



# A Checklist for Investigating Broiler Performance Problems

**Enter**




# Introduction

The Investigating Broiler Performance tool is a user-friendly checklist designed for poultry producers to help remind them of critical production components that should be monitored and checked periodically to ensure optimum flock performance.

This interactive pdf is designed to be simple to use on your mobile device or computer.

## To navigate this document:

- Each item listed in the table of contents is linked to take you directly to that topic within the document.
- On each page of the document are blue buttons. Select the options most appropriate for your situation to see details to investigate as well as recommended actions and records for improving performance.
- The “←” button will take you back to the question you are reviewing. “**Contents**” will return you to the table of contents. The **chicken icon** at the top right of each page will take you back to the table of issues page.
- The table of issues page relates to the main problems that may be experienced during the broiler production process. Clicking the  buttons in the columns will take you directly to the section(s) related to the issue highlighted in the table.

## Key supporting documents & background publications:

- **Aviagen Brief: Optimizing Broiler FCR, July 2011**
- **Aviagen Brief: Low Broiler Kill Weights, April 2008**
- **Relevant sections of the current Aviagen Broiler Manual**

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**Introduction**

**Issues**



# Table of Issues

Performance-related issues experienced in the broiler production process are listed in the left column. Topics that addresses solutions are displayed to the right. Click in the corresponding box to go directly to that section of this checklist.

Issue Presented	1 Feed	2 Chick Start	3 Feeders & Drinkers	4 Ventilation & Temp	5 Lighting	6 Health
ADG Low	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High cumulative mortality				<input type="checkbox"/>		<input type="checkbox"/>
High first week cull levels		<input type="checkbox"/>				
High first week mortality		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
High levels of back scratch damage			<input type="checkbox"/>			
Increased FCR	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased hock burn / breast blister				<input type="checkbox"/>	<input type="checkbox"/>	
Increased levels of bird damage during catching					<input type="checkbox"/>	
Increased water intake	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Low depletion body weights	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low first week weight	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor bird uniformity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Poor feather quality	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		
Poor litter quality	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduced feed intake	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduced water intake			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

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# Section 1

## Feed

- A. Feed Form**
- B. Milling Process**
- C. Diet Specifications**
- D. Raw Materials**

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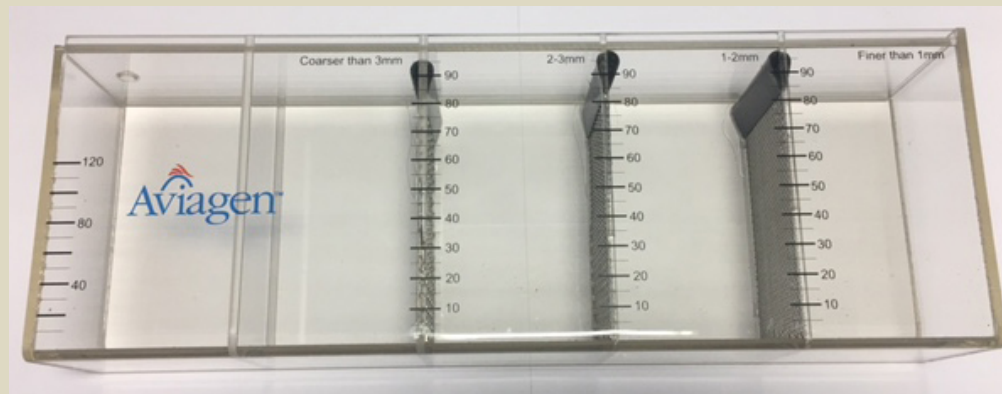
# Section 1: Feed

## A. Feed Form

### 1: Is feed form adequately monitored?

*For more information on the topics, download the pdfs or view the video from these links or from [aviagen.com](http://aviagen.com).*

- ✓ Durability
- ✓ Particle size analysis (sieve test)



Yes

No



# Section 1: Feed

## A. Feed Form

### Recommended Immediate Action:

- Identify gaps in monitoring program and remedy to track performance in this area:

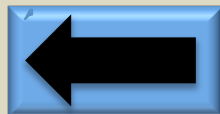
### Recommended Records

#### Feedmill

- ✓ Durability test
- ✓ Particle size analysis (sieve test)

#### Farm

- ✓ Particle size analysis (sieve test)





# Section 1: Feed

## A. Feed Form

2: Is feed form within specification?

Form	Starter	Grower	Finisher
	Crumb	Pellet (3.5 mm)	Pellet (3.5 mm)
> 3 mm	15%	>70%	>70%
> 2 mm	40%	20%	20%
> 1 mm	35%		
< 1 mm	< 10%	< 10%	< 10%

Particles	Coarse Mash
>3 mm	25%
2-3 mm	25%
1-2 mm	25%
<1 mm	25%



Yes

No





# Section 1: Feed

## A. Feed Form

### Details to investigate:

#### Feedmill

- ✓ Pellet press settings (knives)
- ✓ Pellet press temperature
- ✓ Mill crumbler settings
- ✓ Mill sieves
- ✓ Raw material grinding
- ✓ Post press feed conveyance
- ✓ Durability

#### Farm

- ✓ Feed delivery
- ✓ Feed storage
- ✓ Feeding system

A sample of feed from every delivery should be retained on farm for at least 2 consecutive cycles. This is to allow analysis if needed and comparison between feed mill and farm samples.

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# Section 1: Feed

## A. Feed Form

### Recommended Immediate Action:

- Develop an action plan to promptly remedy any issues identified.
- Increase monitoring to ensure remedial action has been effective.



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# Section 1: Feed

## A. Feed Form

**3: If feeding a pellet, has durability or hardness deteriorated?**

Finished feed pellet durability should be tested in the feed mill prior to dispatch, aiming for a Holmen test result of 95% pellets after a 30 second test period or, for the Tumbling Can method, 98% pellets after a 10 minute test period.

**Yes**

**No**



# Section 1: Feed

## A. Feed Form

**You are following best practices.**



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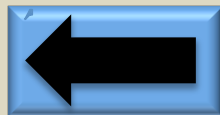


# Section 1: Feed

## A. Feed Form

### Details to investigate:

- ✓ Diet specification
- ✓ Heat treatment / conditioning
- ✓ Steam addition
- ✓ Water addition
- ✓ Oil / fat addition
- ✓ Pellet press settings
- ✓ Raw materials
- ✓ Raw material grinding
- ✓ Post press cooling
- ✓ Feed augurs



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# Section 1: Feed

## B. Milling Process

**4: Are key milling parameters monitored?**

**Yes**

**No**



# Section 1: Feed

## B. Milling Process

### Details to investigate:

#### Raw Materials / Premix

- ✓ Quality analysis (vs Specifications)
- ✓ Quantity stocktakes (vs Theoretical Use)
- ✓ Storage conditions / inspections
- ✓ Stock rotation / expiry dates

#### Grinding / Mixing

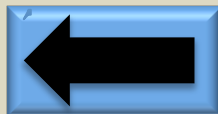
- ✓ Particle size analysis
- ✓ Mixing CV
- ✓ Batching accuracy (weighing / calibration)
- ✓ Cleaning / maintenance

#### Conditioning / Pelleting

- ✓ Conditioning time & temperature
- ✓ Ex-press temperatures
- ✓ Pellet press throughput (tonnes/hr)
- ✓ Die compression / press amps
- ✓ Press downtime log (reasons)
- ✓ Residue / bio-security flushing

#### Cooling / Storage

- ✓ Ex-cooler temperatures
- ✓ Ex-cooler moisture
- ✓ Storage conditions / inspections



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# Section 1: Feed

## B. Milling Process

### Recommended Records:

#### Raw Materials / Premix

- ✓ Quality analysis (vs Specifications)
- ✓ Quantity stocktakes (vs Theoretical use)
- ✓ Stock rotation / expiry dates

#### Grinding / Mixing

- ✓ Particle size analysis
- ✓ Mixing CV
- ✓ Batching accuracy (weighing / calibration)
- ✓ Cleaning / maintenance

#### Conditioning / Pelleting

- ✓ Conditioning temperature
- ✓ Ex-Press temperatures
- ✓ Pellet press throughput (tonnes/hr)
- ✓ Press amps
- ✓ Press downtime log (reasons)
- ✓ Residue / bio-security flushing

#### Cooling / Storage

- ✓ Ex-Cooler temperatures
- ✓ Ex-cooler moisture



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# Section 1: Feed

## C. Diet Specification

### 5: Is finished feed routinely analyzed?

Expected tolerances of analysis:

- ✓ Proteins (CP & AA's) +/- 5%
- ✓ Moisture +/- 10%
- ✓ Other Minerals +/- 10%
- ✓ Fats (FFA & PV) – must have minimum value
- ✓ Contaminants (e.g. toxins, heavy metals etc.) – Maximum value
- ✓ Energy +/- 2%
- ✓ Fiber +/- 10%
- ✓ Vitamins +/- 10%
- ✓ Ca & P +/- 10%

**Yes**

**No**



# Section 1: Feed

## C. Diet Specification

### Recommended Immediate Action:

➤ Identify gaps in testing regime and remedy to track performance in this area:

- ✓ Proteins (CP & AA's)
- ✓ Moisture
- ✓ Minerals
- ✓ Fats (FFA & PV)
- ✓ Contaminants (e.g. toxins, heavy metals etc.)
- ✓ Energy
- ✓ Fiber
- ✓ Vitamins

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# Section 1: Feed

## C. Diet Specification

**6: Is the diet still within specification ?**

**Yes**

**No**



# Section 1: Feed

## C. Diet Specification

### Details to investigate:

- ✓ Raw material stock takes
- ✓ Raw material specification analysis
- ✓ Raw material storage
- ✓ Feedmill batching / weighing
- ✓ Feed heat treatment
- ✓ Diet implementation (at feedmill)
- ✓ Contamination of raw materials:
  - ✓ Mill feed conveyance / storage
  - ✓ Delivery

Has there been a change in coccidiostat - type or supplier?

**Continue**



# Section 1: Feed

## C. Diet Specification

### Recommended Immediate Action:

- Develop an action plan to promptly remedy any issues identified.
- Increase monitoring to ensure remedial action has been effective.





# Section 1: Feed

## C. Diet Specification

### 7: Has the diet formulation changed?

E.g.

- Wheat &/or corn percentage change
- Fishmeal addition
- Protein source change
- Oil type change – Soy to sunflower etc.

**Yes**

**No**



# Section 1: Feed

## C. Diet Specification

**You are following best practices.**



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# Section 1: Feed

## C. Diet Specification

### Details to investigate:

- ✓ Variance to previous diet
- ✓ New raw materials
- ✓ Medication contraindications
- ✓ Adverse reactions to any prescribed medicines



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# Section 1: Feed

## D. Raw Materials

### 8: Are key raw materials routinely analyzed ?

- ✓ Proteins (CP & AA's)
- ✓ Moisture
- ✓ Minerals
- ✓ Toxins
- ✓ Fiber
- ✓ Vitamins
- ✓ Fats (FFA & PV)
- ✓ Ca & P

**Yes**

**No**



# Section 1: Feed

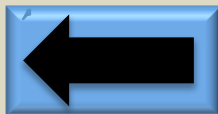
## D. Raw Materials

### Recommended Immediate Action:

- Identify gaps in testing regime and remedy to track performance in this area:

### Recommended Records

- ✓ Proteins (CP & AA's)
- ✓ Fats (FFA & PV)
- ✓ Energy
- ✓ Moisture
- ✓ Vitamins
- ✓ Fiber
- ✓ Minerals
- ✓ Toxins



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# Section 1: Feed

## D. Raw Materials



**9: Are key raw materials within specification?**

**Yes**

**No**



# Section 1: Feed

## D. Raw Materials

**You are following best practices.**



**Chick Start**

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# Section 1: Feed

## D. Raw Materials

### Details to investigate:

- ✓ Contamination
- ✓ Storage
- ✓ Stock rotation
- ✓ Supplier / manufacturer
- ✓ Purchasing
- ✓ Seasonal influences
- ✓ Grain varieties

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# Section 1: Feed

## D. Raw Materials

### Recommended Immediate Action:

- Develop an action plan to promptly remedy any issues identified.
- Increase monitoring to ensure remedial action has been effective.



**Chick Start**

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# Section 2

## Chick Start

- A. Chick Quality**
- B. Delivery**
- C. Brooding**

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# Section 2: Chick Start

## A. Chick Quality

### 1: Are these key elements of chick quality adequately monitored at the hatchery?

*For more information on the topics, download the pdfs from these links or from aviagen.com.*

- ✓ Incubation temperature
  - [How to measure eggshell temperature](#)
- ✓ Incubator humidity
  - [How to measure water loss](#)
- ✓ Incubator turning
  - [How to check incubator turning](#)
- ✓ Hatch window and timing
  - [How to measure chick yield](#)
  - [Poster: Are your incubation times correct?](#)
- ✓ Hatch debris analysis
  - [How to breakout and analyse hatch debris](#)
  - [Investigating Hatchery Practice](#)
- ✓ Chick holding temperature
  - [How to check your chicks are comfortable](#)
- ✓ Chick quality
  - [Page 34](#)
- ✓ Chick weights and uniformity
  - [How to weigh chicks](#)

**Yes**

**No**





# Section 2: Chick Start

## A. Chick Quality

### Recommended Immediate Action:

- Identify gaps in monitoring program and remedy to track performance in this area:

### Recommended Records

- ✓ Chick vent temperature (39.4 – 40.5°C) (103 - 105°F)
- ✓ Chick activity
- ✓ Navel condition
- ✓ Chick weights
- ✓ Chick CV (7 – 9%)



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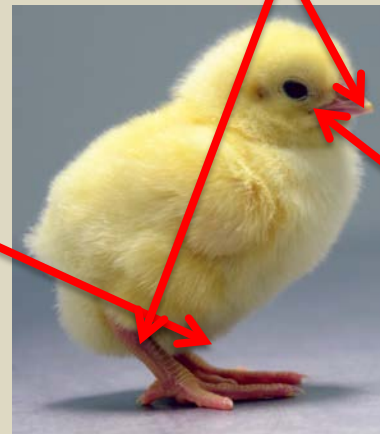
# Section 2: Chick Start

## A. Chick Quality

### 2: Is chick quality within specification?

- ✓ Low DOA
- ✓ Chicks active and quick to respond
- ✓ Navals healed correctly

✓ No red hocks or beaks



- ✓ Well hydrated legs with no dark wrinkled discoloration seen
- ✓ Bright clear eyes
- ✓ No discolored or malodorous yolks or navals

- ✓ Uniform chick plumage (color and distribution)
- ✓ Vent temperature of 103 – 105°F (39.4-40.5°C)

**Yes**

**No**

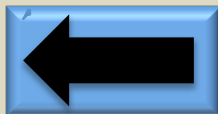


# Section 2: Chick Start

## A. Chick Quality

### Recommended Immediate Action:

- Develop an action plan to promptly remedy any issues identified.
- Increase monitoring to ensure remedial action has been effective.



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# Section 2: Chick Start

## A. Chick Quality

### 3: Other Areas to Consider

**Breeder Farm**

**Hatchery**



# Section 2: Chick Start

## A. Chick Quality

### Breeder Farm

- ✓ Donor flock
- ✓ Donor age
- ✓ Vaccination
- ✓ Maternal antibodies
- ✓ Disease / health status
- ✓ Nutrition
- ✓ Environmental conditions
- ✓ Egg handling
- ✓ Egg storage
- ✓ Egg hygiene
- ✓ Egg transport

Breeder Farm – Can have a significant impact on chick quality depending on management strategies in place.

[Hatchery](#)

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# Section 2: Chick Start

## A. Chick Quality

### Hatchery

- ✓ Egg storage
- ✓ Egg age
- ✓ Egg handling
- ✓ Incubation temperature
- ✓ Incubation humidity
- ✓ Incubation CO<sub>2</sub>
- ✓ Environmental conditions
- ✓ Hatchery hygiene
- ✓ Fumigation
- ✓ Egg hygiene
- ✓ Egg transport
- ✓ Chick hold times / conditions
- ✓ Chick processing equipment
- ✓ Treatments (vaccinations, etc)

Hatchery – Can have a significant impact on chick quality depending on management strategies in place.

[Breeder Farm](#)

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# Section 2: Chick Start

## B. Chick Delivery

### 4: Are chick delivery conditions adequately monitored?

*For more information on the topics, download the pdfs from these links or [www.aviagen.com](http://www.aviagen.com).*

- ✓ Delivery vehicle temperature (multiple locations within vehicle)
- ✓ Delivery vehicle humidity (multiple locations within vehicle)
- ✓ Chick comfort (rectal temps)
  - *How To...Check Your Chicks Are Comfortable*
- ✓ External environmental conditions (temp / humidity)
- ✓ Transit times
- ✓ Delivery vehicle air exchange
- ✓ Delivery vehicle hygiene

**Yes**

**No**



# Section 2: Chick Start

## B. Chick Delivery

### Recommended Immediate Action:

- Identify gaps in monitoring program and remedy to track performance in this area:

### Recommended Records

- ✓ Temperature
- ✓ Humidity
- ✓ Chick comfort
- ✓ External environmental conditions
- ✓ Air exchange
- ✓ Truck hygiene
- ✓ Transit times



**Continue**





# Section 2: Chick Start

## B. Chick Delivery

### 5: Are chick delivery conditions within specification?

- The hatchery and the transport system should ensure that:
  - ✓ The correct vaccines are administered to all chicks in the proper dosage and in the correct form. Only properly trained staff should be employed to do this and the correct equipment must be used.
  - ✓ Chicks are held in a darkened area, in a correctly controlled environment, to allow them to settle before transport.
- Chicks are loaded through controlled-environment loading bays into preconditioned vehicles for transport to the broiler farm.
- Chicks arrive at the farm in a timely manner so that they have access to feed and water as soon as possible after hatch.

Temperature	22 to 28°C (71.6 to 81.4°F) <sup>+</sup>
Humidity	Minimum 50% RH <sup>++</sup>
Air Exchange	0.71 m <sup>3</sup> /min (25 cfm) per 1000 chicks

Summary of optimum conditions for chick holding and transport.

**Yes**

**No**



# Section 2: Chick Start

## B. Chick Delivery

### Recommended Immediate Action:

- Develop an action plan to promptly remedy any issues identified.
- Increase monitoring to ensure remedial action has been effective.



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# Section 2: Chick Start

## B. Chick Delivery

### 6: Other Factors to Consider

- ✓ Delivery time / distance
- ✓ Air flow around chicks
- ✓ Different vehicle
- ✓ Delivery vehicle maintenance
- ✓ Delivery route / road surface
- ✓ Emergency plan/contacts with driver in the truck
- ✓ Different / untrained driver
- ✓ Loading & unloading logistics
- ✓ Supplemental hydration (watermelon / oasis)



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# Section 2: Chick Start

## C. Brooding

### 7: Are key brooding conditions adequately monitored?

*For more information on the topics, download the pdfs from these links or from [aviagen.com](http://aviagen.com).*

➤ *Aviagen Poster: Brooding*

- ✓ Temperature max / min  
(air / bedding / floor)
- ✓ Humidity max / min
- ✓ Lighting
- ✓ Water consumption & sanitation
- ✓ Feed consumption
- ✓ Ventilation / air quality
- ✓ Medication / vaccination records
- ✓ Crop fill
- ✓ Chick CV day old & 7 day
- ✓ Chick spread / behavior
- ✓ Stocking density
- ✓ Mortality to 7 days
- ✓ Bodyweight to 7 days

**Yes**

**No**



# Section 2: Chick Start

## C. Brooding

### Recommended Immediate Action:

- Identify gaps in monitoring program and remedy to track performance in this area:

### Recommended Records

- ✓ Temperature max / min (air / bedding / floor)
- ✓ Humidity max / min
- ✓ Lighting
- ✓ Water consumption & sanitization
- ✓ Feed consumption
- ✓ Ventilation / air quality
- ✓ Medication / vaccination records
- ✓ Crop fill
- ✓ Chick CV uniformity day old & 7 day
- ✓ Chick spread / behavior
- ✓ Stocking density
- ✓ Mortality to 7 day



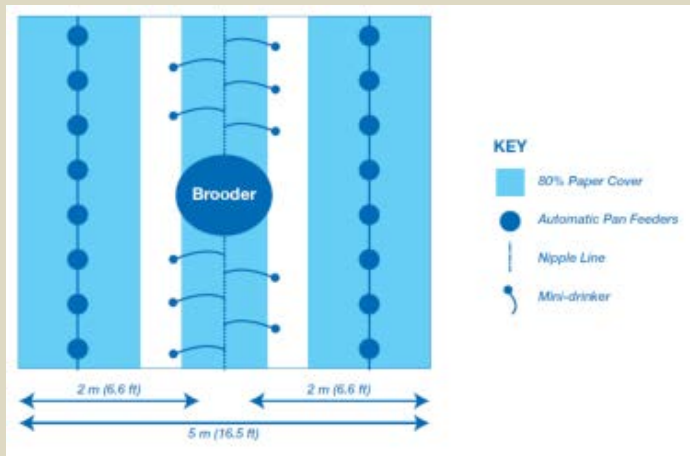
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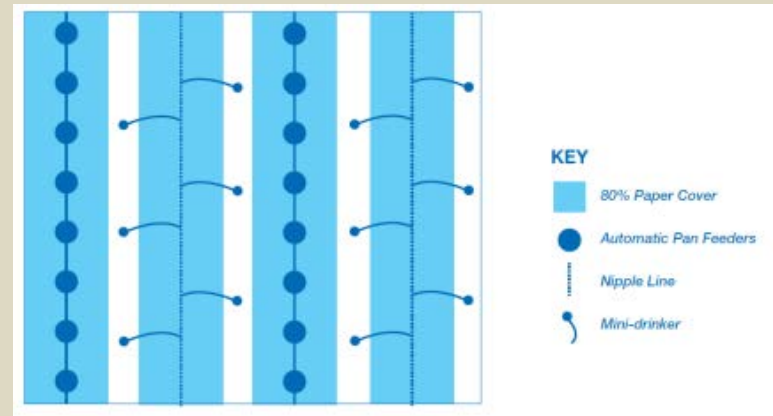
# Section 2: Chick Start

## C. Brooding

### 8: Are key brooding conditions within specification?



Spot Brooding



Whole House Brooding

- Recommended environmental conditions at placement are:
  - ✓ Air temperature: 30°C/86°F (measured at chick height in the area where feed and water are positioned)
  - ✓ Litter temperature: 28-30°C (82.4 – 86.0°F)
  - ✓ RH: 60-70%
  - **Broiler How To ...Temperature and Humidity, Brooding, Crop Fill**

Yes

No



# Section 2: Chick Start

## C. Brooding

### Recommended Immediate Action:

- Develop an action plan to promptly remedy any issues identified.
- Increase monitoring to ensure remedial action has been effective.



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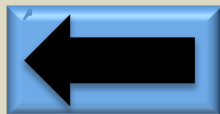


# Section 2: Chick Start

## C. Brooding

### 9: Other Factors to Consider

- ✓ Conduct pre-placement system checks.  
Allow adequate time to remedy any issues prior to placement.
- ✓ Thorough preparation & attention to detail are key attributes for a good start.
- ✓ Consider donor flock age range.  
Brood young donor flock in separate surround.



**Feeders & Drinkers**

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# Section 3

## Feeders & Drinkers

- A. Feeders**
- B. Drinkers**
- C. Water Quality**

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# Section 3: Feeders & Drinkers

## A. Feeders

**1: Which type of feeder system is in use?**

**Mechanical**

**Manual**



# Section 3: Feeders & Drinkers

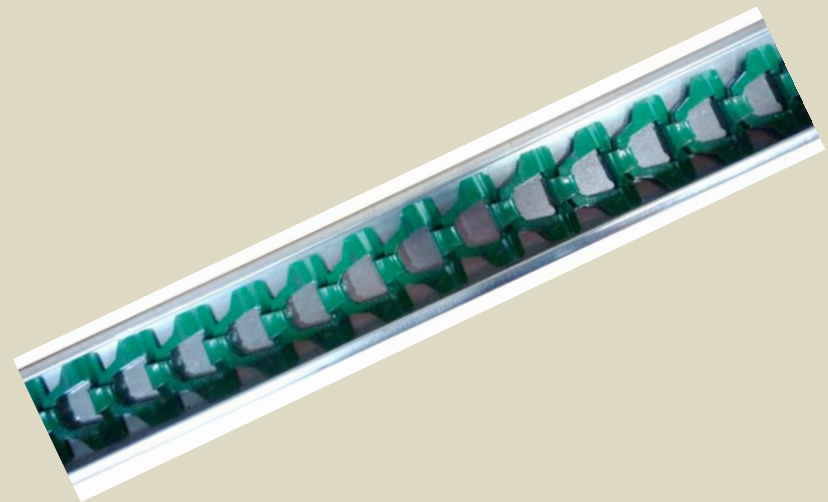
## A. Feeders

### 2: Which type of mechanical feeder?

- Birds per feeder recommendations
  - Pans – (45-80 birds per pan)
  - Chain – (2.5cm / bird)



Pans



Track



# Section 3: Feeders & Drinkers

## A. Feeders

### Details to investigate on pans:

- ✓ Silo to feeder auger speed
- ✓ Feed line auger speed
- ✓ Even feed distribution
- ✓ Feeder height
- ✓ Feeder space per bird
- ✓ Feed level in pan
- ✓ Partial obstruction / blockage
- ✓ Maintenance / mechanical failure
- ✓ Spillage / waste
- ✓ Cleanliness; residual moisture / moldy feed

These two factors also may impact performance.

**Feed Quality**

**Feed Intake**

**Tracks**



# Section 3: Feeders & Drinkers

## A. Feeders

### Details to investigate on track feeders:

- ✓ Silo to feeder auger speed
- ✓ Track speed
- ✓ Even feed distribution
- ✓ Feeder height
- ✓ Feeder space per bird
- ✓ Feed level in track
- ✓ Partial obstruction / blockage
- ✓ Maintenance / mechanical failure
- ✓ Spillage / waste
- ✓ Cleanliness; residual moisture / moldy feed

These two factors also may impact performance.

**Feed Quality**

**Feed Intake**

**Pans**



# Section 3: Feeders & Drinkers

## A. Feeders

### 3: Which type of manual feeder?

- Birds per feeder recommendations
  - Tube – (70 birds / tube for a 38cm diameter feeder)



**Tube Feeders**

**Floor/Tray Feeding**



# Section 3: Feeders & Drinkers

## A. Feeders

### Details to investigate on tube feeders:

- ✓ Feeder height
- ✓ Feeder space per bird
- ✓ Feed level in tube feeder pan
- ✓ Partial obstruction / blockage
- ✓ Spillage / waste
- ✓ Even feed distribution

These two factors also may impact performance.

**Feed Quality**

**Feed Intake**

**Floor/Tray Feeding**



# Section 3: Feeders & Drinkers

## A. Feeders

### Details to investigate on floor/tray feeders:

- ✓ Litter depth (feed loss)
- ✓ Even feed distribution
- ✓ Feeding space per bird
- ✓ Spillage / waste

These two factors also may impact performance.

**Feed Quality**

**Feed Intake**

**Tube Feeders**



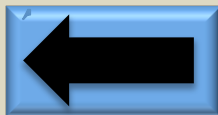


# Section 3: Feeders & Drinkers

## A. Feeders

### 4. Other Factors to Check: Feed Quality

- ✓ Diet formulation  
(*see Diet Spec Section*)
- ✓ Freshness / shelf life
- ✓ Dusty feed “bridging” in feed bins
- ✓ Foreign object contamination
- ✓ Impact of feeder system on feed form
- ✓ Feed form on arrival



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# Section 3: Feeders & Drinkers

## A. Feeders

### 5. Other Factors to Check: Feed Intake

- ✓ Feeding program
- ✓ Maximizing feed intake during hot weather
- ✓ Running out of feed
- ✓ Feeder height
- ✓ Time clock error (lights or feeders)
- ✓ Sufficient feeder space
- ✓ Electrical fault (system start; micro switches etc.)
- ✓ Bird damage / scratching caused by feed outage



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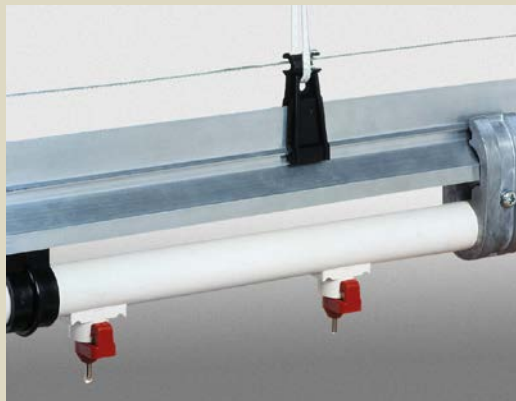
# Section 3: Feeders & Drinkers

## B. Drinkers

### 6: Which drinker type is in use?

- Birds per drinker recommendations:

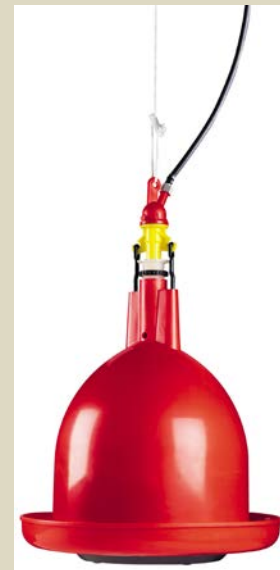
Nipple drinker



Chick drinking angle 35-45°  
From 14 days 75-85°

**Nipple / Cup**

Bell drinker



Lip should be level  
with the back of the  
bird

**Bell / Strip**



# Section 3: Feeders & Drinkers

## B. Drinkers

### Details to Investigate:

- ✓ Drinker height
  - ✓ Cleanliness
  - ✓ Maintenance
  - ✓ Filters
  - ✓ Adequate birds per nipple or cup (9-12 birds per nipple)
  - ✓ Water pressure
  - ✓ Level drinker line
- ✓ Minimum flow rates:

< 7 Days	60ml/min
<14 Days	70ml/min
<21 Days	80ml/min
<28 Days	90ml/min
>28 Days	100ml/min

**This factor also may impact performance.**

**Water Supply System and Network**



# Section 3: Feeders & Drinkers

## B. Drinkers

### Details to investigate:

- ✓ Drinker height
- ✓ Water level
- ✓ Cleanliness
- ✓ Maintenance
- ✓ Filters
- ✓ Water pressure
- ✓ Birds per bell drinker (8 drinkers per 1000 birds)

This factor also may impact performance.

**Water Supply System and Network**



# Section 3: Feeders & Drinkers

## B. Drinkers

### 7: Other factors to consider:

#### Reticulation / Water Supply System

- ✓ Adequate pump capacity
- ✓ Adequate pressure and flow
- ✓ Adequate pipe diameters
- ✓ Flow restrictions (taps, joiners, etc.)
- ✓ Airlocks
- ✓ Pressure loss (pipe length)
- ✓ Filters
- ✓ Water supply – Mains or Bore Hole?
- ✓ Header tanks
  - Adequate daily storage
  - Sediment / cleanliness
  - Adequate head of pressure
- ✓ Adequate flushing/cleaning of entire system
- ✓ Rust or sediment
- ✓ Algae



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# Section 3: Feeders & Drinkers

## C. Water Quality

### 8: Is water quality adequately monitored?

*For more information on the topics, download the pdfs from these links or from [aviagen.com](http://aviagen.com).*

- ✓ Mineral content
- ✓ Microbiological analysis
- ✓ On-farm sanitation performance
  - [Aviagen Brief: Water Quality](#)
  - [AviaTech: Water Line Sanitation, Aug. 2007](#)

**Yes**

**No**



# Section 3: Feeders & Drinkers

## C. Water Quality

### Recommended Immediate Action:

- Identify gaps in testing regime and remedy to track performance in this area:

### Recommended Records

- ✓ Mineral content of water supply
- ✓ Microbiological analysis
- ✓ Effectiveness of farm sanitation



**Continue**

**Contents**





# Section 3: Feeders & Drinkers

## C. Water Quality

### 9: Is water quality within specification?

Criteria	Concentration (ppm)	Comments
Total Dissolved	0-1000	Good
Solids (TDS)	1000-3000	Satisfactory: Wet droppings may result at the upper limit
	3000-5000	Poor: Wet droppings, reduced water intake, poor growth and increased mortality
	>5000	Unsatisfactory
Hardness	<100 Soft	Good: No problems
	>100 Hard	Satisfactory: No problem for poultry but can interfere with effectiveness of soap and many disinfectants and medications administered via water
pH	<6	Poor: Performance problem, corrosion of water system
	6.0-6.4	Poor: Potential problems
	6.5-8.5	Satisfactory: Recommended for poultry
	>8.6	Unsatisfactory
Chloride	250	Satisfactory: Highest desirable level, levels as low as 14 ppm may cause problems if sodium is higher than 50 ppm
	500	Maximum desirable level
	>500	Unsatisfactory: Laxative effect, wet droppings, reduces feed intake, increases water intake
Nitrates	trace	Satisfactory
	>trace	Unsatisfactory: Health hazard (indicates organic material fecal contamination)
Bacterial Coliforms	0 cfu/ml	Ideal: Levels above indicates fecal contaminations
Sodium	50-300	Satisfactory: Generally no problem, however may cause loose droppings if sulphates >50 ppm or if chloride >14 ppm

**Yes**

**No**



# Section 3: Feeders & Drinkers

## C. Water Quality

### Recommended Immediate Action:

- Develop an action plan to promptly remedy any issues identified.
- Increase monitoring to ensure remedial action has been effective.



**Continue**

**Contents**



# Section 3: Feeders & Drinkers

## C. Water Quality

### 10: Other Factors to Consider:

- ✓ Security of supply
- ✓ Source inspection / monitoring
- ✓ Contamination (toxins)
- ✓ Temperature of water at drinker (Ideal 15-21°C or 59 - 70°F)
- ✓ Adequate water consumption (mls/bird)

*Water-to-feed ratio is not a good measure when assessing FCR issues as poor water quality can reduce water intake with a resulting drop in feed consumption (i.e. water-to-feed ratio can stay within an acceptable range despite a problem with water quality / intake).*



**Ventilation**

**Contents**



# Section 4

## Ventilation & Temperature

### A. Environmental Management

[Continue](#)

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# Section 4: Ventilation & Temperature

## A. Environmental Management

### 1: Are key environmental conditions monitored?

- |                                     |                   |
|-------------------------------------|-------------------|
| ✓ Ammonia                           | ✓ Air exchange    |
| ✓ CO                                | ✓ CO <sub>2</sub> |
| ✓ Temperature                       | ✓ Humidity        |
| ✓ Litter condition & moisture level | ✓ Air speed       |
| ✓ Negative pressure                 |                   |

*For more information on the topics, download the pdfs from these links or from [aviagen.com](http://aviagen.com).*

- [Aviagen Poster: Winter Ventilation for Broilers](#)
- [Aviagen: Environmental Management in the Broiler House](#)
- [Aviagen Poster: Minimum Ventilation](#)
- [Aviagen Poster: Transition Ventilation](#)
- [Aviagen Poster: Tunnel Ventilation](#)
- [Ventilation How To's](#)

**Yes**

**No**



# Section 4: Ventilation & Temperature

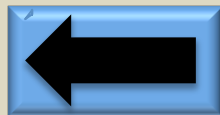
## A. Environmental Management

### Recommended Immediate Action:

- Identify gaps in monitoring program and remedy to track performance in this area:

### Recommended Records

- ✓ Ammonia
- ✓ CO<sub>2</sub>
- ✓ CO
- ✓ Temperature (max / min)
- ✓ Humidity (max / min)
- ✓ Air exchange
- ✓ Litter condition
- ✓ Air speed
- ✓ Negative pressure



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# Section 4: Ventilation & Temperature

## A. Environmental Management

**2: Are key environmental conditions adequately maintained within specification?**

Ammonia	<p>Ideal level &lt;10 ppm.          Can be detected by smell at 20 ppm or above.          &gt;10 ppm will damage lung surface.          &gt;20 ppm will increase susceptibility to respiratory diseases.          &gt;25 ppm may reduce growth rate depending upon temperature and age.</p>
Carbon Dioxide	<p>Ideal level &lt;3,000 ppm.          &gt;3,500 ppm causes ascites. Carbon dioxide is fatal at high levels.</p>
Carbon Monoxide	<p>Ideal level 10 ppm.          &gt;50 ppm affects bird health. Carbon monoxide is fatal at high levels.</p>
Dust	<p>Damage to respiratory tract lining and increased susceptibility to disease. Dust levels within the house should be kept to a minimal.</p>
Humidity	<p>Ideal level 50-60% after brooding.          Effects vary with temperature. At &gt;29°C (84.2°F) and &gt;70% relative humidity, growth will be affected. Relative humidity &lt;50% particularly during brooding will affect growth.</p>

**Yes**

**No**

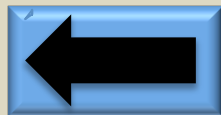


# Section 4: Ventilation & Temperature

## A. Environmental Management

### Recommended Immediate Action:

- Develop an action plan to promptly remedy any issues identified.
- Increase monitoring to ensure remedial action has been effective.



**Continue**

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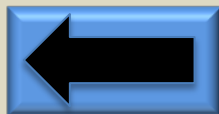


# Section 4: Ventilation & Temperature

## A. Environmental Management

### 3. Other Factors to Consider:

- ✓ Fan run time (set to reduce temperature variation)
- ✓ Cycle time (set to reduce temperature variation)
- ✓ House tightness
  - [Ventilation How To ... Measure House Air Tightness](#)
- ✓ Air flow
  - [Ventilation How To](#)
- ✓ Effective temperature
- ✓ Bird comfort / behavior
- ✓ Equipment fit for purpose / maintenance
- ✓ Correct open sided broiler management
  - [A Guide to Managing Broilers in Open-Sided Housing](#)
- ✓ Light filtration
- ✓ Bird health issues possibly arising from poor ventilation:
  - ✓ Ascities
  - ✓ Pododermatitis
  - ✓ Breast blisters / plant condemnations, etc.



**Lighting**

**Contents**



# Section 5

## Lighting

- A. House Lighting**
- B. Light Program**
- C. Open Sided Houses**
- D. Lights During Catching**

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# Section 5: Lighting

## A. House Lighting

**1: Are house light levels adequately monitored?**

- ✓ Evenness (min / max lux)
- ✓ Average lux (fc)
- ✓ Appropriate for age

**Yes**

**No**



# Section 5: Lighting

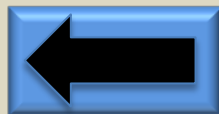
## A. House Lighting

### Recommended Immediate Action:

- Identify gaps in monitoring program and remedy to track performance in this area:

### Recommended Records

- ✓ Average lux (fc)
- ✓ Min / max lux (fc)
- ✓ Correct lux for age



**Continue**

**Contents**



# Section 5: Lighting

## A. House Lighting

### 2: Do house light levels meet specifications?

- ✓ Brooding: Min 30 – 40 Lux (fc)
- ✓ Growout: 5 – 10 Lux (fc)
- ✓ Dark period: < 0.4 Lux (fc)
- ✓ Meet country specific welfare levels

**Yes**

**No**



# Section 5: Lighting

## A. House Lighting

### Recommended Immediate Action:

- Develop an action plan to promptly remedy any issues identified.
- Increase monitoring to ensure remedial action has been effective.



**Continue**

**Contents**



# Section 5: Lighting

## A. House Lighting

### 3: Other Factors to Consider:

- ✓ Bird behavior
- ✓ Outside light levels (seasonal?)
- ✓ Light proofing
- ✓ Lights operational (maintenance)
- ✓ Different light sources
- ✓ Light dimmers
- ✓ Dusty light bulbs
- ✓ Dirty curtains
- ✓ Curtain management
- ✓ Time clocks



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# Section 5: Lighting

## B. Lighting Programs

4: Is a lighting program used?

**Yes**

**No**





# Section 5: Lighting

## B. Lighting Programs

### Kill Wgt < 2.5Kg

0 – 7 Days 23 Light & 1 Dark

8 Days + 20 Light & 4 Dark

-3 days to depletion 23 Light & 1 Dark

### Kill Wgt > 2.5Kg

0 – 7 Days 23 Light & 1 Dark

8 Days + 18 Light & 6 Dark

-3 days to depletion 23 Light & 1 Dark

### Intermittent Program

0 – 7 Days 23 Light & 1 Dark

8 Days + e.g. 3 Light & 3 Dark

*Country-specific welfare regulations should be met.*



**Continue**

**Contents**



# Section 5: Lighting

## B. Lighting Programs

**5: Is the lighting program effective?**

➤ **Lighting for Broilers**

**Yes**

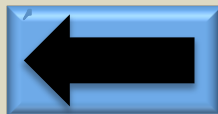
**No**



# Section 5: Lighting

## B. Lighting Programs

You are following best practices.



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# Section 5: Lighting

## B. Lighting Programs

### Details to investigate:

- ✓ Light Infiltration
- ✓ Lights (maintenance)
- ✓ Time clocks functioning correctly
- ✓ Length of dark period
- ✓ Feed availability
- ✓ Water availability



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# Section 5: Lighting

## C. Open Sided Houses

**6: Can light intensity be managed?**

**Yes**

**No**

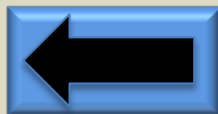


# Section 5: Lighting

## C. Open-Sided Houses

### Details to investigate:

- ✓ Ensure intensity at different ages is correct.
- ✓ Ensure curtain management is optimized.
- ✓ Ensure local legislation is adhered to at all times.



**Continue**

**Contents**



# Section 5: Lighting

## C. Open-Sided Houses

**7: Is light intensity uniform throughout the house?**

**Yes**

**No**



# Section 5: Lighting

## C. Open-Sided Houses

### Details to Investigate:

- ✓ Ensure no dark spots exist.
- ✓ No bright sunlight inside the house.
- ✓ Monitor bird spread within the house.
- ✓ Curtain management



**Continue**

**Contents**





# Section 5: Lighting

## C. Open-Sided Houses

8: Does light intensity change with age?

Yes

No



# Section 5: Lighting

## C. Open-Sided Houses

### Details to Investigate:

- ✓ Ensure intensity at different ages is correct.
- ✓ Check if light program is followed.



**Continue**

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# Section 5: Lighting

## C. Open-Sided Houses

**9: Do changes to curtain height impact on light intensity within the house?**

**Yes**

**No**

**Contents**

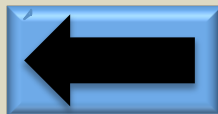


# Section 5: Lighting

## C. Open-Sided Houses

### Detail to Investigate:

- ✓ Explore methods to minimize impact of curtain height changes on house light intensity.



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# Section 5: Lighting

## C. Open-Sided Houses

**You are following best practices.**



**Next Topic**

**Contents**



# Section 5: Lighting

## D. Lights During Catching

**10: Does light intensity change during catching?**

**Yes**

**No**



# Section 5: Lighting

## D. Lights During Catching

### Detail to Investigate:

- ✓ Reduce light intensity during catching.



**Continue**

**Contents**



# Section 5: Lighting

## D. Lights During Catching

**11: Is a different colored light used?**

**Yes**

**No**





# Section 5: Lighting

## D. Lights During Catching

### Detail to Investigate:

- ✓ Blue light used during catch.
- ✓ Day-length increased to 23 hours for 3 days prior to catching?



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# Section 5: Lighting

## D. Lights During Catching

**12: Change in the hours of light pre-catch?**

**Yes**

**No**

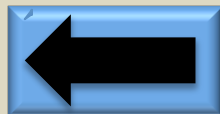


# Section 5: Lighting

## D. Lights During Catching

### Detail to Investigate:

- ✓ Go back to 23 hours light 3 days prior to catching (5-10 lux).



**Continue**

**Contents**



# Section 5: Lighting

## D. Lights During Catching

**13: Catching during day or night?**

**Day**

**Night**

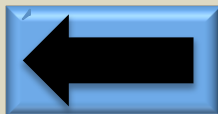


# Section 5: Lighting

## D. Lights During Catching

### Details to Investigate - If Day Catch:

- ✓ Curtains closed
- ✓ End doors shut while catching
- ✓ Start catch during coolest part of the day
- ✓ Use black out filters on fans if possible
- ✓ Ensure catching crews are trained appropriately



**Continue**

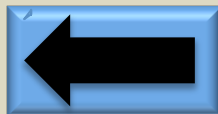
**Contents**



# Section 5: Lighting

## D. Lights During Catching

**You are following best practices.**



**Health**

**Contents**



# Section 6

## Health

- A. Biosecurity**
- B. Disease**
- C. Gut Health**

[Continue](#)

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# Section 6: Health

## A. Biosecurity

### 1: Does the farm have a biosecurity program?

- Hygienic conditions within the poultry house are achieved through the implementation of correct biosecurity, cleaning and vaccination programs.

**Yes**

**No**





# Section 6: Health

## A. Biosecurity

### Recommend Immediate Action:

- ✓ Cleaning and disinfection
- ✓ Pest control program
- ✓ Isolation
- ✓ Traffic control
- ✓ Dead bird disposals



**Continue**

**Contents**



# Section 6: Health

## A. Biosecurity

**2: Is biosecurity being monitored?**

**Yes**

**No**



# Section 6: Health

## A. Biosecurity

### Recommended Records:

- ✓ Cleaning procedures inspections
- ✓ Bacterial swabs
- ✓ Water sanitation
- ✓ Bird health and productive records
- ✓ Pest control records
- ✓ Footbath and disinfectant records
- ✓ Visitor log
- ✓ Biosecurity internal / external audits



**Continue**

**Contents**



# Section 6: Health

## A. Biosecurity

**3: Does the current Biosecurity program prevent or help eradicate current disease outbreaks on the farm?**

**Yes**

**No**



# Section 6: Health

## A. Biosecurity

### Recommend Immediate Action:

- Redefine and re-evaluate the biosecurity program



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# Section 6: Health

## A. Biosecurity

**Program is working. You are following best practices.**



**Next Topic**

**Contents**



# Section 6: Health

## B. Disease

**4: Is mortality high or are some productive parameters being highly affected?**

- ✓ Feed Consumption / FCR
- ✓ Water consumption
- ✓ Average Daily Gain
- ✓ Overall bird behavior

**Yes**

**No**

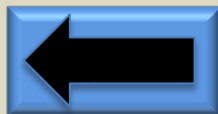


# Section 6: Health

## B. Disease

**If there are problems with FCR, it could be a sub clinical infection.**

- ✓ Discuss with Vet







# Section 6: Health

## B. Disease

**5: Are there any lesions or signs present that can suggest a disease?**

✓ Discuss with Vet

**Yes**

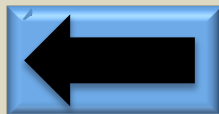
**No**



# Section 6: Health

## B. Disease

If there are problems with FCR, could be a sub clinical infection.





# Section 6: Health

## B. Disease

### 6: Are laboratory tests performed?

✓ Discuss with Vet

➤ [Vet How To's](#)

Yes

No

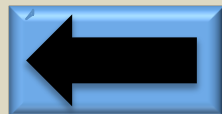


# Section 6: Health

## B. Disease

### Recommend Immediate Action:

- Necropsies and laboratory tests according with Vet diagnoses if available.





# Section 6: Health

## B. Disease

**7: Are results conclusive?**

**Yes**

**No**

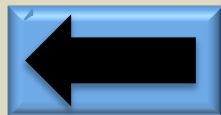


# Section 6: Health

## B. Disease

### Details to Investigate:

- ✓ Repeat Test
- ✓ Increase sample size
- ✓ Use other tests method  
(Serology, Molecular (PCR), VI, HI, etc.)





# Section 6: Health

## B. Disease

**8: Is biosecurity likely to affect the condition?**

**Yes**

**No**

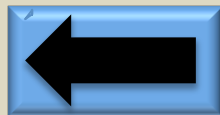


# Section 6: Health

## B. Disease

### Details to Investigate:

- ✓ Source flock
- ✓ Hatchery
- ✓ Equipment
- ✓ People
- ✓ Housing
- ✓ Litter
- ✓ Water
- ✓ Feed
- ✓ Insects
- ✓ Rodents
- ✓ Wild Birds







# Section 6: Health

## B. Disease

**9: Is drug treatment able to affect the condition?**

**Yes**

**No**

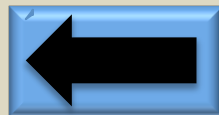


# Section 6: Health

## B. Disease

### Details to Investigate: Drug Areas

- ✓ Drug selection
- ✓ Drug storage
- ✓ Drug dosage
- ✓ Method of application
- ✓ Sensitivity test
- ✓ Post-treatment management





# Section 6: Health

## B. Disease

**10: Is vaccination likely to affect the condition?**

**Yes**

**No**

**Contents**



# Section 6: Health

## B. Disease

### Details to Investigate: Vaccination Areas

- ✓ Vaccine selection
- ✓ Vaccine storage
- ✓ Vaccine application
- ✓ Post-vaccination management



**Continue**

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# Section 6: Health

## C. Gut Health

### 11. Are there abnormal droppings (diarrhea, mucus, bloody) or malabsorption syndrome in the flock?

Wet, Loose Faeces  
with Feed Passage



Wet and Mucoid  
Faeces



Blood in Faeces



Normal  
Caeca

Good  
Faeces



Yes

No



# Section 6: Health

## C. Gut Health

**12. Are there any other lesions, e.g. enteritis, tongue necrosis, ulcers in gut and renal lesions?**

**Yes**

**No**



# Section 6: Health

## C. Gut Health

### Details to Investigate:

- ✓ Ventilation
- ✓ Management and cleanness of water lines
- ✓ Feed contamination
- ✓ Feedstuffs (high viscosity) without use of exogenous enzymes
- ✓ Dysbacteriosis
- ✓ Coccidiosis (investigate with microscope or histopathology)
- ✓ Treatments (drugs)



**Continue**

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# Section 6: Health

## C. Gut Health

### Details to Investigate:

- ✓ Mycotoxins
- ✓ Drugs toxicity
- ✓ Feed cross contamination
- ✓ Feed mixing in feed mills
- ✓ Feedstuffs quality
- ✓ Enteric viruses (Reo virus, Rota virus, Astra virus, etc.)
- ✓ Coccidiosis

**Continue**





# Section 6: Health

## C. Gut Health

**13. Have you taken feed samples?**

**Yes**

**No**

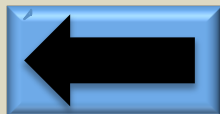


# Section 6: Health

## Gut Health

### Details to Investigate:

- ✓ Sample and look for mycotoxins, other medications / drugs, etc.)



**Continue**

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# Section 6: Health

## Gut Health

**You are following best practices. Further investigation may be required.**

**Continue**



# You have reached the end of the Broiler Performance Check List.

*Every attempt has been made to ensure the accuracy and relevance of the information presented; however, Aviagen accepts no liability for the consequences of using the information for the management of chickens. For further information, please contact your local Technical Service Manager.*

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**Introduction**

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