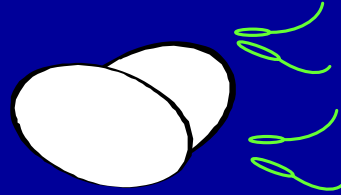


Managing Broiler Breeder Males In Hot Weather

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Male Fertility



Classic Approaches To Hot Weather Management

- More water
- More ventilation
- More space

Classic Approaches To Hot Weather Management

- More water
- More ventilation
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We are not going to talk much about these.

Heat Stress And Broiler Breeder Males

Is It Real
Or
Artifact?



Breeder Diet % AvP	Phytase	Broiler Breeder	
		Male Mortality (%)	Female Mortality (%)
0.40	+	16.67	8.5 ^B
0.40	-	12.50	13.0 ^B
0.13	+	12.50	11.5 ^B
0.13	-	16.67	41.5 ^A
To ~50 weeks of age			BBP-2

% AvP	Phytase	Fertility (%)	Fertile Hatch (%)
0.40	+	96.7	94.6
0.40	-	96.1	95.3
0.13	+	95.3	95.2
0.13	-	96.9	93.7

BBP-2

Broiler Breeder Phosphorus Experiment

- Summer ambient temperatures were **HOT**
- Females on the low phosphorus diet exhibited high heat stress related mortality (+30%) without added phytase
- The females that did not die exhibited normal reproductive function
- No major male effects observed

Hot Weather Management

If it is hot enough to kill 30% of the females but have no effect on male livability or fertility...
what does this say?

Hot Weather Management

If it is hot enough to kill 30% of the females but have no effect on male livability or fertility...
what does this say?

Obviously males need less phosphorus than do females...

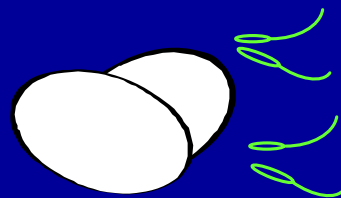
Heat Stress And Broiler Breeder Males

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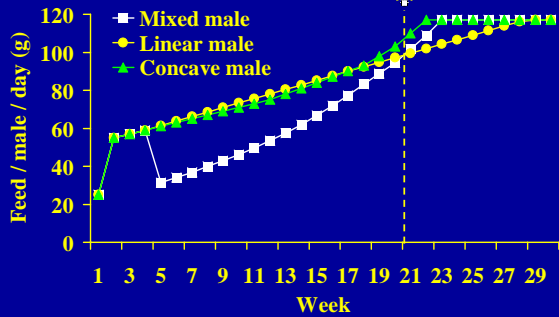
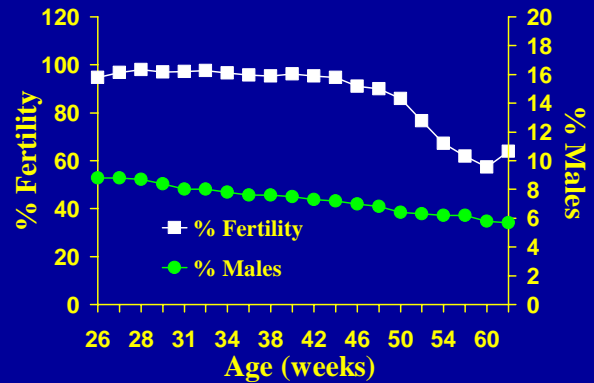
It probably means that we do not understand the problem very well!

Rule # 1: Broiler Breeder Males Must Live To Be Fertile!



Male Fertility

For the most part, male fertility is simply a numbers game.



BB14

Male Mortality (%)

Male treatment	Male Mortality (%)				
	22-29 wk	30-44 wk	45-64 wk	30-64 wk	22-64 wk
Mixed	3.8	17.5 ^a	8.7	26.2 ^{ab}	30.0 ^{AB}
Linear	8.7	17.5 ^a	13.8	31.3 ^a	40.0 ^A
Concave	7.5	10.0 ^b	7.5	17.5 ^b	25.0 ^B

This may happen when late rearing period is in hot weather and we watch body weight closely.

Hot Weather Management

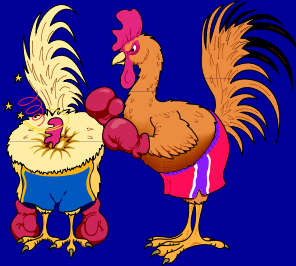
Many of the negative effects of hot weather are associated with reduced feed intake.

Do we reduce feed at the wrong time?

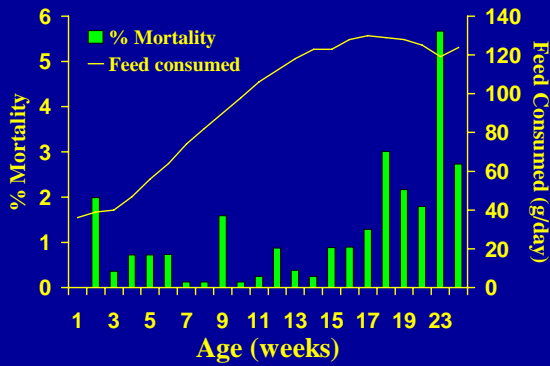
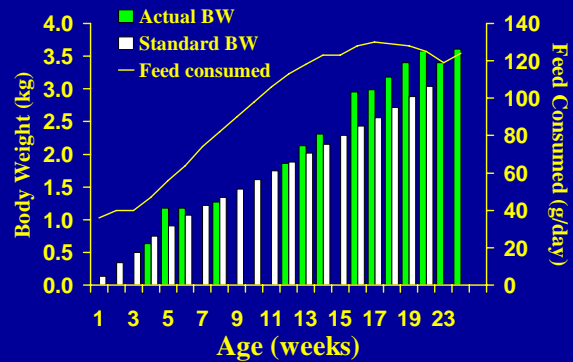
Hot Weather Management

Is our emphasis on body weight control part of the problem?

“Male Aggression”



Feeding and Male Aggression

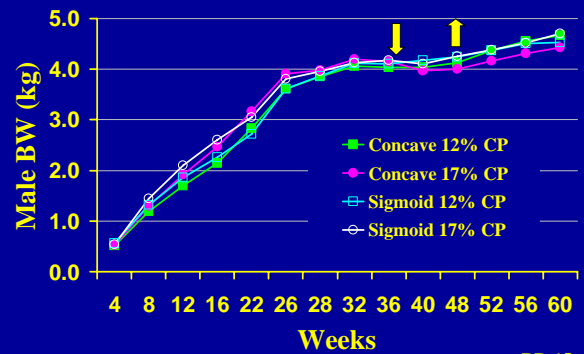


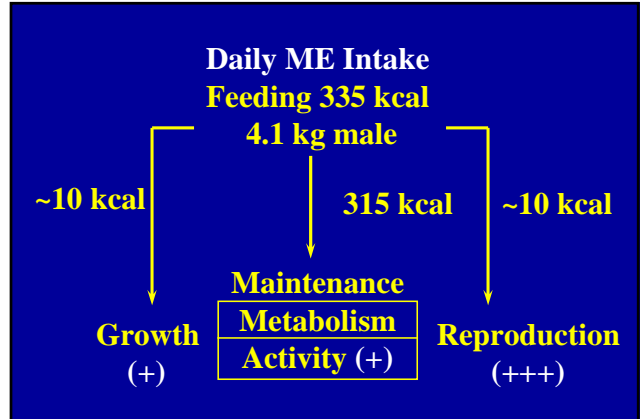
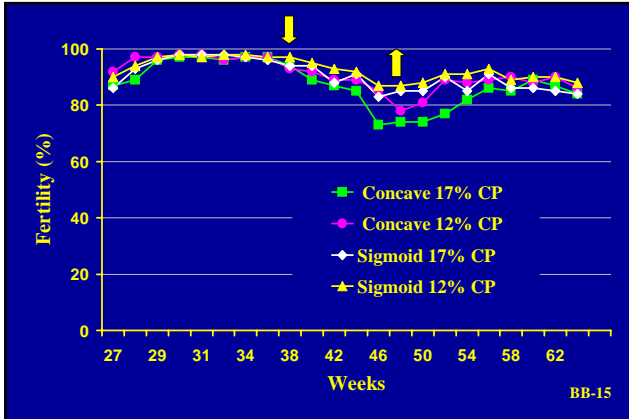
Male Fertility

- For the most part, male fertility is simply a numbers game.
- The rest is having enough ME and CP in the bird at the correct times in proportion to the body weight that exists.

Hot Weather Management

- Many of the negative effects of hot weather are associated with reduced feed intake.
- Males are very sensitive to feed intake.





Hot Weather Management

Is our emphasis on body weight control part of the problem?

Male Broiler Breeder Fertility

Small changes in body weight or conformation can have a profound effect on subsequent fertility...unless appropriate management is employed.

Heat Production

Breast Meat

Food and Digestion

Heat Stress Management For Broiler Breeder Males

Control Breast Meat

↓

Control Heat Production

Breast Meat Potential Continues To Increase



1957

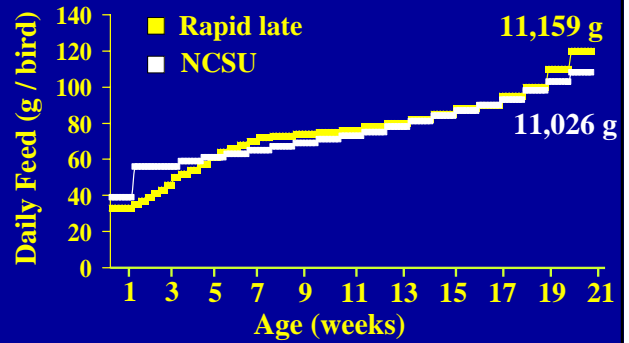
1991

Broiler Male
42 Days of Age



2001

Male Feeding Programs



Typical Dietary Formulations

	Starter	Grower	Breeder
ME, kcal/g	2.85	2.85	2.85
CP, %	17.0	15.0	15.0
Lysine, %	0.85	0.75	0.75
M + C, %	0.71	0.62	0.60
Calcium, %	1.00	1.00	2.70
AvP, %	0.45	0.45	0.41
Na, %	0.22	0.25	0.20
Cl, %	0.30	0.30	0.30
K, %	0.80	0.75	0.75

Dietary Formulation Strategies

- There is limited scientific evidence to support the recommendation to use low protein, essential amino acid-supplemented diets during heat stress.
- Most data favors normally balanced diets.
- Summer diets?

Heat Production

Breast Meat



Food and Digestion



Heat Stress Management For Broiler Breeder Males

Control Digestion

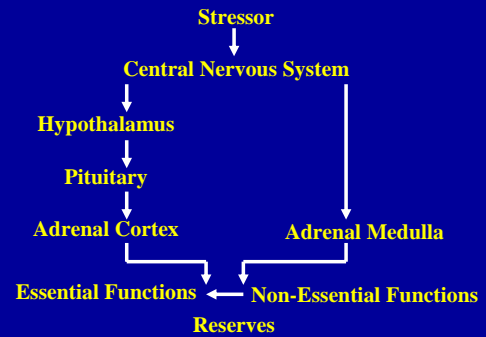


Control Heat Production

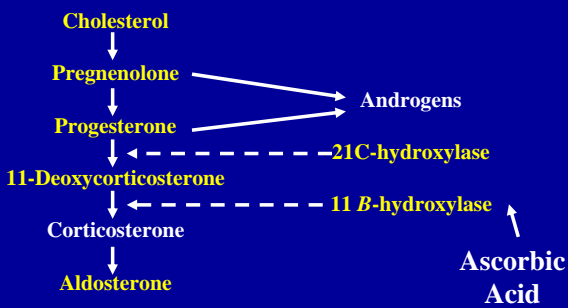
Acute Heat Stress Management

- Remove feed 1 or 2 days
- Return feed gradually
- Provide calcium only

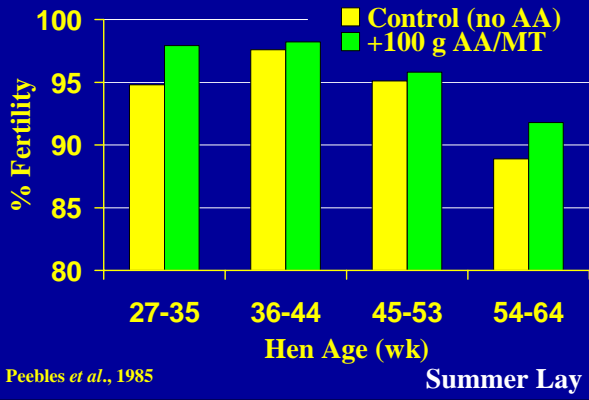
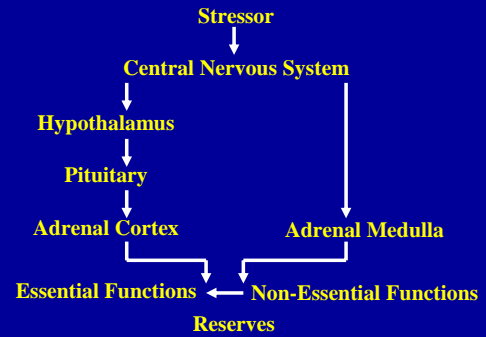
Endocrine Aspects of Physiological Stress



Corticosterone Biosynthesis

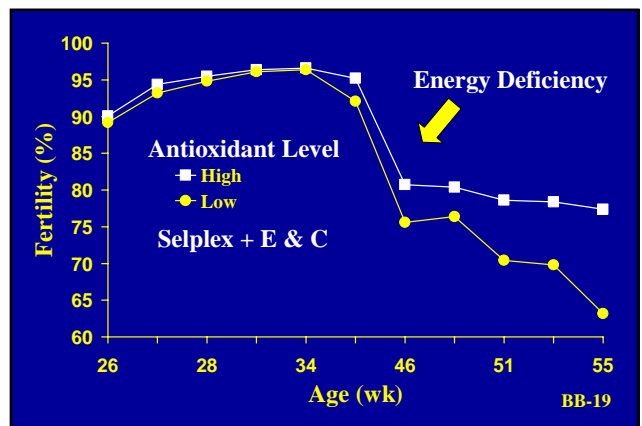
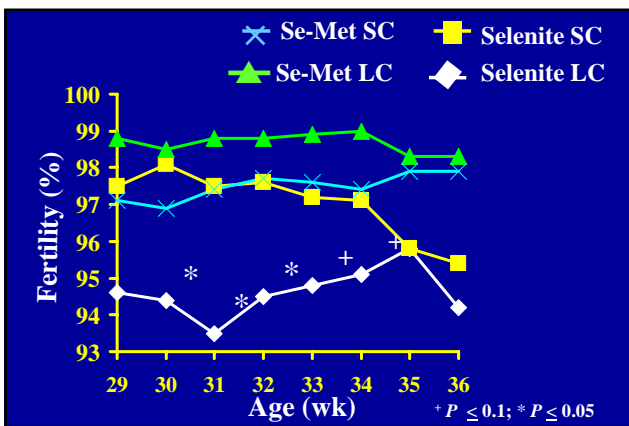
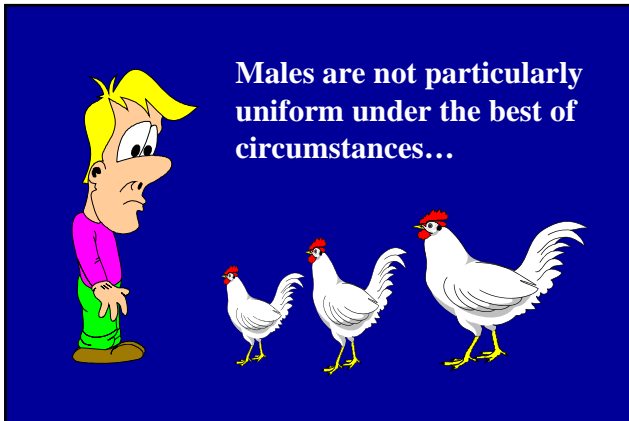


Endocrine Aspects of Physiological Stress



	Ascorbic Acid (mg/kg)			
	0	125	250	500
Broiler Breeder				
Semen volume (ml)	0.47	0.51	0.62	0.77
Spermatozoa (10^9 /ml)	2.94	2.54	2.86	3.11
Sperm/ejaculate (10^9)	1.42	1.32	1.84	2.40

Monsi and Onitchi, 1991



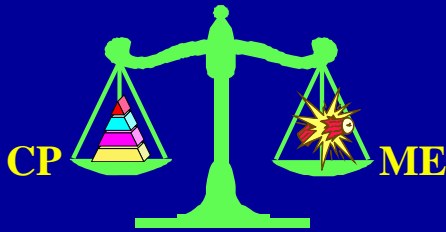
We think of selenium, vitamins C and E as antioxidants, and they are, but might this all be simply...

...a nutrient-sparing effect...
...or, at least a combined effect?

We think of selenium, vitamins C and E as antioxidants, and they are, but might this all be simply...

...a nutrient-sparing effect...
...or, at least a combined effect...
...because we are feeding relatively too little?

Balancing Body Weight And Fertility



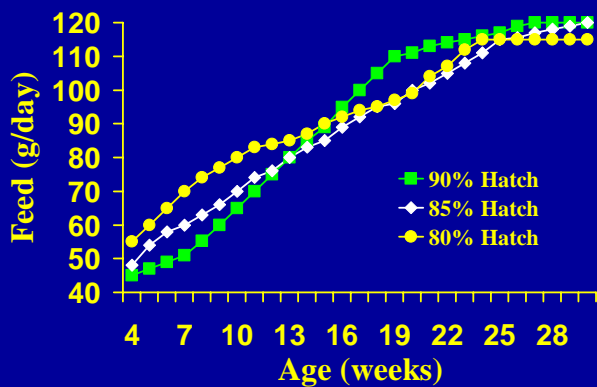
A Feed and Nutrition Program Proportional to Controlled Body Weight is Required

Hot Weather Management

Is there a truly super-sensitive period?



Hot weather around the time of sexual maturity has often been cited as a cause of fertility problems.



Broiler Breeder Nutrition

Is there a nutritional interaction between males and females?

Male-Female Nutrient Interaction

Male CP intake to 20 weeks at		Female ME/CP intake to 20 weeks	
31,000 kcal ME Male diet	Male diet	22000/1200	24170/1200
(g)	(% CP)	— (% fertile eggs) —	
1440	13.1	80.3	82.8
1585	14.7	89.1	89.3
1733	16.3	77.0	90.4
1885	18.0	78.1	93.6

MEGROW

Broiler Breeder Nutrition

Is there a nutritional interaction between males and females?

Evidently there is...can this be a factor in hot weather rearing?

Body Weight in Broiler Breeder Males

As males grow they actually need an increased ME allocation to maintain reproduction rather than a reduction in ME to control body weight.

Maintain Balance!

Male BW		Maintenance	Feed	
lbs	kg	ME	g	lbs
6	2.72	239	83.6	.184
7	3.18	264	92.3	.203
8	3.63	288	100.7	.222
9	4.08	311	108.7	.239
10	4.54	333	116.4	.256
11	4.99	354	123.8	.272
12	5.44	375	131.1	.288

Feed = 2.86 kcal/g or 1300 kcal/lb @ 21°C

General Conclusions

- Minimum cumulative nutrition needed
- Do not substantially alter what works in cooler weather
- Remove feed in acute situations
- Nutrient-sparing and antioxidant additives
- Keep males in positive nutrient balance

Listen to the chickens.

