

Hatchery Talks

Egg weight loss



Before we start ...

- **Polls**
- **Questions in chat**
- **Webinar-replay + hand-out**



Content

- **Why is it important to monitor egg weight loss**
- **Water regulation in the egg**
- **Influences on egg weight loss**
- **How to measure egg weight loss**
- **How to use egg weight loss**
- **Summary**



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Poll

Yes or no, Are you currently measuring egg weight loss in your hatchery?





Hatchery Talks

Why is it important to monitor egg weight loss



Good hatchery results

Why is it important?

- **Routine monitoring for controlling incubator humidity**
- **Weight loss is essential for internal egg balance and for the formation of the air cell**



Good hatchery results

Why is it important?

- **Eggs should lose 11-13 % of their initial weight during the first 18 days of incubation**
- **Suboptimal weight loss leads to**
 - Increased embryonic mortality
 - Lower chick quality





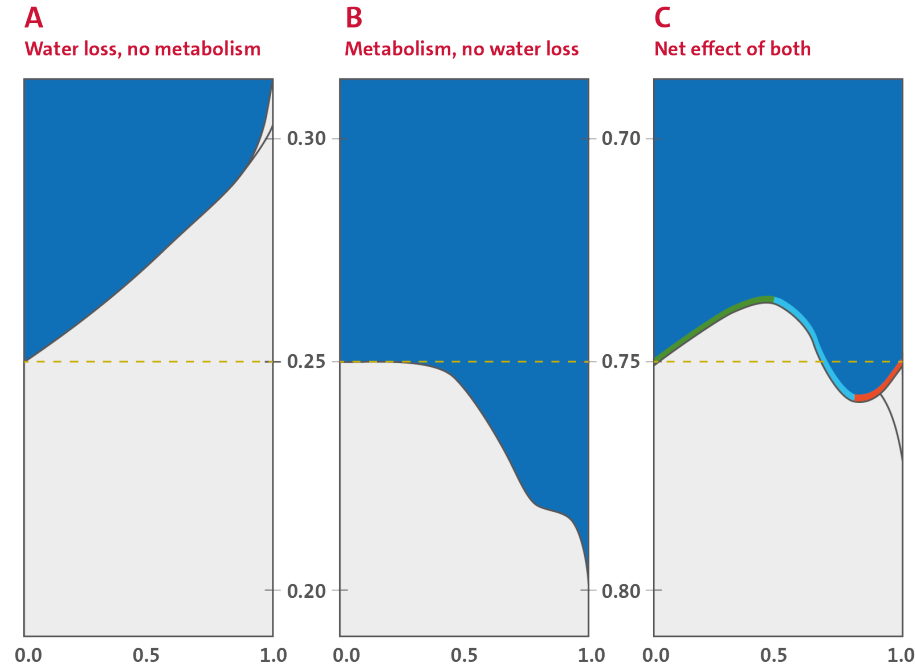
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Water regulation in the egg



Water regulation in the egg

Water movement



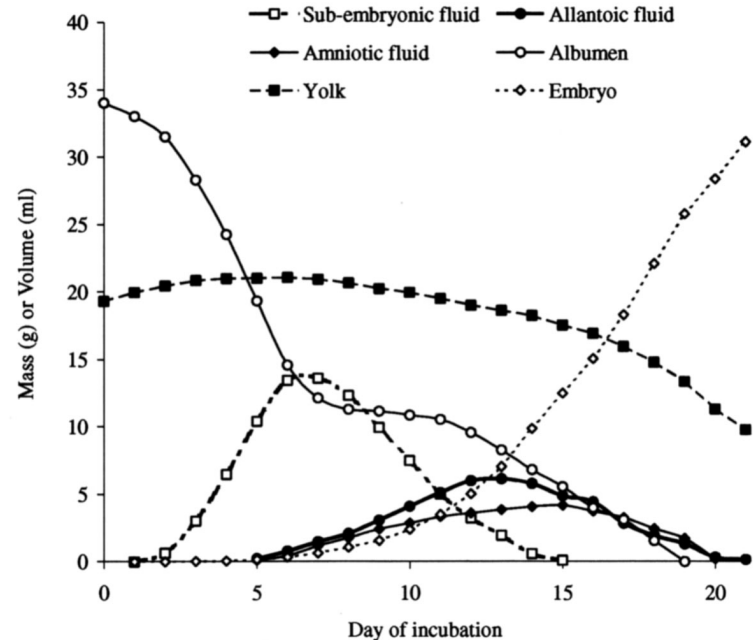
Incubation time (fraction)

- **Evaporation from egg to environment**
- **Internal movement between embryonic compartments in the egg**



Extra embryonic tissues

- Differences through incubation period.
- Moisture loss influences osmotic balance (Davis et al., 1988)
 - Low: excess albumen found
 - High: dehydration





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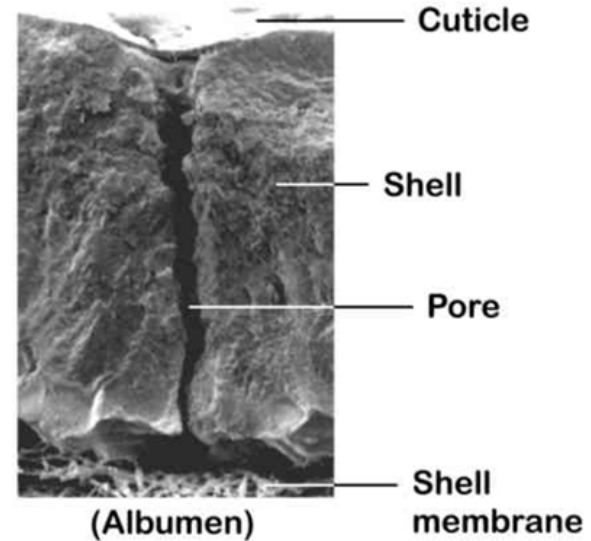
Influences on egg weight loss



Eggshell

Main factors

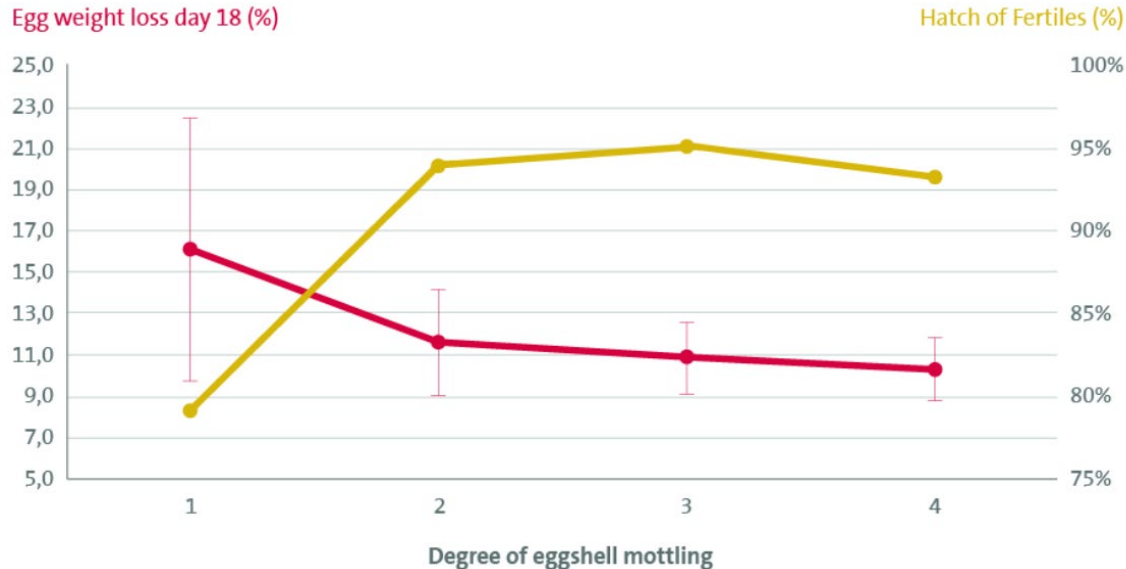
- **Conductance**
 - Resistance of the eggshell to diffuse water
- **Porosity of the egg**
 - more pores = more evaporation
- **Water vapour pressure**
 - Difference between RH within the egg (always 100%) and RH of external environment
- **Cracks**



Influences on egg weight loss

Eggshell mottling

Poor egg shell quality can lead to extreme weight loss in individual eggs (>20%)



Influences on egg weight loss

Incubation profile

Temperature

- Evaporation

Ventilation

- Dehumidification

Relative Humidity

- Humidifiers



Influences on egg weight loss

Control of relative humidity %

Setpoint!

Humidity is added by

- Moisture leaving the eggs
- Water from humidifiers
- Humid inlet air

Humidity is decreased by

- Ventilation

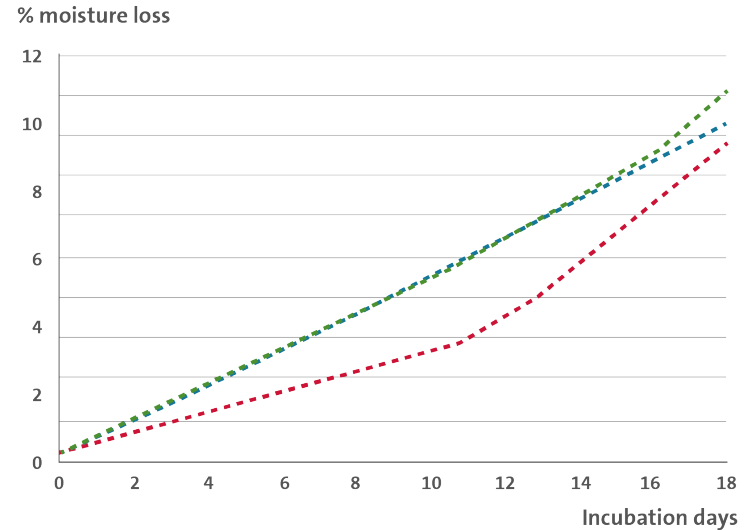
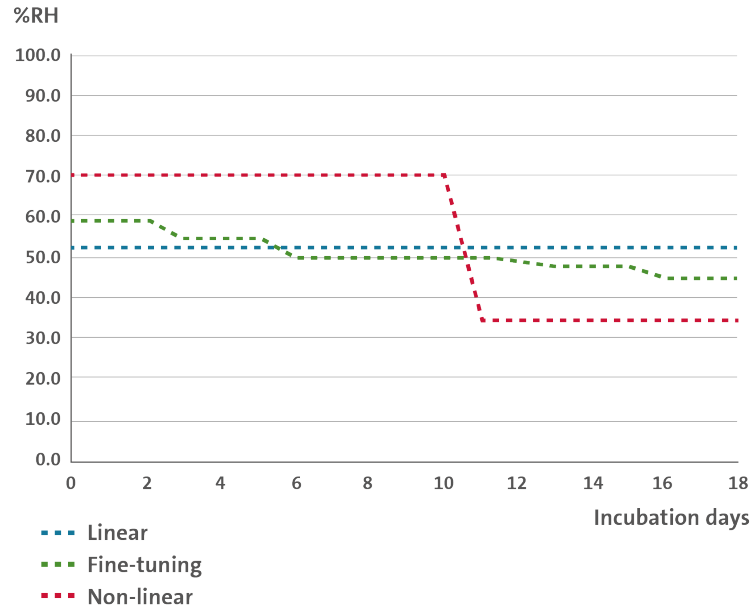


Influences on egg weight loss

Linear vs non-linear weightloss



RH% profiles \longrightarrow weight loss profiles





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How to measure egg weight loss



How?

- **Mark and weigh a tray**
 - Empty tray
 - Full tray before incubation
 - Full tray at transfer
- **Random distribution in machine**
 - Or consciously not random!
- **Standard procedure**



How?

- **Mark and weigh a tray**
 - Empty tray
 - Full tray before incubation
 - Full tray at transfer

Calculation Weightloss =

((weight of eggs before incubation –
weight of eggs at transfer) / weight of
eggs before incubation) x 100



When?

- **On a routine basis:**
 - To obtain hatchery specific reference data
 - As an 'early warning'
- **In case of a problem:**
 - To find the cause and take correct action
 - To judge the effect of an action



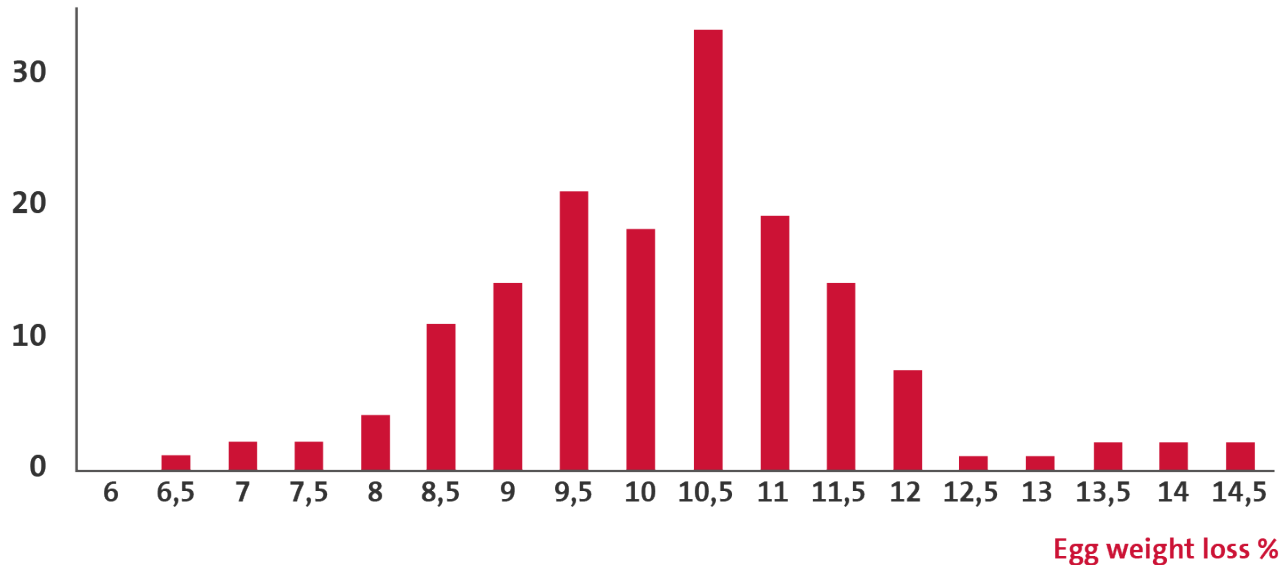
How to measure egg weight loss

How many trays?

Example: individual egg weight loss differs!

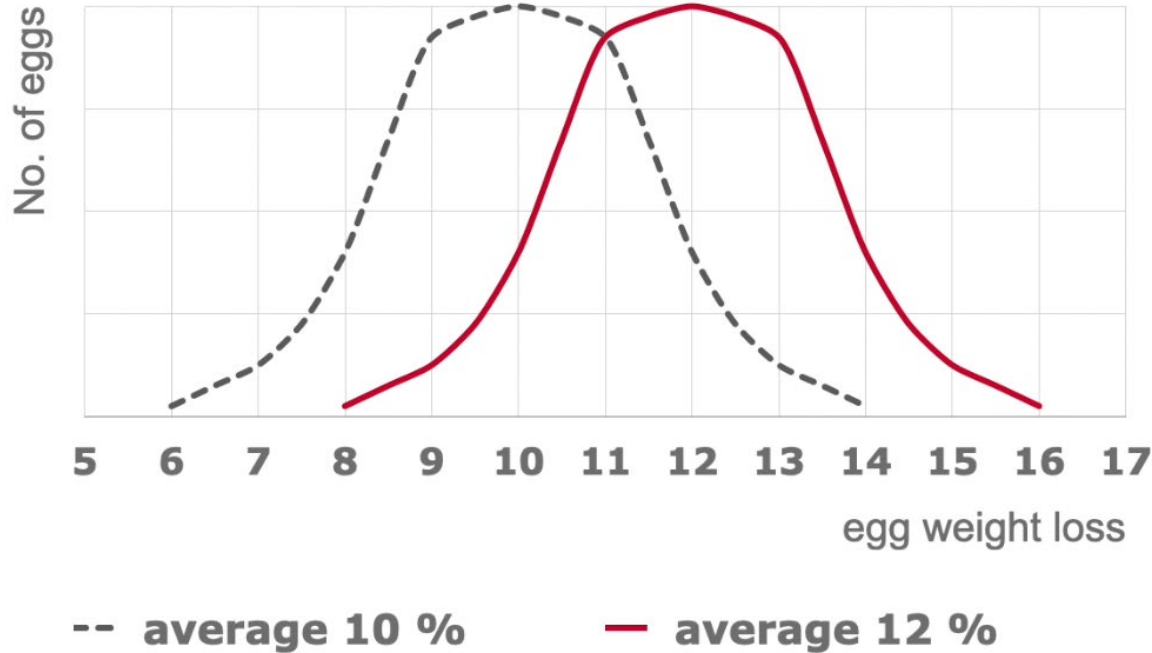
Optimum natural egg weight loss is $\pm 12\%$

Frequency



How to measure egg weight loss

Weight loss per egg → variation



Conceptual data



How to measure egg weight loss

Recording form

To make a hatchery specific reference

Recording Form 8E: Egg weight loss						
Setter number						
Start date of incubation cycle						
Name of incubation program						
Trolley						
Tray						
Egg ID-code						
Production date						
Breed						
Maternal age						
Storage days						
Incubation time: 0 days	0	0	0	0	0	0
Weight empty tray = WT						
Weight tray + eggs						
Weight eggs only = W0						
Incubation time: A days	A =	A =	A =	A =	A =	A =



How to measure egg weight loss

Chick quality

Too low weight loss

- Late hatch
- High late embryonic mortality (internal pip)
- Wet dead-In-shell chicks (albumen)

Too high weight loss

- Early hatch
- High number of pipped dead in shell
- Dehydrated chicks (long time in hatcher)



How to measure egg weight loss

Chick yield

- Evaluate chick pulling time and compare chick quality
- Target is 66-68%

Low Chick Yield	High Chick Yield
Long incubation time	Too short incubation time
High incubation temperature	Low incubation temperature
Low incubator humidity	High incubation humidity

Courtesy of Aviagen



How to measure egg weight loss

Poll

Where should the pipping line be on the egg shell? Position A, B or C



A.



B.



C.



How to measure egg weight loss

Pipping height



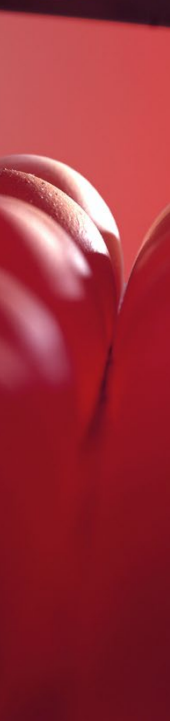
A.



B.



C.



How to measure egg weight loss

Pipping height

In practise





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How to use weight loss

How to use weight loss

What to do

Adjust incubation profile

Select a RH profile that allows for optimum weight loss with the lowest possible humidification



Hatchery Talks Summary



Summary

There are many factors influencing egg weight loss

- Eggshell itself
- Environmental conditions

Signs of suboptimal weight loss

- Lower hatchability
- Lower chick quality

Egg weight loss data can be used to optimize incubation profile



Thanks for watching!

- **Webinar-replay + hand-out**
- **Knowledge section at our website**

See you at our next webinar!

