



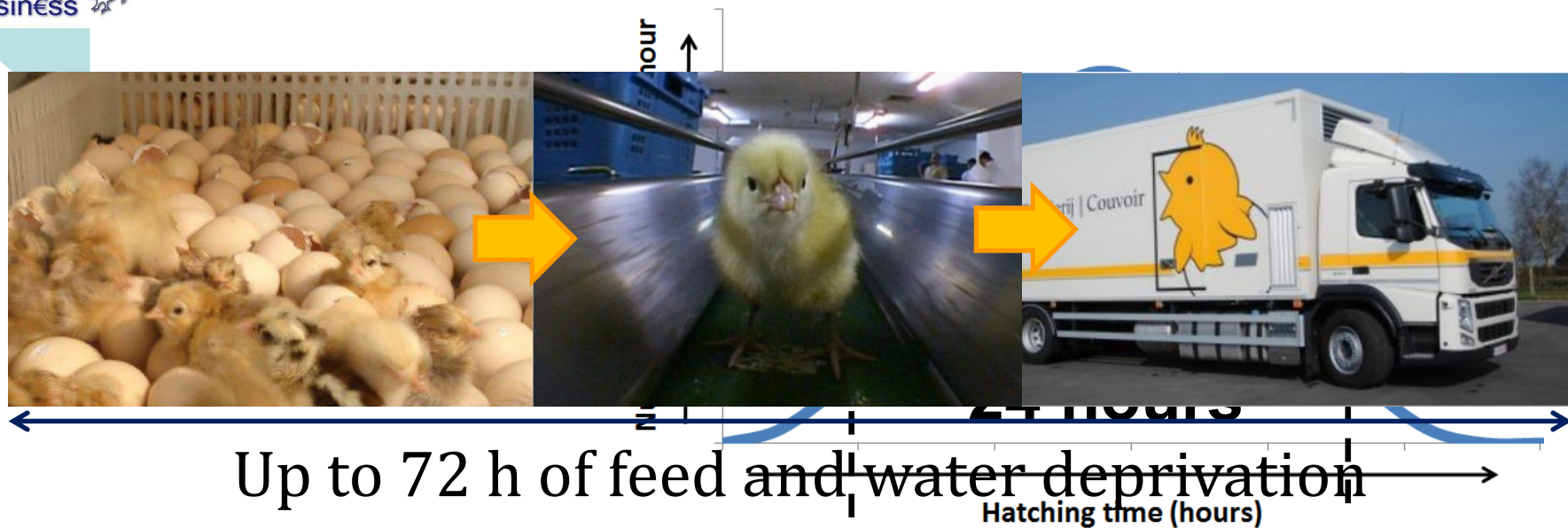
Monitoring the hatching time of individual chicks and its effect on chick quality



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The Hatch Window (HW) Problem



Consequences

- Lower chick weight
- Lack of uniformity
- Reduced chick quality
- Impact on animal welfare
- Economical losses for chicken industry



Hatch Window in Modern Incubation

**Capacity:
115.000 eggs/batch**



***PLF sensors detect embryo
development***



PETERSIME



***“Embryo-Response
Incubation”***



***Synchro-Hatch detects
hatch window***



From Group HW to Individual focal eggs

Early VS late hatchlings ?



- Specific embryonic development
- Monitored individual eggs
- Time of hatching

Monitoring Individual Focal Eggs

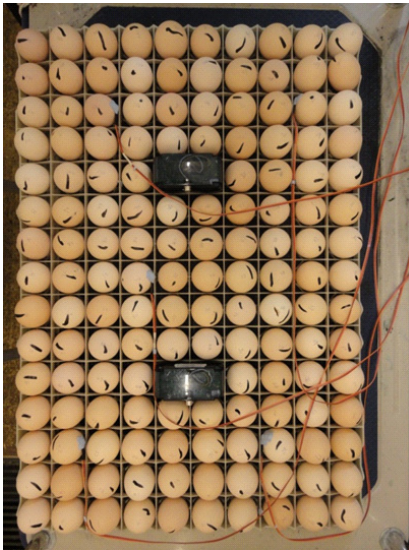
Experimental Protocol



- Two small scale incubators (Petersime NV)
- Incubating trays & hatching baskets
- 300 eggs/incubator

Eggshell Temperature of Focal Eggs

Tray

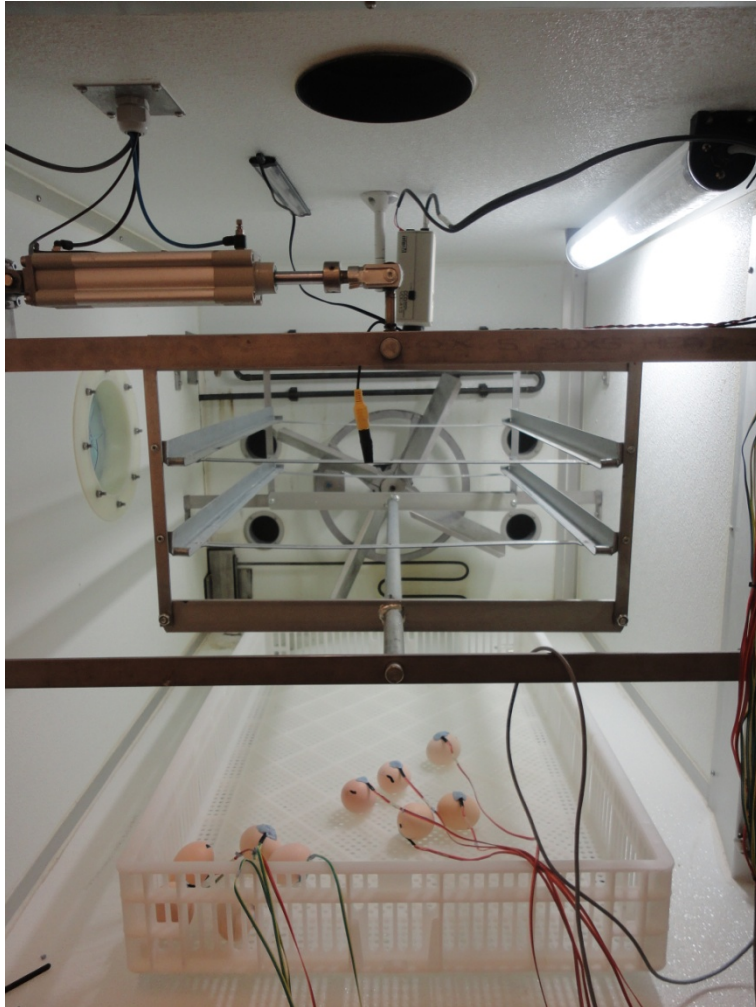


Basket

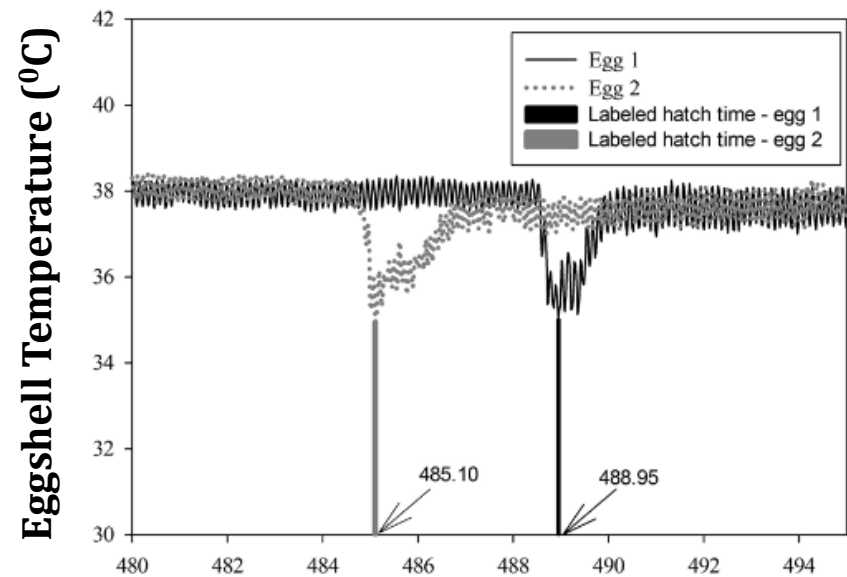


- 8 repeats: breeder Ross 308, 36-45 weeks age
- Tegg sensors: accuracy of ± 0.07 °C attached to the eggshell, 1 meas/min
- 200 “focal eggs” : monitoring of eggshell temperature (Tegg)

Tegg Drop in Hatched Focal Eggs



- ~3.5 degrees celsius
- “Gold standard”-camera sequence



Incubation Time (h)



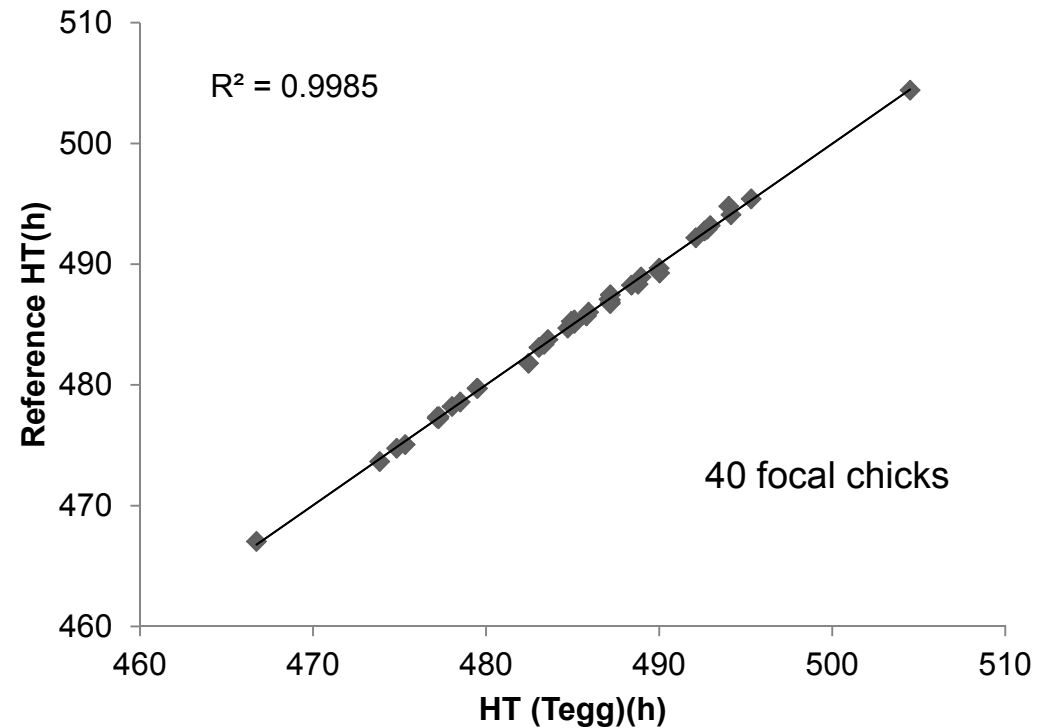
Tegg Drop Linked to Hatching Time(HT)

□ Reference HT

Seeing chick emerged from the shell in the camera image.

□ HT (Tegg)

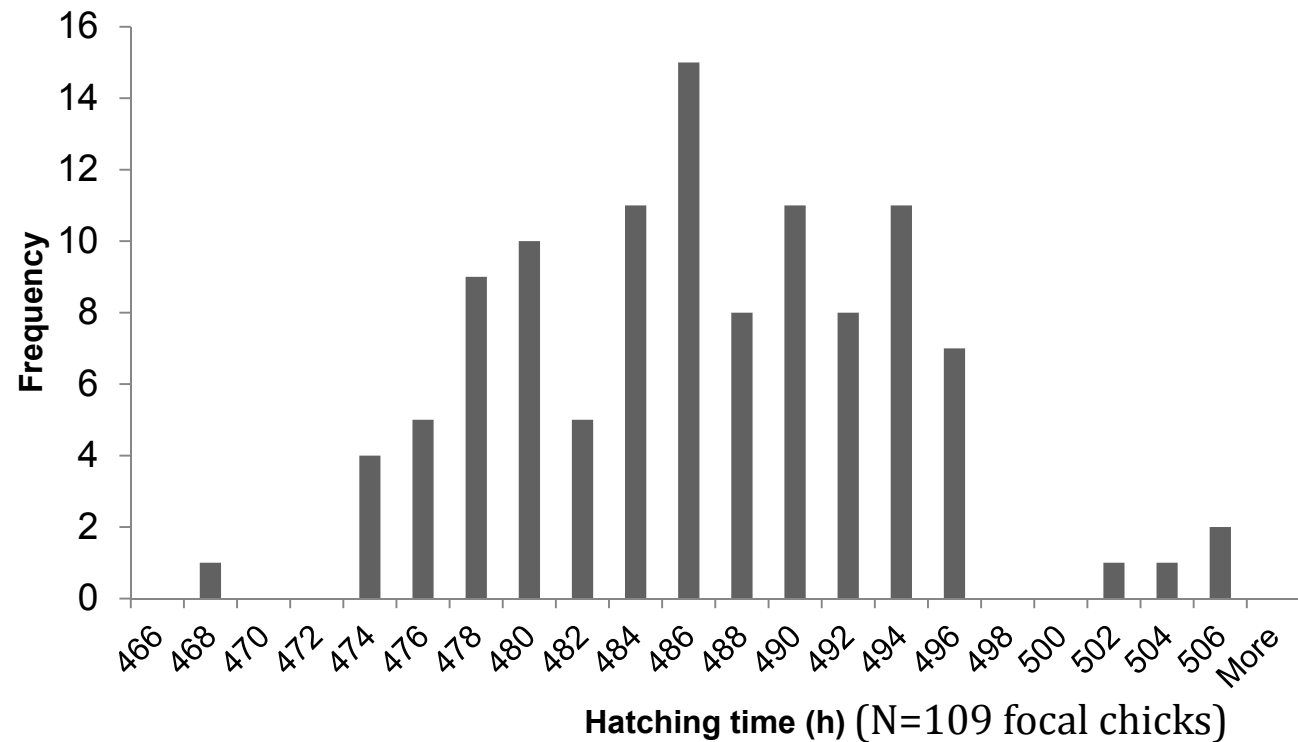
Tegg drop (2.1 to 5.9°C) occurred after transfer.





Hatching Time Distribution

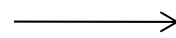
Focal eggs
hatchability:
70%





Hatching Time & Body Weight

At hatch



No effect

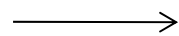
Body weights are similar

(van de Ven, 2013)



Take-off

Focal chicks were pulled
out at 512h and weighted.



Effect ?

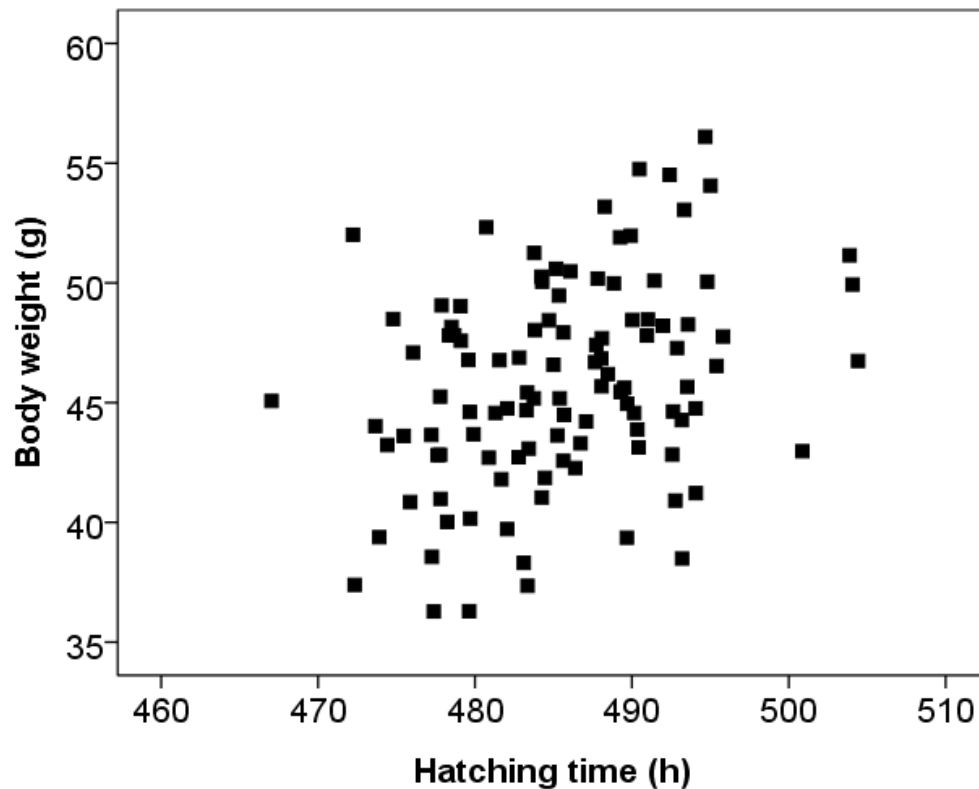
Dehydration or fasting ?



Effect on Body Weight at Take-off

$$\text{Chick weight} = 0.19 \times \text{hatching time} - 47.50$$

($r=0.32$; $P=0.001$)



**Losing 0.19g of weight
with
every hour post hatch!!**



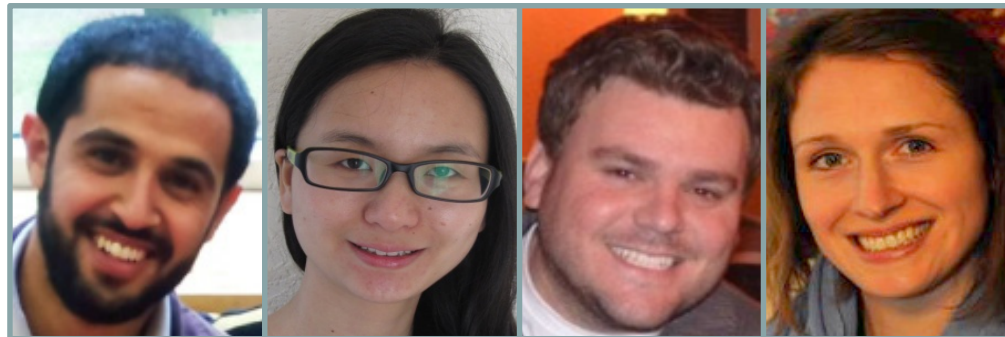
Conclusions

- Method to monitor the precise hatching time of individual egg
- Reference of hatching time to maintain chick uniformity
- The knowledge was transferred to industrial partner Petersime for future incubator technology development



Thank You !

Fellows of the chicken product group in the BioBusiness project



Hakim
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Eduardo
Romanini

Nancy
Roulston