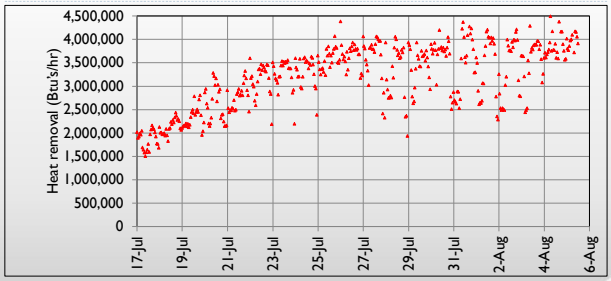
1

1. Run fans at night

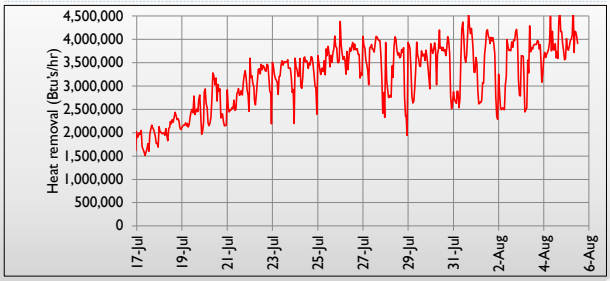
2

Bird heat removal in 50' X 560' house



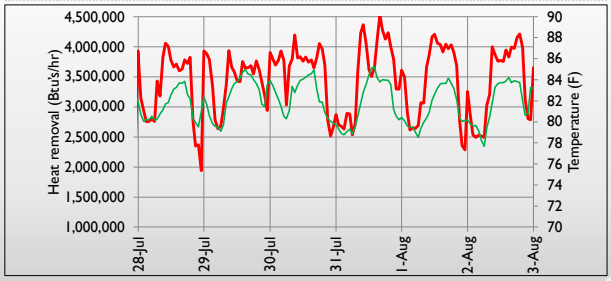
3

Bird heat removal in 50' X 560' house



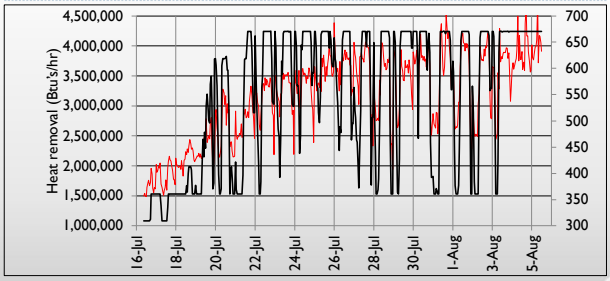
4

Lowest heat removal occurred when air temperatures were at their lowest



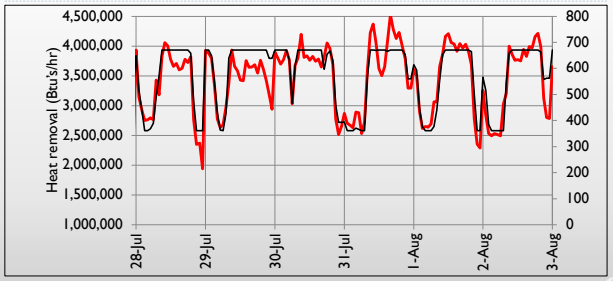
5

But air speed was not a constant…



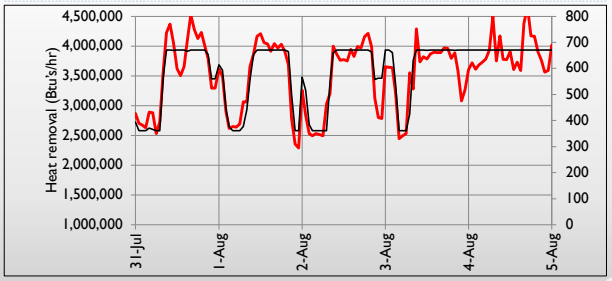
6

It was significantly lower at night because fans were shutting off



7

Which resulted in a 20% decrease in daily heat removal

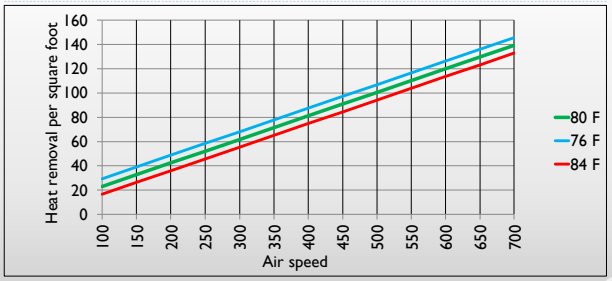


8

Heat removal chart was developed from data collected from this particular house

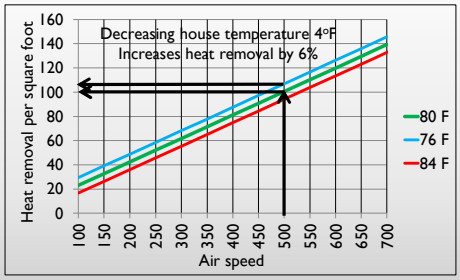
9

Heat removal as a function of air speed and house temperature



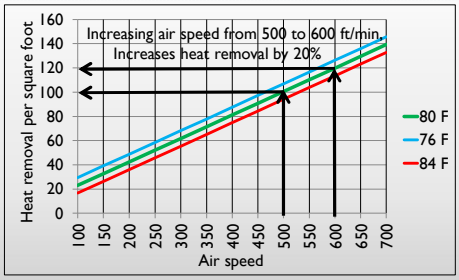
10

Air temperature and heat removal



11

Air speed and heat removal



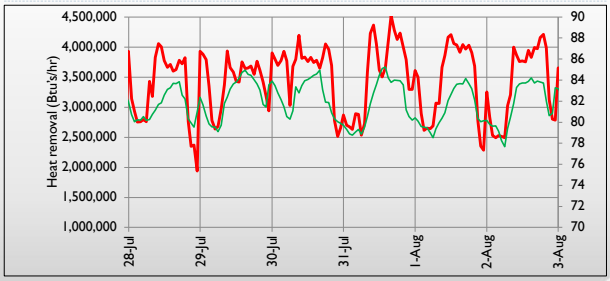
12

Air speed vs. temperature

- At normal summertime operating conditions
  - 76°F to 84°F = Rh > 80%
- **Air speed is far more effective in removing heat from the birds than air temperature.**

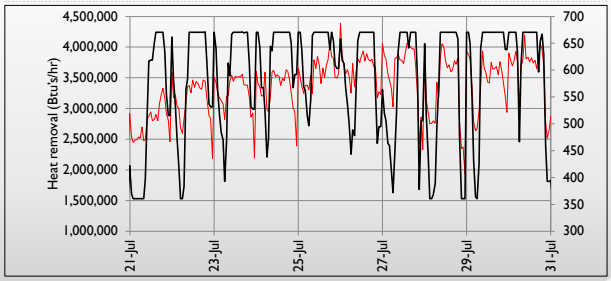
13

It is important to realized that inside a house it may only be 4 to 6 degrees cooler at night!



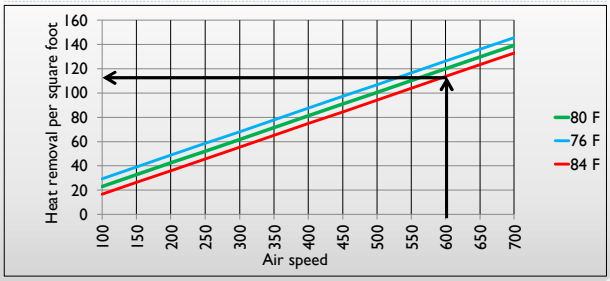
14

If we decrease our air speed because the air is "cooler"….the birds will be hotter



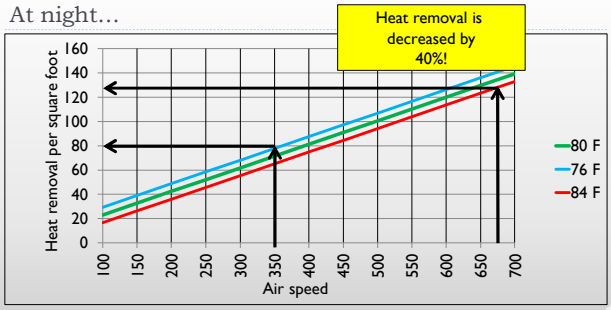
15

During the day….



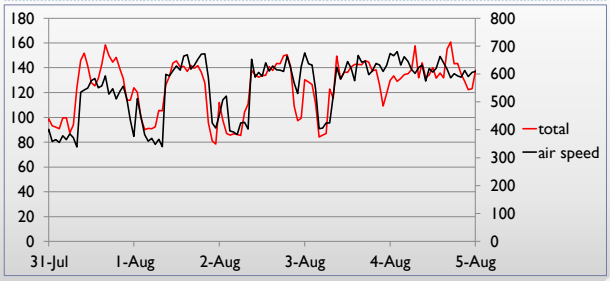
16

At night…



17

The net result is 20% decrease in daily heat removal



18

2. Manage bird distribution (bird density)

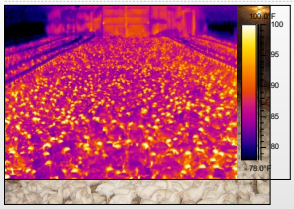
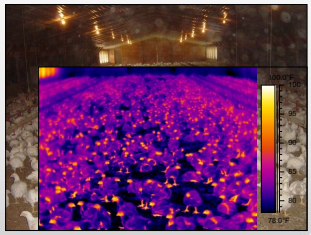
- Why does density impact on bird performance?


19

Feed and water space/access becomes a limiting factor


20

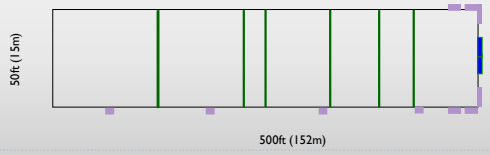
Another problem with increased density is increased heat stress

21

To avoid these problems migration fences are a must

- A minimum of three…ideally four
  - One fence every 100' (30m)
- No later than three weeks of age…preferably two weeks.
- Installed year round



22

Migration fences

- Not all fences are equal

23

Plywood fence

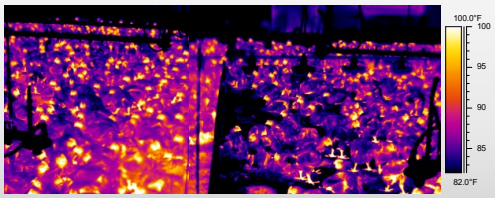
Air flow

Not a good option

24

Plywood

Air flow



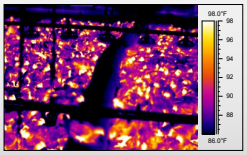
25

Plastic pipe

Not too much of problem with air flow

If not managed properly
may not keep birds uniform

Air flow

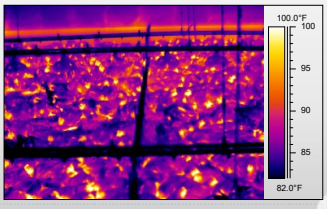


26

Wire fence

- Good for air flow and keeping birds spread out
- Piling can be an issue, but can be managed

Air flow

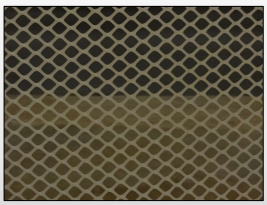


27

Inverted V Migration Fence

28

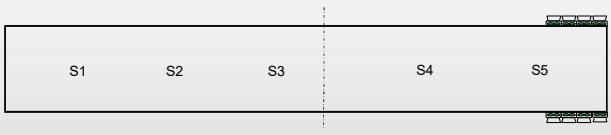
Make sure fence material does not restrict air flow



This looks like it would work, but air does not move through this efficiently

29

3. Use correct sensors



30

Basic controller settings (week 7 – 70°F (21°C))

Temperature	On Temp	Off Temp	Fans	Sensors
Evap. Cooling	85°F (29°C)	84 F (29°C)	-	
Tunnel	79°F (26°C)	76°F (24°C)	3	4,5
	78°F (26°C)	75°F (24°C)	2	4,5
	76°F (24°C)	73°F (23°C)	-	4,5
Inlets	74°F (23°C)	73°F (23°C)	2	1,3,4,5
	73°F (23°C)	71°F (22°C)	1	1,3,4,5
	71°F (22°C)	70°F (21°C)	2	1,3,4,5
	70°F (21°C)		-	-

31

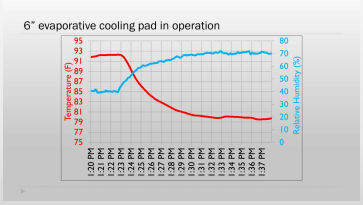
"Off temperatures" should well below "on temperatures"

Temperature	On Temp	Off Temp	Fans
Evap cooling	85°F (29°C)	83°F (28°C)	-
Tunnel	78°F (27°C)	74°F (23°C)	9
	77°F (25°C)	73°F (23°C)	6
	75°F (24°C)	71°F (22°C)	-
Inlets	72°F (22°C)	71°F (22°C)	4
	71°F (22°C)	69°F (21°C)	3
	69°F (21°C)	68°F (20°C)	2
Target	68°F (20°C)		-
Heat	62°F (17°C)		

32

4. Focus on airspeed

- Evaporative cooling is not a substitute for airspeed
- Evaporative cooling augments cooling done by airspeed



33

Evaporative cooling…

- After all the fans are running to provide the required air exchange and air velocity…then turn on the evaporative cooling.

34

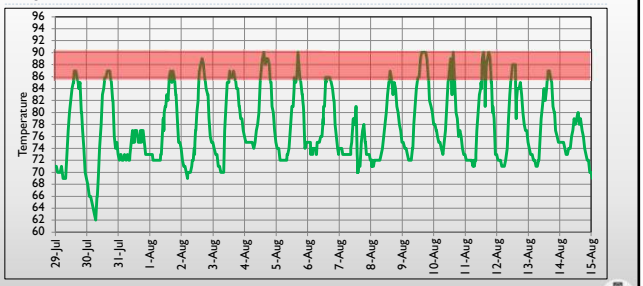
Let's take a look at a very good example of this fact

35

50' X 500' house growing 8+ pound bird
(one square foot per bird, July – August flock)

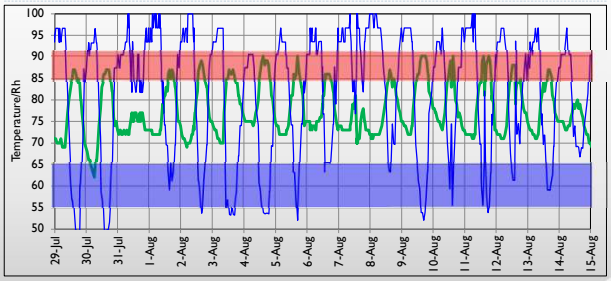
36

Outside temperature during the last three weeks of the 59 day-old flock



37

Outside temperature/Rh during the last three weeks of a 59 day-old flock



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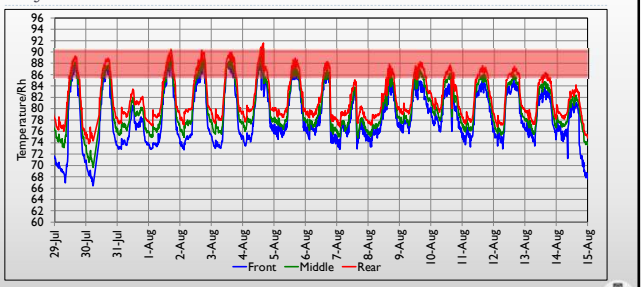
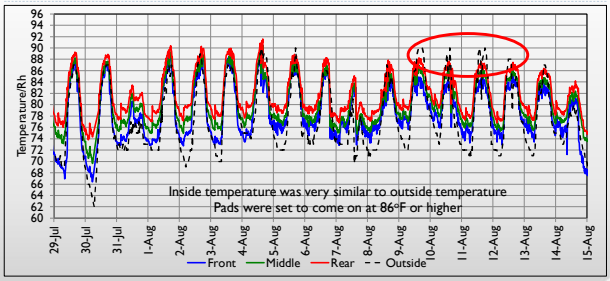
Inside temperatures during the last three weeks of a 59 day-old flock



39

Inside and outside temperatures during the last three weeks of a 59 day-old flock



40

Evaporative cooling system…

- Was essentially only used on three days

41

Litter was dry…

- Even in front of the pads

42

Birds were clean…
(fogging system was not used)

43

Paws look good

44

Performance?

- Finished first for the week
- 3% total mortality
- Second highest weight = 8.34 lbs (3.8 kg)
  - 0.01 lbs below heaviest (which 3 days older)
- Best feed conversion by 8.5 points…16 points from next heaviest bird
- Condemnations were ½ that of any other farm
- Excluded from the settlement sheet…cost too low

45

Summary

- Make sure fans run at night
- Manage bird distribution (bird density)
- Use correct temperature sensors when in tunnel mode
- Focus on air speed
- Use evaporative cooling after proper fans are running

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