The right heat, the right air: best results

Marcos Grassini, Alfa Chicks

In our previous article we discussed the importance of temperature in the production of broiler chicks. My plan was to discuss ventilation in this article, however due to the cold winter that we are experiencing and the problems that we are seeing in the field, it is clear that we need to revisit the importance of temperature control in the cage.

Remember, temperature is king! If you can maintain the cage temperature as required you are well on your way to raising healthy, big and uniform chickens within the shortest possible period.

If your house temperature is not correct from the start, you may experience immediate high mortalities within the first 24 hours, and the chicks that do not die in the first few days of life may pick up infections that will kill them later on in the cycle. So it is very important to get the temperature right from the beginning and to maintain it throughout the cycle.

As mentioned in the previous article, an environment in which the chicks feel comfortable will encourage them to start eating and drinking from the start, which in turn ensures that they absorb all the nutrients and maternal antibodies that are contained within the yolk sac inside of the chick. If this yolk is not absorbed into the chick as soon as possible, it will start to rot. This will then result in high mortalities during the first week of life. Should the chick survive the first few days, the bacteria within the chick that thrives as a result of the rotting yolk sac contents will eventually kill the chicken at a later stage - after it has eaten all your feed. This is commonly known as 'mushy chick'.

Failure to maintain the correct temperature will also result in poor uniformity and a poor feed

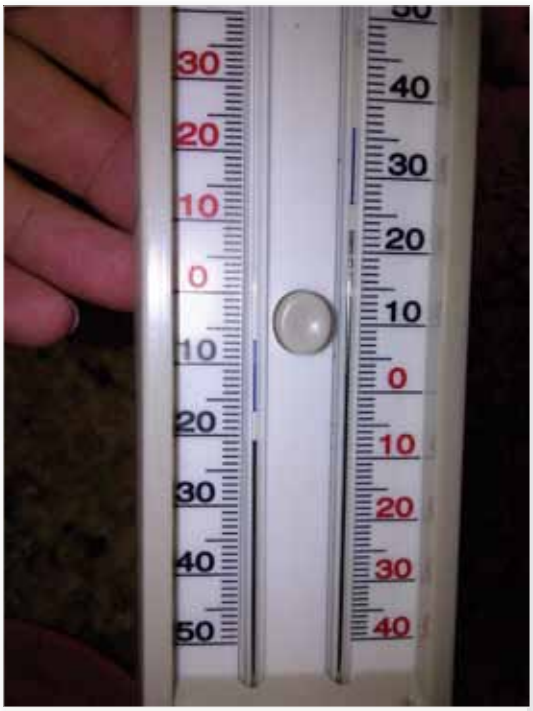
Photo left: **This photo represents poor preparation overall in terms of feed, water and temperature control. Although the brooding area of this broiler house is in place, only a small section of the cage has heaters in place. This is totally insufficient. Also, not enough feed has been placed and none of the feed is near the heat source. All the chicks will gather under the heat source and only go to the feed and water when absolutely desperate. This is a very poor start, which will lead to poor growth and a high occurrence of yolk sac infection. Also note that no temperature monitoring equipment is in place. The cage was too cold for the chicks to be unpacked, so they were kept in the boxes until more heaters were in place later on in the day.**

conversion ratio. Where the environment is too cold, the energy from the food will go into keeping the chick warm and alive rather than into growth/meat. However, if the cage is too hot the chicks will not have a good appetite and again poor growth may result.

It is very important to note that all temperature recording and controlling equipment is placed at chick height and not directly under the heat source.

Top temperature tips for tiny chicks:

1. Ensure your cage is well sealed and insulated, and that there are no air leaks. Shade cloth is not adequate for use here.
2. Ensure your floor is well insulated with fresh, clean (disinfected) wood shavings at least 10cm thick.
3. Make sure you have enough thermometers spread throughout the cage (in working condition at chick height) to ensure that you are able to monitor the temperature throughout the entire cage. A range of manual and electronic temperature recording equipment is commercially available to use for this purpose and is well worth the investment for the successful production of broiler chickens.
4. It is very important to note that all temperature recording and controlling equipment is placed at chick height and not directly under the heat source.
5. Ensure that your heaters are operated by automatic temperature controllers (thermostats) that turn the heat sources on and off as required to maintain the desired temperature.
6. Test your house's heating equipment to ensure it is in proper working condition. Run the heating equipment two or three days before your chicks arrive over a 24-hour period, making sure to note the minimum and maximum temperatures throughout the chicken house during this 24-hour test period.
7. During the 24-hour test period, the temperature should remain consistent at about 32 °C. If this is not the case, you need to increase the heat source (add more heaters).
8. Feed and water should be placed near the heat source so that the chicks do not have to move out of the warm areas to feed and drink. If the feed and drink is only available in the cold areas, the chicks will only eat and drink when they are absolutely desperate and this will result in poor and non-uniform growth



This minimum/maximum thermometer shows that the temperature in the house had dropped to 17°C, and the highest it had been was around 22°C. This is definitely not sufficient when trying to get quality chicks to perform to their maximum potential.

and a lot of mortalities in the first few days.

9. Make sure your brooding area is in place: you should not place more than 55 chicks per square meter during the brooding period. (*For more information on brooding, refer to the article on page 40 of the May edition of Poultry Focus Africa*). Place a solid surround of 0,5m high around the chicks in the brooding area.
10. In the winter months it is very important to have a back-up heat source in case of electrical failure or gas supply problems, or in the event that equipment may fail.
11. For the first 48 hours after placing the chicks in the house it is imperative that the temperature and chick behavior is checked every two hours. This will ensure that the chicks are kept at a constant temperature of 32°C. Immediate action should be taken in the event that the temperature is too high or too low.
12. Fans should also be used to circulate hot air in the cage. The fans must blow horizontally over the heat sources and never be directed at the chickens. The purpose of this is to ensure a proper mixing of the air in the cage to eliminate hot and cold spots in the cage. This will also help with ventilation.
13. Record all temperature readings on paper graphs, especially the minimum and maximum temperature readings, and remember to make a note of the time at which the temperature reading was taken. Also remember to reset the min/max thermometer when recording the temperature.

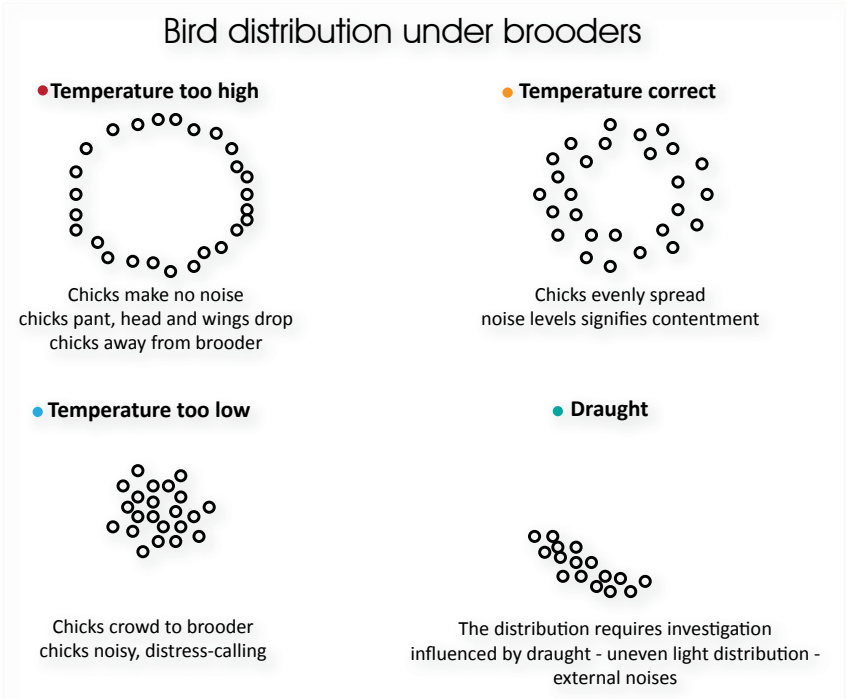
Please remember that no matter how difficult you think it may be to reach and maintain the required temperature, many small-scale producers have been able to do so by simply sticking to the rules and good advice given in this regard. Where there is a will there is a way.

Successful winter farmers make very good money because the weaker competition loses market share due to high mortalities and poor growth of their birds. It is always disappointing to see farmers who do not realise the full potential of their chicks – and therefore their business – by not sticking to the above rules when farming in winter.

Ventilation

Ventilation is important for a few reasons and is very closely related to temperature control.

The air in the broiler house needs to be exchanged to ensure that carbon dioxide (CO_2) is removed and replaced with fresh air containing oxygen (O_2). Effective ventilation also removes other harmful gasses and fine particles containing bacteria or viruses and prevents these from being introduced into the litter.



The behaviour of the chicks and their distribution in the house and around the heat source will tell you whether the temperature in the house is correct and even. If this is not so, action should be taken to correct the problem immediately.

In addition, the water vapour contained in the air exhaled by the chicks needs to be removed from the cage to prevent condensation forming on the inside of the cage roof, resulting in water droplets falling onto the cage floor and wetting the litter, which can in turn cause endless problems.

Ventilation is important for correct temperature control at chick level.

A few important points to consider around the subject of ventilation:

1. Side curtains should open from the top down.
2. For maximum effectiveness of the side curtain cage it is recommended that an adequately sized extraction fan is installed as high as possible in the cage.
3. The cage should be sealed as near to air tight as possible and the only air entering the cage should be through the side gaps created by lowering the side curtains.
4. Hot air from the heat source rises and accumulates in the roof nock of the cage. Through using the curtains and creating negative pressure within the cage with an extractor fan, it is possible to force fresh air up along the inside of the roof. This fresh, cooler air then mixes with the warm air that has accumulated in the roof nock and the mixed air then sinks down to chick level where it provides air exchange in the form of fresh air and it dries the wet litter before being expelled through the extraction fan.
5. It is very important that the chicks are not subjected to cold or hot drafts, as this will upset them and make the environment very uncomfortable for them - resulting in poor performance.
6. Invest in the proper infrastructure. Future performance and returns will justify the capital cost of building a proper broiler house.
7. Proper ventilation means that litter remains dry and prevents the formation of ammonia. It also reduces the severity of bacteria formation in the bedding. This is important because high ammonia levels affect the birds' respiratory immune system, allowing bacteria and viruses to enter the chicken during respiration (breathing).
8. If chicks do not receive proper ventilation from day one throughout their lifecycle, they will die from conditions such as ammonia poisoning, *E coli* infections and heart attacks and will be prone to catching viruses like brucellosis (Gumboro) due to general weak heath.

Remember: you have an obligation to keep your livestock in a good, healthy condition - and you are farming to make money, not to waste money.

Although every effort has gone into ensuring that the information given in this article is accurate and complete, there are many aspects that may merely be touched on or left out all together. It is important that producers know what to do to best take care of their flock and achieve the best possible farming results. For more in-depth advice or information, please contact Marcos at Alfa Chicks on 012 561 1205 or at sales@alfachicks.co.za.

A paper graph like this is ideal to use in recording the temperature readings in the broiler house. The areas marked in green indicate the safe, correct temperature range. As the birds get older, they are better able to cope with colder house temperatures. Record the temperature readings in the house on day one, before the chicks are placed in the house. Record the minimum and maximum temperatures twice a day, at the same time each day (for example at 07h00 and at 17h00). If the temperature readings are out of the green range, take immediate action to correct it.