

Factors leading to early Broiler Chick Mortality

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The profitability of any broiler enterprise is hinged on the number, quality and weight of the birds that make it to slaughter stage. A good number of small scale poultry farmers in Zimbabwe are not very particular about the quality of the meat produced or the weight as it is usual that one sells off live birds at a fixed price regardless of the parameters mentioned above. This article focuses on what most of us think matter the most, that is the numbers that make it to slaughter or to the market. Whilst it is desirable for any to have 100% survivability, it remains normal to incur some mortalities in the broiler business. Suppliers of day old chicks and poultry production experts state that for these modern genetics a mortality of 5% is acceptable as normal and does little impact to your bottom line and anything above that should be cause for concern. That withstanding it is commonplace for one to experience a batch of chicks that just die in large numbers often without very good explanation. When this occurs within the first 14 days of chick placement, it is generally known as early chick mortality and the various causes of early chick mortality are explored hereafter.

Hatchery Problems

The hatcheries have an obligation to deliver good quality chicks. Generally a good quality chick is one that is alert, active, well hydrated, free of diseases and deformities. There are chicks that succumb within the first two weeks of their lives owing to errors committed at the hatcheries. At day old a farmer can detect a problem chick by checking to see if the legs are dehydrated. Also take note of the colour of the legs and hocks. If the hocks and legs exhibit a reddish pigmentation accompanied by swelling, that chick will surely succumb before depletion time. Obvious candidates for early mortality are detected by inspecting the underside of the day old chicks. If you notice black dots on the belly just about the navel and or a large yolk sac, that alone spells trouble. An inappropriately absorbed yolk and unhealed navel often leads to a fatal disease called ***omphalitis***, which is a result of the invasion of the navel and yolk sac by bacteria. This condition is responsible for some of the mortalities that occur within 7 days of chick placement. These problems are the direct responsibility of the hatcheries' quality control department to screen out chicks with the above-mentioned anomalies. However time and again one such chicks find their way onto the market either by way of human error or otherwise.

Diseases

It is important to note the role played by infections in early chick mortality. Owing to the fact that the chicks are still young and lack the requisite capacity to fight off infection, mortalities due to infection can be quite rife within the first 10 days. This normally accompanies a breakdown in bio-security. There are several diseases associated with early mortality but the most common ones are pullorum, salmonellosis, colibacillosis. These diseases are discussed briefly below:

Pullorum disease is an acute systemic disease in of young birds. The distinguishing sign of pullorum disease is a white diarrhoea, ruffled feathers, breathing difficulties, chirping and high death rate. The morbidity and the mortality are particularly high between the 7th - 10th day after placement. The affected chickens appear somnolent, depressed and their growth is retarded. The feathers around the vent in many chickens is stained with diarrhoeic faeces or pasted with dry faeces.

Colibacillosis is a respiratory disease common in young birds, as it capitalises on immune-suppressed birds. Morbidity can vary and mortality ranges between 5-20%. The major signs of colibacillosis are respiratory afflictions, coughing, sneezing and snick. The disease also causes reduced appetite and resultant poor growth rates.

Salmonellosis is a group of acute rapidly spreading diseases caused by various sub-types of salmonella bacteria. It affects birds of any age even up to 90% of the flock but resultant mortality is low. Major signs of salmonellosis infection are diarrhoea, vent pasting, loss of appetite, ruffled feathers, crowding close to heat sources, sitting with drooping wings and closed eyes.

Nutrition

It is important to ensure that the feed taken by the chicks is balanced enough to provide all the nutrients required by the birds in order to achieve the expected growth rates. In addition to that feeds should be of good quality that is free from disease causing organisms, moulds and other adulterants because feed can act as a portal via which toxins enters the birds.

Vitamin deficiencies: Vitamins are essential and they are derived from the diet taken in by the birds. In older broilers dietary shortage of these vitamin is not detrimental because they tend to have stored vitamins in the liver. Day old chicks tend to depend on the vitamins passed on from parents through the egg and this lasts only for 7 days. If diet is deficient in vitamins then problems start to manifest. General signs of fat soluble vitamins(i.e A,D,E & K) in chicks are growth retardation, anorexia, weakness, incoordination, emaciation and ruffled feathers; whilst lack of water soluble vitamins(B- complexes and C) is shown by loss of weight, poor feathering, poor growth, dermatitis, perosis, nervous signs and anaemia. Vitamin deficiencies are not always fatal except in severe cases. The significance of vitamin deficiency is that it predisposes the birds to infections as it compromises immunity build up. Further the lack of vitamins interferes with the metabolic processes which can result in gross malfunctioning of vital such organ as the brains. Such cases often lead to mortalities.

It is prudent to mention at this stage that it is not only deficiencies that can be fatal, the opposite is also true. An excess of one or more nutrients above the optimum level can prove to be very fatal. A good example is salt poisoning. If salt is taken excessively via feed or water intake it results in early chick mortality which are often difficult to explain.

Farmers should ensure that they use fresh feed as mouldy feeds expose the young birds to mycotoxins. These are poisons that found in mouldy feeds and grain as fungal metabolic by-products. Mycotoxins are highly fatal and when present in very good concentrations can cause sudden high mortalities upward of 80%.

Poor husbandry Practices

Many farmers are always found wanting when it comes to general management of the birds, the poultry house and adherence to bio-security protocols.

Brooder temperature: Whilst it is common knowledge to all that day old chicks require brooding where a source of heat is provided, the common problem encountered most of the time is getting the temperature right. When brooding temperatures are above optimum (i.e. between 30 °C – 32 °C during the first week), the chicks become heat stressed and after prolonged exposure to such conditions, they die of dehydration and vent blockage. On the other hand when temperatures slump lower than desired the chicks are hit by pneumonia and mortalities do occur by chilling. When cold the young birds tend to stop feeding, huddle together and in most cases more chicks die of smothering than from the low temperatures. To do away with this problem farmers should ensure that recommended temperatures are achieved, stabilised and maintained. This temperature should be measured at chick level.

Ventilation: Adequate ventilation is a key factor to broiler survival especially in the first 2 weeks. Good ventilation allows for equitable distribution of heat around the house as well as maintain good air quality. Poor ventilation leads to accumulation of noxious gases such as ammonia, carbon monoxide and carbon dioxide. Ammonia gas is very toxic and it kills chicks in large quantities once it surpasses 100ppm (*parts per million*). Whilst it is impossible to run an ammonia free poultry house, it is recommended to keep the concentration ammonia below 10 ppm. The following signs point to an uncomfortable level of ammonia gas in the house: irritation of mucous membranes and eyes, reduced feed intake, retarded growth rate, haemorrhages and death. Carbon monoxide tends to accrue when one uses fossil fuels as source of heating in the poultry house for it normally comes from incomplete combustion of fuels. Carbon monoxide is quite toxic to chicks at concentrations between 2000-3600 ppm whilst carbon dioxide causes serious respiratory challenges, suffocation and death when its concentration in the air goes beyond 30% by volume.

Humidity: Away from poisonous gases that can bedevil the air, it is important to note that the ventilation mechanism should take care of the humidity levels of the air in the poultry house. High relative humidity can compromise litter quality and create a conducive environment for the proliferation of pathogens. It can also delay the healing and drying up of navels in day old chicks paving way for the entry of bacteria resulting in omphalitis and death.

Floor space: This is one parameter often taken for granted by smallholder farmers unbeknown to them that it has the potential to decimate one's project. In crowded pens chick mortalities are rife due to physical stampede as well as dehydration and starvation resulting from inadequate feeder and watering space. When chicks are crowded the litter is constantly damp which creates an enabling environment for diseases to thrive and in such cases ensuing mortalities are inexplicable.

Bio-security: As you seen earlier in this article, early chick mortality can be caused by infections and most of these are bacterial. The occurrence of a bacterial infection is testimony to prevalence of unsanitary conditions in your environment. This is resultant of failure to observe bio-security protocols and proper sanitation measures. All this comes about as a result of poor management on the part of the farmer.

Conclusion

Farmers can minimise early chick mortalities by ensuring that they procure their day old chicks from reputable suppliers whose standards are certified in order to avoid inheriting problems that were cultured at the hatchery. The same could be said of the feed which without doubt should be purchased from reputable stockfeed compounders famed for churning out quality feed as a way of avoiding deficiencies as well as toxicity. Having acquired quality supplies, it then remains the farmer's duty to make sure that his management practices ensure a conducive environment for the chicks to thrive and does very little to allow disease a chance to creep in. This and a little more will surely see one managing to push a batch up to slaughter stage having lost only 5% of the birds or less.

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