**Advances in brooding management in commercial poultry farming**

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**Abstract**

In order to raise healthy chicks and avoid early mortality, brooding is an essential management practice that contributes to successful poultry farming. One common mistake made by poultry producers when managing brooding is to focus only on keeping the proper temperature. Besides from temperature, we need address other challenges. Other concerns include the 80-20 rule, which states that 20% of causes account for 80% of the results. The brooding temperature, ventilation, stocking density, light intensity, nutrition must all be considered throughout the times. Proper management of these areas will be critical to achieving uniformity, which leads to improved performance.

**Key words:** brooding, chicks, management, mortality, temperature

1. **Introduction**

To maximize a flock's egg laying potential, the brooding environment must be optimally managed. This is the time when the chick's immune system and digestive tract, two essential systems that will grow as the foundation of its healthy life. Furthermore, chickens are homoeothermic, which implies that even when the temperature of their surroundings changes, their body temperature remains constant. Chickens cannot sustain their body temperature and increase weight simultaneously throughout the winter and rainy seasons (Sable et al 2018). Consequently, they are unable to appropriately regulate their body temperature during the first few weeks of life and may experience chilling, which could increase mortality. Therefore a proper manage mental approach needed during brooding chicks, as it is extremely sensitive period. Furthermore, optimal brooding may also help to reduce antibiotic use, which is a crucial strategy to prevent the antibiotic-resistant harmful bacteria from spreading around the world (Cohen, 2009; Van Duijn et al., 2011).

Brooding with boody hens is the most basic and easiest approach to raise a few chicks, but it requires convenient facilities and continuous attention. Where winter or extremely early spring chicks are reared, or where early leghorns or non-sitting breeds of poultry are housed, artificial brooders are required. They are also required in commercial poultry operations that rear a large number of birds, despite the fact that they demand an additional investment, more care, and closer attention.

1. **Brooding of Chicks**

Brooding refers to the care and management of young chicks in their early stages of development. Brooding is required until 3 to 6 weeks of age, depending on the climatic conditions. The following are the main advantages of brooding:   
i. For the first few weeks of their lives, newly hatched chicks are unable to regulate their own body temperature. They must have a source of heat. During this critical time, the chicks are kept warm in a brooding chamber.

ii. Brooder guards keep chicks from remaining too far from the heat source until they can identify it. It is recommended to provide a brooder guard that is not more than 1.5 feet in height and has a diameter of 5 feet. We can use things like wire mesh, cardboard, mats, and GI sheets for construction.

iii. The right growth and development of chicken body tissues is ensured by brooding, which aids in achieving a healthy body temperature and a sound body structure. Brooding helps the chicks develop a healthy feather cover in addition to regulates their body temperature. There are two types of brooding

1. **Natural brooding**

This method is frequently used in backyard poultry farming. Broody hens do this as soon as they hatch and up to three- or four-weeks following incubation. One hen can care for twelve to fifteen chicks (Ahlers et al., 2009). A brooding nest and nighttime protection are essential. Cut feeding of grains or household garbage may be used to promote faster chick growth. In order to search for food during the day, the broody hen must be allowed to remove the newly hatched chicks.

1. **Artificial Brooding**

Chicks need additional heat from an artificial source in order to regulate their body temperature. The brooder's temperature must be lowered by 2.80C (50F) per week until the end of the fourth week, or up to 210C (700F), in order to maintain the required temperature of 350C (950F) during the first week of the brooding phase.  
There are two systems of brooding:

**a**. **Hot-room brooding:** The entire brooding chamber is heated by a central heating device. It facilitates airflow, preventing litter from becoming wet.

**b. Cold-room brooding:**This method only heats the space beneath the brooder canopy and, to a lesser extent, the space outside of it. Feathering looks to be improved with this brooding technique. Most tropical nations adopt cold brooding for both egg and broiler chicks. Furthermore, it is also two types: battery brooding and floor brooding. Floor brooding and Battery brooding.

1. **Battery brooding:** Many chicks can be brooded in a comparatively small amount of floor area because birds in battery brooders are housed in multiple layers. On commercial farms, brooding in batteries is quite common. Cages are used to brood and raise over 60% of all commercial layers worldwide. Compared to floor brooding, mortality is typically lower in batteries. There are numerous designs. Most of them have an electric heat source at one end, usually in a partially enclosed space; the other end is left unheated and is around two to three times the size of the heated area. The heating system comprises of an electric heater with thermostatic control.   
   Wire is typically used for the floor and walls of each brooding area. The droppings pan beneath the wire floor needs to be cleaned on a regular basis. Feed and water are available outside the brooding area, making management easier. The caged pullets haveless chances of coccidiosis. Additionally, certain efficient batteries need less labor due to the possibility of automation. Battery brooders are a great way to raise chicks in a small area, but they are expensive to buy.

* No litterborne disease issues because waste falls straight into the fecal tray.
* A larger housing density than in a deep litter system.
* Better feed efficiency since there is no excessive movement of chicks,
* Less mortality

1. **Floor brooding** Most farmers decide to use the floor to brood chicks. Although not much material is needed, the environment is similar to that of battery brooding. It may be infrared brooding or canopy. An incandescent lamp suspended from a bamboo basket or a metal hover can be used for **canopy brooding**. The hover is suspended such that the lightbulb may move about freely. The canopy will aid in trapping the hot air. The total number of brooding chicks determines how many bulbs, hovers, and hover sizes are needed. Each chick needs 1-2 watts of power in our climate.For 250 chicks, a metal hover or inverted bamboo basket with a 90 cm diameter is adequate. For more effective management, smaller units are best. For the first week, a 30 cm high chick or brooder guard that surrounds the hover at a distance of roughly 30 to 60 cm may be employed. GI sheets or bamboo mats can be used to make chick guards. After a week, the circle can be made larger. Then, it can be put in the pen's corner for the second week and taken out by the third.

Because infrared light heats anything that comes into touch with it but not the air, a canopy is not necessary when **infrared brooding**. There are 150 w and 250 w infrared bulbs that can be used to raise 100–250 chicks. It is necessary to hang the lamp at least 25 to 30 cm above the litter floor. Benefits of this include:

* It is simpler to observe chicks because there is no cover.
* Because infrared light has certain germicidal properties, the chicks will have a higher chance of survival.
* Cannibalism is lowered by infrared light.
* Infra red bulb is longer-lasting
* Infrared light stimulates the production of vitamin D in subcutaneous tissues.

1. **Brooder**

The three primary components of a brooder are the heating source, reflectors, and brooder guard.

1. **Heating source**

It is a device that gives the chicks extra warmth.There are many various types of heating sources in the market, including gas and electricity brooders, charcoal brooders, mud pot brooders, infrared and incandescent bulbs etc.

**Charcoal brooder/kerosene stove:**Ordinary charcoal/kerosene burners are used to give chicks extra heat in areas without power.To disperse the heat, these stoves are covered with plates or pans.The room is heated by coal (Mud pot-Bukhari) and one coal heater is enough to heat 300 chicks.

**Gas brooder:**

A heating element that is suspended three to five feet above the chick and powered by natural gas, LPG or methane. One gas brooder is enough for 700 chicks.

**Electrical brooder:**

This brooder also has a thermostatically controlled heating system that uses a reflector and a thermostat to evenly distribute the necessary amount of heat across a vast area, preventing the chicks from being crowded directly beneath it.One electrical brooder is enough to house 250–300 birds.

**Infra-red bulbs:**

Infrared light bulbs are self-reflecting.Chicks are brooded with a 250 watt infrared bulb. One infrared red bulb is enough for 150–250 chicks.

**Incandescent bulb:**60-watt or 100-watt incandescent bulbs (one watt per chick).

1. **Reflectors**

Another name for these reflectors is hovers.Two types of hovers are available:A standard electric bulb and a flat piece of aluminum above it make up the flat type hover, which reflects heat back to the brooding ring.Canopy type hover: This form of reflector is concave and made of a regular electrical bulb.

1. **Brooder guard/chick guard**

Until they learn to regulate their body temperature, they are employed to keep chicks from wandering far from the heat source. We must supply a brooder guard that is five feet in diameter and one and a half feet high. Brooder guards can be made with wire mesh, GI sheets, cardboard sheets, and other materials.Equipment and material requirements for brooding are summarized in table 1.

**Table 1:** Equipment and material requirements for brooding

|  |  |
| --- | --- |
| **Equipment/materials Requirement** | |
| Brooder guard | 40 ft length for 350 chicks |
| Brooder with  hovers | Charcoal (28 kg for 350 chicks) or LPG (30 kg for 700-1000 chicks) |
| Curtains | Good quality to prevent the heat loss from the poultry house |
| Chick drinker | 7 in number for 350 chicks |
| Chick feeder | 7 in number for 350 chicks |
| Round plate feeder  Tyre feeder chicks | 1 in number 50 chicks  1 in number 100 chicks |
| Digital Hygrometer, Thermometer | 1 numbereach  To measure temperature and humidity |
| Lights (CFL or Tube lights in the center line of the shed) | 40 Watts for 400 sq.ft area |
| Newspaper | 4 kg per 1000sq.ft, spread above the litter on first day of brooding |
| Litter material | Husk (400 kg per 1000sq.ft), to absorb moisture from droppings |

1. **Location of brooder house**

The brooder house must be situated apart from other poultry houses.There must be a minimum of100meter between other poultry houses, although more is better. Air must move from brooder areas to other poultry areas not in opposite direnction.

1. **Preparation of brooder house**

**All-in, all-out system-**Even though the fenced-in area may include multiple brooder houses, the chicks should be roughly the same age, with the oldest being no more than seven days older than the youngest. Additionally, the flock should come from a single source, such as a single farm with common parent stock. If the birds come from multiple sources and age groups, vaccination and other programs become a greater challenge. All of the chicks should start the same week and be taken from the house at the same time. This program gives rise to the term "all in, all out." This means that all chicks are brought into the house at the same time and then removed at the same time. The house should not be occupied by another group of chicks until all of the adult birds have been removed and the area has been cleaned. This breaks any disease infection cycle by providing a time when there are no chicks in the enclosure.   
**Cleaning, washing and disinfection of brooder house**

Poultry farms should maintain appropriate hygiene practices. Use detergent powder or disinfectant solution to clean, rub, and wash the house, floor, and equipment. Before the chicks arrive, the brooder shed and its equipment should be fumigated. The house was fumigated with three concentrations (1x conc. = 20g of Kmno4 + 40ml of formalin). To eliminate any residues of toxic gas, the house must be well ventilated and fumigated overnight 24 hours prior to the arrival of the chicks. The area surrounding the farm should be regularly cleaned. Applying phenol and lysol to the area around the broiler shed will help keep flies and other insects under control. It is recommended that the attendants should have proper protective dress and shoes. To prevent disease contamination, a 'foot bath' should be provided at the broiler shed's entry gate.  
**Preparation before the chicks is received**: It is best to pile up the litter from the previous batch first in order to eliminate any germ accumulation. The piled-up material can be taken out of the brooder chamber after two to three days. It is necessary to scrape off the litter that is protruding from the ground. Take all mobile equipment out of the shed. After carefully, cleaning with tap water and soaking in water, dip in disinfectant solutions. Lastly, rinse with fresh water, let it dry in the sun, and store it. Dirt, cob webs, and spider webs must also be removed. Make use of a flame gun to eliminate the insects.If necessary, the metal surfaces should be painted, and the entire floor and side walls should be white washed. Waterers, feeders, and chick guards should all be cleaned and sanitized with lysol or phenyl. Let it dry in the sun for a day. To keep the brooder housing at a consistent temperature, hang the gunny bags around it. For at least two weeks, the shed should be kept under lock (shed rest).

**One day before arrival of chicks:**For cage brooding, set the heating system (turn on brooders) to 29–320C (85–90oF); for floor brooding, set it to 32–350C (90–95oF) at chick level. Arrange food, water, etc., and cover the brooder's floor (litter) with newspaper. Check the water system and adjust to the appropriate height of the chicks. Water lines should be cleaned and flushed.  
**On arrival of chicks:**Count the number of chicks in each part cell while putting them in the brooders to make sure the stocking density is appropriate. Run the water system or fill waterers with clean water. Give the feed in crumbled or mashed form. More consistent growth will be ensured with crumble or pellet feed. During the first two days, provide appropriate lighting throughout all times. Supplementing drinking water with electrolytes and antibiotics will decrease environmental stress and transportation-related stress, as well as initial chick mortality.

**Setting of brooders-** A suitable brooder should be set up and its temperature tested one day prior to the chicks' arrival. The total number of chicks determines the number of brooders. A brooder with 250 chicks is easy manageable. With a gas brooder, the number of chicks can be increased.

1. **Brooding Requirements**

**Floor Space**

Floor space is typically not a major issue until the chicks are two to three weeks old, but as they get bigger and still require heat, significant issues become apparent. It is found that 350 chicks per brood have an advantage over the large flock when considering mortality in relation to the number of chicks per brood.  In temperate conditions, broiler chicks should be given 700 square centimeters (0.75 square feet per bird or 14 square meters per bird) per chick until they are 28 days old, however in tropical conditions, they should be given 1 square foot per bird. Nonetheless, the suggested spaces according to age are as follows:

|  |  |
| --- | --- |
| 1st one Week | 10 sq inches/chick |
| 2nd week | 25 sq inches /chick |
| 4th week | 45 – 65 sq. inches/ chick |
| Up to 6th week | A minimum of 700 Sq cm. should be maintained per chick |

The amount of space needed beneath the hover varies depending on the type of hover and the heat source. For electric hovers, each chick should have at least 10 square inches (65.5 cm) of space; for other types of hovers that use kerosene or coal to heat the area underneath, 7 square inches (45 sq cm) is adequate.

**Feeder and drinkers**- It is best to put the baby chicks' feed on flat surfaces like paper plates or the top of the box where they are delivered. Shallow containers can be made by cutting down the boxes. To encourage the birds to eat, feed should be placed in the flat containers on a regular basis. After the first few days, metal feeders should be utilized. To ensure that the chicks can easily reach for food and water, feeders and drinkers should have lips that are just 5 cm above the litter level. For chicks, the following feeder area is needed:

* 0-2 week – 2.5cm/chick
* 2-6 week- 4.5 cm/chick.

If hanging Federers are used, offer three 36 cm diameter hangings with a weight capability of 12 kg each.The following is the waterer space requirement for chicks:

* 0-2 week – 0.6 cm/chick.
* 2-6 week- 1.3 cm/chick.

Use two 4-liter waterers for every 100 chicks if a fountain-style waterer is being used.

**Watering and feeding**

The bird's first meal should consist of glucose water with vitamin C to quench its thirst and prevent dehydration. It is better to allow the chick more time to consume water. For the first two days, crushed feed grain should be provided on an open tray, flat container, paper, or mat after two hours of water provision. Feeders for chicks should be utilized after two days. The waterer should be positioned just beneath the hover and between two feeders. About four hours before the chicks arrive, fill the waterers. This gives the water time to warm up from the brooder heat. The water should be at least 650 degrees Fahrenheit (180 degrees Celsius). Always use potable, fresh water. The amount of water consumed is double that of food.As with other animals, the broilers' age clearly affects how much feed they need.As a result, the amount of feed needed varies daily.Nonetheless, the following table shows the typical weekly requirements:

**Table 2**: Age wise feed consumption in broiler chicken (at 21.1ºC) North and Bell, 1990

|  |  |  |  |
| --- | --- | --- | --- |
| **Age (Weeks)** | **Feed consumption** | | |
| **g/bird/day** | **g/bird/week** | **Cumulative (g)** |
| 1 | 17 | 119 | - |
| 2 | 41 | 287 | 406 |
| 3 | 65 | 455 | 861 |
| 4 | 91 | 637 | 1498 |
| 5 | 115 | 805 | 2303 |
| 6 | 144 | 1008 | 3311 |
| 7 | 171 | 1197 | 4508 |
| 8 | 188 | 1316 | 5824 |

**Litter management in brooding**

There are numerous varieties of litter material used for brooding that have the following qualities: low thermal conductivity, soft and compressible, medium particle size, light weight, high absorbency, quick drying, low cost, low absorption of atmospheric moisture, and good fertilizer value. A range of materials can be used as bedding material, including as ground corn cobs, peanut and rice hulls, wood shavings (which work best), and chopped hay or straw. Keep in mind that uncut straw or hay is useless as bedding. Hatchlings should never be placed on slippery surfaces like cardboard, plastic, or newspaper since these materials might cause leg issues. Avoid using peanut hulls and hardwood shavings as they can grow mold.   
Sawdust should be avoided since it can affect the chicks' gizzard or crop if they consume it. Woodchips and other large particle litters are not as absorbent as smaller particle litters, making them unsuitable for bedding. The litter should be evenly distributed and two to three inches thick. To stop the chicks from consuming litter, place the fresh paper on the litter (for approximately a week). Remove the top layer of paper everyday to clean, flip it upside down after 4 or 5 days, and ultimately remove it after a few days. The litter should only be slightly damp during the first three weeks of the chick's existence. It should then have around 25% moisture, not more than that.

**Temperature**

During the brooding stage, the hens' body temperature is the most crucial element that must be optimized. Chickens begin their natural behaviors, such as eating, drinking, and growing, when their body temperature is at the proper level. Numerous studies have shown that a high brooding temperature (>28°C) improves the survival and growth of hens (Deaton et al., 1996; Malheiros et al., 2000; Baarendse et al., 2006; Leksrisompong et al., 2009). In general a body temperature of 34.0 to 35.0°C during the brooding phase is ideal for the best growth and development. Chickens behave normally in this temperature range. The starting temperature for brooding is 950F (350C). For the first two or three days, the best results are obtained at 330C at the chick level. After that, the temperature is lowered by 50F or 30C each week until 700F or 210C room temperature is reached (Table 6). It seems that birds do better when the room temperature is lower than what is advised. It seems that the ideal temperature during the growing period is 210C.

**Table 3:** Management brooding temperature

|  |  |
| --- | --- |
| **Age of chicks (weeks)** | **Temp at chick level** |
| 1 | 950F (350C) |
| 2 | 900F(320C) |
| 3 | 850F(300C) |
| 4 | 800F(270C) |
| 5 | 750F240C) |
| 6 | 700F(210C) |

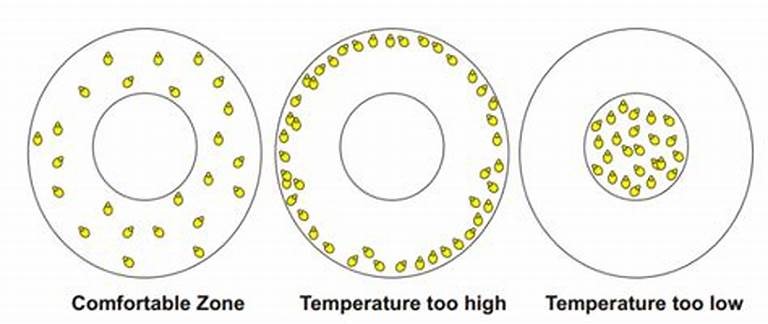
The impact of temperature

1. The brooder temperature that is too high or too low will result in poor growth and, consequently, poor performance from the chicks.

2. When the temperature is low, chicks will attempt to huddle together and crawl beneath one another. As a result of the piling, several chicks may die.

3. When the temperature is high, the chicks will attempt to avoid the heat source and pant with their wings spread out (Bell and Weaver, 2001).

Temperature can be changed according to the birds' behavior, as demonstrated in theFigure below.



**Lighting Management**

1. **Duration of light:**

There should be one hour of darkness and twenty-three hours of light during the brooding period. Under canopy brooding, the light has two functions: it provides visibility and heats the air by convection to the proper brooding temperature. In order to help reduce huddling among chicks and associated death from unexpected power outages, one hour of darkness at a specific time of day is supplied in all brooding systems.

1. **Intensity of light:**

By using a light bulb that is placed at a height of approximately 2.4 meters above the floor, 10 watts per m² of floor space (around 1 watt per square foot) can be used to obtain the necessary level of light intensity. This level of intensity is adequate to draw the chicks by shining brightly on feeders and reflecting off of the drinking water. After 48 hours, the intensity at floor level can be decreased by using 2.70 watts of light per square meter (about 0.27 watts per square foot) of floor space, with the light bulb fixed at 2.4 meters above the ground.

**Ventilation**

The purpose of ventilation is to remove harmful gases and heat while supplying fresh air. Fresh air is essential for the health and well-being of chicks. Two cubic feet of air per hundred chicks per minute is needed for efficient ventilation (for oxygen demand). It can be accomplished with 2-3 air changes. The size of the poultry house, the number of birds housed, and the number of openings maintained all affect air changes. The buildup of ammonia, carbon monoxide, and damp litter is caused by inadequate ventilation. Chicks are poisoned by carbon monoxide concentrations greater than 0.01 percent. The obnoxious odor of ammonia damages chicks' eyes and slows their growth. A common risk factor for coccidiosis outbreaks is wet litter brought on by inadequate ventilation. The condition of the litter determines the amount of ventilation. To keep the litter dry, there should be adequate airflow. Therefore, cross ventilation or an exhaust fan should be provided.

**Humidity**

Even though it has been demonstrated that floor-brooded chicks require a fairly high humidity range (30% to 75% R. H.), excessively high or low humidity levels in the brooder house should be avoided. High humidity leads to wet litter, which promotes the spread of coccidiosis, while low humidity can result in dusty litter, which can cause respiratory issues and stunt feather growth. In a floor-type brooder house, a relative humidity range of 50–60% is ideal to avoid moisture and dust.

**Vaccination**

All birds should receive vaccinations to prevent illnesses. There should be a vaccination programme for the broiler flock. In this situation, the manufacturer's instructions about the immunization date should be followed. Vaccination should begin the day after birth. Farmers in our nation hold broilers for a month. They use vaccinations against Gumboro or Infectious Bursal Disease (IBD), Newcastle Disease (ND), and Infectious Bronchitis (IB)

**Table 4:** Vaccination schedule for broiler chicken

|  |  |  |  |
| --- | --- | --- | --- |
| **Age (days)** | **Disease** | **Vaccine** | **Route** |
| 1 | Marek’s | HVT vaccine | I/M |
| 4-5 | Ranikhet disease (RD) | Lasota/F | Occulonasal/Drinking water |
| 12-14 | Infectious Bursal Disease (IBD) | IBD Live vaccine | Drinking water/ Occulonasal |
| 28-30 | Ranikhet disease (RD) | Lasota/F | Occulonasal/Drinking water |

**Medication**

It is advisable to keep antibiotics away from chicks.Certain antibiotics, such as Enrofloxacin and Ampicillin, are used to treat bacterial infections.Vitamins A, E, Ca, and D are utilized to prevent deficiency illnesses in addition to the vitaminB complex. Furthermore, vitamin C and electrolytes are used to protect birds from heat stress.

**Curtain management**

From the outside, the gunny roll should be fixed throughout the shed. It should be open during the day and closed at night, depending on the situation. Curtain management should be determined by environmental conditions.

1. **Problems during brooding:**

**Stress:**During the early phases, vaccination causes stress and minor physical harm to chicks.Therefore, to prevent stress, birds should be handled with care.The birds will progressively approach the brooder heat as their feed intake declines.To ensure the comfort of the birds, the brooding temperature may need to be raised.

**Coccidiosiscontrol:**One of the most prevalent diseases affecting young chickens is still coccidiosis.It is recommended to administer anticoccidial medications to feed or water in order to inhibit oocyte proliferation.

**Unabsorbed Yolk:**Unabsorbed yolk seen during the first two weeks of autopsy is frequently associated to bacterial or other diseases. Young chicks cannot use yolk material when they have diseases that cause their body temperature to rise. Additionally, feeding chicks shortly after hatching slows down the absorption of yolk contents, thus its presence during the first 14 days shouldn't be considered serious. The absorption of yolks is also reduced when chicks are overheated during the first two days in the brooder house.

**Extreme weather:**Heat in the environment can cause serious stress to newborn chicks, even though they can withstand higher temperatures than older birds. Birds drink more water and eat less. Increase the amount of floor space allotted, as well as the feed and water. Moreover, free air movements can be started. The problem of cold weather should be reduced. Special consideration must be given to better housing, additional heating, etc.

1. **Management strategy during brooding**

Chick mortality during the first week in the brooder house is greater than any week thereafter during the growing period. Losses during the second week should be slightly less. Beginning with the third week, death should be at a relatively low weekly level and run rather uniformly until the end of the growing period. Most replacement pullets are successfully reared with less than 5% loss till point of lay. There are some management strategies followed for reducing chick mortality are as follow:

* + Purchase chicks from a reliable and trustworthy source that produces parent stocks that are healthy.
  + Chick mortality is increased by both high and low brooding temperatures. Therefore, maintaining the ideal brooding temperature for maintaing flock is crucial.
  + Chicks should be examined four times a day to make sure they are healthy and not under stress from the heat or cold and to record any unusual behavior (Barnett and Glatz, 2004).
  + Keeping the drinking trough, feeders, and drinkers clean; throwing away any leftover food and water.
  + When confined to a small space or exposed to insufficient heat, chicks may suffocate and die rapidly. To prevent this, ensure that the humidity and temperature in the brooding house are consistent throughout the pen and at the proper levels.
  + Moldy feeds can be toxic and harmful, causing serious problems and illness.The simplest approach to avoid moldy feeds on your farm is to keep them out of water.
  + Before feeding the birds, provide them water to keep them from stampeding while they fight for food.
  + Predators should be kept away from the farm.For this, surround the enclosures wih sturdy iron mesh nets and frequently apply predator repellents.
  + More than 25 ppm of ammonia causes serious issues, including as stress, poor feed intake, eye and nasal irritation, sluggish growth, and respiratory conditions like bronchitis and coryza.Therefore, removing damp or caked litter is crucial.
  + Inadequate or inappropriate nourishment might cause birds to grow and develop poorly.Make sure your birds have sufficient balanced nourishment.
  + Follow vaccination schedules for Marek's, Ranikhet illness, and Infectious Bursal illness (IBD).
  + **Debeaking** is cutting off part of the upper beak.It aids in reducing pecking injuries and cannibalism among chicks.It is done between the ages of one day and 6weeks.It might be necessary to repeat debeaking occasionally before the pullets are put in the layer or cage house, which is around 16 weeks of age.
  + **Dubbing:** For dayold chicks of some breeds with bigger or lopped comb, comb removal may be necessary.

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