



INTERNATIONAL

The key to your profit!



Micro and hot climate management

H&N Academy May 11th 2021

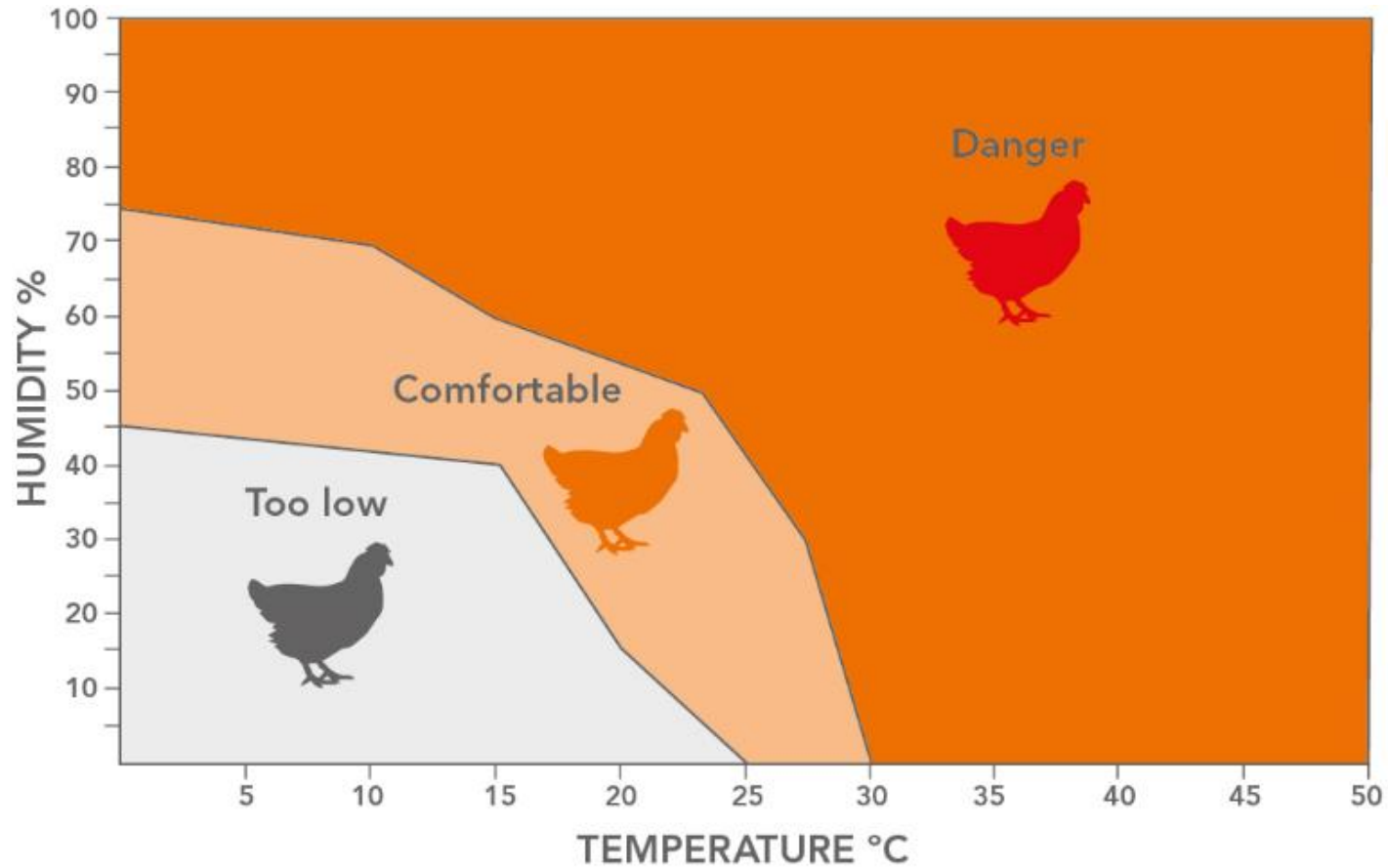
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Climate parameters

- Temperature 20 -26° C (>6 weeks of age)
- Relative Humidity 65 –75%
- Carbon dioxide max: 2.500 ppm
- Ammonia max: 25 ppm
- Airspeed 0,1 –0,2 m/s
- Dust as little as possible




Temperature Humidity Index (THI)



Temperature Humidity Index (THI)

Comfort zone:

- Temperature + Humidity
=> 85-95



	18 °C	19 °C	20 °C	21 °C	22 °C	23 °C	24 °C	25 °C	26 °C	27 °C	28 °C	29 °C	30 °C	31 °C	32 °C	33 °C	34 °C	35 °C
100 %	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
99 %	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134
98 %	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133
97 %	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132
96 %	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131
95 %	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
94 %	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129
93 %	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128
92 %	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
91 %	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126
90 %	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125
89 %	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124
88 %	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123
87 %	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122
86 %	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121
85 %	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
84 %	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
83 %	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
82 %	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117
81 %	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116
80 %	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115
79 %	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114
78 %	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113
77 %	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112
76 %	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
75 %	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110
74 %	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109
73 %	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
72 %	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107
71 %	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106
70 %	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
69 %	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104
68 %	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103
67 %	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102
66 %	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101
65 %	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
64 %	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
63 %	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
62 %	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
61 %	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
60 %	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
59 %	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
58 %	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93
57 %	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
56 %	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91
55 %	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
54 %	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89
53 %	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
52 %	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87
51 %	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
50 %	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
49 %	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84
48 %	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
47 %	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82

Airspeed!?

- Airspeed gives cooling effect
- Temperature on thermometer doesn't change
- Very careful with airspeed during rearing from 0-6 weeks!!
- Use the chilfactor

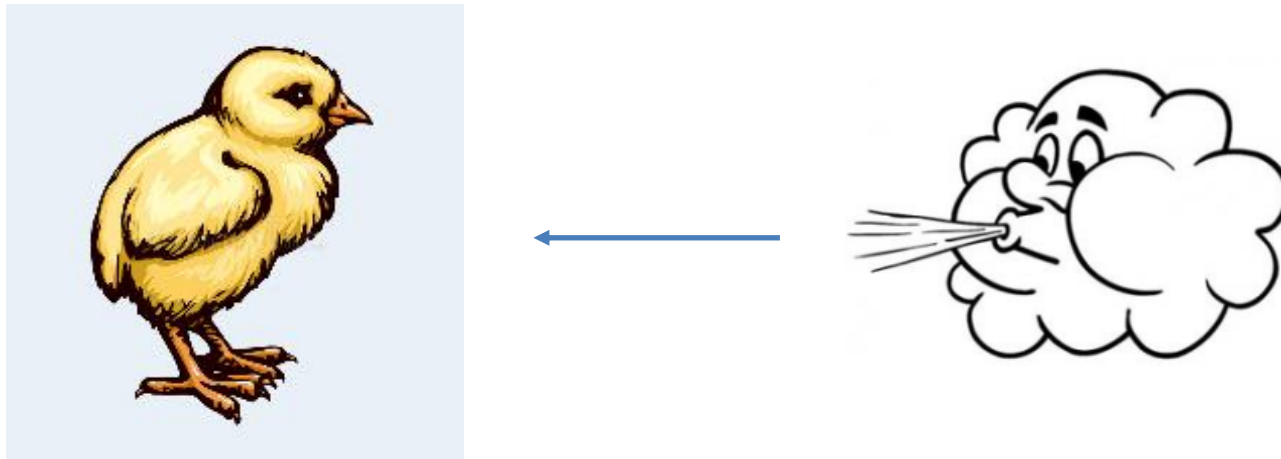


Air speed (chill factor)

Chill effect is the cooling factor of airspeed

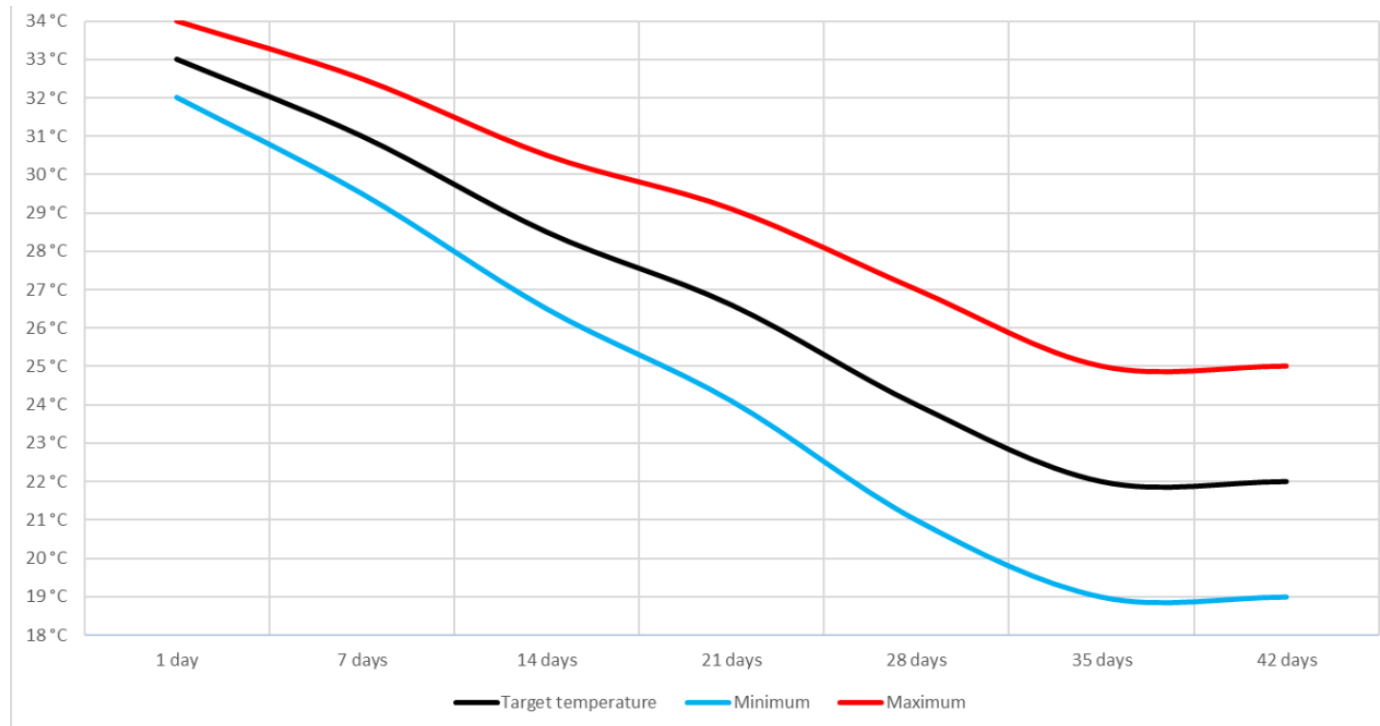
For every extra 1 m/s wind speed, **effective** temperature:

- -8 ° C for young birds
- -3° C for older birds
- + 10% Humidity = +1 ° C effective temperature



Target temperature per age

- The younger the smaller tange of temperature needed





H&N LAYER ACADEMY

INTERACT WITH US!

Make use of our multiple-choice poll tool and pick what you think is correct.

Open house



Construction of open house and shadow

- Prevent sunshine on the chickens
- Position of the house
- With shadow -heat reduction between 30-50%



Open house

- Highly depending on outside circumstances
- Different to control micro climate when there are big differences in outside temperatures
- Ventilation controlled by curtains
- Curtains are not insulated
- Possible to place ceiling fans



Clean and full air circulation

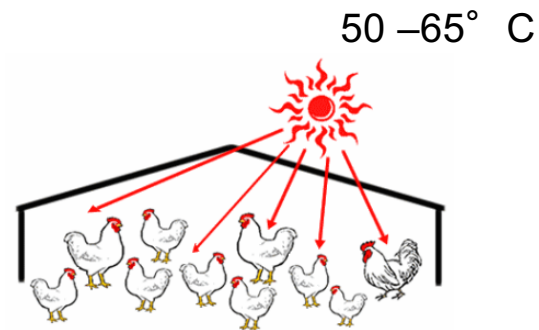
Cobweb

- Increasing the air flow by cleaning the cobweb
- More then **20%** of air flow restricted by cobwebs!



Prevention of radiation heat from the sun

- Insulation of the roof
- Painting the roof
- Result is 5 -10° C lower temperature in the house
- Water sprayers on the roof



Sources: de Heus

Spray cooling

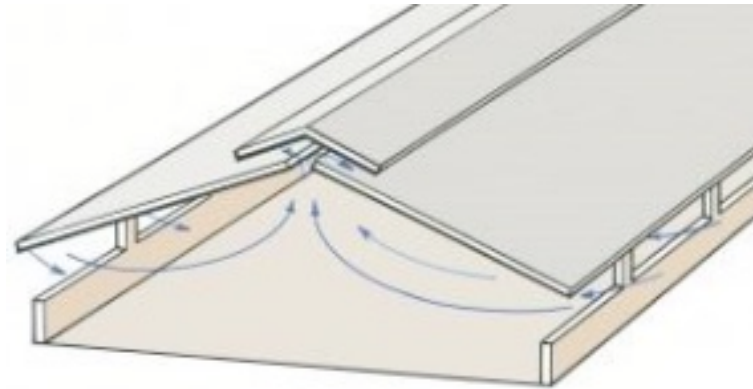
- Outside (low pressure) or inside (high pressure)
- Relative humidity will increase
- Beneficial to maximum **80% RH**



Sources: de Heus

Closed house with natural ventilation with open roof

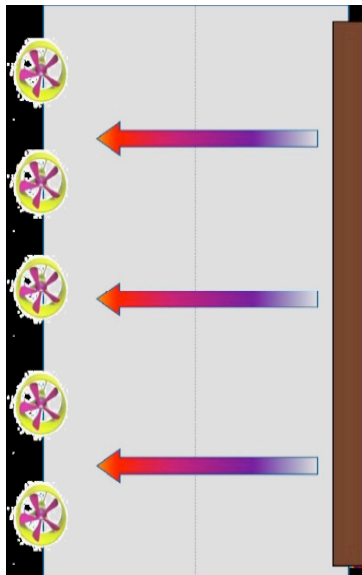
- Works only when implemented the right dimensions
- Microclimate depending on outside circumstances



Sources: de Heus

Closed house with cross ventilation

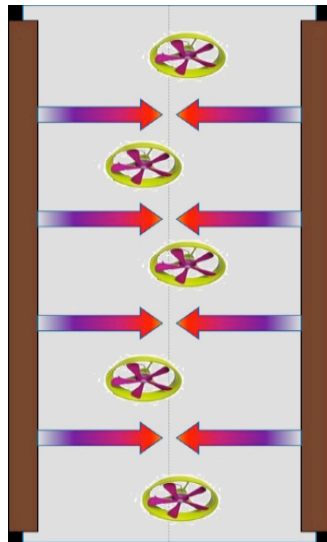
- Difficult to control
- Expensive
- Emergency power supply!



Sources: de Heus

Closed house with inlets and roof ventilation

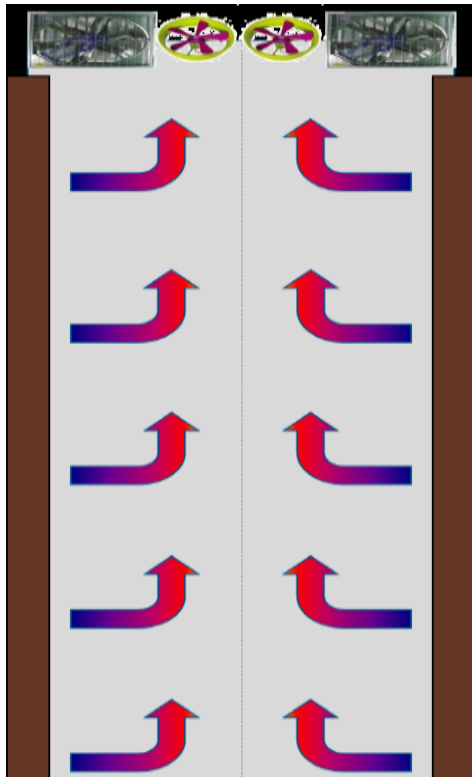
- Perfect for Minimum ventilation!



Sources: de Heus

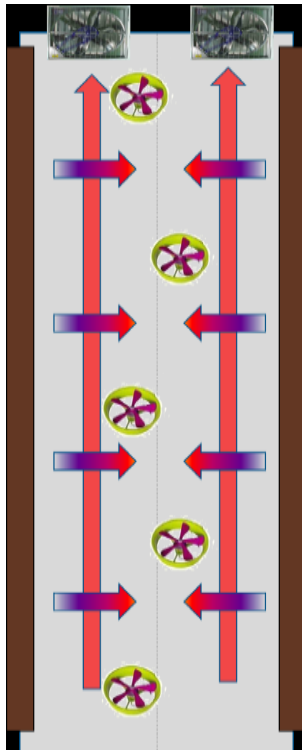
Closed house with side inlets and longitudinal ventilation

- Not easy for Minimum ventilation!



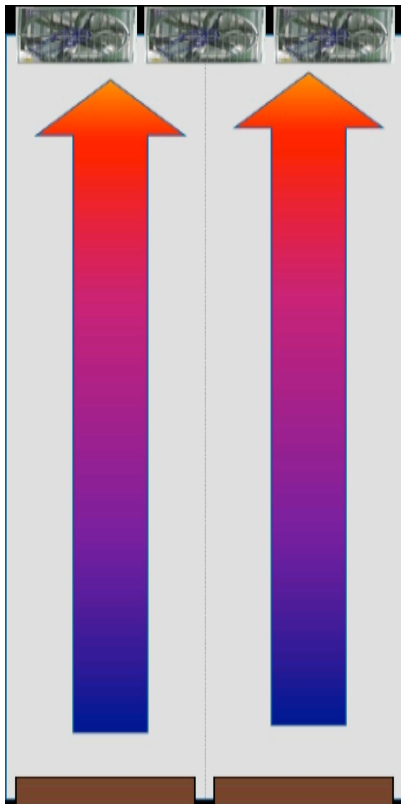
Sources: de Heus

Closed house with side inlets and combined roof and longitudinal ventilation



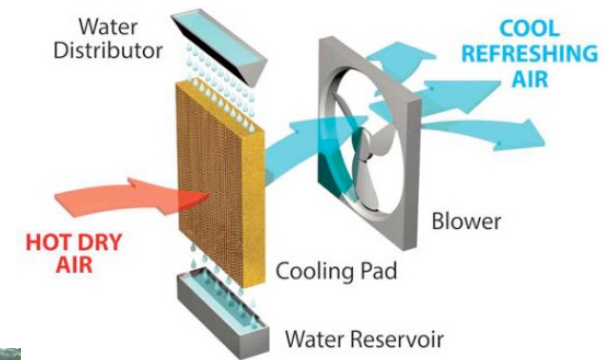
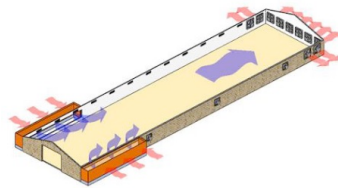
Sources: de Heus

Closed house with tunnel ventilation

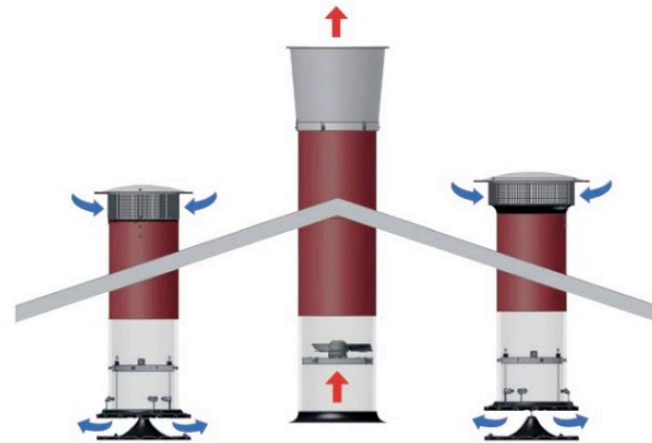


Cooling pads

- Tunnel ventilation with pad cooling
- During rainy season very limited effect of pad cooling
- Humidity will always increase
- **Beneficial to maximum 80% RH**



Equal pressure ventilation



Sources: de Heus

Symptoms of heatstress on the birds 1st stage

- Trying to release energy
- Panting
- Wings spread
- Squatting close to the ground
- Higher water intake



Symptoms of heatstress on the birds 2nd stage

- Limit energy production
- Decreased activity
- Lowered Feed Intake
- Lower growth



Symptoms of heatstress on the birds 3th stage

➤ Mortality

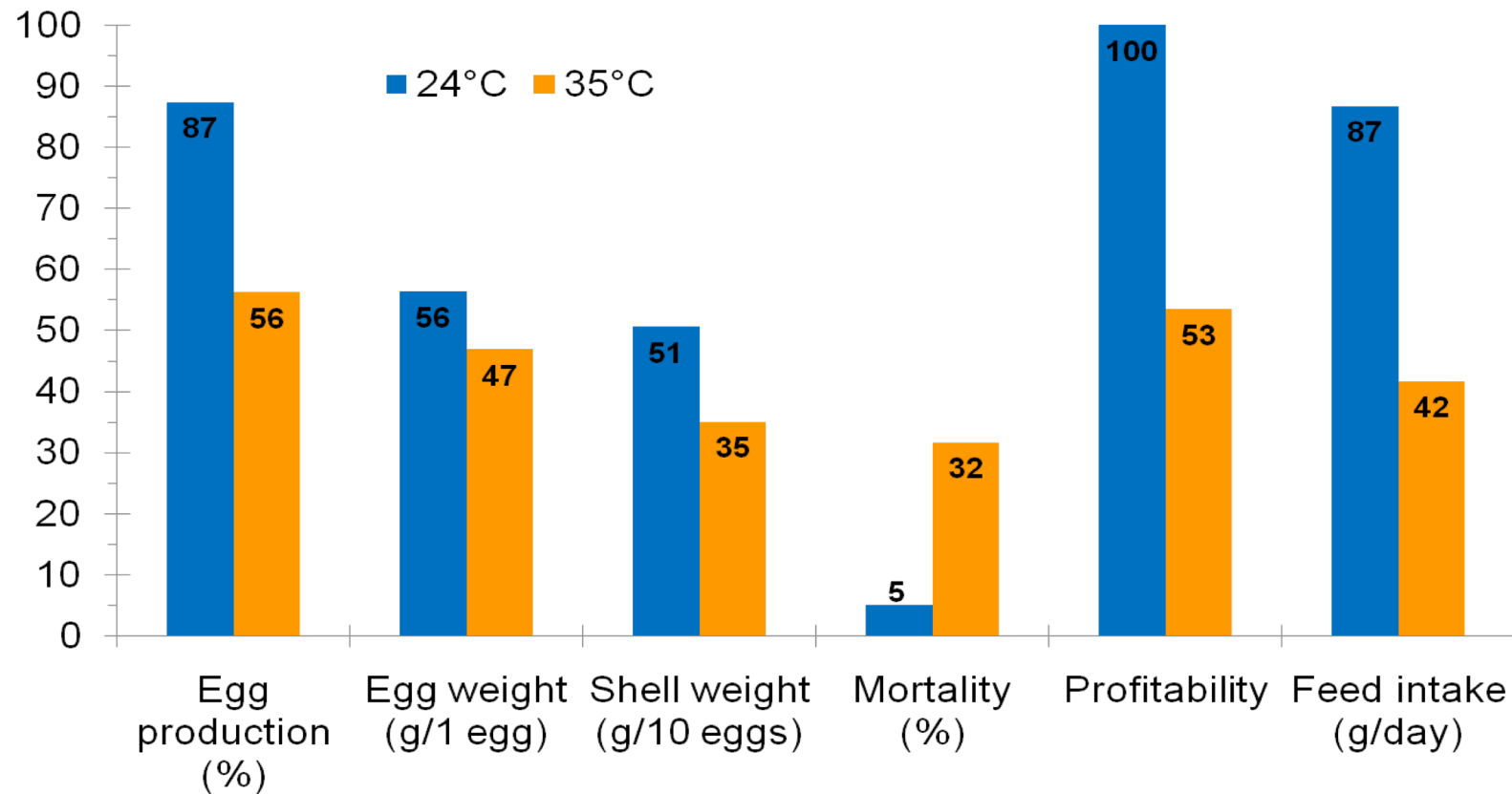


Heat stress and performance

- Lower Feed Intake 5 –30%
- Higher Feed Conversion 10 –12%
- Lower egg production up to 10%
- Higher mortality (daily) up to 2%



Heat stress and performance



(Source: Marshaly et al. 2004)

Take home message

- Proper micro-climate start with good ventilation system
- Balance between ventilation rate and incoming air
- **ROI for in climate systems is very short**

With good climate system:

- Less health issues
- Better performance

Thank you for your attention!
Your Questions, please!

