Evaluation of Candling, Day of Transfer and Metabolic Mass in the Hatcher

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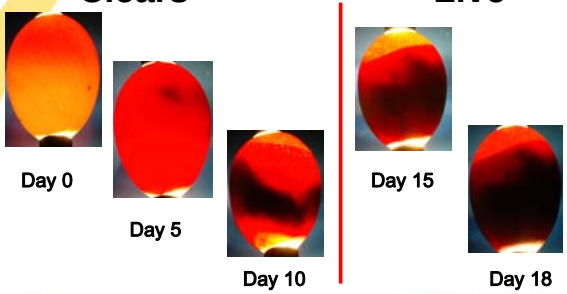
Candling and Clear Egg Removal

- Candling and clear egg removal at transfer has been shown to improve hatchability and reduce early mortality, primarily in eggs from older breeder flocks (>50 weeks of age)
- Candling and clear egg removal at transfer improves automated chick separator operation

Candling at Transfer

'Clears' 'Live'



Hatchability and Clear Egg Removal

Age of Breeder	No Candle	Candle	Difference
24-30 Weeks	81.29%	80.94%	-0.35%
31-39 Weeks	85.23%	85.18%	-0.05%
40-49 Weeks	84.77%	85.56%	0.79%
50-59 Weeks	75.10%	75.50%	0.40%
60 + Weeks	65.39%	67.51%	2.12%
Total	**80.84%**	**81.29%**	**0.45%**

Jamesway®

Hatchability and Clear Egg Removal

Age of Breeder	No Candle	Candle	Difference
24-30 Weeks	84.83%	84.62%	-0.21%
31-39 Weeks	90.33%	89.76%	-0.57%
40-49 Weeks	89.28%	88.96%	-0.32%
50-59 Weeks	81.84%	82.78%	0.94%
60 + Weeks	74.43%	77.02%	2.59%
Total	**85.14%**	**85.84%**	**0.70%**

ChickMaster®

Day of Transfer and Inovo Injection

- In general, the later you transfer the higher the hatchability of transferred eggs
- With later transfer (D 17.5 to D 19), higher levels of metabolic heat production are found in the incubator across the 36 hour difference
- With respect to Inovo vaccination, the older the embryo at injection, the later the protection (MD) after hatch

Hatchability and Day of Transfer

Flock Age	Days @ Inj/Trn	% Net Hatch	Difference (D18-D17)	Days @ Inj/Trn	% Net Hatch	Difference (D18.5-D17.5)
< 31	17	81.10	2.27	17.5	80.54	1.10
	18	83.37		18.5	81.64	
31-49	17	84.48	1.60	17.5	84.01	1.23
	18	86.08		18.5	85.24	
> 49	17	71.16	2.73	17.5	78.51	0.60
	18	73.89		18.5	79.11	

Metabolic Mass in the Hatcher

- Is there a limit (upper or lower) to the amount of embryonic Metabolic Mass that our hatchers can handle?
- What are the factors that can change the answer to the above question?
- Does the Metabolic Mass need to be evenly distributed across the hatching baskets in the hatcher?
- Does day of transfer/injection interact with Metabolic Mass?

Metabolic Mass Determinations

Estimated Metabolic Mass of 15,000 Live Eggs			
Age of Breeder Flock	% Live Embryo at Transfer	Egg Weight (grams)	Metabolic Mass (grams - lbs.)
30	90	50	675000 - 1487
45	85	60	765000 - 1685
60	75	70	787500 - 1735

Testing Methodology

Trial 1 and 2

- Day 19 of Incubation, all eggs candled
- Candle Remove (CR) versus Candle No Remove (CNR), segregated by hatcher
- Equal number of live eggs in hatching basket of Candle Remove group (141, 144, 147), equal number of total eggs in Candle No Remove group (162)
- Metabolic Mass determined
- Hatch of total egg set, candled live, and necropsy determined

Testing Methodology

Trial 3

- Day 18 and 19 of Incubation, all eggs candled
- Candle Remove (CR) D18 versus Candle No Remove (CNR) D19, segregated by hatcher
- Equal number of live eggs in hatching basket of Candle Remove D18 group (147, 150), equal number of total eggs in Candle No Remove D19 group (162)
- Metabolic Mass determined
- Hatch of total egg set, candled live, and necropsy determined

Egg Remover® System

Results and Conclusions

Results

Trial 1	Chicks Hatched	Transfer Candle Live	Total Hatch of Eggs Set	Total Hatch of Candle Live	Necropsy Hatch of Live Normal
D19 CNR	26600	27948	85.52	95.18	96.96
D19 CR	26700	27902	85.84	95.69	98.79

Metabolic Mass Calculations (egg weight X # of eggs)

Day 19 CNR – 3584 lbs live + 404 lbs clear eggs

Day 19 CR – 3578 lbs live

Breeder Flocks 50-,52 WOA, Egg Weights 58,60 g

Results

Trial 2	Chicks Hatched	Transfer Candle Live	Total Hatch of Eggs Set	Total Hatch of Candle Live	Necropsy Hatch of Live Normal
D19 CNR	27300	28944	87.77	94.32	98.69
D19 CR	27500	29055	88.41	94.65	98.27

Metabolic Mass Calculations (egg weight X # of eggs)

Day 19 CNR – 3316 lbs live plus 249 lbs clear eggs

Day 19 CR – 3328 lbs live

Breeder Flocks 37, 45 WOA, Egg Weight 49, 53 g

Results

Trial 3	Chicks Hatched	Transfer Candle Live	Total Hatch of Eggs Set	Total hatch of Candle Live	Necropsy Hatch of Live Normal
D19 CNR	26900	28460	86.48	94.52	98.87
D18 CR	26700	28511	85.84	93.65	98.43

Metabolic Mass Calculations (egg weight X # of eggs)

Day 19 CNR - 3469 lbs live plus 326 lbs clear eggs

Day 18 CR - 3466 lbs live

Breeder Flock 46, 52 WOA, Egg Weight 53, 58 g

Summary of Necropsy - Trials 1 and 2		
Age of Breeder Flock	Candled Removed	Candled No Removal
	% Hatch of Live	% Hatch of Live
31-39 weeks	99.00	98.35
40-49 weeks	98.24	98.21
50-59 weeks	98.68 a	97.36 b
total	98.50	97.92

Summary of Necropsy – Trial 3		
Age of Breeder Flock	Candled Removed (D18)	Candled No Removal
	% Hatch of Live	% Hatch of Live
40-49 weeks	98.98	98.64
50-59 weeks	98.27 b	99.08 a
total	98.43	98.87

Results and Conclusions

- Improvements in hatchability can be seen when candling and removal of clear eggs at injection/transfer is done when total live egg mass exceeds ~1700 lbs (# live eggs X egg weight)
- In current environment, D19 injection/transfer significantly improves hatchability as compared to D18 of incubation
- Data suggests increases and/or improvements in the quality of air flow through the hatcher may improve hatchability of transfer/injection on D18 versus D19 of incubation (metabolic mass??)

Discussion

- Can we alter the temperature, pressure, and/or humidity levels in the hatcher hallway and improve hatchability when injecting/transferring on D18?
- Do we need to control the air flow through the hatcher according to Metabolic Mass? Too little versus too much?

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