# Measuring Egg Water Loss

Aviagen Turkeys Ltd ®

## Definition

Egg water loss is the amount of water that is lost by diffusion through pores in the eggshell during the incubation process.

The rate of egg water loss is controlled by the humidity of the incubator and the conductance (porosity) of the eggshell.

## Objectives/ Discussion

To determine the correct humidity for maximum hatchability and poult quality by measuring the egg water loss.

Typically a turkey egg will lose between 11 – 12% of its fresh egg weight through water loss by the 25th day of incubation.

Too much water loss and the egg will become desiccated and too little water loss will result in too small an air cell at hatch, which will stop the embryo fully inflating its lungs.

Low incubator humidity will increase egg weight (water) loss and high incubator humidity will decrease egg weight loss.

The weight loss targets for turkey eggs depend on the age of the breeder flock see Table 1 below:

Table 1. Weight loss targets for turkey eggs

| Flock Age (wks) | Egg Weight Loss Target |
|---|---|
| 1 – 3 | 9 - 10 % |
| 4 – 15 | 11 – 12 % |
| > 16 | 13 – 14 % |

## Procedures

Although it is possible to weigh individual eggs this is very time consuming and in most cases not necessary. It is normally simpler just to weigh whole trays of eggs. It is possible to combine this procedure with a measurement of poult yield.

1. You will require a weighing balance that can weigh a whole tray of eggs with a readability of at least 5g. Typically the balance should be able to weigh up to 20kg.
2. At setting, weigh an empty setter tray and record weight.
3. Identify the tray so that it can be found again at transfer.
4. Fill tray with eggs from one flock, reweigh and record weight.
5. Calculate the average fresh egg weight (FEW):

FEW = (*Full tray weight – empty tray weight) ÷ number of eggs on tray*

Figure 1: Weighing empty egg tray.

Figure 2: Weighing full egg tray.

6. At transfer, reweigh the full setter tray and record the weight.
7. Calculate the average transfer egg weight (TEW):

***TEW = (Full tray weight – empty tray weight) ÷ number of eggs on tray***

8. Calculate the egg water loss (WL%):

((Average fresh egg weight – average transfer egg weight) ÷ average fresh egg weight) x 100

Or WL% = ((FEW -TEW) ÷ FEW) x 100

9. If the eggs are not transferred on the 25th day of incubation the egg weigh loss needs to be adjusted by dividing by the number of days at transfer and multiplying by 25.
10. If eggs are fertility tested before transfer, do not remove the eggs from the setter tray until transfer – they can be marked at testing for removal at transfer.

It is **important** not to include any cracked eggs in the calculation of egg water loss – **always check** at setting and transfer, removing them before weighing and reducing the number of eggs accordingly in the calculation

## Interpretation

If 25-day egg weight loss is too high then incubator humidity should be increased.
If 25-day egg weight loss is too low then incubator humidity should be decreased.
As an approximate guide, humidity adjustments can be made as follows:

- For every 1% shift in water loss required adjust humidity by 4%RH or 0.8degC (1.5 degF) wet bulb.

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