

## Air quality and thermal regulation for laying hens in alternative housing systems

### Problem

Inappropriate air quality and inadequate thermal regulation (excessive cold or heat) in the laying hen house may affect hen welfare (e.g. disease, mortality and stress) and productivity.

### Solution

The ISA Management Guide recommends a minimum required fresh air exchange rate of 0.7 m<sup>3</sup>/h/kg live bird and a temperature range between 18 and 22°C in the laying hen house.

### Benefits

Provision of clean, fresh air and a suitable temperature range may prevent common malefactors such as the development of diseases, poor litter quality, bad hen health and a decrease in egg production.

### Practical recommendations

The ISA Management Guide recommends sufficient ventilation in the laying hen house: **fresh air and a minimum air exchange rate of 0.7 m<sup>3</sup>/h/kg live bird.** In the colder seasons, the temperature in the rearing house of pullets should be adjusted to the temperature in the laying house before the transfer of hens.

Additionally, special care should be paid to: the removal of excess moisture (improves litter quality and laying hen health), the removal of dust from the atmosphere (helps to prevent disease), maintaining a sufficient oxygen supply and the removal of gasses such as NH<sub>3</sub>.

Furthermore, the ISA Management Guide recommends keeping the house temperature **between 18 and 22 °C**. Temperatures below and above this range will require hens to spend energy on thermoregulation and less on egg production.

### APPLICABILITY BOX

#### Theme

Animal husbandry

#### Keywords

Laying hens, air quality, thermal regulation

#### Context

Transition and operating cage-free housing systems for laying hens

#### Application time

All year round, seasonal variation

#### Required time

Depending on the on-farm situation, after correct assessment: immediately

#### Period of impact

Depending on the size of the flock(s)/housing

#### Equipment

Air ventilation, heating and cooling equipment

#### Best in

All cage-free housing systems for laying hens: barn, free-range and organic production

#### Target audience

Farmers, farm advisors

Action is strongly recommended if temperature related behavioural changes occur:

- **Feed intake:** lower temperatures may increase hen feed intake due to an increased maintenance requirement. Similarly, at higher temperatures, hens may decrease feed consumption.
- Under cold conditions, hens may **ruffle their feathers outwards** to trap heat and/or (in extremem circumstances) may start **shivering** to keep warm.
- At high temperatures, hens will **increase and deepen respiration rates (panting)** and **hold their wings away from the body** to increase evaporation (Figure 1). Furthermore, hens may look for **cooling** to lose excess heat (e.g. shade, cool places and surfaces).



Figure 1: Hen trying to cool by panting (open beak, quick and heavy breathing) and holding wings away from the body. (Source: ILVO)

## On-farm application

### System approach

- Air quality and thermal regulation can be applied directly on-farm provided that appropriate equipment is present. Consultation with an expert is recommended for better applications and results.

### Evaluation

- Based on visual cues (e.g. behaviour of the hens) and measurable parameters (air quality, temperature, feed and water intake, egg production,...).

## Further information

### Further readings

ISA Management Guide: alternative productions systems: <https://cpif.org/wp-content/uploads/2014/04/ISA-Alternative-Productions-Management-Guide-copy.pdf>

## About this practice abstract and Best Practice Hens

### Publishers:

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**Best Practice Hens:** To support egg production in non-cage systems and improve animal welfare, a consortium consisting of 7 partners will develop Best Practices for Non-cage Egg Production Systems as a European Commission, DG SANTE pilot project. These Best Practices will provide practical support to egg producers to encourage them to convert from cage to non-cage systems, including organic production.

**Project website:** [www.bestpracticehens.eu/](http://www.bestpracticehens.eu/)

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