

The importance of correct hatchery maintenance to preserve chick quality

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Insufficient maintenance in the hatchery can compromise hatchability and chick quality, the two most important performance factors a hatchery's success is measured upon. A scheduled hatchery maintenance programme minimises the risk of machine failure and the impact of incorrect machine operation on hatch and quality. During my hatchery visits I often notice that maintenance is neglected and things are fixed only when they finally break down completely. This not only puts pressure on the maintenance crew, who then have to mend machines in a hurry, when they are full of eggs or chicks, but the failing part will often result in a loss of hatch or produce inferior quality chicks over time as it deteriorates.

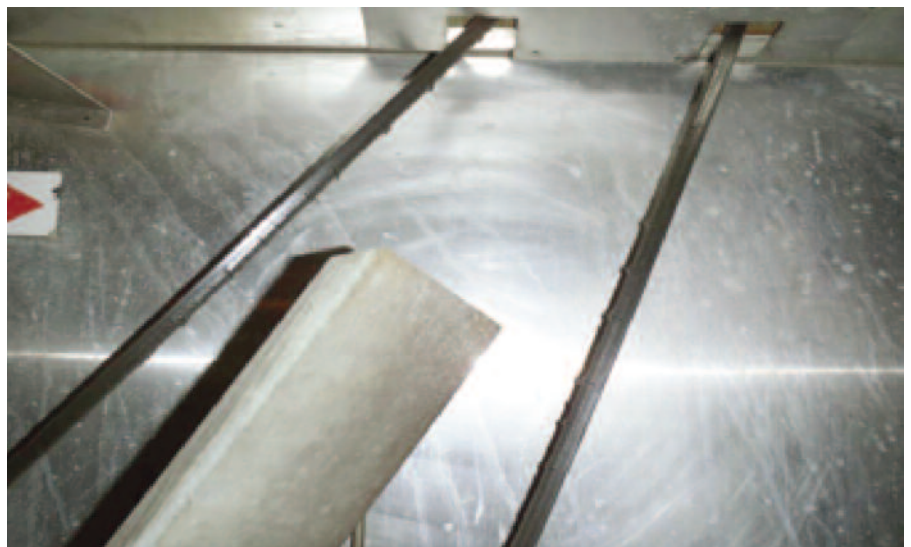
Pay attention to fan belts

A good and often underestimated example of where preventative maintenance is vital is with fan belts in the setters and hatchers. Every time a belt passes around a pulley, it bends and flexes. This produces heat and hardens the rubber over time.

The wear process can be greatly accelerated if the belt is loose and slips because any added friction between belt and pulley makes the belt run even hotter.

This extra heat will cause glazing on the faces of the belt causing it to slip even more.

Inadequate turning angles will result in increased early and late embryo mortality and sticky chicks due to unabsorbed albumen.



An example of severe cracking along the underside of the belt and excessive sidewall wear causing it to ride lower than normal in the pulley grooves.

What we do not see is that this eventually slows the fan speed, limiting ventilation rates and affecting the embryos and chicks in the setters or hatchers; insufficient ventilation will not remove excess carbon dioxide, heat and humidity, or bring in enough oxygen.

A loose fan belt can easily be diagnosed. Signs to look for are:

- Belts squealing when starting up the machines.
- Severe cracking along the underside of the belt and/or excessive sidewall wear causing it to ride lower than normal in the pulley grooves.

Excessive fan belt wear can be easily avoided by replacing the belts on a regular basis at the frequency recommended by the incubator manufacturer.

Turning mechanisms

Turning mechanisms are another good example of where maintenance is often overlooked. We all know that eggs need to be turned regularly and through an adequate angle during incubation to ensure proper development of the embryo. Regular turning also helps by directing and redirecting airflow within the setters, which helps to prevent hot or cold spots.

The best incubation results are obtained if the eggs are turned smoothly once an hour at a 38-45 degree angle from the horizontal position.

Over time the turning mechanism angles become worn, and the angle of turn drifts lower. Inadequate turning angles will result in increased early and late embryo mortality, more malposition II (embryo upside down) and sticky chicks due to unabsorbed albumen.

This slow change is often completely undetected; because the deterioration over time

Continued on page 25



Continued from page 23

is gradual, decreasing hatchability and chick quality are not noticed immediately. Routine measuring of turning angles should be included in the hatchery maintenance programme. This will allow rapid detection of turning angles starting to drift, and so that they can be corrected before they have an impact on biological performance out of the hatchery.

The preventative maintenance programme in a hatchery should not be limited to setters and hatchers but should also include all ancillary equipment and the building structure.

Air conditioning

Air conditioners or coolers in the egg room are often excluded from the regular maintenance programme. However, when these are not maintained they not only become less energy efficient but are an excellent source of contaminants which are then blown onto our precious hatching eggs.

How does this happen? Refrigerant gas is pumped through the air conditioner coil, which is made up of copper tubing with aluminium fins. As the air (fresh and returned) passes over the coils and fins it will be cooled but at the same time the chilled fins will condense the moisture out of the air.

The moisture drips off the fins down to a collector or drip pan where it is usually drained away.

The problem comes into play when the filtered and often 'not so filtered' return air deposits bacteria, mould spores and dust on the moist coil surfaces. As the air conditioner cycles on and off, the air conditioner gets damp, cold and warm.

This wet and dark environment becomes a perfect breeding ground for mould and bacteria. Why did I mention 'not so filtered'? Because most air conditioning filters are not able to filter mould spores and bacteria out of the air, and they actually act as a reservoir and breeding ground for them both.

Air conditioner units, filters and drip pans should be included in a regular hatchery maintenance plan. When they are cleaned regularly they will be less likely to contaminate the eggs and will be more energy and cost efficient.

A few things to consider when setting up a maintenance programme are:

● Who will be responsible for maintenance?

To be effective a clearly defined maintenance manager should be responsible, doing the work and keeping track of all maintenance tasks to be performed and reporting to the hatchery manager directly.

● What maintenance is required?

Maintenance is required on any equipment that can affect the performance of the



An example of an air conditioning unit in the egg room that has not been properly maintained.

hatchery. This includes setters, hatchers, all chick processing equipment, any measuring equipment (thermometers, hygrometers, pressure gauges, etc), ventilation, generators, all possible water treatment systems, alarm systems and trucks.

It is therefore recommended to produce a list of all the equipment that needs to be maintained including frequency and who will perform this routine task.

● How should maintenance be done?

All maintenance should be done according to manufacturers' instructions by using their provided checklists.

It is also recommended to follow their recommended maintenance intervals as a minimum and if the same equipment keeps failing or needs more maintenance than others it could indicate a more serious problem somewhere else. This is why it is so useful to keep good records.

Some of the incubation manufacturers now offer technical audits which are extremely helpful to get you started with your maintenance program.

● How should performance be monitored?

Monitoring the equipment allows us to see if the equipment is performing within the acceptable limits and to take action if we notice unacceptable readings.

A good and accurate alarm system is a minimum requirement for the incubation essentials which are:

- In the machines: temperature, humidity, turning and possible power failure.
- In the building: functionality of the ventilation system, pressures in plenums, room temperatures and cooling water temperature if applicable.

Regular visual checks should still be carried out several times a day to ensure temperature, humidity, ventilation and turning are as expected.

Equally important is monitoring outcomes from the equipment – do egg shell temperatures and chick vent temperatures in setters and hatchers meet targets? Are the egg weight losses and chick yields on target?

The Aviagen Hatchery Specialist team has produced a series of 'Hatchery How To's' describing the procedure on how to perform these important tasks and measurements.

These are available on the Aviagen website or can be obtained from your local technical manager and have been translated into several different languages so they can be used in the hatchery by the person responsible for the task.

● What are the costs and benefits?

Over time it should be possible to assess costs and benefits of the maintenance program. A well organised workshop, with an appropriate stock of spare parts will cost money to set up and maintain in good order. But the cost of a hatch failure to a business is not only the immediate loss of the value of the day old chicks, but also the live value of the broilers not placed, that of empty shackles in the processing plant and the value of chicken meat orders to retailers not filled.

Preventative maintenance generally has benefits in all industries and the hatchery is no exception.

It contributes to a better hatchability and chick quality, safer work environment, certification, reduced power and utility costs as efficiency is increased, lower insurance costs and retaining a higher value of assets. ■