

EFFECTIVE TEMPERATURES FOR CHICKS & BROILERS

Insufficient control of the chick or broiler environment is what prevents a lot of poultry companies from obtaining the genetic potential of the birds. The objective of this article is for poultry personnel to work actively with the effective temperature concept. This article # 110 is a follow up of other articles on ventilation. The information on page 2 is extremely useful to manage the correct (effective) temperatures in broilers and breeders. It is recommended to print the page, have it LAMINATED for its use in the houses.

The most common concept errors in the area of ventilation are:

1. Excess air speed over the chicks in the first 21 days. This causes the energy of the feed to be used to maintain body temperature instead of being used for growth.
2. Too much temperature fluctuation during the 24 hours of the day giving the same negative effect as point # 1, especially in chicks in the first 14 days.
3. Failing to understand what Relative Humidity (RH) really means and its importance when heat stress is observed in broilers (over 28 days). It is the RH that kills broilers not temperature as such.
4. That more airspeed over the birds is better in tunnel ventilated houses. The maximum airspeed in broilers that is economical is 500 feet / minute (f/m). More airspeed increases electrical cost considerably and in general is also not feasible, then with the increase in airspeed, increases the negative pressure and decreases fan volume of the air they move.

**Air Temperature & Air Speed
over chicks and birds**
For broilers and parent stock

- 1^a week – Still Air - Max. 15 f/m. Temp. 32 °C (90 °F) of litter and immediately below the brooders temperature between 35 and 37 °C (100 °F).
- 2^a week – Still Air - Max. 30 f/m. Temp. 29 °C (84 °F)
- 3^a week - Max. 100 f/m. Effective Temp. 27 °C (81°F)
- 4^a week - Max. 200 f/m. Effective Temp. 25 °C (77 °F)
- > 28 Days - Max. 500 f/m. Effective Temp. 22 °C (72 °F)
- > 35 Days - Max. 500 f/m. Effective Temp. 18 °C (64 °F)

■ EFFECTIVE TEMPERATURE = Dry Bulb Temperature with Relative Humidity and Air Speed (Wind Chill Index) across the birds. Temperature that the birds really feel.

In the following page one can determine what should be the airspeed for the birds to feel comfortable with, in order to be able to convert the maximum of feed energy into growth (GPD).

DRY BULB TEMPERATURE - % RH & EFFECTIVE TEMPERATURE

| ACTUAL TEMPERATURE | | % RH | | AIR SPEED IN FEET PER MINUTE | | | | | |
|--------------------|------|------|-----|------------------------------|------|-----------|-----------|-------------|-------------|
| °F | °C | 50% | 70% | 0 | 100 | 200 | 300 | 400 | 500 |
| 95 | | * | | 95+ | 90 | 80 | 76 | 74 | 72 |
| | 35 | * | | 35 | 32.2 | 26.6 | 24.4 | 23.3 | 22.2 |
| 95 | | | * | 101 | 96 | 87 | 84 | 79 | 76 |
| | 35 | | * | 38.3 | 35.5 | 30.5 | 28.8 | 26.1 | 24.4 |
| 90 | | * | | 90+ | 85 | 78 | 75 | 73 | <u>70</u> |
| | 32.2 | * | | 32.2 | 29.4 | 25.5 | 23.8 | 22.7 | <u>21.1</u> |
| 90 | | | * | 96 | 91 | 84 | 81 | 78 | 74 |
| | 32.2 | | * | 35.5 | 32.7 | 28.8 | 27.2 | 25.5 | 23.3 |
| 85 | | * | | 85+ | 80 | 76 | 73 | <u>70</u> | 68 |
| | 29.4 | * | | 29.4 | 26.6 | 24.4 | 22.8 | <u>21.1</u> | 20.0 |
| 85 | | | * | 89 | 86 | 81 | 78 | 76 | 74 |
| | 29.4 | | * | 31.6 | 30 | 27.2 | 25.5 | 24.4 | 23.3 |
| 80 | | * | | 80+ | 76 | 72 | <u>70</u> | 66 | 65 |
| | 26.6 | * | | 26.6 | 24.4 | 22.2 | 21.1 | 18.9 | 18.3 |
| 80 | | | * | 83+ | 79 | 76 | 74 | <u>69</u> | 67 |
| | 26.6 | | * | 28.3 | 26.1 | 24.4 | 23.3 | 20.5 | 19.4 |
| 75 | | * | | 75+ | 73 | <u>70</u> | 68 | 64 | 62 |
| | 23.9 | * | | 23.9 | 22.8 | 21.1 | 20 | 17.7 | 16.6 |
| 75 | | | * | 78 | 76 | 74 | 72 | 68 | 66 |
| | 23.9 | | * | 25.5 | 24.4 | 23.3 | 22.2 | 20 | 18.8 |
| 70 | | * | | <u>70+</u> | 66 | 65 | 64 | 62 | 61 |
| | 21.1 | * | | 21.1 | 18.9 | 18.3 | 17.7 | 16.6 | 16.1 |
| 70 | | | * | 74 | 69 | 67 | 66 | 65 | 63 |
| | 21.1 | | * | 23.3 | 20.5 | 19.4 | 18.8 | 18.3 | 17.2 |

Effective Temperature °F + RH % = Index

| Index # | Consequences |
|---------|--|
| 150 | Or lower, no problem for the birds. |
| 155 | Danger (example 86 °F + 69% RH). |
| 160 | Panting, loss of production, less feed consumption in broilers & less GPD. |
| 165 | Start of mortality. |
| 170 | High mortality (ex. 95°F + 75% RH). |