What can cause too many mid-size eggs?

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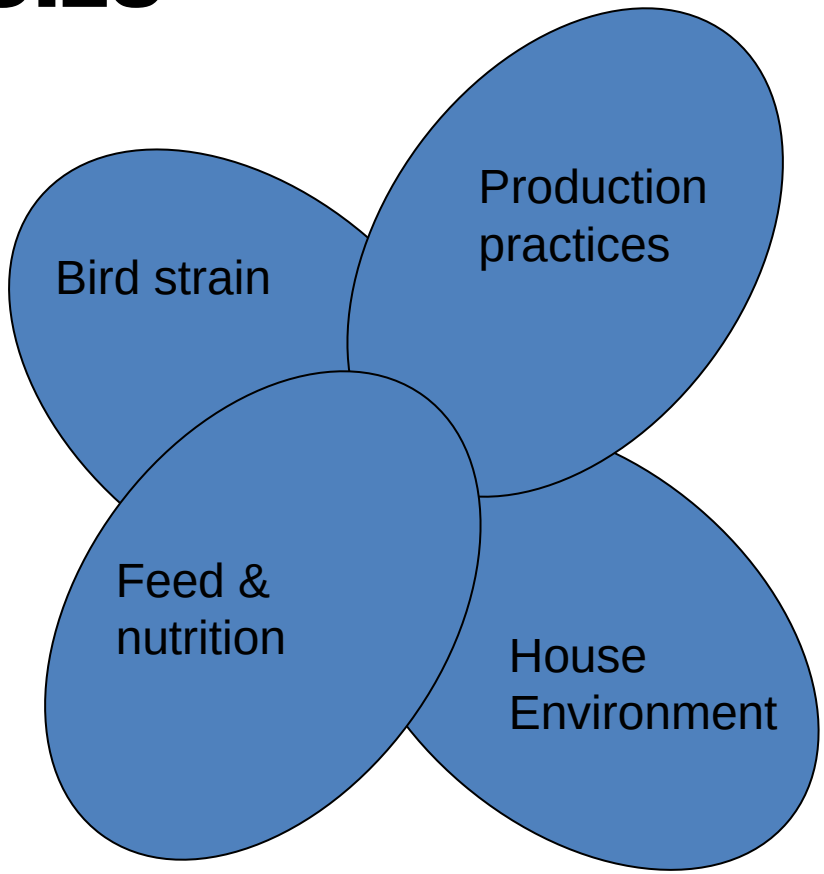
Table Egg Sizes

Size	Weight Range	Price/Doz
peewee	under 42 g	$0.27*
small	42 g - 48 g	$1.07
medium	49 g - 55 g	$1.45
large	56 g - 63 g	$1.67
extra large	64 g - 69 g	$1.67
jumbo	over 69 g	$1.67

*AB producer price, March, 2009

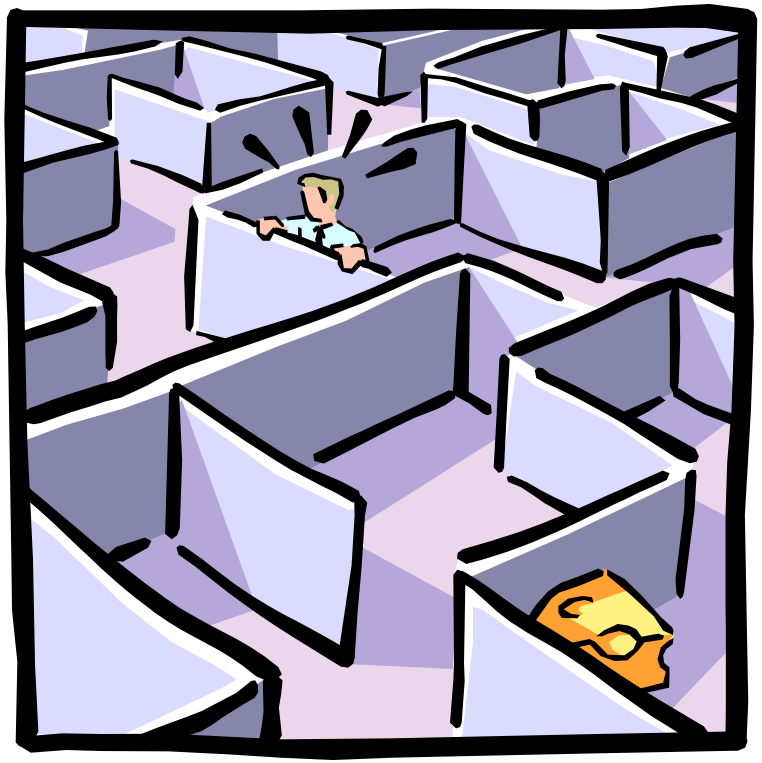
http://data.canadaegg.ca/prog/ProducerPriceListRep.asp

Egg Size

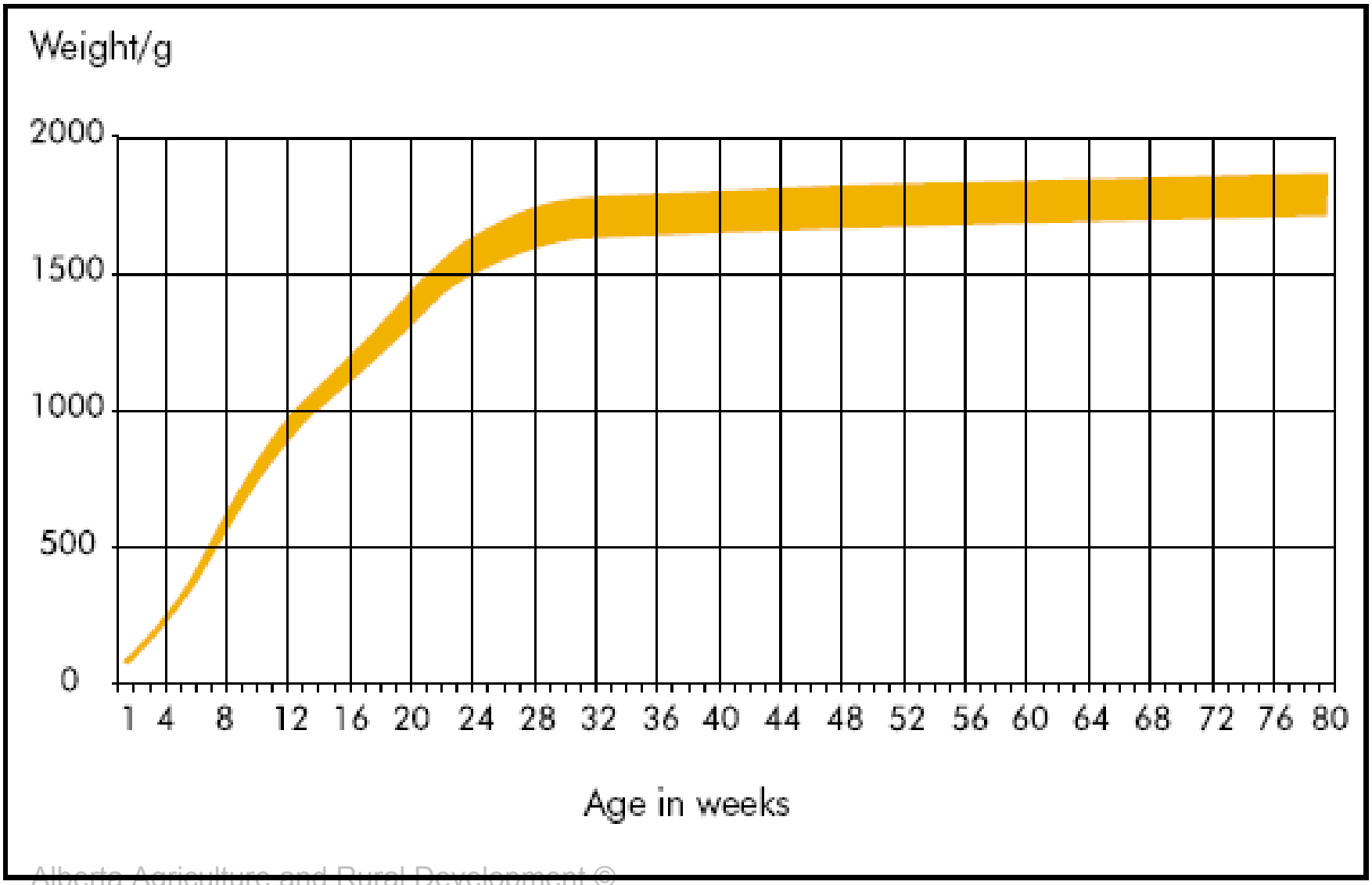


Without knowing much…

- What are some of the factors resulting in too many mid-size eggs?
  - Depends on what is happening in your barns
  - Pullet weights
  - Diet formulation
  - Dietary protein and amino acids
  - Phase feeding changes



Weight Development of LOHMANN LSL-CLASSIC Layers



Bird strain => flock age, weight

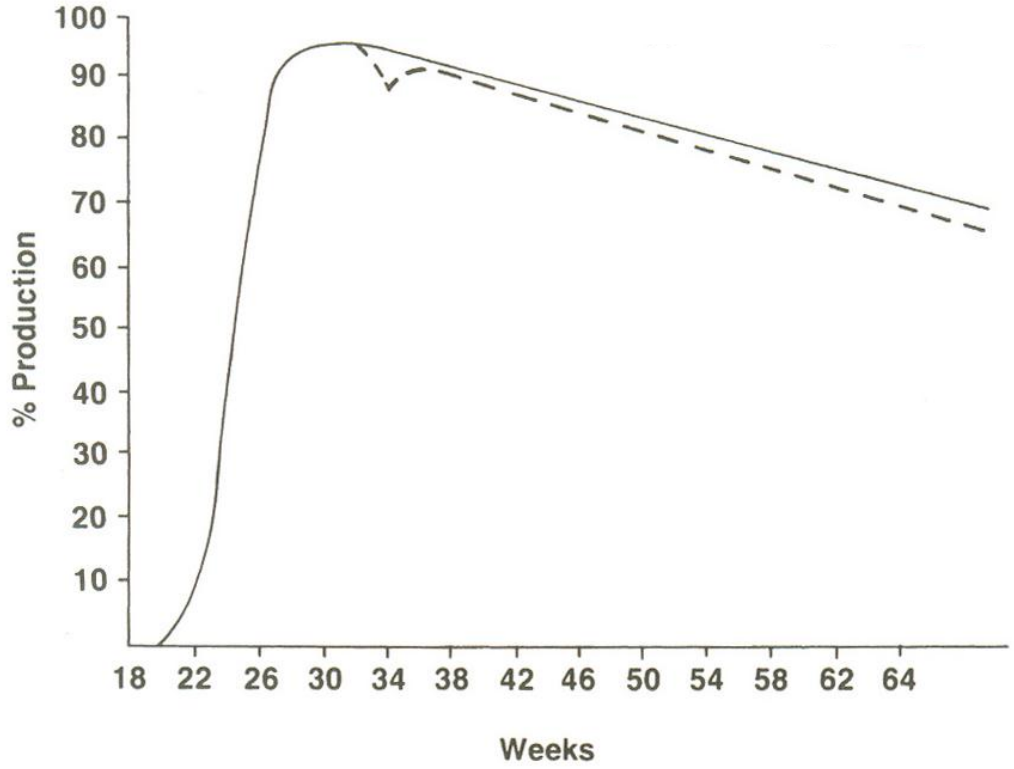
- The older the pullets before first eggs laid, the larger the avg egg size over prod cycle
- Response to delay light stimulation is strain dependent
- Short photoperiods can reduce feed intake
- Larger birds have higher requirements
- Uniform BW close to target is the goal

Pullet Diets

- Need appropriate body weight/size ***before*** sexual maturity
  - larger eggs early on
  - nutrient reserves
  - less prone to subsequent problems
    - rapid drop in production following peak
    - more body reserves
- Flock uniformity

Pullet Diets

- Insufficient energy intake before peak egg production
  - Pullet size => appetite, nutrient intake



From Leeson and Summers, 2005. Commercial Poultry Nutrition (3rd ed.)

Bird strain => feed intake

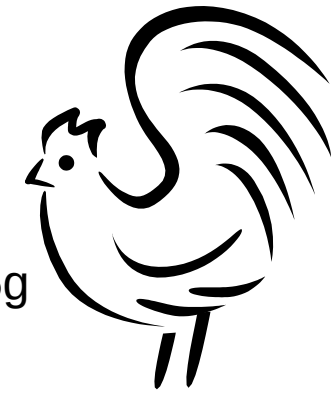
- Birds do not eat ***percentages*** !!
- Same feed, 18% protein

eats **100g**/d

18% of 100g = 18g

eats **80g**/d

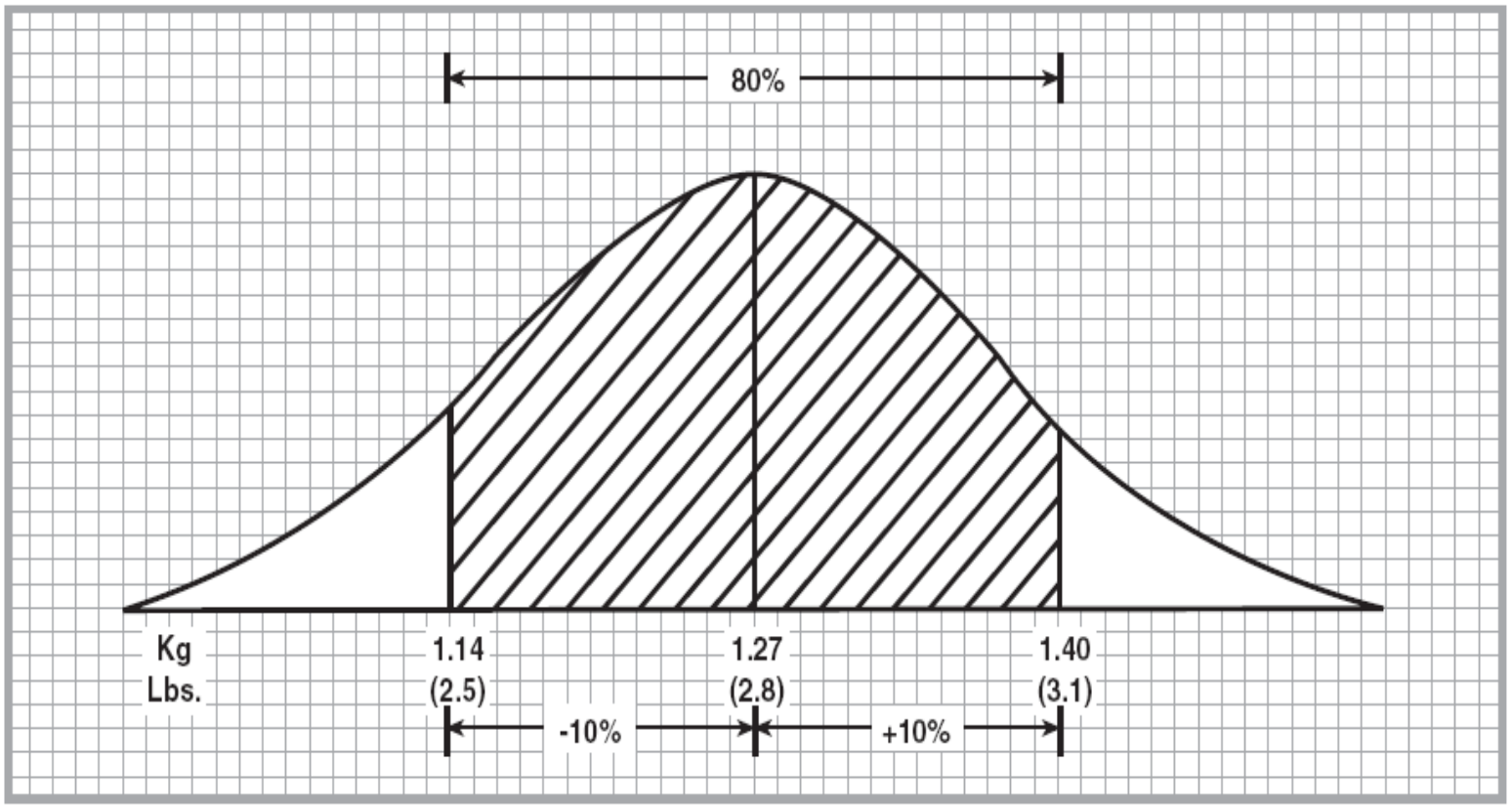
18% of 80g = 14.5g



- Thus, nutrients concentration in feed must be in relation to expected feed intake

A non-uniform flock

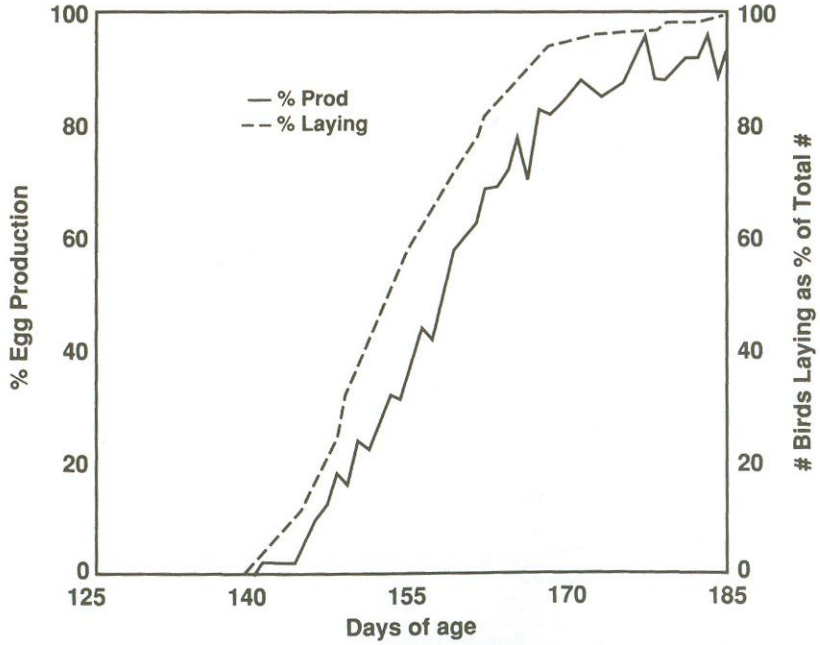
Variability Between Individual Birds Within A Flock

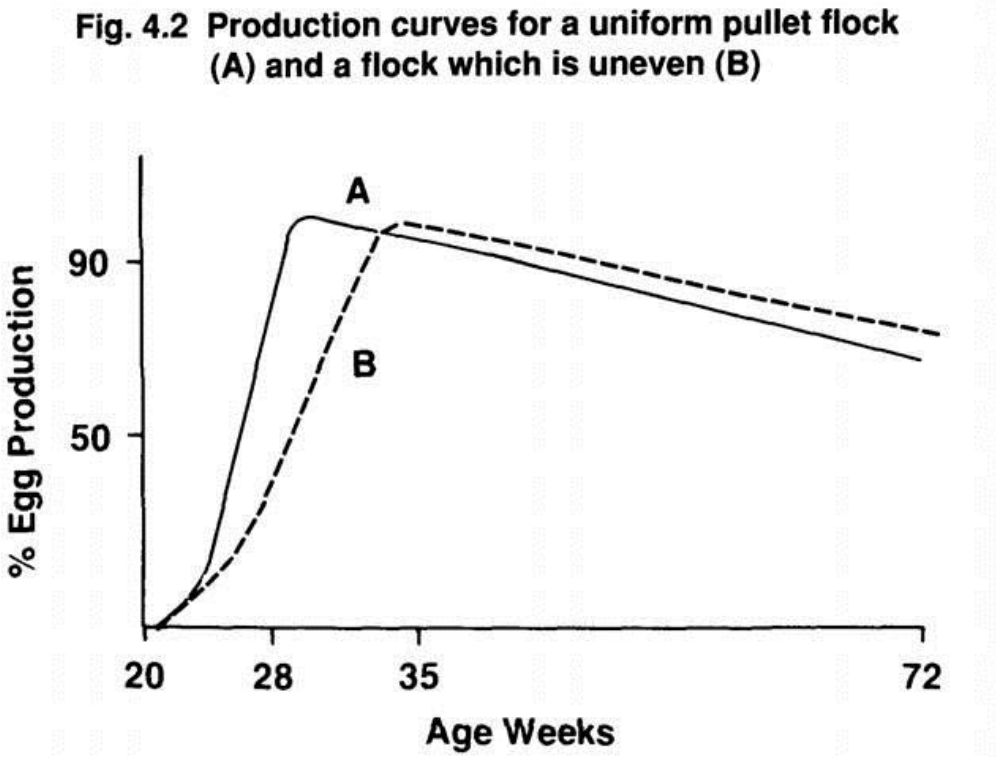


The more uniform the flock, the more you can feed "one bird"

Pullet Diets

- Uniformity





- Does a bird that lays an egg have the same nutrient requirements as a hen that doesn't?

From Leeson and Summers, 2005. Commercial Poultry Nutrition (3rd ed.)

Phase Feeding

- Based on egg mass/hen/day, not age
  - Reflects nutrient requirements
  - Feed based on expected intake, not a fixed % of diet

Recommended Nutrient Levels per kg of Feed for different daily Feed Consumption in Phase 1 (29 to approx. 45 week ≅ above 57.5 g Egg Mass/Hen/Day)

Lohmann Brown

Nutrient	Requirement g/Hen/Day	Daily Feed Consumtion			
		105 g	110 g	115 g	120 g
Crude Protein	19.60	18.70 %	17.80 %	17.00 %	16.30 %

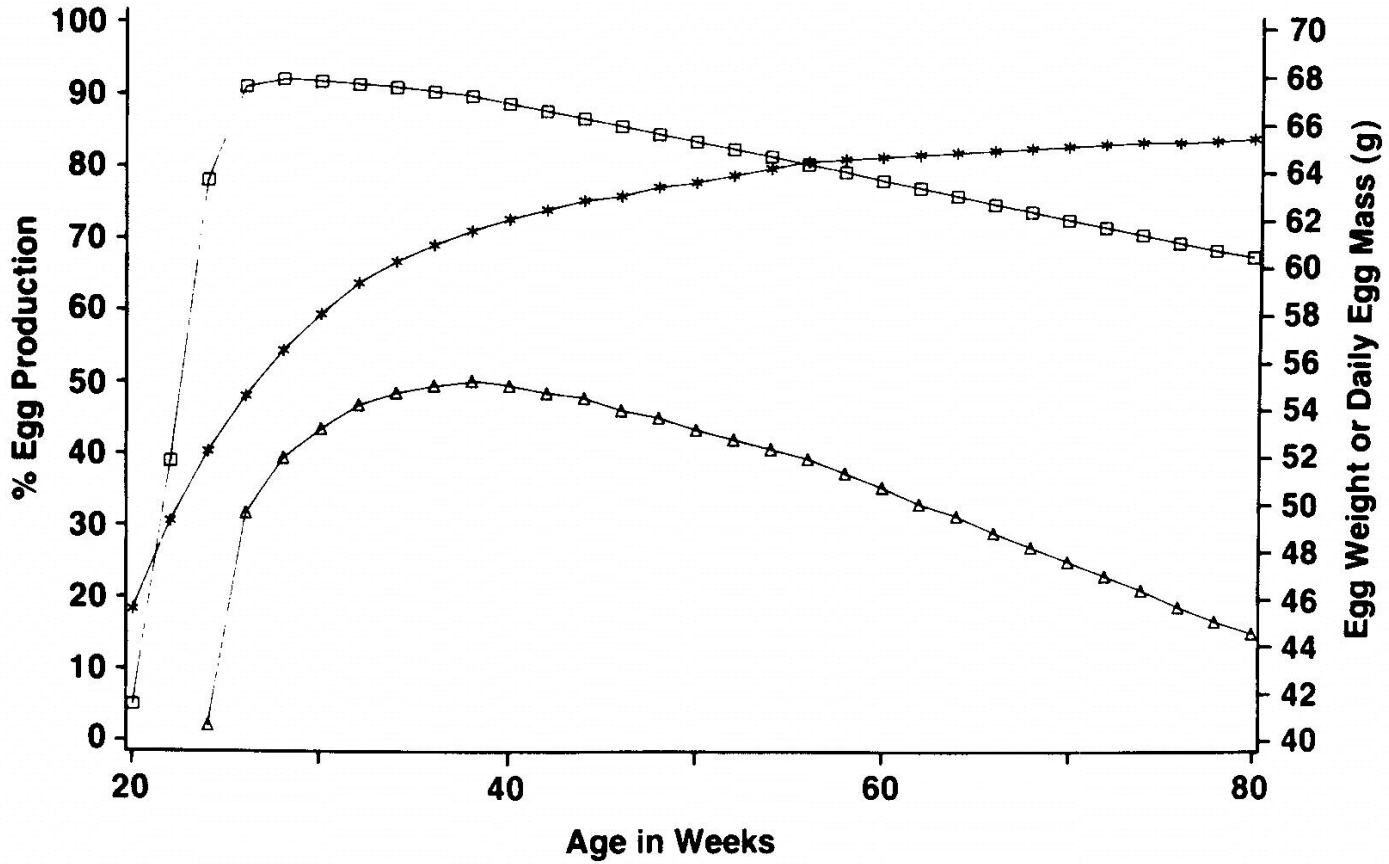
Lohmann White

Nutrient	Requirement g/Hen/Day	Daily Feed Consumtion		
		105 g	110 g	115 g
Crude Protein	19.60	18.70 %	17.80 %	17.00 %

Issues in Laying Hen Nutrition

Egg Production Curve -- Layers

Fig. 4.9 Bird age: egg production, egg weight and egg mass.



From Summers and Leeson, 2005. Commercial Poultry Nutrition (3rd ed.) p. 190

Egg Production Curve -- Layers

Jumbo

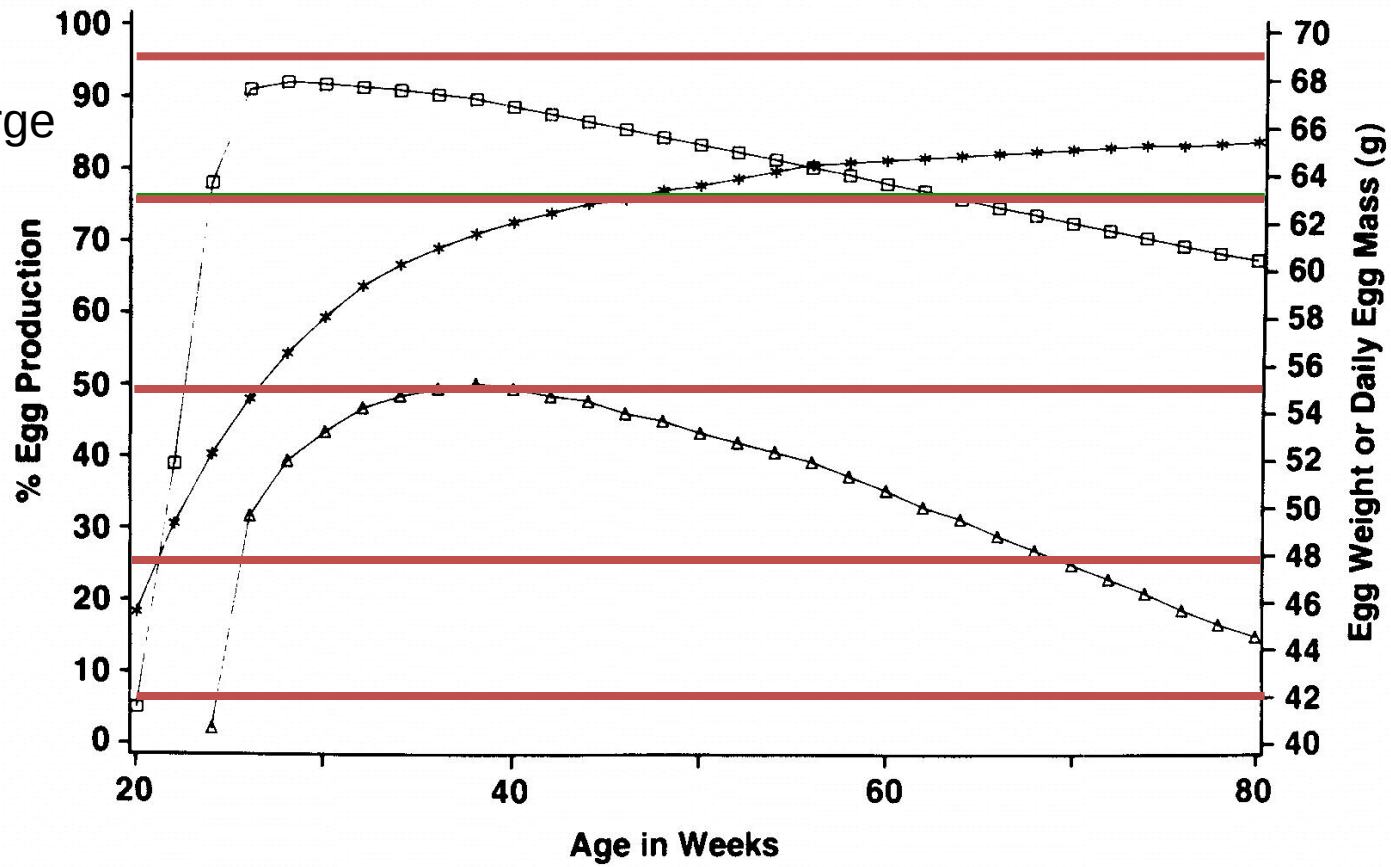
Extra Large

Large

Medium

Small

Peewee



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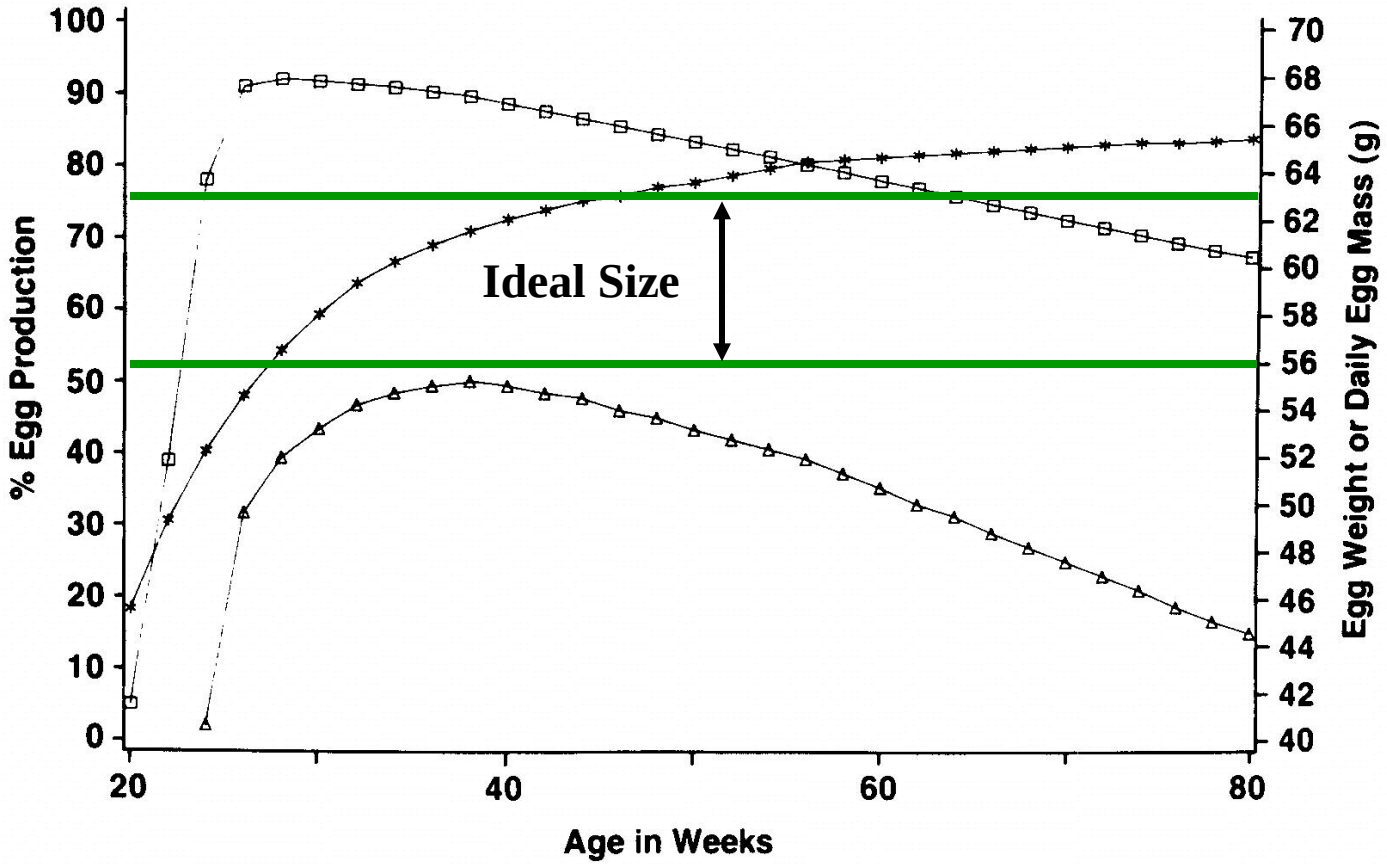

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Egg Production Curve -- Layers

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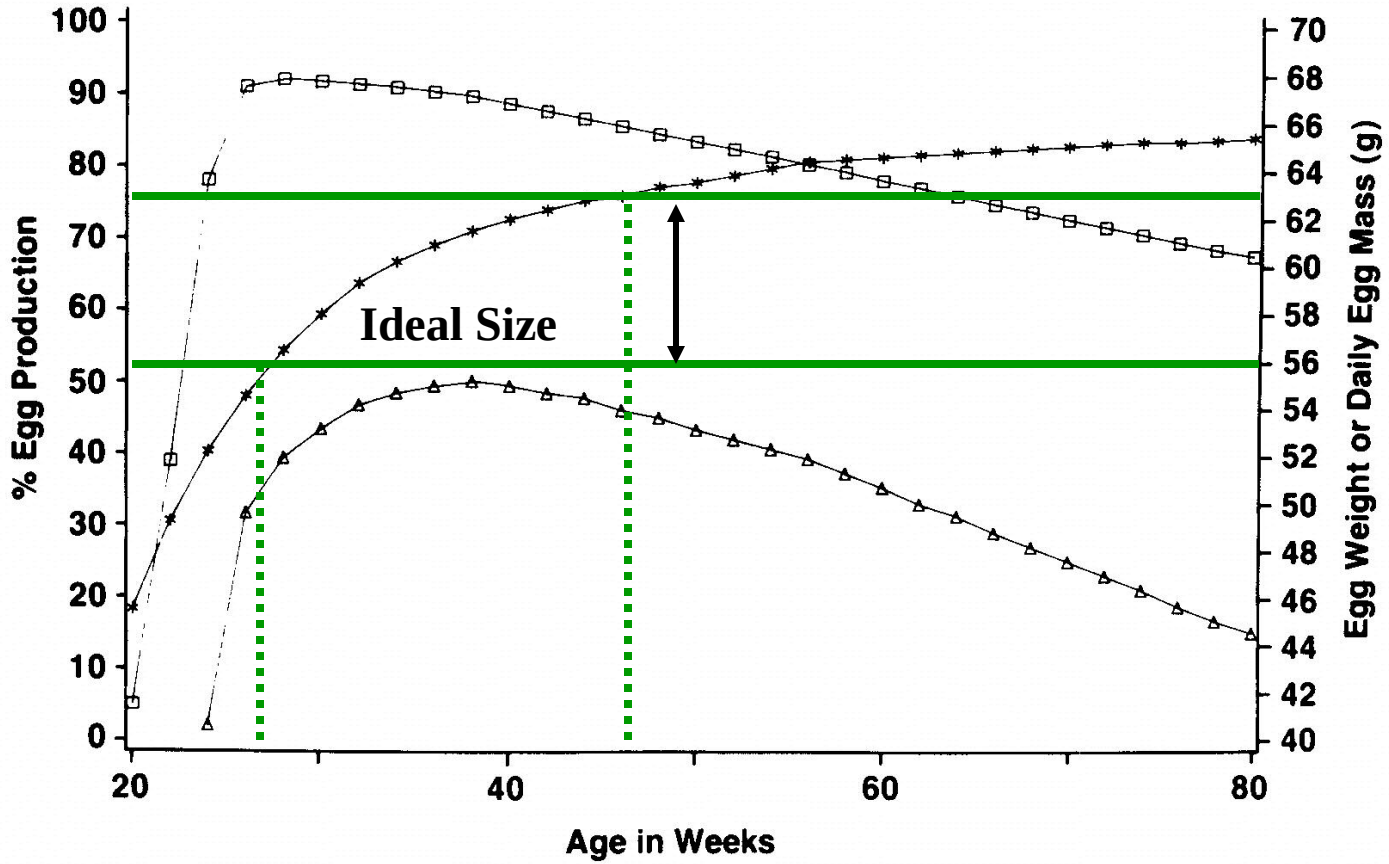

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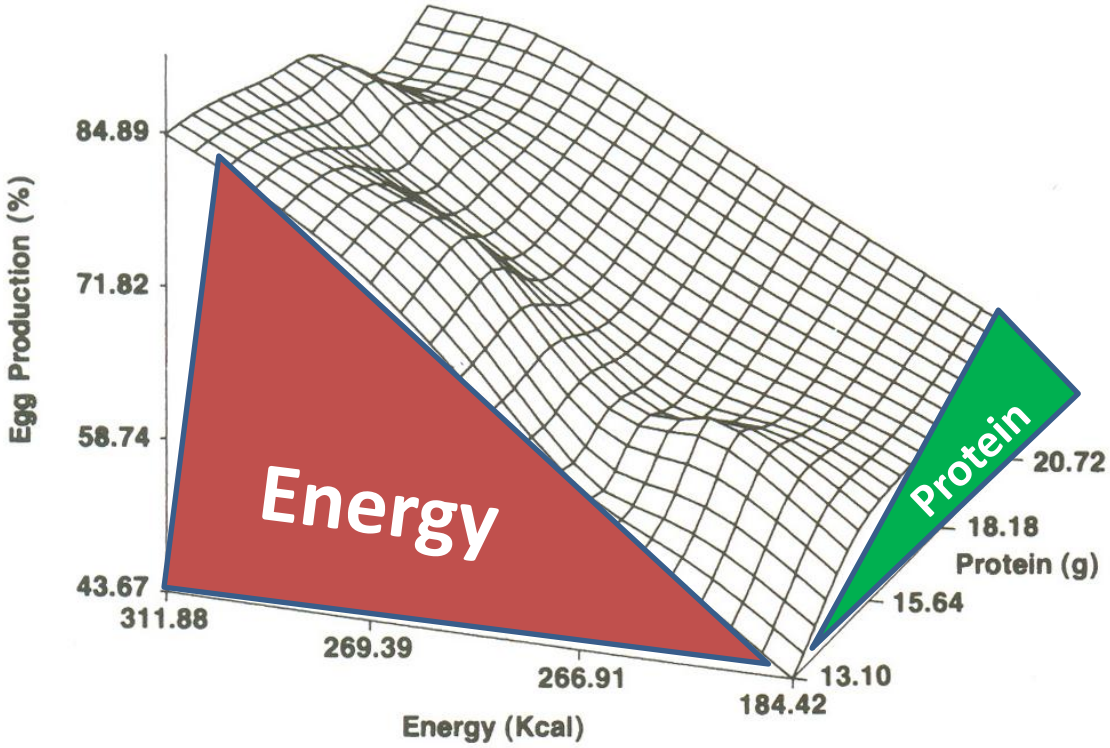
Egg Production (numbers)



Energy intake has a greater effect on egg numbers than protein intake

From Leeson and Summers, 2005. Commercial Poultry Nutrition (3rd ed.)

Feed energy => egg prod

- Suboptimal energy intake delays increase of early egg size
- Hens overconsume energy when fed high-energy diets
- How do you track feed, water intake?
- Are you meeting the energy required?
  - Feed intake x diet ME vs. requirement
  - What happen if birds eat 50 kcal more?
  - Cost vs. benefit

Adjust feed energy

- Diet has 2900 kcal ME => Want 2950 kcal
- Add 10kg tallow:
  - + 7500 kcal, $0.60 x 10kg = 75,000 kcal, $6.00
  - – Wht 2900 kcal, $.12 x 10 = 29,000 kcal, $1.20
- 46,000 $4.80

  or 46kcal/kg, ¢0.48

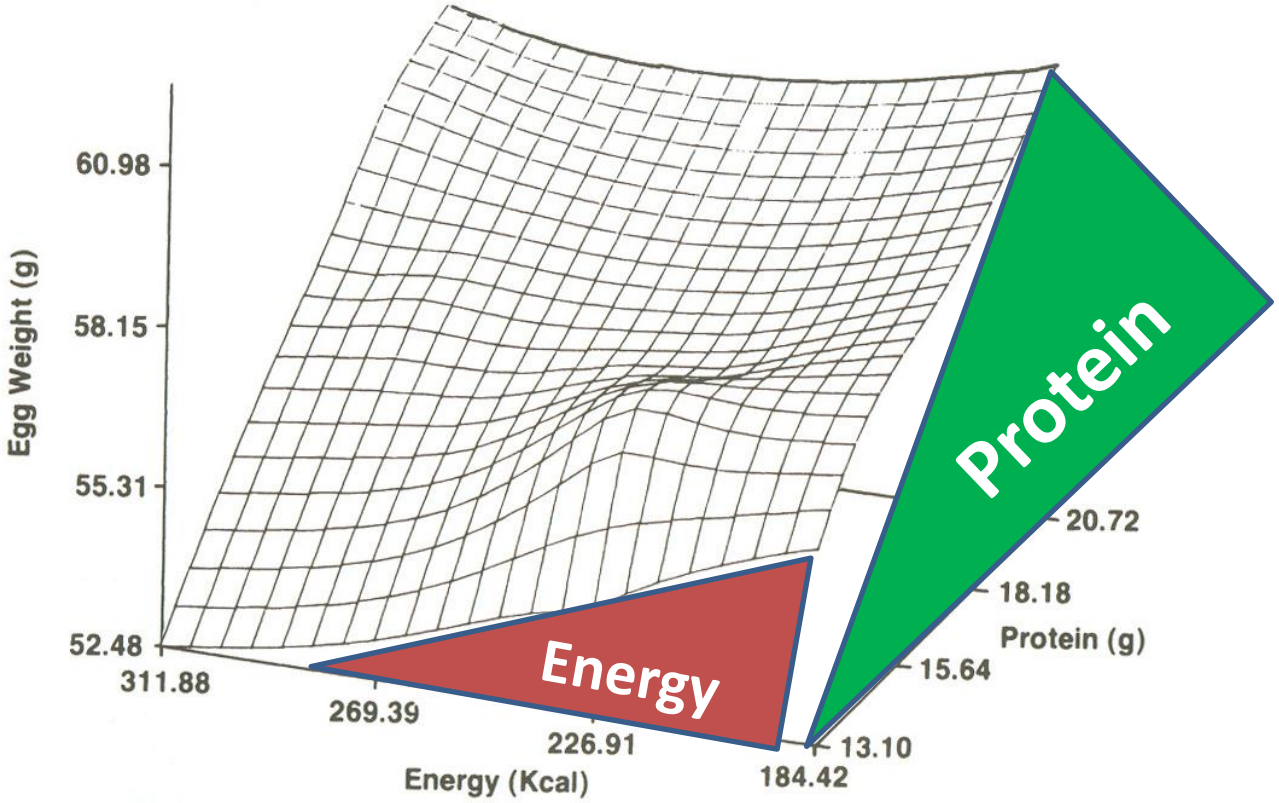
Energy dense diets

- Adding fat, best way to dense energy
- Crank fat if feed intake is limiting
- Adding fat will increase early egg size
- Adding fat will spare protein for energy use
- Easier and more effective to control increase in egg wt than to reduce it once desired egg weight is surpassed

Egg Size

- Yolk size dictates egg size
  - Yolk size tends to be determined by BW of hen
    - Bigger hens at maturity, bigger yolks
  - Early increase in egg size desirable
    - Economics
  - Limit increase in egg size after price premium is reached

Egg Production (size)



Protein (amino acids) has a greater effect on egg size (weight) than energy

From Leeson and Summers, 2005. Commercial Poultry Nutrition (3rd ed.)

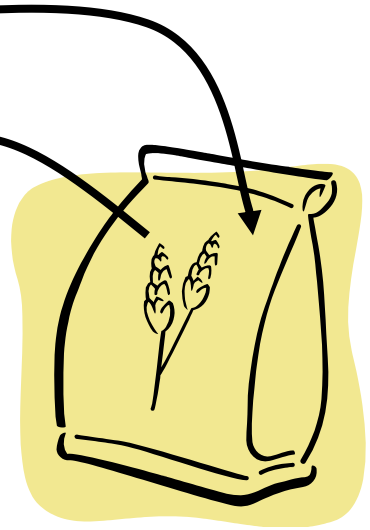
Feed protein => egg size

- <15g/day protein reduced egg size, even when Met was provided
- Feeding higher protein at the onset of lay increased egg size more rapidly
- Met, choline, B12, folate
- How do you know you are feeding enough protein, amino acids?

Adjust Methionine

- Diet has 0.35% Meth => Want 0.40% Meth
- Add 0.5kg DL-Methionine:
  - + 0.5kg, $5/kg = 0.49kg, $2.50
  - – Wht 0.2% Met, $0.12 = very small

  0.49g/kg or 0.05%, $2.50/1000kg



- **Warning!** Excess crystalline AA are toxic!

Protein, Met:Energy ratio

- Typical 1.3 g of Meth / Mcal of ME
- Changes with stage of production (phase feeding)
- Low energy + high protein => no increase in egg size
- Hens fed diets that provided more protein also consumed greater amounts of energy
- Heat stress => dense diets (energy, AA)

Why Worry About Table Egg Size?

- Early in production
  - small eggs
    - low value
- Late in production
  - large eggs
    - breakage
      - shell quality problems
      - too large for flats
    - prolapse

Controlling Egg Size

- Early -- small eggs
  - higher levels of protein may allow more rapid increases in egg size
    - ensure appropriate energy levels; otherwise, AA deamination
    - no response with adequate diets?
  - Linoleic acid
    - Minimum of 1%
      - Easily achieved with corn diets
      - Add canola oil

Heat Stress

- 1.5 g less feed per hen daily for each 1°C increase in ambient temperature over the range of 10° to 35°C (Davis et al., 1973; Sykes, 1979).
- Above 30°C, the decrease in feed consumption may be 2.5 to 4 g for each 1°C increase (Sykes, 1979; Sell et al., 1983).

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