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Care and Management of Poultry in Monsoon Season

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Introduction

Usually, the term monsoon refers to the rainy phase of a seasonally changing pattern. It is the time of year when most of a region's average annual rainfall occurs. Monsoon comes with the challenges of high relative humidity and fluctuations in temperature. Extremes of weather are always harmful to living beings, especially monsoon that favors the propagation of different kinds of pathogenic organisms like bacteria, viruses, fungi, parasites, and different vectors like flies, mosquitoes, etc. This requires due consideration and appropriate measures in poultry farming to maintain livability and efficient production.

I. Housing management

- A well-maintained shed helps minimize the climatic stress and health challenges in birds. Before the ensuing monsoon the roof of the house, and walls should be duly inspected and any kind of holes or leakages anywhere should be properly repaired. The drainage ditch around the shed should be clear. In the roofs, the side overhangs should be a minimum of 3 to 4 ft to prevent the entry of direct rainwater into the shed. The side walls of the empty shed should be completely covered with polythene curtains. Curtains should be in good condition and can easily be regulated depending on the ammonia concentration in the shed or rain intensity. Improper curtain management can result in poor ventilation in the shed leading to ammonia buildup and associated issues like improper digestion, abnormal respiratory sounds, and high incidence of ascites. Allow a 1-2 ft opening at the top of side curtains during the day to ventilate ammonia and other undesirable gases out.
- At least 10 ft outside the shed should be kept properly cleaned and free from bushes and grasses. If there is any water logging in the surrounding area it may cause a huge problem of insects in the poultry shed. Since monsoon is the breeding season for flies, there is always a big concern. Flies act as vectors for many viral, bacterial, and parasitic infections in poultry. Also, there is every chance of developing maggot wounds in case of loose drops/pasty vents. Cleanliness along with judicious use of insecticides and regular bleaching powder and formalin spray (3-5%) outside the shed can keep the insect population under control. Reduction in daylight hours (photoperiod) during the rainy season can be alleviated by providing artificial light to maintain optimum feed intake and egg production.

II. Litter management

- Litter is where the chickens spend all their life in a deep litter system. Rice husk, sawdust, and wood shavings are commonly used litter materials in poultry farming. Adequate care must be taken to manage litter. A good quality litter should be highly absorbent and should dilute the concentration of droppings. The litter thickness should be around 3 inches. Store at least 20% more litter material in a dry place to replace the wet litter material when required. There should not be any seepage from the floor wetting the litter. Wet and caked litter leads to

high built-up ammonia in the poultry house. Ammonia is generated by chemical and microbial degradation of uric acid, which is excreted by the birds. The resulting ammonium ions (NH4+) are converted into volatile ammonia, especially under alkaline conditions, higher temperatures, higher moisture, and higher NH4+ concentrations (Bittman and Mikkelsen, 2009). The maximum permissible level of ammonia in the litter is 25 ppm, though at 6 ppm concentration only, there will be irritation of the eyes and the respiratory tract and at 11 ppm reduced animal performance. Ammonia and other noxious gases irritate the eyes and by inhalation, damage the inner lining of the respiratory tract of the birds exposing them to infections.

- Wet litter causes the growth of mold, bacteria, viruses and germination of coccidial oocysts leading to various diseases and poor performance. Wet litter is also responsible for breast blisters and sores on the foot pads and hocks of the birds and hence, cases of more refusal by lifters or traders. Normally the ideal moisture content of the litter should be 20-25%. If the litter is too dry, the air becomes quite dusty and the respiratory system gets irritated and then easily invaded by microbes, in the process, the resistance against respiratory diseases goes down tremendously. Examine the litter regularly in monsoon, particularly where the drinkers are placed. The caked litter, if formed (indicating litter moisture> 40%), should immediately be discarded, and replaced with fresh litter. To get rid of this caked litter practice twice a day litter racking. To reduce the litter moisture, add 1 kg slaked lime and 150 gm bleaching powder per 100 ft2 floor area. The ceiling fan should be operated @ 1 per 300 birds in deep litter broiler farms. To prevent the growth of mould, new litter can be treated with a 2% aqueous solution of copper sulfate spray. To assess the litter moisture at the farm level, a sample of litter can be taken on the hand and pressed in the palm with the help of fingers. If the litter moisture is optimum, the compressed litter material shows crevices and gently falls apart. If the litter is too wet, it will form a cohesive ball or lump. If the litter is too dry, it will form no impression; it will crumble easily and fall apart.

III. Feed management

- During the monsoon season, birds may reduce their feed intake due to temperature fluctuations and relative humidity. Care should be taken during diet formulation about all the vital nutrients considering the seasonal impact on the feed intake. Do not store feed for long in monsoon. The shelf-life of feed is shorter due to high humid conditions in monsoon. Never allow feed in the bags to get heated up, and/or cake formation. These are preliminary signs of decomposition and mold growth. If the feed is coming from a faraway place, make sure that the transport vehicle is completely closed and there is no water leakage inside the vehicle 4-5 days extra feedstock should be kept in the farm to avoid frequent transportation on rainy days.
- The best way to store the feed bags is on the Dunnage system. The feed bags should be stacked on an elevated platform using wooden/bamboo pallets a minimum of 1 ft off the floor and away from the side walls to avoid any moisture contact also there will be a facility for free air movements under the bags. This will help to minimize the toxicity-related issues. Try to maintain the FIFO system in feed distribution. Avoid strict use of wooden feed troughs since it always leads to the growth of molds giving rise to toxin production. Plastic/polythene trough will be far better to use for easy cleaning and disinfectant purposes. At least once daily the feeder should be wiped with dry cloths. Special care should be taken during feed formulation in a monsoon while selecting in feed anticoccidial and a broad-spectrum mycotoxin binder.

IV. Water management

- Drinking water quality is often an afterthought in many poultry farms. However, a clean, safe water supply can have a huge impact on flock performance. Water quality can be easily affected during the rainy season, especially the surface water. *E. coli* and other coliforms count in water are generally higher during this season. Contaminated water sources can easily cause outbreaks in chickens. So, it is essential to maintain regular water sanitation. Water sanitizers should be used with sufficient contact times and applied with an appropriate dosing. Acidification of drinking water

lowers the pH and a lower water pH has been shown to reduce populations of bacteria, such as *Salmonella*, *Campylobacter*, and *Clostridia* in the crop before they reach the lower digestive system (Watkins *et al.*, 2004). Research shows that poultry prefers water with a pH ranging from 6 to 6.8. But a target can be taken to keep the drinking water pH around 5.0 to 5.5 to retard the growth of most pathogens. Acidified drinking water also can help mitigate the adverse effects of stress (Hamid *et al.,* 2018).

- Drinkers should be cleaned daily with detergents and bleaching powder to reduce the occurrences of water-borne diseases. Pipelines should be cleaned at least once a week. This will help in reducing the biofilm formation inside the line. Oxidation-Reduction – Potential (ORP) is one method used to evaluate the ability of a sanitizer to be a strong oxidizer for destroying bacteria, viruses, and other organic materials present in water or for reacting with harmful minerals such as iron and manganese. An ORP value in the range of > 650 mv indicates good quality water that can effectively be sanitized by as little as 2-4 ppm free chlorine (Oviedo, 2006).

V. Disease management

- The inclement weather during monsoon can cause bird's immunity to take a beating as infections are rampant and the increased humidity can contribute to several outbreaks. Insect population and rodent activities also increase during this time as a result of local crop growth. All together creates a huge challenge to poultry farmers with high morbidity and mortality rates.

Below are some of the diseases commonly encountered in poultry rearing during the rainy season.

1. Mycotoxicoses

- These are diseases resulting from consumption or exposure to mycotoxins. Mycotoxins are secondary metabolites of certain filamentous fungi (primarily to the species of the Aspergillus, Penicillium, and Fusarium genera) found in grains, cereals, and forages, that can cause serious health problems in animals, especially chickens. Mycotoxins affect all poultry species, mainly causing severe immunosuppression along with decreased weight gain, poor feed efficiency, reduced egg production and egg weight, liver, and kidney damage, etc. Preventive measures, like proper monitoring of ingredients, limiting highly contaminated raw materials, and use of a broad-spectrum toxin binder in the feed, can help a great extent reducing the risk of mycotoxins in poultry production.

2. Inclusion Body Hepatitis (IBH) and Hydro-pericardium Syndrome (HPS)

- These are highly contagious diseases caused by chicken Adeno viruses, predominantly in young broilers, characterized by hemorrhages and necrotic changes in the liver and kidneys, accompanied by intra-nuclear inclusion bodies and hydropericardium resulting in sudden onset of mortality with high FCR. Immunosuppressive diseases, like Infectious Bursal Disease (IBD) and Chicken Infectious Anaemia (CIA), help Adeno viruses to produce IBH. Both live and inactivated vaccines are available for control. Strict biosecurity measures at the farm level must be implemented to restrict horizontal transmission.

3. Infectious bursal disease (IBD) or Gumboro disease

- It is a highly contagious viral disease of young chickens characterized by depression, watery diarrhea, ruffled feathers, and dehydration. The virus infects immature B-lymphocytes and causes immune suppression that leads to secondary infections in convalescent birds. The infection spreads easily from bird to bird by way of droppings. Infected clothing and equipment are means of transmission between farms. In monsoon, the disease may be further complicated with mycotoxicoses. There is no such treatment. Vaccination of breeders and young chicks is the best means of control.

4. Coccidiosis

- It is one of the biggest causes of economic losses in poultry worldwide. It is caused by a protozoan parasite *Eimeria spp.* in poultry. The disease course is rapid (prepatent period 4–7 days) and is characterized by parasite replication in host cells with extensive damage to the intestinal mucosa. In

monsoons, wet litter, oxygen, and warm temperatures create the ideal environment to induce sporulation of the coccidian oocysts and therefore, the outbreak of coccidiosis. The clinical form of the disease is generally characterized by defective digestion and absorption, diarrhea, blood loss, dehydration, and increased susceptibility to other diseases. The main financial losses are caused by the subclinical form of the disease, leading to poor performance. Treatment is costlier, so control should be followed in broiler chicken. Anticoccidial compounds are used in feed to prevent disease and the economic loss often associated with subacute infection. At the farm level, during terminal disinfection, using 10% liquor Ammon forte (0.89%), i.e., 2.5 lit liquor Ammon forte in 25 lit of water per 1000 ft^2 of shed can reduce the chance of occurrence of coccidiosis in the next flock to a great extent.

5. **Necrotic enteritis (NE)**

- It is the most common and financially devastating bacterial infection in modern broiler flocks. Necrotic Enteritis is caused by the Gram positive, toxin-forming, spore-forming, anaerobe Clostridium perfringens found in soil, litter, dust, and at low levels in the hind gut of healthy birds. Chickens infected with coccidiosis are more likely to develop the disease. 2 - 5 week old broiler chickens raised on litter are more prone to the acute clinical form, showing severe depression, reluctance to move, diarrhea, ruffled feathers sudden death, and increased mortality. The subclinical form produces no outward signs but has a big impact on performance, like weight loss, reduced weight gain, and impaired FCR. For decades, antibiotic growth promoters, like BMD, enramycin, lincomycin, and avilamycin have been used regularly to prevent necrotic enteritis. On chicken farms, heating the humid litter considerably decreases the number of viable spores. Adding consortiums of probiotics to feed is the most effective and sustainable solution in both preventing and treating clinical necrotic enteritis, presumably by competitive exclusion of *C. perfringens*.

6. **Colibacillosis**

- It is caused by infection with avian pathogenic *Escherichia coli* (APEC). It is an ever-green disease in poultry and is considered among the most economically devastating bacterial diseases of poultry worldwide. During the rainy season, *E. coli* is transmitted to chickens mainly from fecal contamination of water. Immunosuppression from IBD and/or aflatoxicosis makes the bird more susceptible to the infection. Antibiotics based on antibiotic sensitivity tests can be used for treatment. Prevention of colibacillosis relies on good hygiene management, hatching egg management, and drinking water management practices like proper water sanitization, regular cleaning of drinkers, pipelines tanks, etc.

7. **Aspergillosis**

- It popularly known as brooder pneumonia is an upper respiratory tract infection of young chickens caused by the fungus Aspergillus fumigatus. Transmission is by inhalation of fungus spores from contaminated litter (e.g., Damp sawdust, wood shavings, straw) or contaminated feed. Hatcheries may also contribute to the infection of chicks. Symptoms include respiratory distress (dyspnoea and gasping), sleepiness, emaciation, etc. There is no specific treatment for infected birds. The use of 1: 2000 copper sulfate solution mixed with vinegar (acetic acid) in drinking water has shown some results in checking initial mortality. Strict hatchery hygiene, litter management with 2% $CuSO_4$ spray, proper ventilation, and strict bio-security measures can reduce the chance of infection.

Maintenance of a commercial poultry farm during the rainy season

Conclusion

- Monsoon poses unprecedented challenges to poultry farmers in India, necessitating the implementation of effective strategies. By following effective farm management techniques, biosecurity measures and adopting judicious nutritional approach poultry producers can overcome the myriad challenges and maintain productivity levels on the farm.

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