MAINTENANCE

Do we supply enough air to our incubators?

Incorrect ventilation is a common problem in hatcheries.

Even if the basic hatchery ventilation has been correctly specified, the various components need to be installed, calibrated and set up properly. Air pressures must be correct in each room, and the volumes entering the room must be enough to meet the needs of the embryo, and also to maintain room air pressures.
If a hatchery has been extended, it is quite common that the ventilation capacity is either not increased at all, or not increased sufficiently for the number of extra incubators.

There are several ways to check if ventilation rates are meeting the hatchery's needs. Room air pressures, supplied air volumes and CO_2 levels are all good indicators. This tip will explain how to calculate the supplied air volumes – the same method can be used to check air handling units or exhaust capacities.

Each brand and model of incubator has its own specific ventilation needs. For optimum performance, we have to supply the correct pressures and air volumes for the make of machine installed in the hatchery. These will have lower and upper limits, so keeping them on the average level will bring some energy savings when compared to keeping everything at the upper limit. To measure the air intake of a machine, first we need to know the minimum and maximum fresh air needs, which should be specified by the manufacturer. For the calculations, we will need an air speed meter (anemometer), a ruler and a calculator.
All the measurements will be done from the machine air inlet area. Depending on the make of incubator, the air inlets may be placed in front of the machine or in an air supply plenum. Before taking any measurements, the dampers will need to be fully opened. Avoid windy days for this procedure.

Equipment

- Anemometer (Kestrel make multi meters which include a suitable vane anemometer)
- Ruler
- Calculator

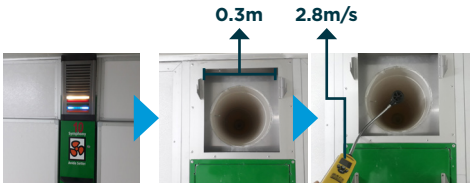
Preparation

- Find the air inlets for the setter or hatcher
- Remove any obstructions, such as a grill
- Open all dampers to 100% open
- Close all room doors, and check static pressures are balanced for that room

Measurements and Calculations

- Measure the dimensions of the air inlet
- Calculate the cross sectional area = π x (diameter/2)2 where π = 3.14
- Measure the average air speed in front of the inlet
- Use the formula to calculate air intake

$$\text{Air Intake} = \text{Air Speed (m/s)} \times \text{Cross Section Area (m}^2\text{)} \times 3{,}600$$



$$\text{Cross Section Area} = \pi r^2 = 3.14 \times \left(\frac{0.3}{2}\right)^2 \approx 0.07\text{m}^2$$

$$\text{Air Intake} = \text{Air Speed (m/s)} \times \text{Cross Section Area (m}^2\text{)} \times 3600$$

$= 2.8 \times 0.07 \times 3600 \approx 705\ \text{m}^3/\text{h}$

Converting m^3/h to cfm : $\text{m}^3/\text{h} \times 0.588578$
$= 705 \times 0.588578 \approx 415$ cfm