CONTENTS:

1. Introduction
2. Pre-placement
3. Chick placement
4. Post placement of chicks
5. Growing Phase
6. Ventilation management
7. Water management
8. Nutrition management
9. Biosecurity
10. Bird health
11. Chicken diseases
12. Record keeping
BROILERS PRODUCTION TRAINING PROGRAM

DAY 1
• Housing Design
• Equipment
• Whole house
• Pre-placement
• Chick placement

DAY 2
• Post placement of chicks
• Growing phase
• Ventilation management

DAY 3
• Water management
• Nutrition management
• Biosecurity procedure

DAY 4
• Bird Health
• Record keeping
DAY 1

1. INTRODUCTION

Broiler production is the raising of birds for the purpose of producing meat for food. These chickens are specifically bred for meat production and they have different body frame and nutritional requirements than other breeds i.e layers. Because of their body type, they grow extremely fast and reach butchering weight in as little as six weeks. The first requirement for growing broilers is adequate housing. Because broiler production is essentially a chick-brooding operation, the house should contain equipment so that such factors as temperature, moisture, air quality and light can be controlled easily. It should also provide for efficient installation and operation of brooding, feeding, watering and other equipment.

2. PRE-PLACEMENT

A key successful broiler rearing starts with having a systematic and efficient management program in place. This program must start well before the chicks arrive on site. As part of a management program pre-placement house preparation provides a basis for an efficient and profitable flock of broilers. The following checks need to be made:

**Equipment check:**

After confirming that the equipment capabilities meet the number of chicks to be placed, install the necessary brooding equipment and check that all equipment is functional. Ensure that all water, feed, heat and ventilation systems are properly adjusted.

**Heater checks:**

Verify that all heaters are installed at the recommended height and are operating at maximum output. Heaters should be checked and serviced an adequate time before preheating commences.

**Thermostat check:**

The thermostat should be placed at bird height and in the centre of the brooding area. Temperature ranges should be recorded daily and not deviate by more than 2 degrees Celsius over a 24 hour period.

**Floor temperature check:**

Houses should be preheated so that both the temperature (floor and ambient) and humidity are stabilized 24 hours before placement. To achieve the above target preheating needs to commence at least 48 hours before chick placement.

*Chicks do not have the ability to regulate body temperature for the first five days and thermo regulation is not fully developed until 14 days of age.* The chick is highly dependent upon the manager to provide the correct litter temperature.

If the litter and air temperatures are too cold, internal body temperature will decrease, leading to increased huddling, reduced feed and water intake, stunted growth and susceptibility to diseases.

At placement, floor temperatures should be at least 32 degrees Celsius with forced air heating.

Litter temperature should be recorded before each placement. This will help to evaluate the effectiveness of pre-heating.
Minimum ventilation check:

Minimum ventilation should be activated as soon as the preheating begins to remove waste gases and any excess moisture.

Drinker check:

14-16 drinkers/1000 chicks should be provided within the brooding area. All drinkers should be flushed to remove any residual sanitizer.

Feeder check:

- Remove all water remaining from cleanout prior to filling
- Feed should be provided as a good quality crumble
- Do not place feed or water directly under the heat source as this may reduce feed and water intake.

3. CHICK PLACEMENT

Spacing chicks of similar age and flock source in a single house. Placement per house should ensure an “all in-all out” regime is maintained. Chicks must be carefully placed and evenly distributed near feed and water throughout the brooding area. Lights should be brought to full intensity within the brooding area once all chicks have been placed. Monitor the distribution of the chicks closely during the first few days. This can be used as an indicator for any problems in feeder, drinker, ventilation or heating systems.

Chick quality

Characteristics of a good quality chick:

- Well-dried, long-fluffed down.
- Bright round active eyes.
- Look active and alert.
- Have completely healed navels.
- Legs should be bright and waxy to the touch.
- Chicks should be free from deformities (i.e. crooked legs, twisted necks and cross beaks).

4. POST PLACEMENT OF CHICKS

Ensure that both the feeders and drinkers are in adequate supply relative to the stock density and are appropriately placed. Feeders and drinkers should be placed in close proximity to each other.

Bell Drinker Check:

- Height should be maintained such that the lip is at the level of the birds back.
- Frequent assessment and adjustment is essential.
- Must be cleaned daily to prevent build-up of contaminants.
- Water should be 0.5 cm from the lip of the drinker at a day of age and reduced gradually after seven days to a depth of 1.25cm or thumbnail depth.
- All bell drinkers should be ballasted to reduce spillage.

Feeder check:

- Feed should be provided in crumb form and placed on trays or lids.
- Feeders should be raised incrementally throughout the growing period so that the lip of the trough or pan is level with the birds back at all times.
- The feed level within the feeders should be set so that feed is readily available while spillage is minimized.

Never allow the feeders and the drinking bells to run empty at any time.
DAY 2

5. GROWING PHASE

Broiler producers must place added emphasis on supplying feed that will produce a product to meet their customer’s specifications. Growth management programs optimizing flock uniformity, feed conversion, average daily gain and liveability are likely to produce a broiler that meets these specifications and maximizes profitability. These programs may include modification of lighting and feeding regimes. Every time you enter a poultry house these activities need to be observed:

Temperature Humidity Guide:

<table>
<thead>
<tr>
<th>Age-days</th>
<th>Relative Humidity %</th>
<th>Temperature in degrees Celsius</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>30-50%</td>
<td>32-33</td>
</tr>
<tr>
<td>7</td>
<td>40-60%</td>
<td>29-30</td>
</tr>
<tr>
<td>14</td>
<td>50-60%</td>
<td>27-28</td>
</tr>
<tr>
<td>21</td>
<td>50-60%</td>
<td>24-26</td>
</tr>
<tr>
<td>28</td>
<td>50-65%</td>
<td>21-23</td>
</tr>
<tr>
<td>35</td>
<td>50-70%</td>
<td>19-21</td>
</tr>
</tbody>
</table>

Lighting

Light is a key factor for a good broiler performance and flock welfare. The amount of light and light intensity alters broiler activity. Correct stimulation of activity during the first 5-7 days of age is necessary for optimal feed consumption, digestive and immune system development. Reducing the energy required for activity during the mid-portion of the growing period will improve production efficiency. Uniform distribution of light throughout the house is essential. It is important to provide 24 hours light on the first day of placement to ensure adequate feed and water intake.

Standard Lighting Program:

<table>
<thead>
<tr>
<th>Age-days</th>
<th>Hours dark</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>100-160 grams</td>
<td>12</td>
</tr>
<tr>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>24</td>
<td>9</td>
</tr>
<tr>
<td>29</td>
<td>8</td>
</tr>
<tr>
<td>30</td>
<td>7</td>
</tr>
<tr>
<td>31</td>
<td>6</td>
</tr>
</tbody>
</table>
Lighting program benefits:

- A period of darkness is a natural requirement for all animals
- Energy is conserved during resting, leading to an improvement in feed conversion.
- Mortality is reduced, and skeletal defects are reduced.
- The light/dark period increases melatonin production, which is important in immune system development.
- Bird uniformity is improved

6. VENTILATION MANAGEMENT (MINIMUM VENTILATION)

The minimum amount of ventilation is required to maintain full genetic potential. To do this ensures an adequate supply of oxygen while removing the waste products of growth and combustion from the environment. The requirements of a correctly operated minimum ventilation system include:

- The provision of oxygen to meet the birds' metabolic demand.
- The control of relative humidity
- The maintenance of good litter conditions.
DAY 3

7. WATER MANAGEMENT

Water is an essential nutrient that influences virtually all physiological functions. Water comprises 65-78% of the body composition of a bird depending on age. Factors including temperature, relative humidity, diet composition and rate of body weight gain influence water intake. Good water quality is vital to efficient broiler production.

Drinkers:

- Ensure that water is made available to all chickens at all times.
- Ensure that water is readily accessible to all chickens inside the house.
- Ensure that water does not create an uncomfortable environment.
- All drinkers inside the house must be fully functional.
- Non-functional drinkers must be repaired/replaced promptly.
- Drinkers must be washed 3 times a week.
- When skip a day is operational, they are washed during off-feed day.
- They are also washed before administering a drinking water vaccine.

8. NUTRITION MANAGEMENT

Broiler diets are formulated to provide the energy and nutrients essential for health and efficient broiler production. The basic nutritional components required by the birds are water, amino acids, energy, vitamins and minerals. These components must act in concert to assure correct skeletal growth and muscle deposition.

Selection of the optimum diets should take into consideration these key factors:

- Raw material availability and cost.
- Separate sex growing.
- Live weights required by the market.
- The value of meat and carcass yield.

Phase feeding:

Nutrient requirements generally decline with broiler age. From a classical standpoint, starter, grower and finisher diets are incorporated into the program of broilers. However, bird nutrient needs do not change abruptly on specific days, but rather they change continuously over time.

Feed withdrawal:

During this period, special attention should be directed towards medication and vaccine withdrawal dates to ensure there is no residue retained in the carcass at processing. Record keeping is essential in this determination.

9. BIOSECURITY PROCEDURE

What is biosecurity?

Biosecurity is the protection of biological entities from factors that influence its adaptation, performance or survival. Biosecurity is often understood to be limited to disease control and tends to forget all the other stress factors that adversely affect the animal. Most often it is easier to minimize the environmental and management stresses than to eliminate the risk of disease challenge or exposure.
Showering

Showering is done when entering and leaving the transit change room before and after visiting the site.

How it is done?

- Personal belongings are to be left in the car or at the transit change room
- Enter through the dirty side of the shower after dipping shoes into the footbath at entrance
- Take off all of your personal clothing
- Step into the shower cubicle
- Open shower taps to the required temperature level
- Wet the whole body
- Smear the whole body with the correct soap
- Rub it thoroughly onto the body
- If soap is not available DO NOT START TO SHOWER until soap is made available
- It is absolutely critical that hair is properly washed with shampoo or soap
- Blow out nose during the process of showering
- Brush fingernails with nail brush
- Rinse off the soap from the body
- Dry up the body with a clean towel
- Step onto the clean side of the transit shower and put on transit clothing
- Exit the transit shower through the clean side

Why is it done?

- To minimize the risk of carrying diseases from the departure point, e.g. home, other site, or any other point of departure before coming to the site concerned
- Many pathogens survive in nasal passages, hair, ears etc. for several days
- To kill or isolate disease causing micro-organisms

Consequences if not done or improperly done

- Increasing the probability of transmitting diseases onto a closed site
- Cause economic losses to the company and employees as no incentives/ reduced increase if company does not do well
- Poor performance of birds
DAY 4

10. BIRD HEALTH

Prevention is by far the most economical and best method of disease control. Prevention is best achieved by the implementation of an effective biosecurity program in conjunction with appropriate vaccination. However diseases can overcome these precautions and when they do, it is important to obtain advice from veterinary professionals. Caretakers and service personnel should be trained to recognize problems that may be attributed to disease. These include water and feed consumption patterns, litter condition, excessive mortality, bird activity and behaviour. Prompt action to address the problem is essential.

Vaccination

Water vaccination guidelines:

• Flocks should ingest all vaccine within 1-2 hours of administration
• Ensure that the vaccine is stored at the manufacturer’s recommended temperature
• Vaccinate early in the morning to reduce stress, especially in times of warm weather
• Avoid using water rich in metallic ions
• Ensure rapid uptake of vaccine by depriving the birds of water a maximum of 1 hour before administration of vaccine begins
• Walk through the birds gently to encourage drinking and uniformity of application
• Record vaccine product type, serial number and expiry date

Monitoring water vaccination intake:

• Start to monitor after birds receive vaccine
• Select 100 birds in the house and check how many have dyed tongues, beak or crops.
• Divide the house into four parts and check the staining from 25 birds per house division
• Calculate number of birds on a percentage basis with staining.
• Vaccination is considered successful when 95% of birds showing staining.

Spray vaccination guidelines:

Spray vaccination requires careful management

• Use fresh, cool distilled water
• Turn all the fans off and dim the lights before vaccination to reduce stress on the birds and allow easy movement through the house for the vaccinator
• Leave the fan off for 20 minutes after spraying has finished

It is important to take a good care of the equipment.

11. CHICKEN DISEASES

Poultry are kept all over the world for various reasons. They are one of the cheapest sources of meat and can be kept by anyone, even in backyards. In South Africa poultry is kept by commercial farmers, smaller farmers and by households in backyards for meat and egg production.

Two important factors that should be addressed to ensure that you have a healthy flock of chickens are management and environment. When chickens are healthy they eat less food and produce more meat and eggs. They are less trouble to look after and less money is spent on medical costs.
Spread of diseases

Disease can spread rapidly among chickens because they are kept together in a cage or chicken house. They share the same food and water bowls, which can spread disease and infections from sick to healthy chickens.

Factors contributing to disease

Factors that can contribute to disease include management, environment and the chickens themselves.

Management

• Poor-quality food and water
• Poor hygiene and inadequate cleaning programme
• Leaking water bowls
• Pests
• Overcrowding of chicks
• Chickens of mixed ages reared together
• No security measures to prevent people and animals from entering the chicken house

Environment

• Too hot or too cold conditions
• Wet litter
• Dusty bedding
• High build-up of chicken droppings
• No air circulation
• Sharp wires

Chickens

• Young chickens
• Weak second-grade chickens
• Chickens infected with other diseases
• Poor bird condition as a result of underfeeding
• No vaccination

Action at first sign of diseases

You must act quickly at the first signs of disease. The chickens must be treated, and the managements mistake that may have led to the problem must be corrected to prevent the disease from occurring again.

• Consult your animal health technician or veterinarian to help you find a correct solution to your problem as soon as possible
• Call your animal health technician or veterinarian. They will cull some of the infected chickens from which samples are taken. Blood or egg samples can also be taken depending on the disease. The samples taken are sent to a laboratory for testing and analysis.
• The animal health technician or veterinarian should then assist in assessing the entire system to identify possible problems in management and environment that can be corrected
General treatment

- There are not many forms of treatment or in certain cases no treatment for some diseases, which is why prevention is so important
- The treatment will depend on the cause of the disease
- If it is at all possible, try to separate all sick chickens from the healthy ones daily. The sick chickens should be handled and treated last to prevent the spread of the disease
- Correct management problems

General prevention

Diseases can be prevented through management, environmental and chicken factors.

Management

- Apply correct methods for raising young chicks (temperature, food, water, bedding)
- Disinfect and clean the housing of the different groups of chicks
- Maintain the correct stocking density (avoid over-crowding)
- Use the best-quality food that is available and provide clean water daily
- Use bedding that is not dusty
- Prevent the build-up of gases by cleaning and ventilation
- Pest control measures
- Ensure that no people from outside your farm visit the chicken house
- Have bird-proof houses to keep out wild birds that eat food and bring diseases to your chickens

Environment

- Restrict entry into the poultry house
- Fix leaky water troughs
- Feed and water bowls should be cleaned daily and fresh food and water should be supplied daily or at every feeding time
- Houses should be warm in winter and cool in summer and well ventilated
- Dust causes irritation of the respiratory tract, and the environment must therefore not be dusty
- Use cages for laying hens that do not have sharp edges that can injure the hens. Make sure that there is sufficient space per hen

Chickens

- Get only first-grade chicks from a good, reliable supplier
- Vaccinate chicks against diseases
- Keep chickens of the same age together in one house

DISEASES

Diarrhoea

Symptoms

- Diarrhoea (also known as scours or dirty vent). The stool or droppings of the chickens are not firm but very loose, watery, not of the normal colour and may contain blood.
- Depression
- Reluctance to eat, drink and move about
- Poor growth
Post mortem diarrhoea signs

• Poor condition
• The intestines may be red and swollen and the contents watery
• There may also be a yellow butter-like substance around the heart, liver and intestines

Causes

There are many different types of organisms that can cause diarrhoea, which include:

• Bacteria (Salmonella, E. coli, Pasteurella)
• Viruses (Newcastle disease, gumboro disease)
• Parasites (coccidiosis, worms)
• Fungi (Candida, Aspergillus)

Treatment

• Use an antibiotic or coccidiostatic drug in the water that was recommended by the animal health technician or veterinarian in the water for 3 to 5 days.
• Stress preparations that contain electrolytes, vitamins and minerals can be added to the water.

Respiratory diseases (infectious Bronchitis)

Symptoms

• The sinuses of the chicken (the area between the eye and the beak) are swollen. These may be swollen in such a way that the eyes are closed.
• Tears and wetness often occur around the eyes and nostrils. The discharge from the nostrils may look like clear water in the early stages but can become cloudy and yellow when secondary bacterial infections cause complications.
• Sneezing
• Coughing
• Difficulty in breathing. They breathe with an open beak and you can hear a snoring or clicking sound
• Loss of appetite
• Weakness
• Weight loss

Post mortem Respiratory infection signs

• A very red windpipe and throat
• Fluid in the windpipe

Causes

There are many different types of organisms that can cause disease in the upper respiratory tract. These include:

• Mycoplasma
• Bacteria (E. coli, Pasteurella, Haemophilus)
• Viruses (Newcastle disease, influenza, infectious bronchitis, infectious laryngotracheitis)
• Parasites (mites and worms)
• Fungi (Aspergillus)
Treatment

• Use an antibiotic drug that was recommended by your animal health technician or veterinarian in the water for 3 to 5 days
• Stress preparations that contain electrolytes, vitamins and minerals can be added to the water

Nervous/Nerve system disease (Botulism)

Symptoms

• Signs may vary, but usually chickens lie down because they cannot stand up
• They also walk with a limp or are reluctant to move
• Nervous signs may include staring into the sky, not knowing where they are, pulling the head and neck over their backs, paralysis
• Sores on the breast muscles from lying down

Causes

There are many different types of organisms that can cause nervous signs and lameness. These include:

• Bacteria (Salmonella, Botulism)
• Viruses (Newcastle disease, Mareks disease, avian encephalo-myelitis)
• Fungi (Aspergillus)

Treatment

• A complete hygiene and disinfection programme should be planned together with the animal health technician or veterinarian
• Antibiotics will only be effective against bacteria and can be used as recommended. If it is a viral disease, such as Newcastle disease, urgent steps have to be taken to prevent possible spread because it causes serious production losses

Causes

There are many different types of organisms that can cause a drop in egg production or quality. These include:

• Bacteria (E. coli, Salmonella)
• Mycoplasma
• Viruses (Newcastle disease, influenza, infectious bronchitis, infectious laryngotracheitis, avian encephalomyeli-tis, egg drop syndrome)
• Parasites

Treatment

• Your animal health technician or veterinarian may recommend a short course of antibiotics but usually it may only help for bacterial infections
• Adding vitamins and minerals to the water or feed may help
Newcastle disease

- Newcastle disease is probably the most important disease for poultry farmers around the world. This is a production disease that causes a large number of deaths in chickens and huge losses to farmers and the industry.
- Because there is no treatment and the disease spreads so quickly, sick chickens should be slaughtered immediately.
- This disease is caused by a virus.

Symptoms

A large number of chickens will die suddenly without any of the following apparent causes:

- Depression
- Nervous signs
- Sneezing, swollen eyes, difficulty in breathing
- Diarrhoea
- Death

Treatment

- There is NO treatment for the disease and all the chickens may die within a few days. Very few chickens survive.
- It is best to prevent the diseases by good management and a vaccination programme.
- Your animal health technician or veterinarian will give you the best advice in a Newcastle disease outbreak, especially as this is a controlled disease.

Prevention

- You should vaccinate all the chickens against this disease by using a good vaccination programme before any signs appear.
- It is a very contagious disease, which means it spreads easily to other farms. You should not visit your neighbours without washing and putting on new clothes and shoes. You should also recommend that your neighbours vaccinate their chickens as soon as possible.
- You should clean the chicken house thoroughly with soap and water. All equipment must be washed. Everything should then be disinfected. You should also wash and disinfect your clothes and shoes. All chicken litter or dead chickens should be burned to prevent the spread of the disease.

12. RECORD KEEPING

Accurate record keeping is essential to monitor the performance and profitability of a flock, and to enable forecasting, programming and cash flow projections to be made. It also serves to provide an early warning of potential problems. The daily records should be on display for each chicken house.

Daily record includes:

- Mortality and culls by house and sex
- Daily feed consumption
- Daily water consumption
- Water to feed ratio
- Water treatments
- Minimum and maximum daily temperatures
- Minimum and maximum daily humidity
- Number of birds taken for processing
- Management changes
**Flock Records:**

- Feed deliveries (Supplier/amount/type/date of consumption)
- Feed sample from each delivery
- Live weight (daily/ weekly/ daily gain)
- Medication (type/batch/amount/date of administration/date of withdrawal)
- Vaccination (type/batch/amount/date of administration)
- Lighting program
- Litter (type/ date of delivery/ amount delivered/ visual inspection)
- Chick delivery (number/date/time/count in boxes/truck temperature and humidity)
- Stock density
- Chick source (hatchery/ breed/ donor breeder code/chick weight)
- Date and time of feed withdrawn
- Date and time catching started and finished
- Cleanout (visual inspection)
- Post-mortem results
- Repairs and maintenance
- Generator tests weekly
- Alarm tests weekly

**Poultry Suppliers:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Address</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Chicks</td>
<td>Day old chicks</td>
<td>P.O Box 105, Camperdown, 3730</td>
<td>031 785 9100</td>
</tr>
<tr>
<td>Epol</td>
<td>Feed</td>
<td>194 Orhtmann Road, Willowton, 3200</td>
<td>033 387 2460</td>
</tr>
<tr>
<td>Shavings Supply Company</td>
<td>Shavings/Bedding</td>
<td>P.O Box 35041, Northway, 4065</td>
<td>031 303 3771</td>
</tr>
<tr>
<td>Poltek</td>
<td>Poultry Equipment</td>
<td>557 Log Road, Roodekop, Germiston</td>
<td>011 866 1240</td>
</tr>
<tr>
<td>Dicla Farm</td>
<td>Poultry Equipment and feed</td>
<td>N14 Highway, Pinehaven</td>
<td>011 662 2846</td>
</tr>
</tbody>
</table>
| F and J                     | Shavings, Day old chicks, Feed, Vaccines and equipment | Plot 50, Eljeesee, Tarlton, Krugersdop (R24) | Tel: 011 952 8074  
                                |                                          |                                              | Cell: 076 548 5004  
                                |                                          |                                              | Fax: 086 273 5025  
                                |                                          |                                              | email: info@fandjpoultry.co.za |
| MSD Animal Health           | Veterinary Services                      | 20 Spartan Road, Spartan Ext 20, Kempton Park, 1619 | 011 923 9300  |
| JF Equipment Machinery CC   | Poultry processing equipment             | 5 Mandini Park, Clough Street, Pietermaritzburg, South Africa | Tel: 033 345 3819  
                                |                                          |                                              | Fax: 033 345 3817  
                                |                                          |                                              | Cell: 082 854 10149  
                                |                                          |                                              | Ron Farragher       |