA
  - Ross, Arbor Acres, Indian River
- Hubbard
  - France
  - Hubbard

### Broilers

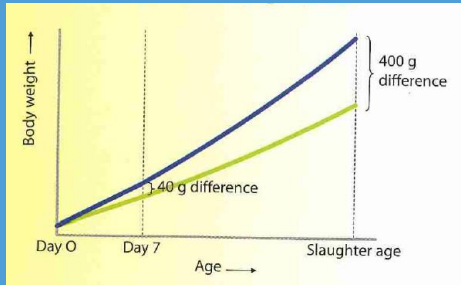


### Characteristics of broilers

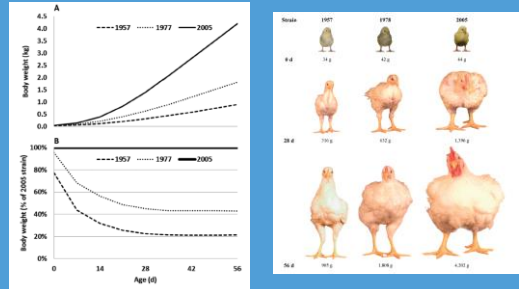
- Broilers grow very fast in a short time:
  - Top athlete!
- It is a delicate process
- Small faults can have huge effects
- Preventing problems is the key
- **Look to the signals of the birds**



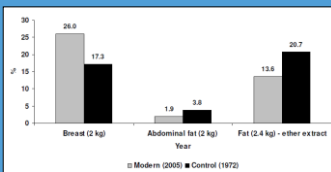
### Small difference at 7 days



### Broilers (development BW)



### Broilers (development body composition)



### Life of broiler (0-14 days)

- Day-old chicks (1<sup>st</sup> week):
  - Give them the best possible care (need warmth)
  - Mistakes 1<sup>st</sup> week affects results at end
- 2<sup>nd</sup> week:
  - Start growing and developing organs, skeleton and muscles



### Life of a broiler (15-30 days)

- 3<sup>rd</sup> week:
  - Gastrointestinal system (GROWTH)
  - Feed intake increased rapidly
  - Vulnerable period (grade)
- 4<sup>th</sup> week:
  - Produces a lot of heat
  - Respiratory problems




### Parameters



### Parameters


- Basic:
  - Water intake
  - Feed intake
  - Mortality
  - Body weight (growth)
- Calculated:
  - Water-feed ratio
  - Feed Conversion Ratio
  - Index



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### Water intake

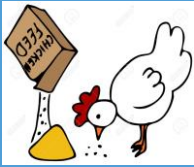
- Healthy chicks drink (somewhat) more water
- Record water intake on a daily basis
- Increased water intake:
  - Higher temperature
  - Increased mineral levels in feed
  - Leaking spots!
- Decreased water intake:
  - Clarity / cleanliness water
  - Taste of the water



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### Feed intake


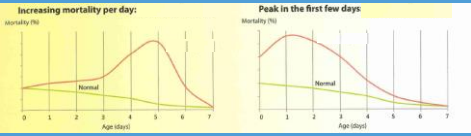
- Healthy chicks eat more feed
- Normally: daily increase
- Decrease (or too low) feed intake:
  - Water intake ?
  - Disorders (diseases)
  - Availability of the feed
  - Quality of the feed



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### Mortality

- Remove dead birds daily (source of disease)
- Count them every day
- Different daily mortality pattern (below):
  - What is the cause?

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Source: Broiler Signals®

### Grade birds at arrival



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### Body weight growth

- A healthy chick gains weight every day
- Weight birds every day (at least 3x / week!)
  - Minimum: 50 / house
  - Same time/day and area of the house
- Causes decreased BW growth:
  - Lower feed (or water) intake
  - Deficits in feed (energy, protein, etc.)
  - Disease: +25% energy requirements

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## Water / feed ratio

- Calculated from feed and water intake
- Normally: older birds, lower W/F ratio
- Increased W/F ratio:
  - Decreased feed intake
  - Intestinal problems
  - Feed or water system?
  - Quality of water and feed?

## Feed Conversion Ratio (FCR)

- Efficiently use of feed for growth
- The lower the more efficient
- Compare:
  - Previous flocks
  - Same type of farms
  - Diets (energy / protein level)
- Higher FCR:
  - Diet composition (lower energy / protein content)
  - Diseases (e.g. intestinal problems)

## Production Index

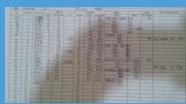
- Comparable figure between farms (bonus system)
- General management (mortality and BWG)
- EPEF (European Poultry Efficiency Factor):
  - $((\text{liveability} * \text{average BWG/bird (kg)}) / \text{FCR}) * 100$
- IP (Index Performance):
  - $(\text{Total Harvest Weight} * 100) / (\text{FCR} * \text{average harvest age})$

## Data collection

The image shows a 'Data Collection Chart Broiler' with a grid structure. The columns are labeled with various parameters such as 'Mortality', 'Body weight', 'Feed / water intake', and 'Remarks'. The rows represent different flocks or time periods. A yellow pencil is positioned vertically on the right side of the chart, pointing to the 'Remarks' column.

## Data collection

- Parameters: note done on a flock chart
- Why?
  - Small problems are often noticed (too) late
  - Behaviour of the flock is not a good indication for example lower water or feed intake
  - Minor changes can result in major problems
  - Earlier interventions

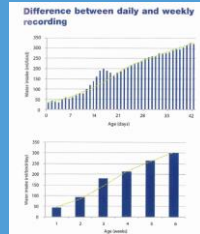


## Data collection chart

- Use a general data collection chart:
  - Mortality
  - Body weight
  - Feed / water intake
  - Remarks (Vit., AB, etc.)
- Compare:
  - Between houses same farm
  - Your farm standards (historical data)
  - With other farms (company)
  - Objectives breeding company

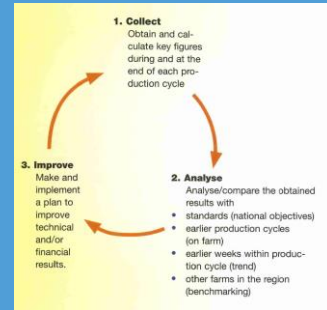
## Frequency

- Daily recording more information than on weekly basis
- Especially short production period = broilers!
- Water and feed intake are critical



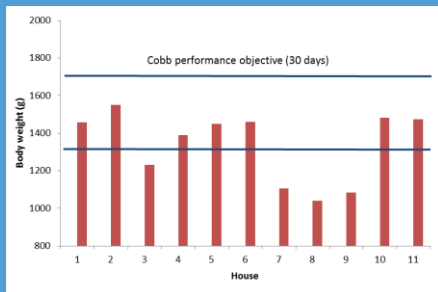
Source: Broiler Signals® 31

## Use the collected data



Source: Broiler Signals® 32

## Example of collected data



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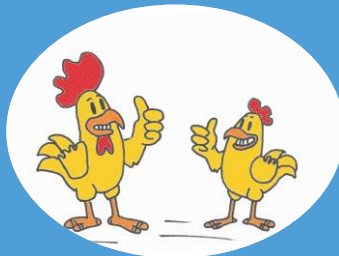
## Key factors: Basic principles of broilers

- An enormous change in characteristics due to breeding and selection
- Feed intake, water intake, mortality and BW are the basic parameters
- (Daily) data collection is necessary !

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## End

Questions ??



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## Working in groups

1. How can you measure (in a easy way) the daily feed / water intake (daily base) in a broiler house?
2. How many times a week can you collect the basic parameters?
3. How can you improve the production performances of broilers under tropical circumstances?

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