Nutramix
the-BIG-feed.com

Broiler Management Guide

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@FarmNutramix

SALES MANAGER
Winston Thomas
876-382-8886
Winston.thomas@mycbgroup.com

LIVESTOCK SUPPORT MANAGER
Dr. Gabrielle Young
876-279-9576
Gabrielle.young@mycbgroup.com

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Content

BROILER MANAGEMENT GUIDE

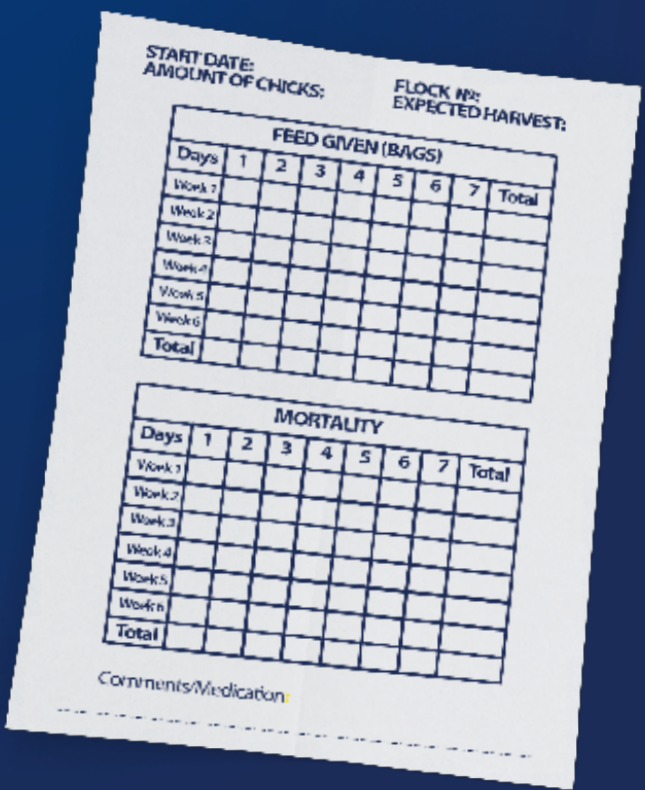
Newport Mills Ltd. manufactures and sells the NUTRAMIX brand of feed. We sell broiler ration in crumble and pelleted forms for the Jamaican farmers. In addition, we sell and distribute day-old broiler birds. The breed of bird is selected to be suited to the varied and challenging tropical conditions in the Caribbean. This guide provides tips to the proper rearing of broiler birds under the conditions encountered in the Caribbean.

Before making any decisions to grow broilers for meat, farmers should investigate their local market to determine the demand for the meat within that area. Every effort should be made to secure a market and agreed price before commencing production. You should consider schools, supermarkets, meat shops and local restaurants. Oftentimes farmers enter into the business of growing broilers as a mean of supplemental income without doing their research into the local situation. This can result in farmers not being able to sell their finished products. It is very important to always grow the amount that your market demands.

RECORD KEEPING

Record keeping assists in determining the effects of changes in nutrition, management, environment, and health status. Accurate production records are essential for effective broiler management. The records should list daily feed intake, daily water consumption, weekly weight sampling, mortality, medication usage and unusual flock symptoms. A sudden change in feed or water intake can often indicate some form of stress factor, disease or other management issues. Your records will provide a history so that problems can be quickly and easily detected.
The more accurate records the farmer can keep, the better you will be able to monitor the performance of each flock.

Example:
SIMPLE BROILER RECORD SHEET


START DATE:
AMOUNT OF CHICKS:
FLOCK N°:
EXPECTED HARVEST:

FEED GIVEN (BAGS)

Days	1	2	3	4	5	6	7	Total
Week 1								
Week 2								
Week 3								
Week 4								
Week 5								
Week 6								
Total								

MORTALITY

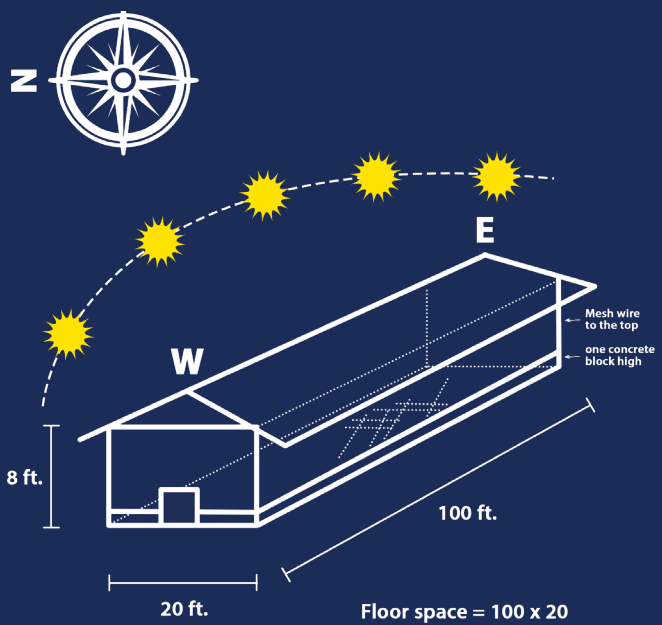
Days	1	2	3	4	5	6	7	Total
Week 1								
Week 2								
Week 3								
Week 4								
Week 5								
Week 6								
Total								

Comments/Medication:

HOUSE DESIGN AND REQUIREMENTS

When planning the construction of a broiler house, select a well-drained site that has good natural air movement. Orient the long axis of the house in an East – West direction to reduce the effect of direct sunlight on the sidewalls during the hottest part of the day (see sketch below). The main objective is to reduce the temperature fluctuation during any 24 hour period. Good temperature control enhances feed conversion and growth rate. Broiler houses should be located away from residential areas, due to the smells and gases that can be emitted from the building.

There is direct correlation between the size of the house and the quantity of birds to be grown. For a naturally ventilated house, the farmer should allow one square foot (1 sq. ft.) per bird. Over-stocking can lead to leg problems, scratching, bruising and mortality.



Floor space = 100 x 20
= 2000 sq. ft.

1 sq. ft per bird= 2000 birds

During the hot summer months, farmers can increase the space per bird to 1.5 sq. ft. to decrease mortality from heat stress. To calculate the amount of birds suitable for a house, multiply the length of the chicken house by its width as in the example (100 ft. X 20 ft. = 2000 sq. ft.). This means that a maximum of 2000 birds can fit in this house. Options for flooring include a concrete floor and compacted marl or dirt. Only concrete floors can be properly cleaned and disinfected. The surrounding base should be approximately 12´´ high (one concrete block high) and wire mesh (4 X 1´´) should be installed from the base to the roof. The roof must be at least eight feet (8 ft.) high on the sides to allow for a cooling effect. There are several roof designs that can be implemented. Newport Mills Limited recommends an A-shaped roof with centre ventilation or a sloping roof as these designs will allow the escape of hot air from the house. The roof can be painted white externally or insulated on the inside to further reduce heat exposure.

LITTER MATERIALS AND MANAGEMENT

Litter management is fundamental to birds' health, performance and final carcass quality.

Good litter absorbs moisture, contains no dust, minimises manure contact and provides insulation from cold floor temperatures. Although sawdust is recommended, avoid sawdust or wood shavings from "bitterwood" or from old furniture or preserved wood as the residual chemicals from the wood can be poisonous to both birds and human beings.

Types of Litter Material

- Hardwood Shavings - may contain tannins which cause toxicity, or splinters that may cause damage
- Sawdust or wood shavings – high moisture absorbing properties
- Shredded paper - difficult to manage when wet, may have a slight tendency to cake, paper does not work well
- Rice Hulls - an inexpensive option in some areas, sometimes causes foot-pad problems
- Peanut Hulls – if available, tend to cake and crust but are manageable
- Sand – not absorbent hard to manage and difficult to heat for brooding purposes
- Bagasse – can cause problems with mould.

Day old chicks are not able to control their body temperature before 2 weeks of age and are sensitive to chilling. For young chicks, maintaining a good temperature in the air is not enough; the floor needs to be warm also as the birds are in constant contact with the floor and lose heat through this surface. A thick layer of dry litter (at least 2-3”- inches deep) makes a good insulating covering.

LITTER QUALITY

A practical way to evaluate litter moisture is to pick up a handful and gently squeeze it. The litter should slightly adhere to the hand and break down when dropped to the floor. Moist, wet litter stays compacted even when dropped. If litter is too dry it will not adhere to hands when squeezed. Increased incidence of breast blisters, skin burns, condemnations and downgrades will result with high litter moisture. Litter with high moisture content will also contribute to elevated ammonia levels. Stir the litter with hands or feet to check the consistency of the litter during daily inspections of the broiler house. Remove and replace any wet litter and cakes on a daily basis.

Causes of Wet Litter

- Drinking water systems that are poorly maintained and leaking.
- Poor choice of litter material and/or inadequate amounts of litter.
- Inadequate ventilation or heating – cold air settling too quickly or damp air not removed fast enough.
- Differences in light intensity – areas with high light intensity, birds are more active in these areas causing litter to be more compacted.
- Too much mineral or salt in feed or water cause birds to drink more, which will eventually makes litter wetter.
- Health problems can lead to loose droppings and wet litter.

HOUSE PREPARATION BEFORE PLACEMENT

Before placing a new flock of birds, the house must be cleaned and then disinfected. This is also a good time to carry out any repairs and maintenance. Cleaning begins with the removal of all organic matter from the previous flock (manure, dust and all equipment). Certain pathogens such as coccidia eggs can survive for long periods in the house even without the birds and so proper cleaning and disinfection is necessary to minimise or eliminate this problem. Cleaning should be done as soon as possible after the old flock is removed. The dry cleaning should include the walls, rafters, ceiling, feed bins and all other feed equipment, fans vents and watering system. After dry cleaning, all surfaces should be cleaned with soap and water followed by a disinfection agent approved for use in poultry houses. Chloride compounds such as bleach are very good at killing bacteria, viruses, mould, fungal spores and coccidia. A mixture of 1 teaspoon of 6% bleach can be used in 1 gallon of water to clean surfaces and left to dry.

Clean curtains / tarpaulins used on the house and properly disinfected them. Footbaths should be cleaned and replenish with fresh disinfectant daily. We recommend a down time of at least 2 weeks between flocks. This allows for pathogens to die off naturally.

Don’t forget to clean the environment around the house and remove any garbage or waste manure. Cut down plants and grass. Dangerous pathogens can often be found in manure and dust in these areas.

CONTROLLING VERMIN

The control of vermin is also a vital part of biosecurity. Use the down time to eliminate these vermin. Do this by making the broiler house inaccessible or less attractive to vermin, look out for traces of droppings, footprints and use pesticides to stop them from multiplying (prevention – monitoring – eradication).

Rodents – spread disease, damage infrastructure and loss of feed
Prevention – clean up waste or feed stuff on farm, close doors and holes in broiler house
Control – rat baits in areas where rodents are likely to enter broiler house

Darkling beetles – spread pathogens and damages insulation
Prevention – remove waste manure from around the farm
Control – use insecticide during down time

Flies – spread pathogens
Prevention – General sanitation. Fly screens can be effective but reduce ventilation, removing waste and manure from the farm

Control – long acting insecticides at point of contact or an insect killer lamps / fly traps.

Baby Chick Quality Checklist

Collect your chicks early at the farm store, and travel during the cooler parts of the days. Make the chicks the last item to purchase, and make no stops on the way home. Ensure ventilation while being transported. It is important to check and count the chickens before leaving the farm stores to ensure quality and the correct amount is present. The table below will help in choosing the right quality birds.

Table: Showing difference between good and bad quality baby birds

CHECKLIST	GOOD SIGNS	POOR SIGNS
Chick reflex	Lay chick on its back. It should stand up within 3 seconds	Chick takes more than 3 seconds to stand up. Chick lacking energy
Eyes	Clean, open and shiny	Closed and dull
Navel	Navel should be closed and clean	Bumpy with remnants of yolk, open navel, feathers smeared with albumen
Feet	Should be normal colour, shiny and warmer than your cheek	Red hocks, swollen hocks, malformations, deformed toes, cold
Beak	Clean with closed nostrils	Red spots on beak, dirty nostrils, malformations
Yolk sac	Stomach soft and malleable	Stomach hard, skin tense
Chick uniformity	All chicks are the same size	More than 20% of chicks are heavier or lighter than average

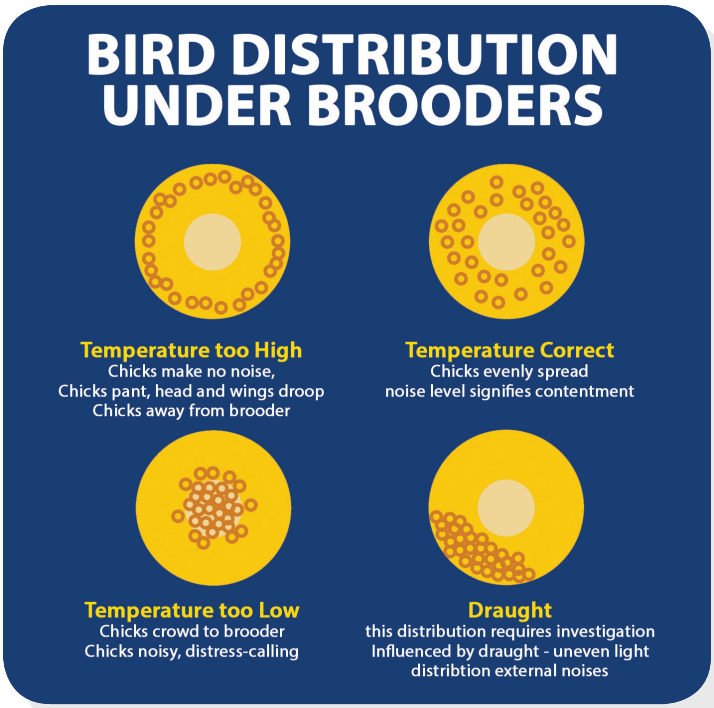
Nutramix baby chicks have been vaccinated for Newcastle Disease, Bronchitis and IBD (Gumboro) disease, just like the chicks for the large commercial farms. This vaccination is most effective if you only have a single age birds on the farm. All-in / all-out farming together with proper cleaning and sanitation reduces disease problems on your farm.

BROODING PERIOD

The brooding period is the first two weeks of the birds' life and is the most critical. The future performance of the newly hatched chicks is largely dependent on how quickly and efficiently the transition is made from the warm hatchery to the farm environment.

- Feed and water access – immediate access to clean potable water to ensure that birds are fully hydrated. Never allow birds to run out of feed and/ or water.
- In the first four to five days, addition of a vitamin / electrolyte mix to the drinking water may be beneficial.
- Chicks fed with NUTRAMIX broiler rations do not require any additional medication during this period.
- Temperature management – warm litter and warm ambient temperature at placement are necessary for good activity. Additional heating must be put in place during the colder months of the year (December - March) to keep baby chicks warm.
- Heating bulbs or gas brooders, especially at nights, are important to keep the entire brooding area warm and to eliminate fluctuating temperatures that will result in poor uniformity in the growing period.
- Bird activity – young birds should be seen moving around in the house. Birds that are huddling and moving to the corners are cold and can result in mortality.
- Fresh air – birds require high level of oxygen.
- High light intensity – well distributed light across the brooding area will ensure good activity.

Diagram: Showing how to recognise proper brooding versus poor brooding of baby chicks



In order to be successful in chick brooding:

- Place curtains (tarpaulin) around the sides of the house to provide a draft-free environment for baby birds. The curtains should remain up (closed) during day and night for the duration of the brooding period.
- Ensure all equipment are in place and working properly:

1. Waterers – round (bell) drinkers 1 per 100 birds (1 per 60 in hot climates). The height of drinkers and feeders should be maintained such that the lip of these is at the level of the back of the birds so that feed and water are readily available and minimise

every other day throughout daily to prevent build-up of contaminants the growing period as necessary. Water ers must be cleaned.

2. Nipples drinkers – 1 per 10 birds.

3. Vitamins and electrolytes can be used in water for the first 4 days to help birds get to a good start. Avoid giving antibiotic to day-old birds as this prevents the development of the immune system.

4. Feeders – 1 per 60, but depending on the type in use.

5. Heating source – 250W heating bulbs – 1 per 100 birds or LPG Gas Heater.

6. Heating bulb(s) should be turned on the evening before the arrival of the chicks to raise temperature to about 32°C (90°F). Use a thermometer to check the temperatures inside the house at chick level. Keep lights turned on day and night for the brooding period.

7. Light-bulbs do NOT provide heat and are useless for brooding. You still do need light bulbs however to provide light to the chicks and to you. One 100W (equivalent) bulb should be OK for 1000 birds. You may also use two 40W bulbs instead. The light is sufficient if you are able to read a newspaper by it.

- Chick paper – For the first day, Newport Mills Limited recommends to cover the litter near to the feeders and drinkers with paper. Spread some feed over paper allowing easy access for day-old birds. Immediate intake of feed and water stimulates the development of the chicks' gastrointestinal system and promotes the re-absorption of the yolk sac.
- Where possible, brooding guard or brooding ring should be created under the heat source to eliminate corners where birds can huddle on top of each other. The ring should be expanded as the birds grow and should be removed completely after about 7-10 days.
- Observe the birds in the brooding area for comfort level at least 4-5 times daily. If birds are cold, they will huddle under the heaters or in corners. If they are too hot, they will move away from the heat source and pant heavily. Check the thermometer temperature and adjust the height of the heating bulbs as needed. Lower the bulbs if birds are cold or raise them if birds are too hot. When the birds are comfortable, they will be equally dispersed throughout the brooding area and will be very active and alert.
- Check that the day-old birds are eating properly. The crop of the bird can be felt to tell you how effectively the birds are feeding. Check at least 10 birds in different areas of the brooder area for crop fill. Approximately 80% should have a full crop after 8 hours and approximately 95% should have full crops after the first 24 hours on the farm.

Table: Target Temperatures for the Chicken grow-out

Age in Days	Temperature°C	Temperature°F
1-7	32.2	90
8-14	29.4	85
15-21	26.6	80
22-28	23.9	75
29-35	21.1	70
36-Market	21.1	70

- A relative humidity between 60–70% for the first few days and above 50% for the remainder of the brooding period would be ideal. A thermometer with relative humidity reading would be ideal for your poultry house.

Growing period

The growing period begins after brooding ends when the birds are ready for market. There is strong growth in skeleton, organs and muscle starting from the second week into the growing period. The late stage of the growing period is the time when birds might suddenly die due to sudden death syndrome (flip over disease). This will only occur with very fast growing birds; the fast growth has placed too much strain on the heart. The bigger birds are the ones that usually die first and can be found on their backs. Genetic improvement and better nutrition have reduced this problem.

LIGHTING PROGRAMME

Lighting programmes can adjust the growth rate of the birds and need to be implemented carefully. Research indicates that lighting programmes, which include several hours of continuous darkness, can also improve the development of the immune system in birds. Newport Mills Limited recommends 24 hours of light during the brooding period and 3 hours of darkness in weeks 3 to harvest. This is because the chickens' digestive system will be completely empty after 5 hours without feed and they will need to eat again. The recommended 3 hours dark period is effective and is widely used in many parts of the world.

Benefits of Lighting Programme

- 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 – reduce lameness.
- Bird uniformity is improved (less differences in bird size).

FEED MANAGEMENT

Nutramix Broiler feed contains all the essential nutrients needed for the growth of your birds. Nutramix Broiler Ration Crumble can be fed from the time the farmer receives the birds until slaughter (day 1 to 42 days). This is because the anti-coccidiostat used in the feed has no withdrawal period. It takes approximately 18 bags to grow 100 broiler birds for 6 week (42 days). For better feed conversion and a lower cost, Nutramix Broiler Ration Crumble can be fed from day 1 to 21 days then Nutramix Broiler Ration Pellet from day 21 to market. The last 5-6 days of grow-out, birds can also be fed with a medication free Withdrawal PELLETS for even more economical results.

Table: Recommended Feeding Programme for Broiler Birds

FEED	AGE	COMMENTS
Nutramix Broiler Ration Crumble	1 – 21 Days	A complete feed that can be fed to grow broilers from hatch to market weight. Medicated with drugs aiding the prevention of coccidiosis and enteritis under normal exposure.
Nutramix Broiler Ration Pellet	21 – Market	A complete feed to can be fed to grow broilers from 21 days to market weight. Medicated with drugs aiding the prevention of coccidiosis under normal exposure.
Nutramix Broiler Ration Withdrawal Pellets.	Last 6 days of grow-out	A complete feed without any medication. Do not feed beyond 6 days to prevent diseases in this or the next flock.

The structure of the feed stimulates the development of good digestion. Lack of structure (too finely ground mash) does not cause optimum absorption. This is why it is important to use a feed that is relatively coarse and not too fine.

Chickens will not choke on larger feed particles, but they will select and leave the larger particles for a later day. This is a natural behavior.

Nutramix broiler feeds have been formulated to give the best results while feeding ad-lib or unrestricted. Ensure that fresh feed and clean, cool water is always available for your birds.

Please note that any transition between different feeds must be gradual so as to minimise digestive problems. This transition should be done over a period of a few days.

Feed Additives / Growth Promoters

Newport Mills Limited does not recommend or add antibiotic growth promoters, or to add other additives to feed or drinking water, unless prescribed by a veterinarian who is familiar with conditions on your farm. Improper applications increase the risk of resistance development in bacteria. Marketing companies have recently promoted the use of “pre-biotics” in an effort to enhance gut bacteria associated with good gut health. However, most studies examining the effects of pre-biotics do not deliver the expected benefits in growth rates, feed intake rates and feed conversion ratio. It is assumed that these additives are effective however in alleviating the effects of a poorly balanced diets or poor management practices.

Feed Withdrawal Period Causing More Coccidiosis?

Some medications such as certain anti-coccidials can enter the meat and may reach the consumer. This is prevented by using a withdrawal period if the medication in the feed requires such. Nutramix Broiler Ration crumble and pellet contain medication with no prescribed withdrawal periods and as such, there should be no problem with coccidiosis leading up the slaughter. If a withdrawal feed is used with no anti-coccidials beyond 6 days, there is a risk at developing coccidiosis. This is particularly risky for the next flock of birds that will enter the farm if your house is not properly cleaned,

disinfected and given the recommended 2 weeks down time. The use of withdrawal feeds is not recommended in operations with multiple aged birds.

WATER MANAGEMENT

Water must be available to broilers at all times. Inadequate water supply, either in volume or available drinker space, will reduce growth rate. Monitor and record the water consumption to ensure that the flock is receiving and consuming sufficient water as this is a good indicator of the health and performance of the flock. Any sudden change in water consumption is an important signal.

- If there is an increase in water consumption, first check for leaks or spillage of water or the temperature of the house could be too high. If none of these are the problem, then check birds' health. When birds drink more, the house will need to be ventilated more. This is particularly a problem in houses where stocking density is too high (too many birds in the poultry house).
- If birds are drinking too little, first check that the water system is working properly (providing adequate amount of water). Birds that drink too little will look drowsy and will not feed properly, thus will not grow.

If you are using nipple drinkers, then the pressure in the line should not be too high or too low as this will result in lower water intake for birds.

Water Consumption

Water is the most important nutrient for your birds and it is the nutrient that creates the most issues when not clean or not available. Birds drink more water than they eat feed. They will drink even more water at higher temperatures; for instance: water intake will double if the temperature moves from 22°C to 32°C. If the water temperature is too hot or too cold, it will reduce water intake and growth rate of the birds. Your farm should be equipped with tank to provide at least 24 hours of water at maximum consumption to ensure that birds will continue to drink adequate amount of water. Water tanks also allow for water treatment.

Keep water lines away from the direct impact of the sunlight (bury underground). Paint water tanks white to reflect the heat of the sun. (helps keeping water cool). Consider to use ice blocks in water tanks on hot days to keep the birds from consuming (or refusing) hot water.

Water intake depends on feed intake, feed composition, house temperature and age

Under normal conditions - 1.6 – 2 times the amount of feed consumed

High temperatures - 3 – 4 times the amount of feed consumed

Ensure that water is clean, tastes pleasant and does not contain impurities. Young baby chicks are particularly vulnerable to poor water quality.

Filter and Chlorinate tank or surface water with bleach.

A “shot glass” of bleach for a 50-gallon drum
A beer bottle of bleach for a 500 gallon tank

Water drinkers should be suspended to ensure that the level of the lip of the drinker is equal to the height of the birds’ back when standing normally. The height should be adjusted as the birds grow in order to minimize contamination and spillage. Water should be about 0.5 cm from the lip of the drinker at day old and gradually lowered to a depth of 1.25 cm after week one.

Key Points to Remember

- Clean Drinking water should be available to the birds 24 hours a day.
- The water intake should be monitored daily to check that water intake is sufficient.
- Make allowances for increased water consumption at high temperatures.
- Flush drinker lines in hot weather to ensure that the water is as cool as possible.
- Adjust drinker heights every other day.
- Provide adequate drinker space and ensure that drinkers are easily accessible to all birds.
- Clean water lines between flocks to remove sludge and “bio-film”

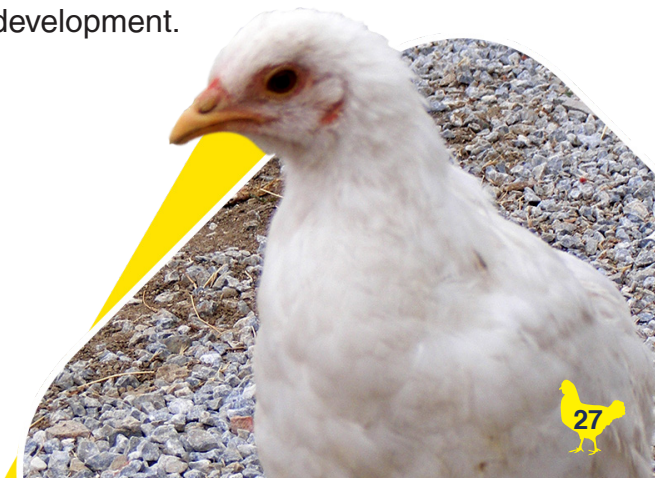
"MEDICATION" USE DURING BROILER BIRD PRODUCTION

Newport Mills Limited recommends supplementing the drinking water of day old birds with vitamins and electrolytes for a period of 4-5 days but never more than one week. Vitamins and electrolytes are useful in increasing birds' appetite, reducing stress and boosting their immune system.

Some farmers provide molasses, glucose or sugar in water for baby birds. This is done in an effort to provide energy for birds that have not been put on water and feed soon after purchase from the farm store. We recommend to use sugar or glucose only when needed.

Older Birds

Any time that broiler birds are put through a stressful period, the addition of electrolytes and vitamins may assist the birds in a quicker recovery. These additives can also cause lose droppings if not properly administered, so they are not always beneficial or economical. Sick birds or those with a compromised immune system will consume less feed and subsequently slow-down in growth and development.



Household Products

The use of garlic and Aloe Vera has been a common practice in broiler production among small farmers. Both products are known for its anti-bacterial, anti-viral, anti-fungal, anti-tumour and anti-inflammatory properties. Some studies have shown that Aloe Vera can improve immune response and growth performance in broilers. As such, Newport Mills Ltd does not deter the use of these products, but the incorrect administration can do significant damage to your flock. Adding these products to drinking water can change the taste and may result in lower water intake and poor performance. None of these additives will be as effective as practicing good management of your flock.

Antibiotics Use in Broiler Production

Antibiotics are a good way of inhibiting bacterial growth or killing bacteria, but their use should be limited. It is better and cheaper to improve the general management on your farm, to reduce stress and infection risks and get birds off to a good start.

- Animals have both good and bad bacteria in the gut. The good bacteria are necessary for good gut health, but antibiotics will kill both good and bad bacteria.

- Giving antibiotics in water to baby birds as a preventative measure will have a negative effect on the good bacteria that they need for good gut health. It may also affect water intake.
- The use of “preventative” or performance enhancing antibiotics will limit your options of treatment when a disease is found.
- When antibiotics are fed to birds, not all bacteria are killed. The strongest survive and multiply and may develop resistant strains that antibiotics cannot kill.
- Often, antibiotics are used to compensate for poor management practices. Improving water quality, sanitation and a stress-free environment can replace the need for antibiotics and the farmer will save money.
- Keep antibiotics use to a minimum and always consult your Newport Mills Livestock Support team before carrying out any treatment on your farm.

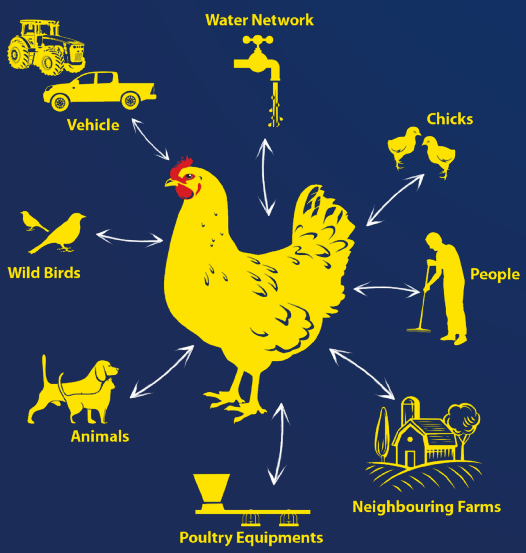
BIRD HEALTH ISSUES AND BIO-SECURITY

Bird health is of extreme importance in broiler production. Poor chick health will have a negative impact on all aspects of production and flock management, which include growth rate, feed conversion efficiency, condemnations, mortality, and processing traits. The flock should start with good quality and healthy day-old chicks.

The disease control programmes include:

- Disease prevention – minimise the risk of diseases
- Early detection of illness – early and frequent monitoring for disease
- Proper treatment of disease condition – prevention is always better than cure.

A strong bio-security programme needs to be in place to ensure that good flock health is maintained. The farmer and staff must understand that bio-security is an important part of the daily routine and regular education and training is necessary.



Decreasing the Risk of Disease Transmitted by Humans

- Limit the number of visitors to the farm and prevent all unauthorised access – everyone entering your facility should follow strict bio-security procedures developed for your farm. This should include wheel baths, foot baths, clean clothing, plastic boots, hair nets etc. Maintaining records of all visitors and their previous farms visited is a good practice.
- Applying disinfectant liquids for shoes and vehicles entering the farm will help minimise transmission of disease pathogens.
- If personnel are not able to avoid visiting more than one farm per day, it is advisable to visit the youngest flock first to avoid transmitting pathogens from older birds into the young flock.
- Do not allow your staff to walk between and into chicken houses without your approved bio-security measures.

Decreasing the Risk of DiseaseTransmitted by Animals

- It is ideal to practice an all-in/all-out placement cycle, which will minimise disease transmission from older flocks to younger one.
- The decision on the length of down-time is one of major economic importance, but the longer the downtime between flocks, the lower the risk of disease transmission. A two week downtime should be ideal for broiler production.
- Leaving equipment, litter and building material lying around is a perfect cover for rodents and other animals. Minimise this and secure the facility to be as animal proof as possible without compromising ventilation to the flock.
- Keep wild birds out of the building as these can carry disease that can cause serious infections to broiler flocks. Wire mesh siding is suggested at all openings into the poultry house to prevent entry of even small birds and rodents.
- Rodents affect us in the following manner:
    - Contamination of feed by faeces, urine and hair.
    - Consumption and contamination of feed and attacking and killing young chickens.

- Transmission of numerous diseases including Salmonella, Pasteurella etc. Measures to be included in rodent control are:
    - Keep the area around the poultry houses clear of clutter and the grass cut short.
    - Repair and seal any holes or openings that would permit passage by rodents.
    - Install traps and keep poison baits in designated places such as around feed storage bins, poultry houses, and sanitary areas. The baits and traps must be monitored and maintained. Do not allow any littering of feed or food stuffs
- Darkling beetles and mites need to be kept under control. These insects can hide in small cracks and in insulation materials.
- Do not allow any other livestock roaming on or near your chicken farm. This includes dogs, cats, cows, geese, goats etc.

Decreasing Risk of Contamination by Other Means

- Trucks and equipment should be disinfected upon entering the farm, or when moving from one coop to the other.
- Stagnant water will harbour pathogens, flies, rodents.
- Make sure dead birds are immediately removed from the chicken growing area.

- Make sure your storage of litter is also not affected by animals or water.
- Remove old litter from the farm.

DISPOSAL OF DEAD BIRDS

Dead birds need to be removed from the house as soon as possible. Dead birds are a bio-security risk and an environmental risk for your operation and the entire poultry industry. Incineration or burial with lime are the preferred method for small numbers of birds. For larger numbers, proper disposal methods will be recommended by the Public Health Official in your parish.

DISEASE INVESTIGATION IN BROILER PRODUCTION

It is important to be familiar with normal production parameters in order to detect abnormalities should they occur on your farm. Whenever health problems are detected in broiler flocks, veterinary advice should be sought immediately in order to have the problem fixed and get the birds back on track as soon as possible.

Some Common Disease Problems/Conditions Encountered in Jamaica

WHAT YOU OBSERVE	WHAT TO INVESTIGATE	THE LIKELY CAUSES
Small chicks from days 1–4	**Feed, Light, Air, Water and Space** >Crop fill at 24 hours post chick placement >Availability and accessibility to feed and water >Bird comfort and welfare	>exposure to heat or cold during transport to the farm. >Feed and water not available or not palatable >Weak chicks >Inadequate feeders and drinkers >Inadequate feed and water levels >Equipment location and maintenance issues >Inappropriate brooding temperature and environment
Runted and Stunted Chicks-Small birds, as early as 4-7 Days	**Feed, Light, Litter, Air, Water, Space, Sanitation and Security** >Hydration status of chicks >Brooding conditions >Feed quality and accessibility >Down-time between flocks >Disease challenge	>Dehydration of the chicks >contaminated or poor quality feed >Poor quality brooding conditions >Short down-times between flocks > No all in/all out >Inadequate cleaning and disinfection >Disease >Poor biosecurity and hygiene practices > Multiple ages

Most diseases or afflictions can be first recognised by experienced poultry farmers. The most obvious symptoms of diseases are:

- Changes in the birds' normal behaviour, like laying down, being agitated, or making uncommon sounds or displaying abnormal movements like spreading wings or spreading legs.
- Changes in appearance like ruffled feathers, discoloured shanks or comb, poor uniformity, infected or swollen eyes, beaks, vents, etc.
- Changes in dropping's quantity, colour or consistency.
- Changes in feed or water consumption are often the first indication, but too often missed
- An abnormal smell in the house may indicate a change in droppings or a ventilation issue.

The Observations Above May Help in Diagnosing Some of the following Afflictions:

Coccidiosis

This is one of the more common diseases in poultry. It is caused by a parasite that can affect birds of all ages. The parasite is passed in the faeces and needs moisture and warmth to mature before it can infect other birds. The parasite can multiply and can remain viable for months in litter, dust, and on surfaces. The parasites can also be transmitted from other farms on shoes and equipment, so strict bio-security measures must be followed to prevent this problem.

How to Tell if Birds are Infected?

You will often find birds that have:

- Enteritis and sometimes bloody diarrhoea
- Ruffled and protruding feathers (helicopter feathers)
- Anaemia
- Poor growth and development
- Droopiness
- Paleness of the comb

Treatment should be started immediately once coccidiosis has been identified and diagnosed. Coccidiosis will respond to treatment using coccidiocidal drugs in drinking water. Please note that withdrawal periods of all drugs used must be observed to ensure that drug residues do not end up in the food chain!

Prevention

Sanitation is an important preventative measure to decrease or eliminate the risk of coccidiosis. Biosecurity measures will also help to significantly reduce the risk of the disease.

Nutramix Feeds Contain Medication that will Prevent Coccidiosis Outbreaks Under Most Circumstances

- Practice all in/all out. Having flocks of different ages in the same space can help to spread the parasites.
- If flocks of different ages are present on the farm, attend to younger birds first then older ones.
- Clean and disinfect poultry house and all equipment regularly and between flocks.

NB: Orange/reddish droppings are sometimes seen and can be indicative of malabsorption syndrome or it could be that the birds have gone too long without feed. If birds stay too long without feed, faeces can mix with bile and the droppings will come out green, which can mimic coccidiosis in chickens

Necrotic Enteritis

This results in problems with wet droppings or poor consistency of the faeces and is caused by a change in the bacterial flora in the small intestine.

This disruption in the intestine can be caused by coccidiosis, a sudden change in feed or feed composition, any poorly digestible feed source or simply a shortage of feed or sudden change in house temperatures.

Treatment

Many antibiotics are highly effective in treating bacterial enteritis in birds. Often birds are being treated for bacterial enteritis with antibiotics when the main cause of the problem is an underlying coccidiosis infection that can only be treated with an anti-coccidiostat. In cases like this the bacterial infection must be treated along with the coccidiosis to gain an effective treatment.

Nutramix Broiler Ration crumbles has a medication that aids to prevent the occurrence of necrotic enteritis unde most conditions.

Ascites

This condition can affect broiler birds as early as a few days old, but the problem is often seen during the grow-out period. The main causes are low house temperatures or high carbon dioxide concentration during the first weeks of life (poor brooding). The birds' hearts have to pump harder due to the relatively low oxygen. Eventually the hearts will get bigger and weaker as the blood becomes thicker and blood pressure increases causing fluid to be forced out of the blood vessels and accumulate around

the organs, thus making breathing difficult. This disease was very prevalent in previous years, but now relatively rare due to adjustments in genetics and nutrition.

Signs

- Sudden deaths in rapidly growing birds
- Poor development
- Progressive weakness and abdominal distention
- Difficulty breathing and lying down mostly
- Birds might look blue in colour especially when pick up by the feet

Prevention and control

Ensure that the brooding area is comfortable, warm and properly ventilated (allows air exchange to remove carbon dioxide and other noxious gases).
Ensure proper ventilation during the entire grow-out period.

Heat Stress

This condition in broiler birds is caused by high environmental temperatures compounded by high relative humidity and slow air speed. High stocking density of the house is a major factor to heat stress as this will make it more difficult for birds to get rid of body heat.

Signs

- Panting heavily
- Increased thirst
- Reduced feed consumption
- Legs and wings are usually seen outstretched

Treatment and prevention

- Cooling and ventilation to remove hot air from around the birds – open cutains and introduce fans if necessary.
- Decrease stocking density in the hotter months of the year – provide greater than 1 square foot per bird.
- Cool drinking water – not cold. Cover or paint water tanks white to reflect sun rays and run water lines underground.
- Fast the birds before and into the hottest part of the day. Ensure the birds are able to eat during the night and the cooler parts of the day to compensate.
- Electrolytes in the water help to reduce heat stress.

Slaughtering and Processing of Broiler

The goal here is to successfully process the maximum number of high quality carcases and this will be impacted by:

- Timely feed withdrawal before slaughter of about 8 hours to clean the digestive tract.
- Ensure birds have access to drinking water up to catching.
- Careful catching and transport will reduce downgrades due to damages. Avoid carrying birds by neck or wings and try to keep stress in the birds to a minimum.

Stunning and Bleeding the Birds

This is done to render the animal unconscious before slaughter. Methods include electrical current, gas or mechanical means. The aim is to slaughter the birds in a humane manner and remove the blood from the carcase without causing any damage or downgrade to the meat. We recommend the use of a slaughter cone. Hold the head firmly in one hand and pull down for a slight tension to steady the bird. Use a sharp knife to cut the throat from the outside just behind the lower jaw – two jugular veins and two carotid arteries on both sides of the neck and allow birds to bleed for no less than 1½ minutes. Do not cut the oesophagus (feed-pipe) or trachea (windpipe).

Killing cones for poultry

Scalding

After bleeding, submerge the carcase in hot water – optimum temperatures is about 55°C (131°F) – Do not scald longer than 3 minutes. Agitate to ensure that the birds are not floating on top of the water and ensure that all the feathers are properly covered. Some dishwashing liquid helps for better water – skin contact.

- Test one feather as you scald to ensure that it comes out easily.
- Remove birds from water and pick feathers preferably with a gloved hand (rubber glove). Use rubbing motions to help get rid of small feathers – it is important to move quickly to get the feathers out.
- A kitchen torch (flames) may be used to quickly singe off small feathers or hair that remain. Be careful not the burn the skin of the bird.
- Put the clean carcass in ice-water for a quick cool-down.

Evisceration (Plucking Chicken)

The goal of evisceration is to prepare the bird for chilling while maintaining a high quality and yield.

- Remove the head by cutting between head and first vertebra. Cut the skin at the points of the shoulders; pull the crop, windpipe and oesophagus and cut off where they enter the body.

- Remove the shanks by cutting through the hock joint
- Remove the oil gland by cutting deep to the tail vertebra then follow the vertebra to the end of the tail in a scooping motion to remove the gland.
- Carefully cut from the point of the keel bone (breast bone) to the vent and take care not to cut the intestines. Complete the cut around the vent then pull the vent and intestines, heart and gizzard away from the carcase to prevent contamination of the meat.
- Remove the lungs from the inside of the ribs
- Check to ensure that all the desired organs have been removed from the carcase. Wash the inside of the bird with clean water or a hose (running water preferably) and wash the outside carefully and rub off any dirt, pinfeathers or blood.
- Place the carcase in a chilled water container with ice to cool it to the water temperature (4°C or 39.2°F).
- After cooling, remove birds, drain, then package and freeze promptly. Birds should not be frozen until they have been chilled to 4°C or below.