

# Cooling system for poultry house with micro sprinklers and foggers

## Background

Chickens and turkeys are sensitive to high temperatures.

High temperatures lower the chicken's metabolism, which reduces egg production.

Extremely hot days can even raise the mortality rate.

A cooling system is critical in order to achieve high production rates and increase efficiency.

Poultry houses with layers (egg-laying hens), broilers (chickens farmed for meat) and free range chickens all require some kind of cooling system

## Cooling Principles

The cooling concept is based on evaporative cooling. There are three main systems:

### 1. Fogger system with exhaust fan extraction—

Evaporation of small water droplets that float along the poultry house. As the fine droplets evaporate, they cool the entire room with minimal wetting of the ground floor.

### 2. Micro-sprinklers—Cooling of the chickens' bodies with larger droplets that fall directly onto the chickens (mainly for layers and turkeys).

This system can be combined with air extraction. It can be operated independently for poultry houses that don't

have any other cooling system, or as support for the wet pad system on extreme hot days (providing additional moisture).

### 3. Wet Pad system—Moisture enrichment and cooling of the poultry house by means of suction of dry air from the outside through a wet pad.

There are two types of wet pads:

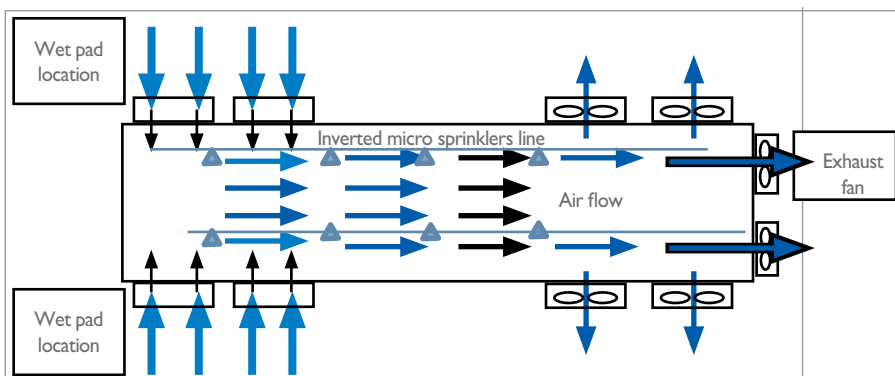
1. Water circulation and air ventilation through a pad made of special grade paper in a honeycomb configuration.

2. Multiple black net layers, instead of the above "wet pad".

It's similarly based on a fan system and are moistened by 180° sprayers (Modular or 7110), without the need for a circulation system.

## System Structure, Design and Operation

### 1. Tunnel House—Wet Pad and Internal Micro- Sprinkler System



## 2. Simple Wet pad –Net & Sprayers

The design for a 150 m house would be a net wall section length of about 15 m

Sprayers: Modular 180° 70 l/hr mounted along the net every 2.0 m

Operation in pulses according to climate controller sensor for 30-60 secs

Outside

A wall of 2-3 layers of black net with modular 180° sprayers mounted on top.



The green carton is lifted when the cooling system is operated

Inside



Modular 180°, 70 l/hr every 2.0 m



An alternative method:

A cooling net is placed along the side of the poultry house. A half-circle modular sprayer, 40-70 l/hr, is mounted along the net every 2.0 m and is operated in pulses.

Large fan on the other side of the poultry house suck external air through the wet pad.



## Traditional Small Farming Open Poultry Houses

This type of farming is mainly for layers and turkeys. Turkeys are sensitive to smaller droplets under 50 microns.

Micro-sprinklers (modular model with LPD) are very effective in natural ventilated conditions of open poultry houses.

Low flow nozzles and low precipitation, combined with a timer controller, minimize excess of water on the floor.

- Dan Fogger controller with temperature sensor
- Modular inverted sprinkler 40-105 l/hr, at 2.0-2.5 bar
- Filtration recommendation: 200 microns

\* Water quality and possible stains on eggs are factors to be considered when selecting the suitable system for layers.



## Guideline for design

House width (m)	No. of laterals	(Spacing (m)		Nozzle flow rate (l/h)	Precipitation rate (mm/h)
		Between sprinklers	Between laterals		
10	2	6	5	70	2.3
12	2	5	6	70	2.3
14	3	6	5	70	2.3
14	2	6	7	100	2.4
16	3	5	6	70	2.3



## Guideline for operation Time vs. Temperature

On very hot, dry days shorten the intervals, according to chickens' behavior.

(As a rule of thumb, the surrounding temperature is restored after 3-5 min.)

For young chickens without feathers, apply shorter pulses

.Temp (°C)	Duration ((secs	Intervals (.min	Water consumption (liters) for 6 hr a day, house size 100*16m
28-30	40-50	15	1230
30-33		13	1415
34-36		10	1840
37-41		8	2300
over 41		4	4600

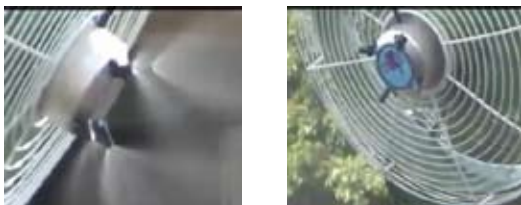


## Fogger System Design

Super Fogger 4 outlets with 3 x 3 or 3 x 4 m spacing  
Required pressure: 4.0 bar  
Flow rate: 24 l/hr  
Precipitation rate: 2.7, 2.0 mm/hr, according to spacing  
Height of installation: maximal height  
Operating time: a few seconds to 1.0 min, depending on ventilation operation time  
Basic operation is a sequence of 5 seconds on, 1.0 min. off.  
Adjust the time, according to temperature and humidity.  
Filtration: 120mesh \ 130 micron



## Rotating Fan system with fogger nozzles



## Medicine application

A separate system can be used with the fogger system for the injection of medicines.



## Climate control system

