Egg Production

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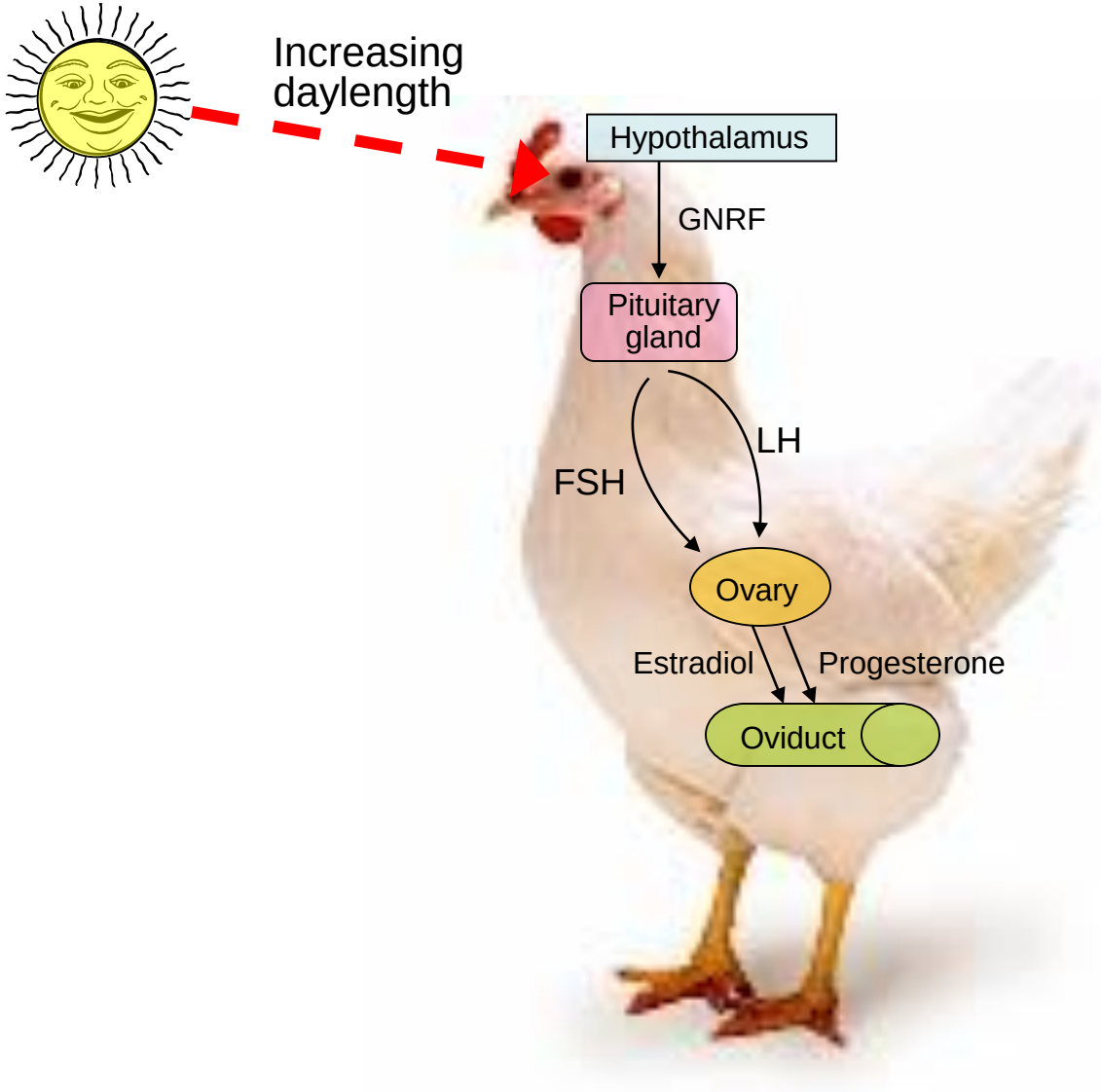
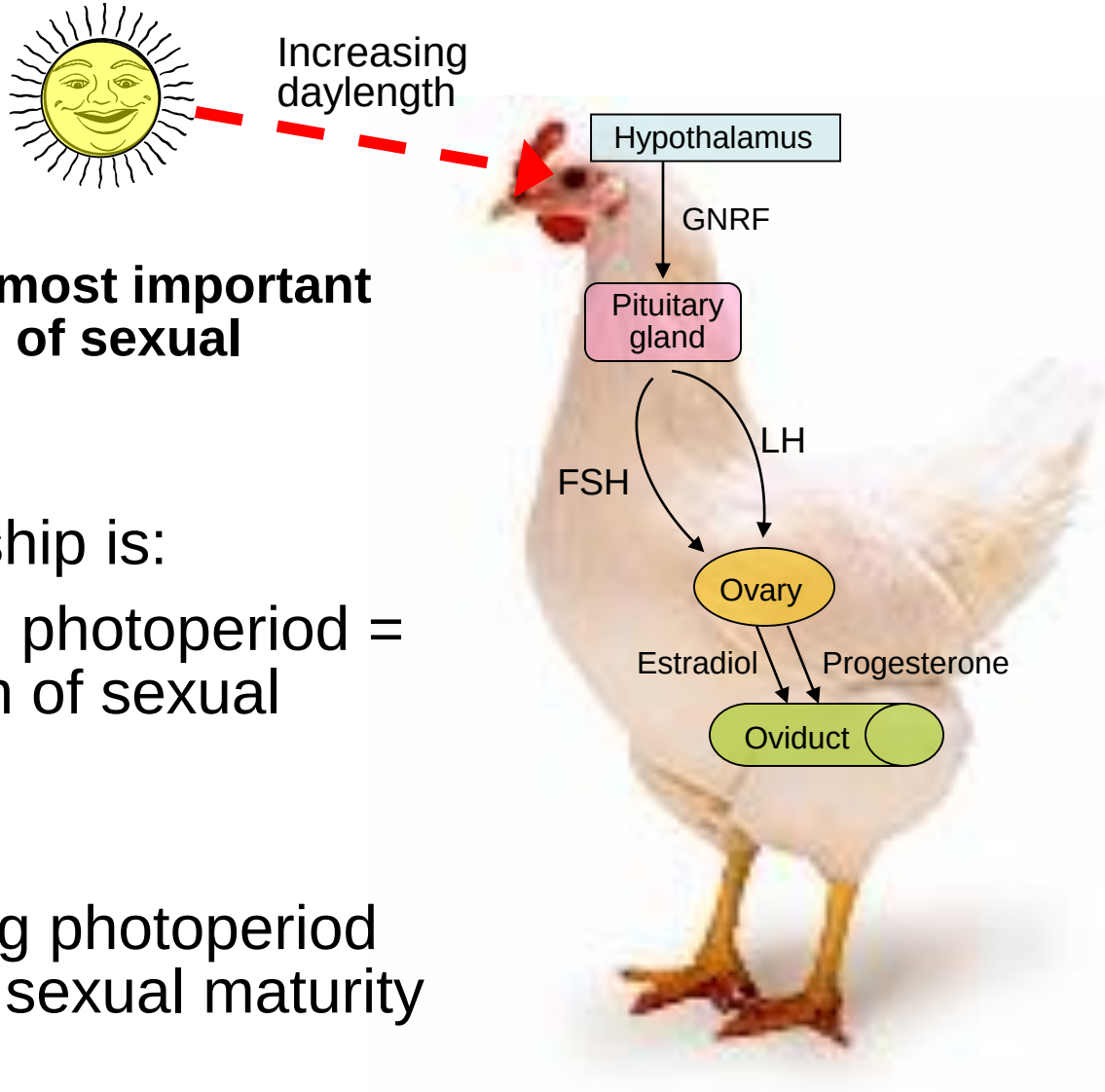
TEXAS A&M AGRILIFE EXTENSION

What makes a chicken lay eggs?

Light is the stimulus

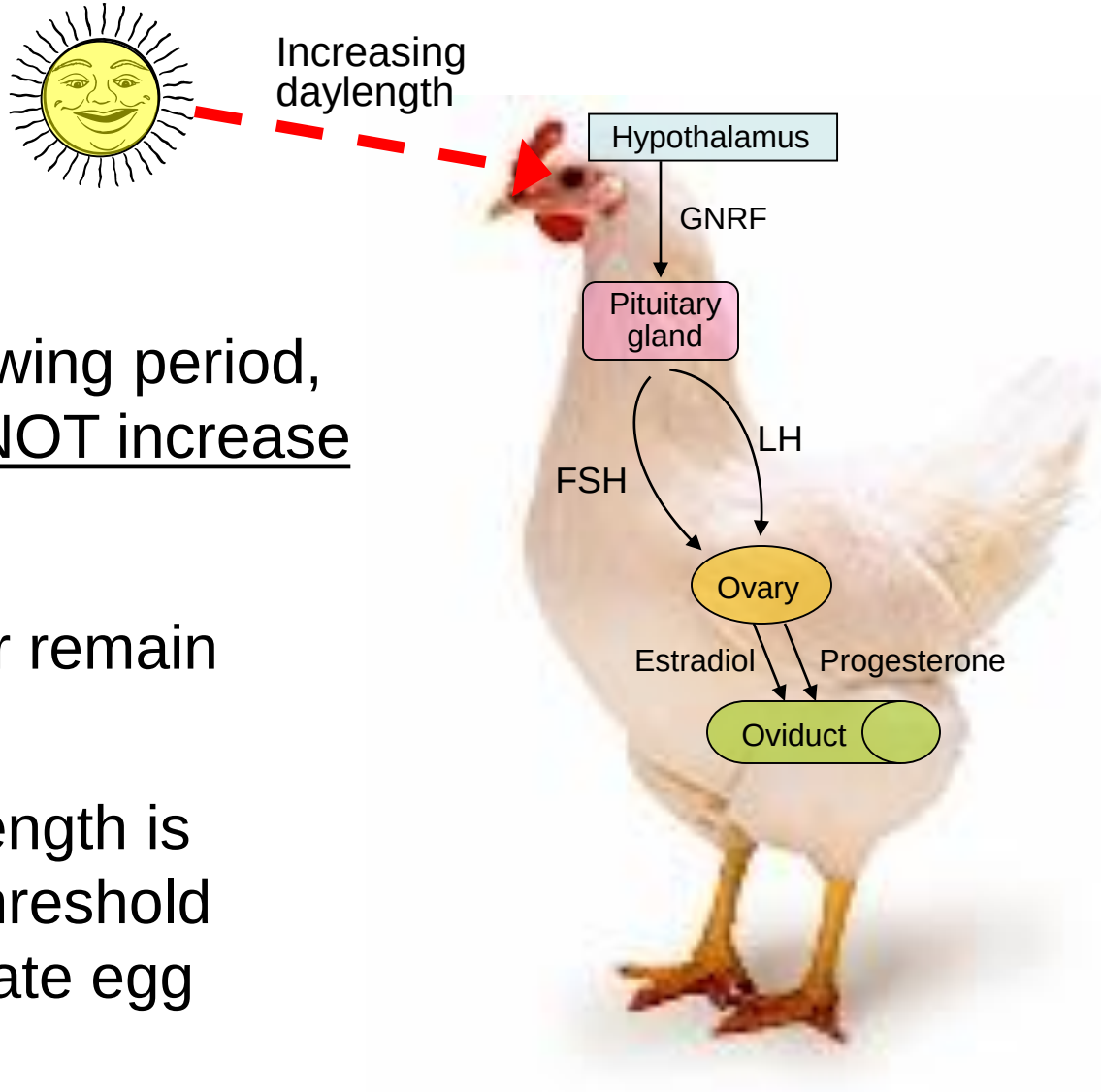




- **Length of daylight most important facet in stimulation of sexual maturity.**

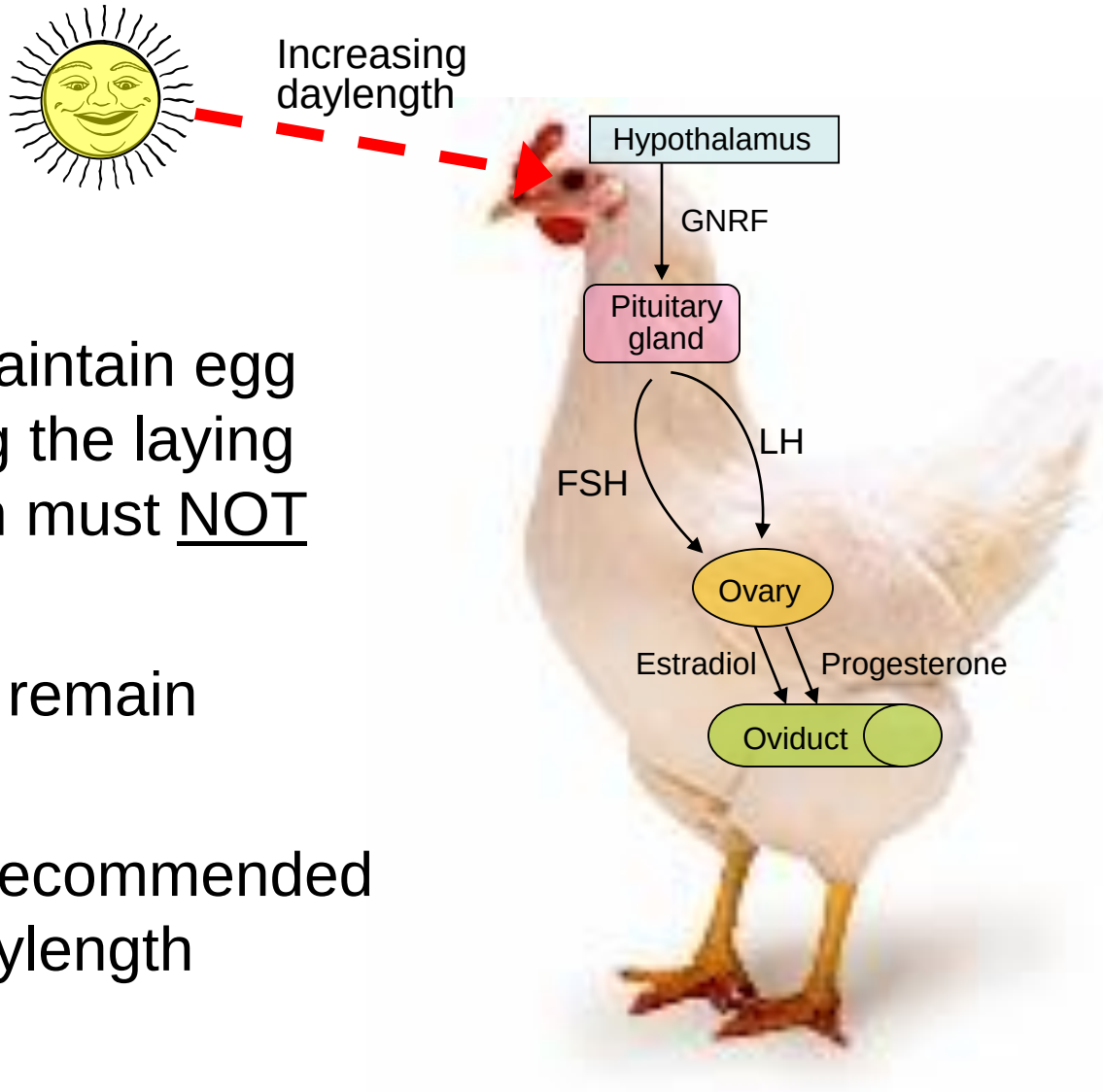
General relationship is:

- Increasing photoperiod = stimulation of sexual maturity
- Decreasing photoperiod = delay of sexual maturity

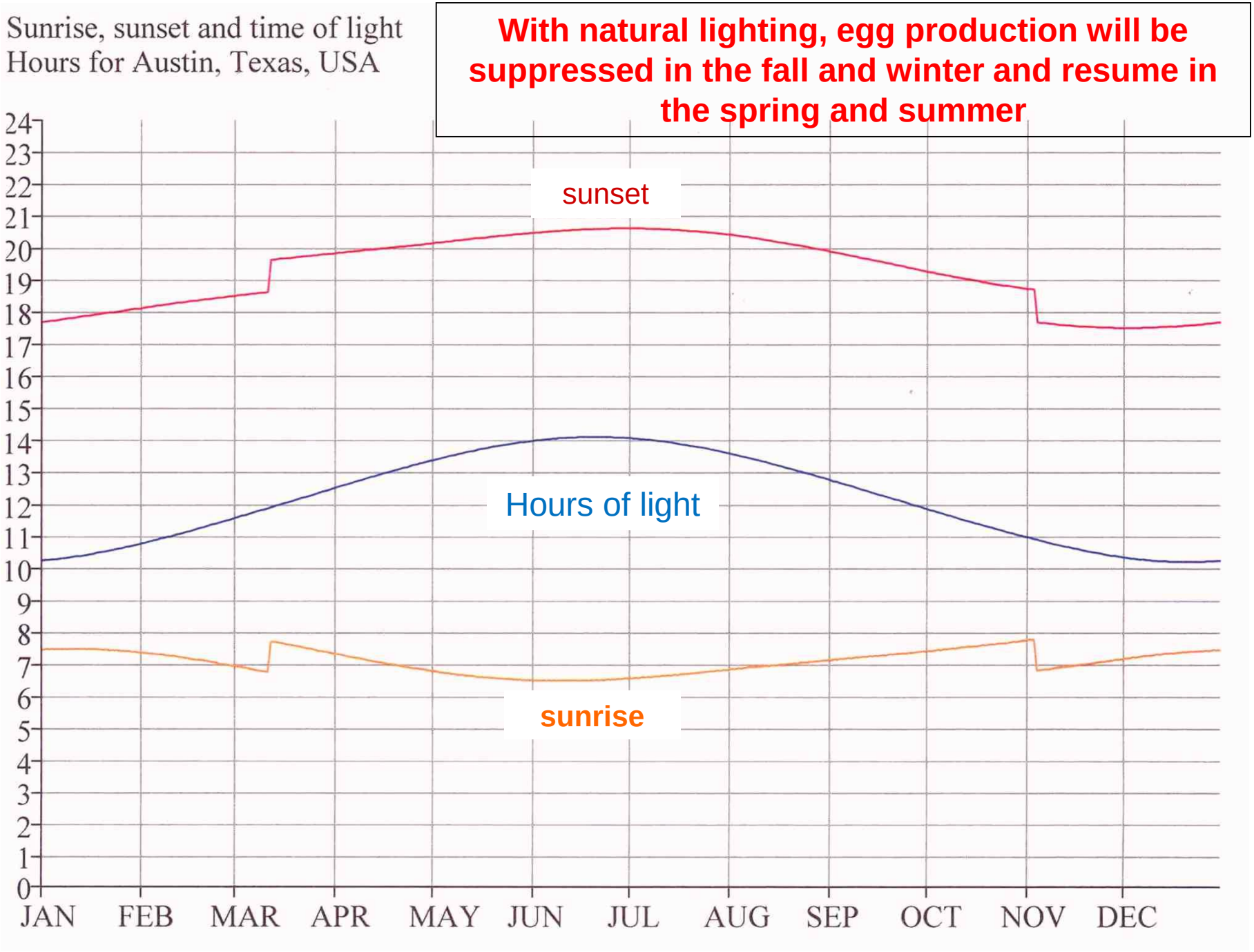


- During pullet growing period, daylength must <u>NOT increase</u>

- Must decrease or remain constant
- 12 hours of daylength is considered the threshold needed to stimulate egg production



- Conversely, to maintain egg production during the laying period, daylength must <u>NOT decrease</u>
- Must increase or remain constant
- 15 - 16 hours is recommended for a constant daylength


Sunrise, sunset and time of light
Hours for Austin, Texas, USA
With natural lighting, egg production will be suppressed in the fall and winter and resume in the spring and summer
sunset
Hours of light
sunrise
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
JAN
FEB
MAR
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MAY
JUN
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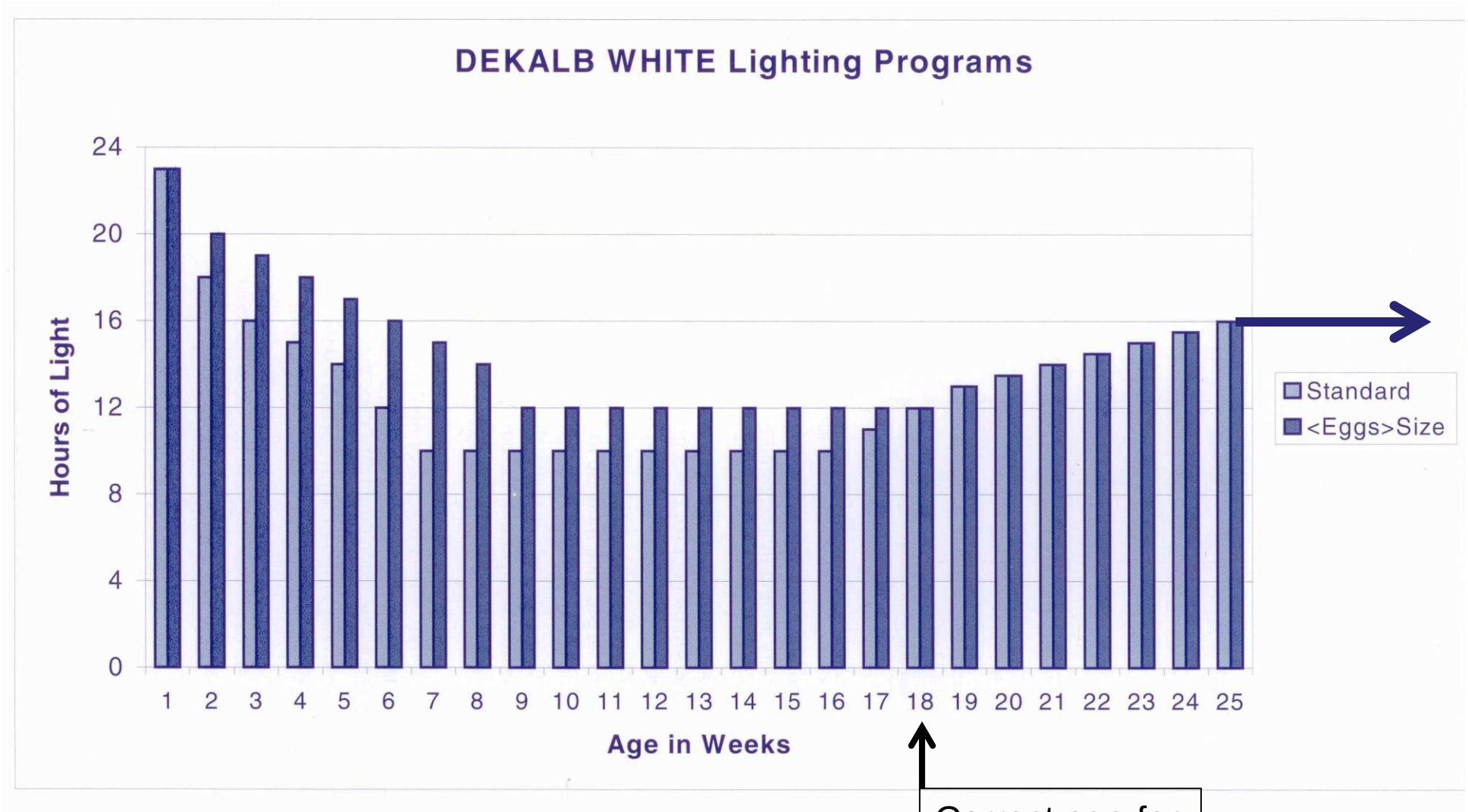
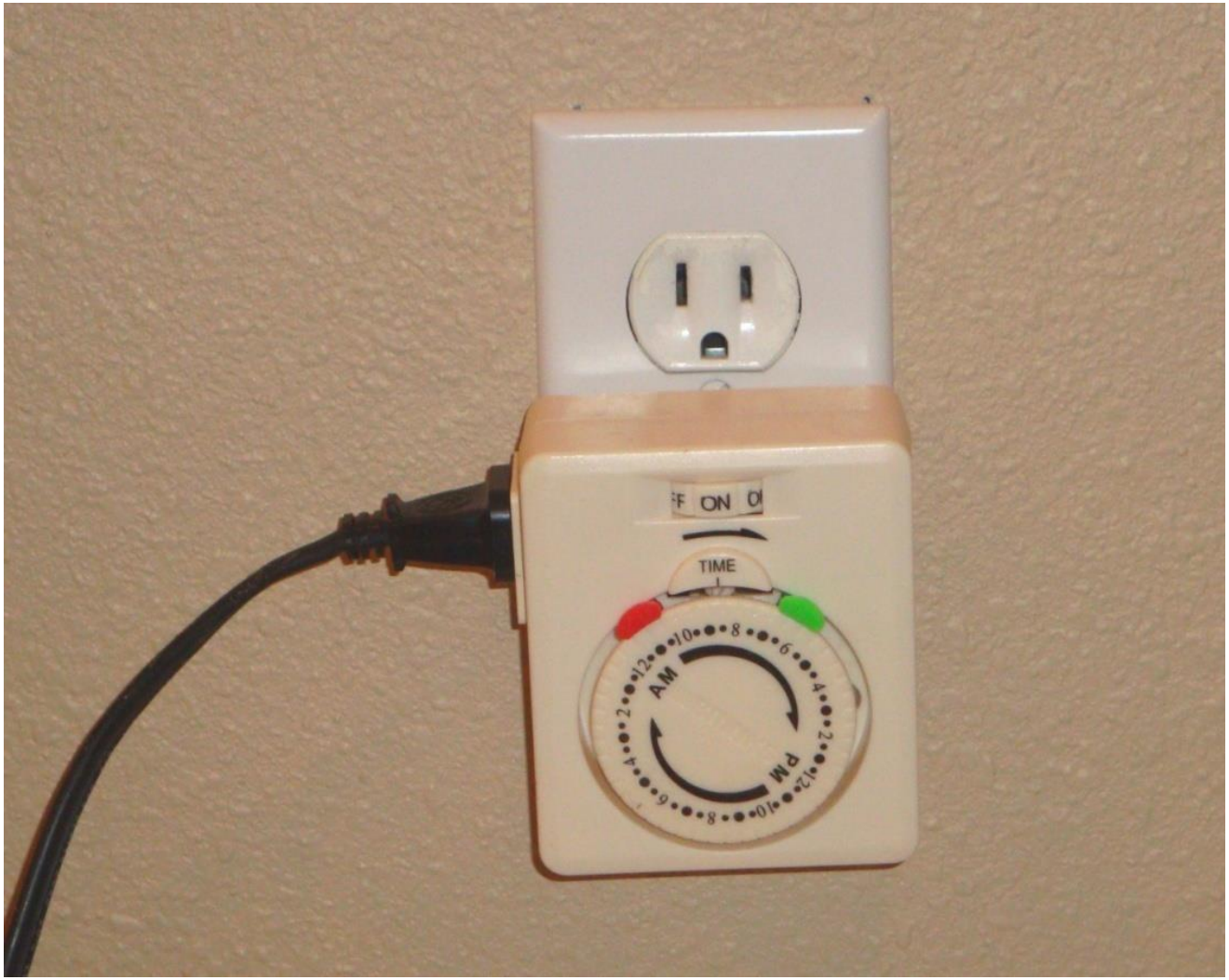
AUG
SEP
OCT
NOV
DEC

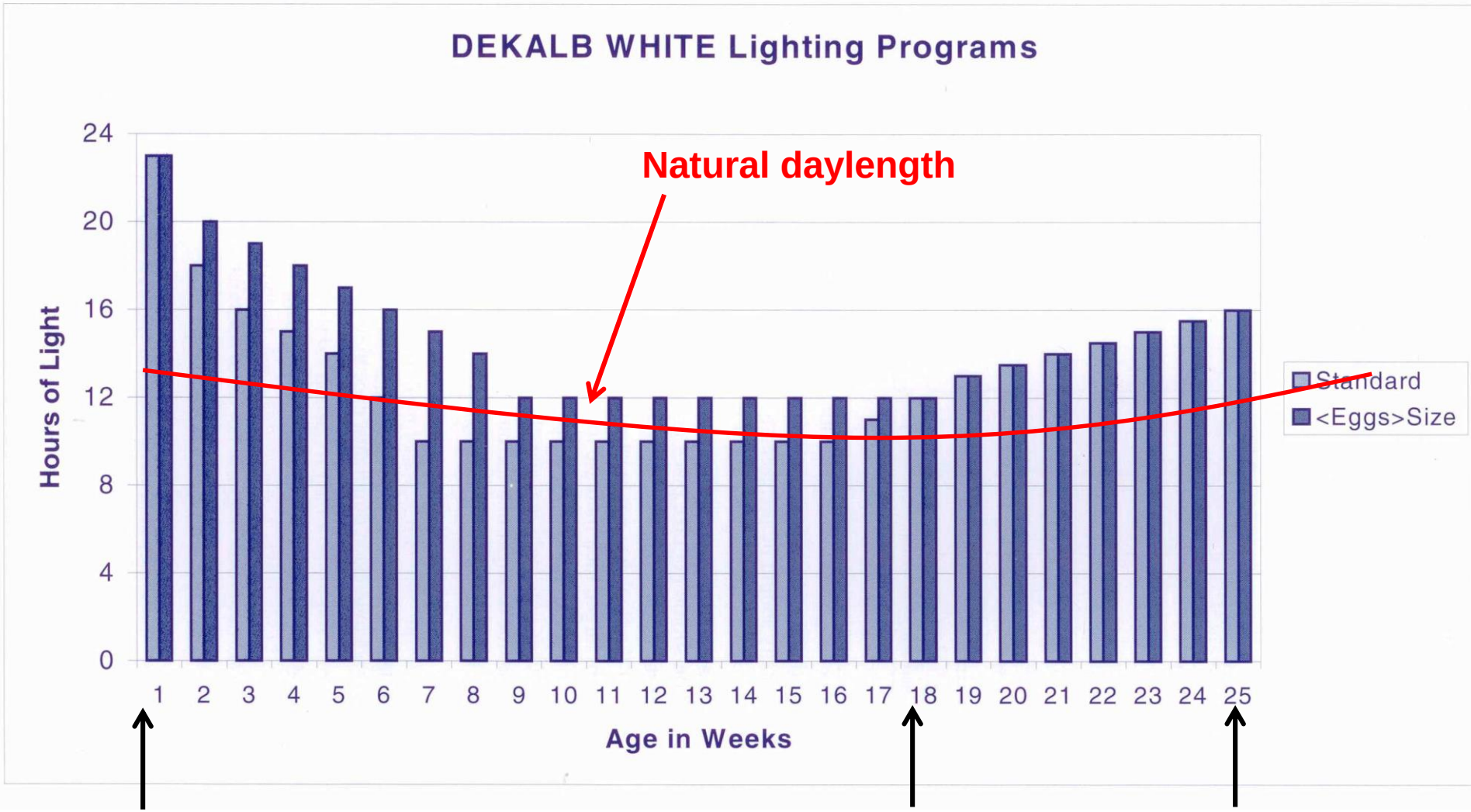
Example Lighting program



Controlling Day Length Can Be Achieved With Simple Timers

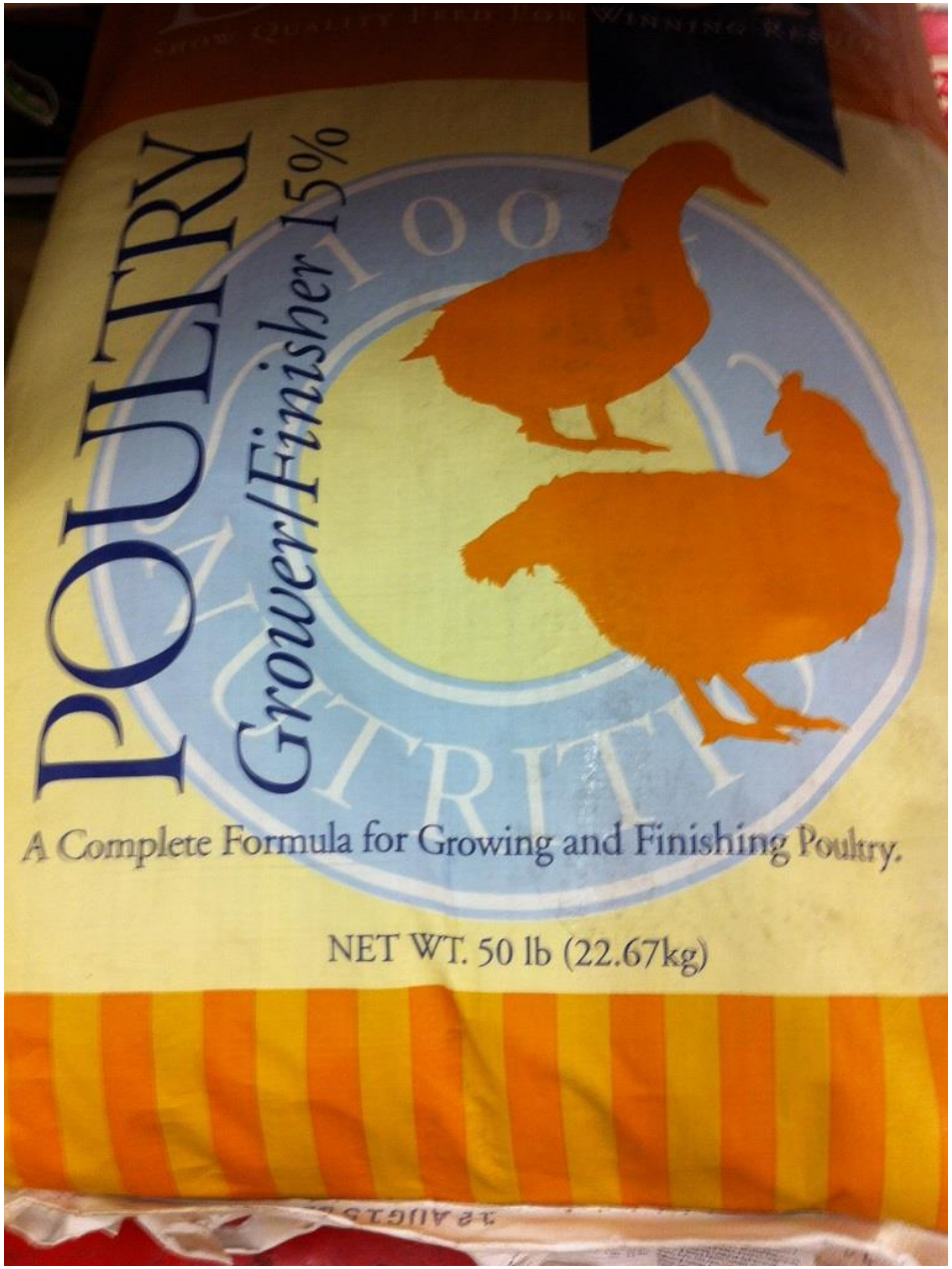


Starting chicks using only natural lighting



Feeding Layer Pullets

- In general, pullet diets contain:
  - Starter – 18-20% crude protein, 2850-3000 kcal ME/kg, 1% Ca
  - Grower – 15-16% crude protein, 2850-3000 kcal ME/kg, 1% Ca
  - Pre-lay – 15-17% crude protein, 2850-2900 kcal ME/kg, 2-2.5% Ca


POULTRY
Grower/Finisher 15%
A Complete Formula for Growing and Finishing Poultry.
NET WT. 50 lb (22.67kg)

DUMOR

POULTRY GRO/FINISH 15% (GD)

This feed is designed to be fed to growing and finishing poultry.

GUARANTEED ANALYSIS:

Crude Protein	Min.	15.0 %
Lysine	Min.	0.65 %
Methionine	Min.	0.29 %
Crude Fat	Min.	2.70 %
Crude Fiber	Max.	5.0 %
Calcium	Min. 0.6 % Max.	1.1 %
Phosphorus	Min.	0.6 %
Salt	Min. 0.2 % Max.	0.4 %
Sodium	Min. 0.1 % Max.	0.2 %
Selenium	Min.	0.3 PPM

INGREDIENTS:
Grain Products, Plant Protein Products, Processed Grain By-Products, Animal Protein Products, Cane Molasses, Vitamin A Supplement, Vitamin D Supplement, Vitamin E Supplement, Vitamin B12 Supplement, Riboflavin Supplement, Niacin Supplement, d-Calcium Pantothenate, Thiamine Mononitrate, Pyridoxine Hydrochloride, Menadione Sodium Bisulfite Complex (source of Vitamin K activity), Biotin, Folic Acid, Choline Chloride, L-Lysine, DL-Methionine Hydroxy Analogue, Calcium Carbonate, Dicalcium Phosphate, Monocalcium Phosphate, Salt, Manganous Oxide, Manganese Sulfate, Ferrous Sulfate, Copper Chloride, Copper Sulfate, Zinc Oxide, Zinc Sulfate, Ethylenediamine Dihydroiodide, Sodium Selenite, Propionic Acid (a preservative).

FEEDING DIRECTIONS: Feed DUMOR® Poultry Grower/Finisher 15% as the sole ration to pheasant, quail, turkey, and chukar from 12 weeks until market or up until one month prior to egg production. Feed as sole ration to chickens, ducks, and geese greater than 10 weeks of age until one month prior to egg production.

For laying and breeding hens, begin feeding DUMOR® Poultry Layer 16% one month prior to egg production.

This is a complete and balanced ration. Do not blend with grain.

Provide access to clean drinking water at all times.

Store feed in a dry, well ventilated area protected from rodents and insects. Do not feed moldy or insect-infested feed to animals as this may cause illness, abortion, or death.

Ruminant Meat and Bone Meal Free

Made in U.S.A.

Feeding Laying Hens

- Suggested daily nutrient intake per hen (under ideal conditions)

  Leeson and Summers, *Commercial Poultry Nutrition*, 2nd ed.

Crude protein	17g
Metabolizable energy	280 kcal
Methionine	360 mg
Lysine	720 mg
Calcium	3.5 grams
Available P	0.4 grams

Feeding Laying Hens

- Suggested daily nutrient intake per hen (under ideal conditions)

Leeson and Summers, *Commercial Poultry Nutrition*, 2nd ed.

		at 100 g/hen/day
Crude protein	17g	17%
Metabolizable energy	280 kcal	1271 kcal/lb
Methionine	360 mg	0.36%
Lysine	720 mg	0.72%
Calcium	3.5 grams	3.5%
Available P	0.4 grams	0.4%

TAMU Poultry Farm Layer Diet

Can be fed as a mash feed – pelletizing not necessary

Ingredient	%
Ground corn	59.5
Soybean meal	27.3
DL-methionine	0.14
Lysine	0.14
Limestone	10.7
Monocalcium phosphate	1.6
Salt	0.38
Trace mineral premix	0.05
Vitamin premix	0.25

Nutrients	%
Crude protein	18.5
Crude fat	2.5
Crude fiber	2.4
Calcium	4.4
Available P	0.44
Energy (kcal/lb)	1,213
Methionine	0.42
Lysine	1.1


DUMOR
SHOW QUALITY FEED FOR WINNING RESULTS
POULTRY
Layer 16%
100%
PELLETS
A Complete Formula for Egg Producing Poultry.
NET WT. 50 lb (22.67kg)
broken
DUMOR
SHOW QUALITY FEED FOR WINNING RESULTS
POULTRY
Layer 16%
100%
CRUMBLE
Formula for Egg Producing Poultry.
NET WT. 50 lb (22.67kg)

DUMOR

POULTRY LAYER
16% CR (GD)

This feed is designed to be fed to caged layers and free-range hens from onset of egg production to the end of the laying cycle.

GUARANTEED ANALYSIS:

Crude Protein		Min.	16.0 %
Lysine		Min.	0.7 %
Methionine		Min.	0.35 %
Crude Fat		Min.	2.5 %
Crude Fiber		Max.	7.0 %
Calcium	Min. 3.8 %	Max.	4.8 %
Phosphorus		Min.	0.5 %
Salt	Min. 0.25 %	Max.	0.5 %
Sodium	Min. 0.1 %	Max.	0.2 %

INGREDIENTS:

Grain Products, Plant Protein Products, Processed Grain By-Products, Vitamin A Supplement, Vitamin D Supplement, Vitamin E Supplement, Vitamin B12 Supplement, Riboflavin Supplement, Niacin Supplement, d-Calcium Pantothenate, Pyridoxine Hydrochloride, Folic Acid, Menadione Sodium Bisulfite Complex (source of Vitamin K activity), Thiamine Mononitrate, Biotin, L-Lysine, DL-Methionine Hydroxy Analogue, Calcium Carbonate, Dicalcium Phosphate, Monocalcium Phosphate, Salt, Bentonite, Manganous Oxide, Manganese Sulfate, Ferrous Sulfate, Copper Chloride, Copper Sulfate, Zinc Oxide, Zinc Sulfate, Ethylenediamine Dihydriodide, Sodium Selenite, Propionic Acid (a preservative).

FEEDING DIRECTIONS:

Feed DUMOR® Poultry Layer 16% as the sole ration to hens producing eggs for human consumption beginning at 18 weeks of age.
For breeding hens, begin feeding DUMOR® Poultry Layer 16% one month prior to egg production. This is a complete and balanced ration. Do not blend with grain. Provide access to clean drinking water at all times.
Furnish grit and/or oyster shell as supplement to daily diet. Store feed in a dry, well ventilated area protected from rodents and insects. Do not feed moldy or insect-infested feed to animals as this may cause illness, abortion, or death.

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Made In U.S.A.

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Ruminant Meat and Bone Meal Free
Made In U.S.A.


Producer's
PRIDE
QUALITY ★ VALUE ★ NUTRITION
SCRATCH GRAINS
NET WT. 50 LB (22.67KG)
SCRATCH GRAINS
Lot:2242
2242


SCRATCH GRAIN
$ 13 49

Producer's PRIDE
QUALITY • VALUE • NUTRITION

SCRATCH GRAINS (GD)

This feed is designed as an energy source for growing and laying poultry.

GUARANTEED ANALYSIS:

Crude Protein	Min. 8.0 %
Crude Fat	Min. 2.5 %
Crude Fiber	Max. 4.5 %

INGREDIENTS:

Grain Products, Soybean Oil.

FEEDING DIRECTIONS:

Feed Producer's Pride® Scratch Grains as energy supplement to growing and laying poultry. Producer's Pride® Scratch Grains is not a complete feed and should not be offered free choice. Provide specific poultry feeds for the birds being raised at the rate of 90% or greater of the poultry's daily diet. Scatter Producer's Pride® Scratch Grains on dry ground where poultry species are present. Scratch grains are not fortified and should not comprise more than 10% of total daily intake for poultry.

Provide plenty of fresh clean water at all times.

Store feed in a dry, well ventilated area protected from rodents and insects. Do not feed moldy or insect infested feed to animals as this may cause illness, abortion, or death.

Ruminant Meat and Bone Meal Free
Made In U.S.A.

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QUALITY • VALUE • NUTRITION

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Ruminant Meat and Bone Meal Free
Made in U.S.A.

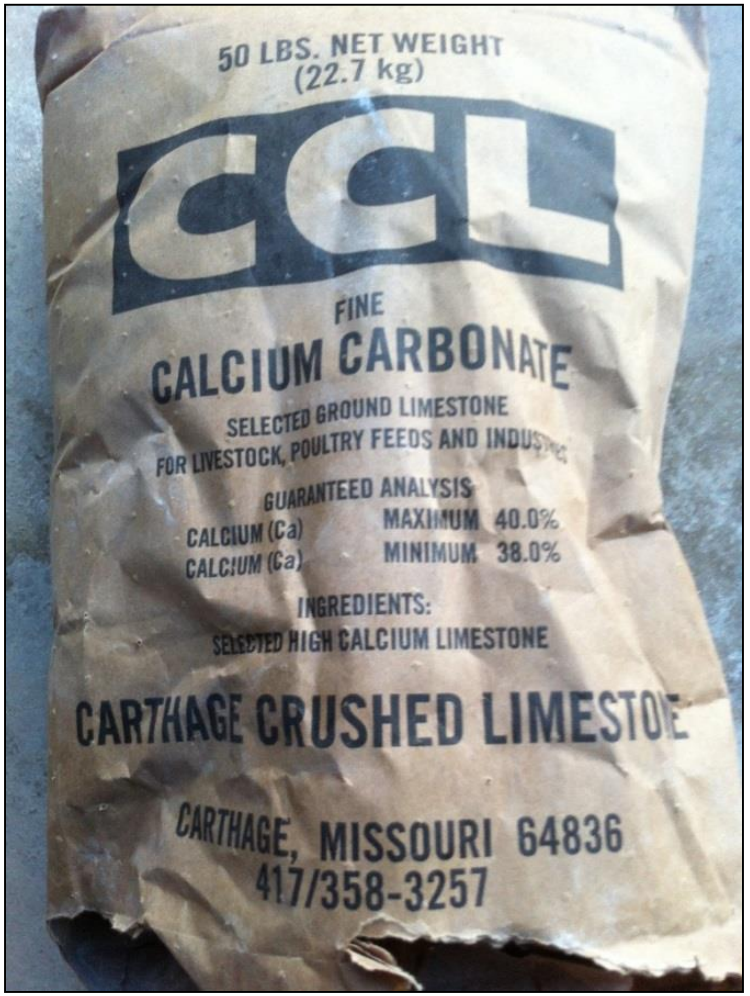

PURINA
LAYENA
PELLETS
• Natural Plant Proteins (No Added Animal Proteins or Animal Fats)
• Complete and Balanced
• Large Quantities of Wholesome Healthy Eggs with Strong Shells
Natural
SunFresh Recipe
PURINA
LAYENA
PELLETS
PURINA
LAYENA
CRUMBLES
Natural
SunFresh Recipe
PURINA
LAYENA
CRUMBLES

Improving Shell Quality

- It is recommended that 50% of the calcium in a layer diet be of large particle size.
  - Limestone, depending on particle size and physical structure, is more soluble, and there is little retention in the gut.
  - Oyster shell is regarded as an “insoluble” slow-release form of calcium and residues remain in the digestive tract longer.
- Vitamin D supplementation can help calcium absorption in older hens.
  - Can be added in drinking water

Calcium Sources in Feed

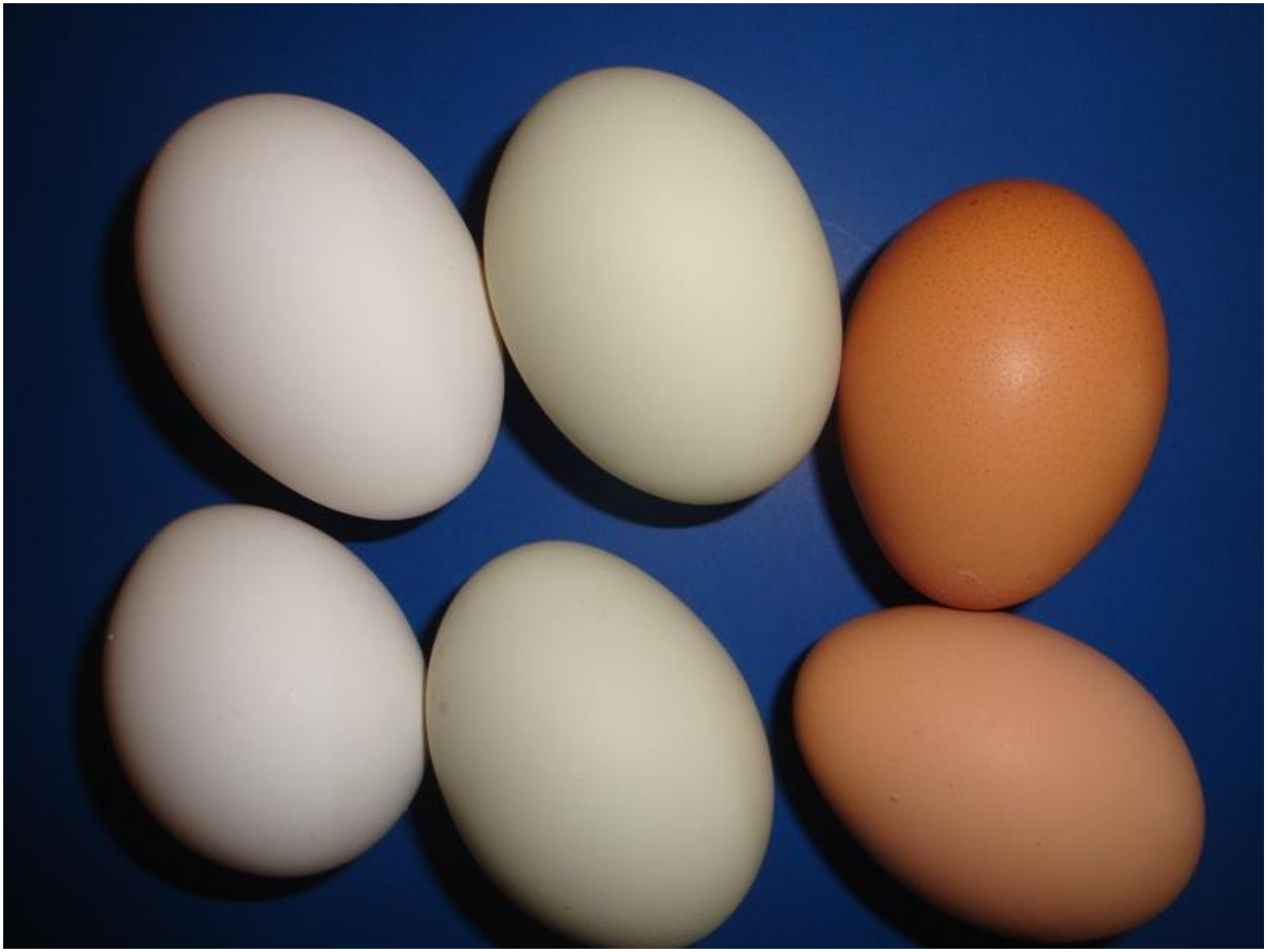
- Limestone and oyster shell are usually added to layer diets as primary sources of calcium.

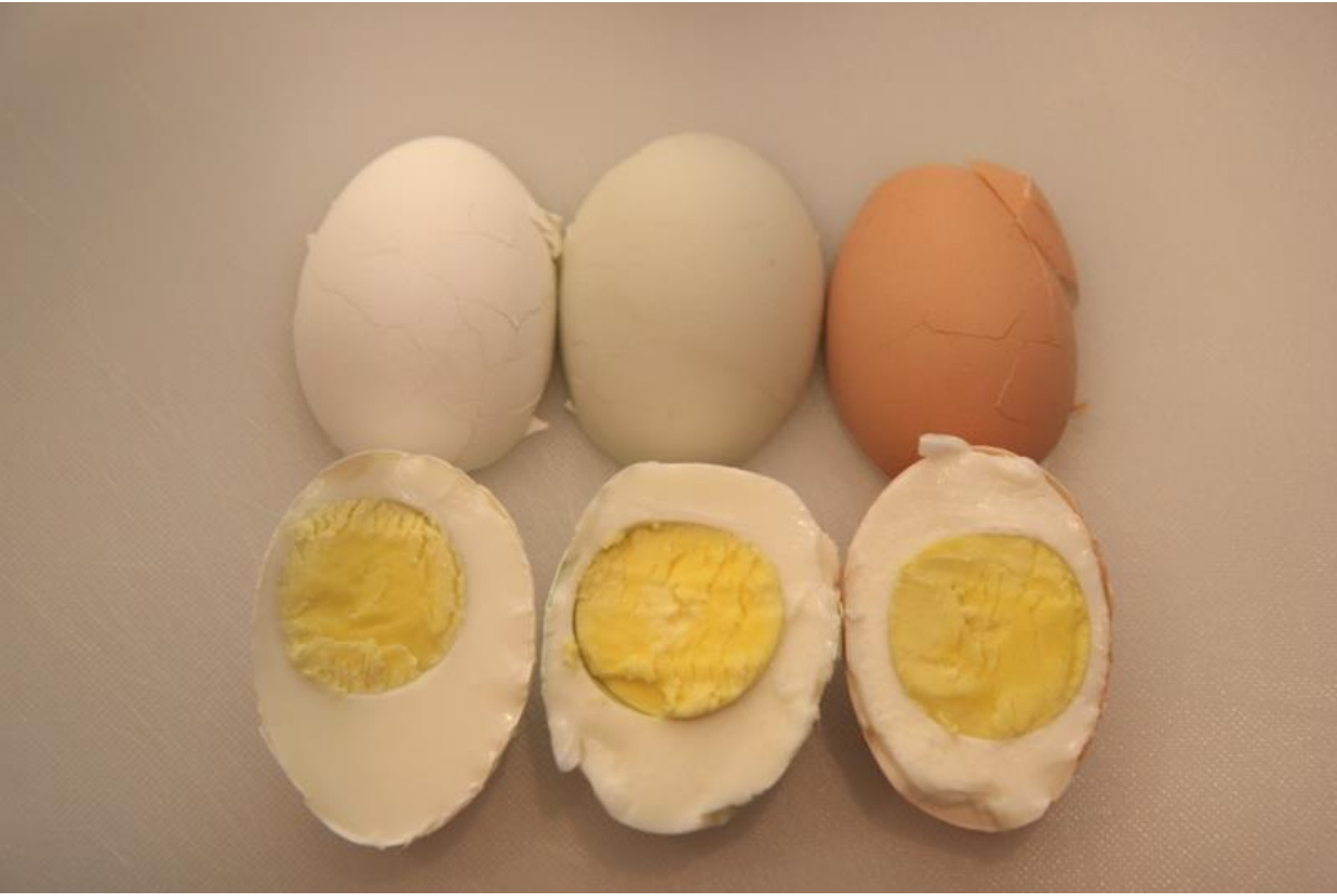


Feed ingredients

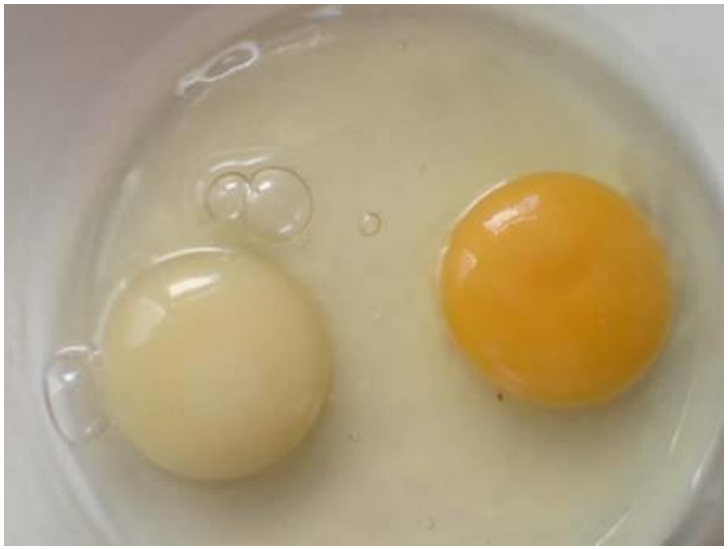
- **Avoid cottonseed meal**
  - Cottonseed contains the compound gossypol.
  - Gossypol can cause green-brown-black **discoloration in the yolk** depending on gossypol levels and length of egg storage.
  - As storage time increases, the discoloration intensifies, especially at cool temperatures (5°C).
  - If cottonseed meal contains any residual oil, a characteristic “pink” albumen discoloration can occur.

Yolk color?





Yolk Pigmentation



- Yolk color is the result of carotenoid pigments called xanthophylls.
  - Xanthophyll content of various feed ingredients:

Corn	20 mg/kg
Wheat	4 mg/kg
Milo	1 mg/kg
Alfalfa meal	175 mg/kg
Corn gluten meal	275 mg/kg
Marigold petals	7,000 mg/kg

Poultry: Science and Practice, 1951

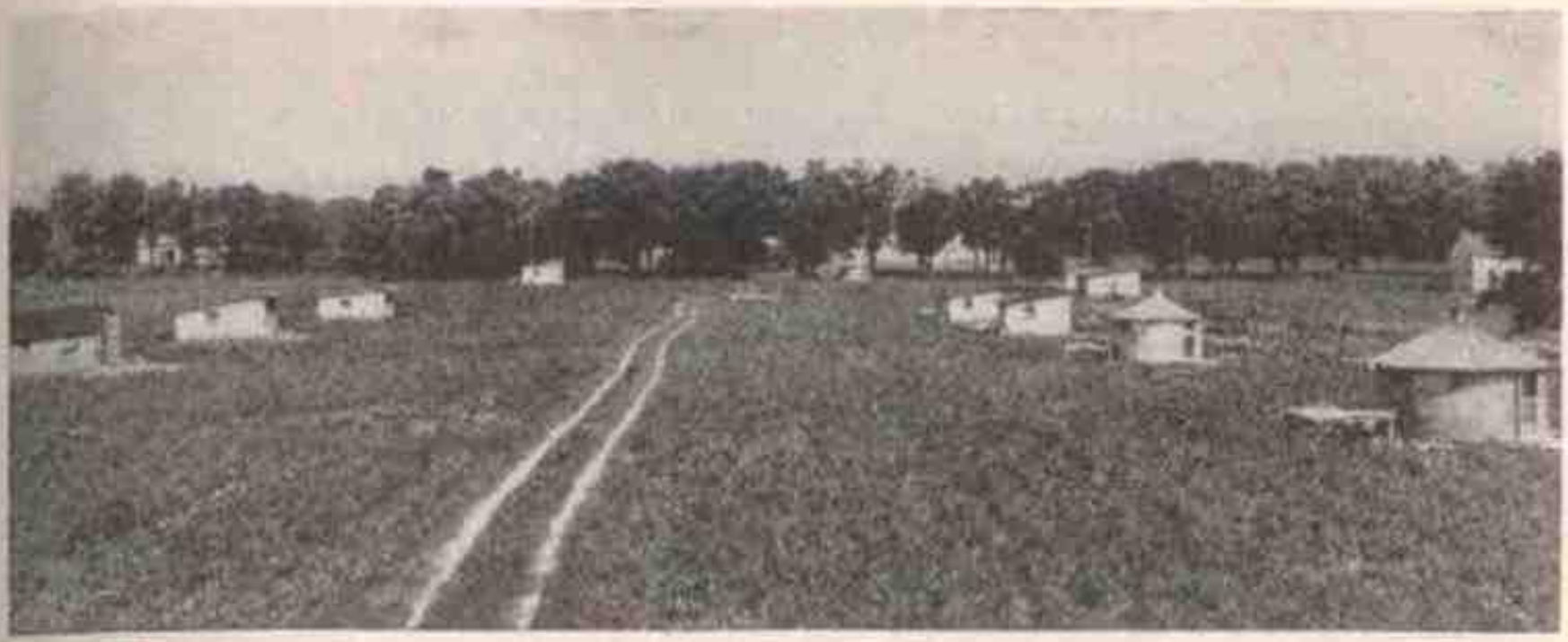


Fig. 136. Colony houses on grass range. All the vitamin requirements are taken care of when birds have a good green, young, and tender grass range. (Ohio Extension Bulletin 126.)

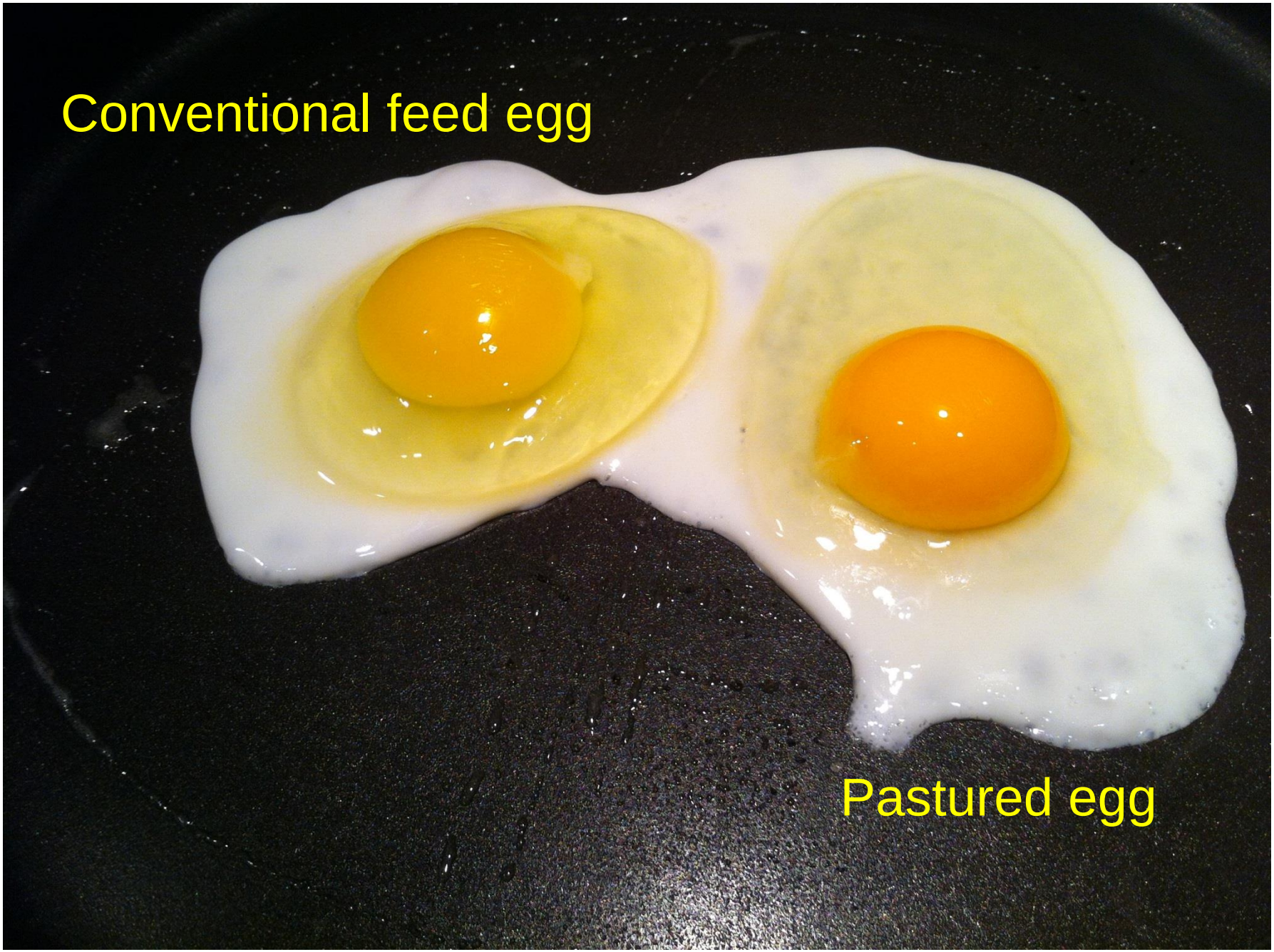
Vitamin Feedstuffs

Many of the feedstuffs used in poultry rations are good sources of more than one group of nutrients. In this chapter the feedstuffs have been classified according to the primary purpose for which they are fed. Some of the following feedstuffs classed as vitamin feedstuffs are also good sources of proteins and minerals.

Green grass. Young, tender, green grass supplies all of the vitamins needed by chickens except vitamin D (Fig. 136). When the birds are on range they will secure this vitamin from sunlight. Grass also supplies protein, minerals, and carbohydrates needed by poultry. Less expensive feed and a smaller amount are needed by poultry when they are kept on young, tender, green grass range (Table 55). Unfortunately, suitable range is generally available only during the spring and early summer months. As the season advances and the grass becomes older, the protein, mineral, and vitamin content declines rapidly and the fiber content increases. By pasturing the range closely or by making frequent cuttings of the grass, and by irrigation, it is possible to maintain suitable pasture for poultry. Alfalfa or ladino clover range may be used to supply green feed throughout the summer and fall.

Layers given green grass range produce eggs of lower market quality than birds kept in confinement. The yolks have a darker yellow color and the whites are more watery. While such eggs are of lower value from the standpoint of market grade, they are of greater food value because of the higher vitamin A, D, and G content.

Alfalfa. Alfalfa meal or hay is used as a substitute for green grass for birds kept in confinement and during the winter months. It is fed primarily to supply vitamins A and G, but it also supplies other vitamins, proteins, and minerals.


Conventional feed egg
Pastured egg

Egg Handling

Change litter in box-type nests regularly

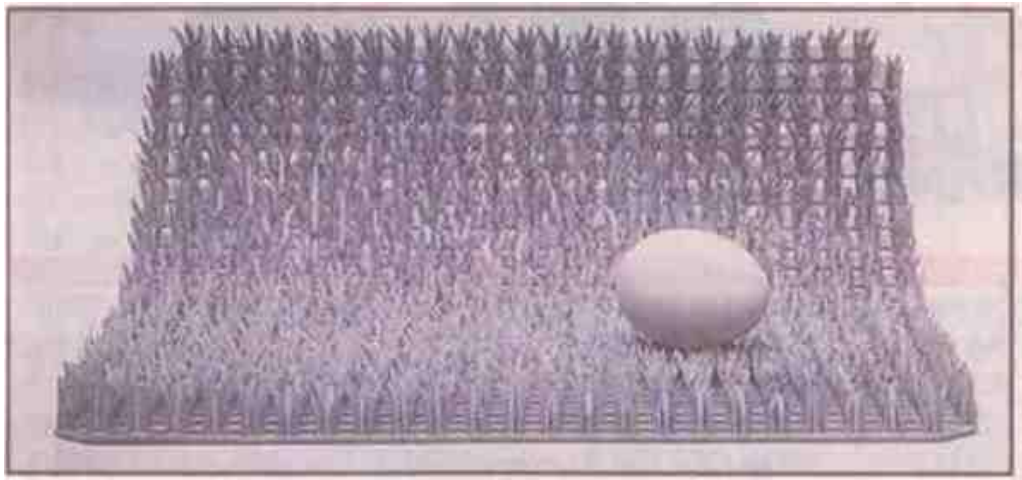
Nest Management

- Use excluding mechanism to prevent nighttime roosting in boxes
- 4 to 5 birds per nest

Nest Management

- Roll-away nests are superior
- Change litter in box-type nests regularly
- Use excluding mechanism to prevent nighttime roosting in boxes
- 4 to 5 birds per nest

Nest Pads



Allows better air circulation and deters manure buildup.

- 12" x 13" nest pads, with unique ventilation slot design, allow for maximum air and debris flow, reducing the percentage of contaminated eggs.
- Clean-up time is quick and easy.
- Molded from a special UV-resistant plastic, these pads have a useable life expectancy of up to 7 years.
- Offers comfort to your hens, while resisting lice, insects, rot, mildew and fungus growth.
- Encourages hens to use the proper nesting site.
- We recommend one nest pad for each nest hole.

GRAY NEST PAD

STK#	EACH	100 & UP
EH1406	$3.99	$3.29

- No organic matter to harbor bacteria
- Can be cleaned and sanitized
- Hens won't scratch it out

FarmTek Catalog or FarmTek.com

Chick-Inn Laying Nests promote poultry health, greater egg production.

- 4 and 6-Hole Laying Nests, with plastic lids and front and back partitions, are ideal for smaller or specially configured pens.
- Popular 8 and 10-Hole Laying Nests are made of galvanized steel and are easy to assemble with a pop rivet gun.
- High front and back panels prevent litter from being scratched out of nests.
- Removable plastic bottom inserts on 4, 6 and 8-hole nests are easy to clean, keeping birds healthier.
- Perches are hinged upward.
- Nest pads, sold separately below, offer comfort, reduce chances of bacterial contamination and encourage hens to use proper nesting sites. We recommend one nest pad for each nest hole.

103675

105356

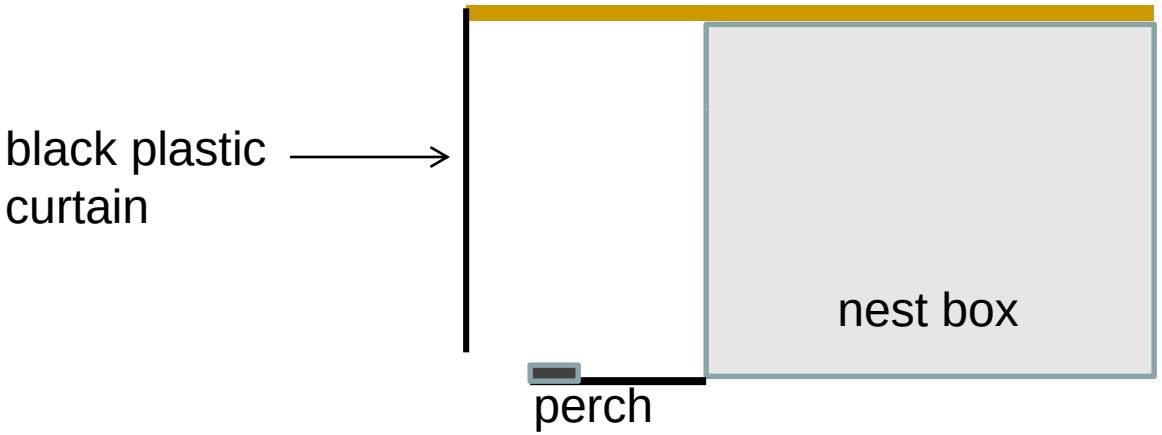
CHICK-INN LAYING NESTS

STK#	STYLE	SIZE	EACH	DISCOUNT PRICE
103674	4 Hole	33"H x 24"W	$156.35	$151.65 (4 & up)
103675	6 Hole	33"H x 36"W	173.35	168.15 (4 & up)
103676	8 Hole	33"H x 48"W	203.75	197.65 (4 & up)
105356	10 Hole	34-1/2"H x 60"W	214.95	208.49 (4 & up)
EH1406*	Nest Pad	12" x 13"	3.99	3.29 (100 & up)

*Nest Pad shown below.

Preventing Floor Egg Laying

- Avoid direct light into boxes (make boxes as dark as possible)



- Collect floor eggs frequently to discourage laying on floors
- Disrupt floor or ground nest sites to discourage laying

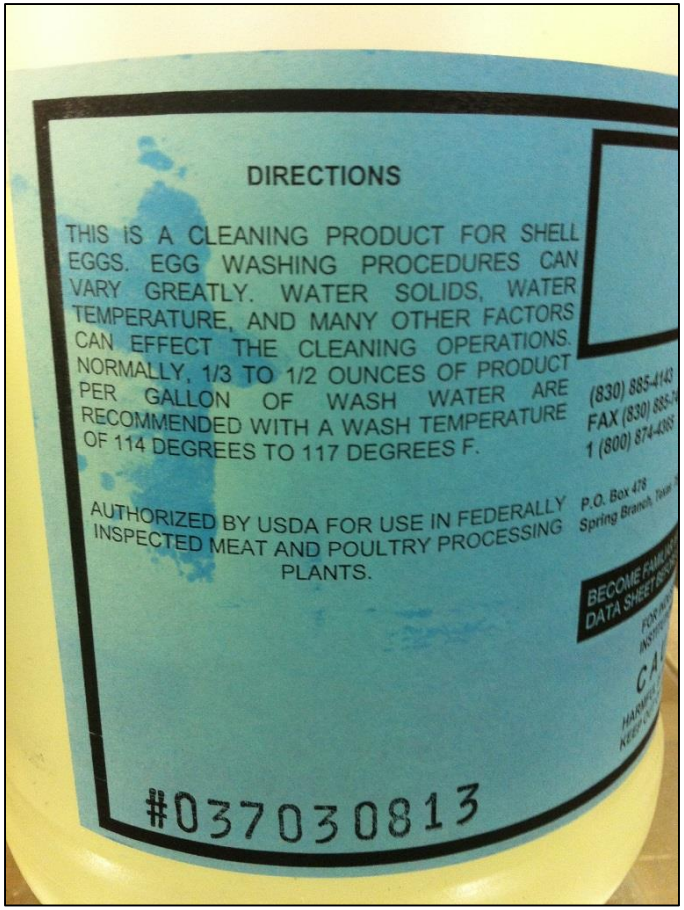
Washing of Eggs

- Most washing procedures will remove the cuticle (bloom).
- Generally accepted recommendations:
  - Dipping or soaking (submersion) of eggs is highly discouraged.
    - may aid in bacterial penetration of shell
    - increase cross contamination between eggs

Washing of Eggs

- Washing should be done by spraying eggs with a wash solution
  - use an approved egg detergent
  - wash water conditions very important
- Wash water should be at least 20°F warmer than the internal temperature of the eggs
  - minimum of 90°F

Example egg detergent



Washing of Eggs

- Rinse eggs after washing
  - rinse water should be slightly warmer than wash water
  - Can apply an approved sanitizer
    - chlorine or a quaternary ammonium compound at 100 to 200 ppm is most commonly used (USDA guidelines)

- Dry eggs before packaging

DISAN-1

Disinfectant-Sanitizer-Food Contact Sanitizer

Fungicide, Virucide*, For Poultry/Turkey, Federally Inspected Meat and Poultry Plants

This product is recommended for use as an Egg Shell sanitizer, with best results achieved in water temperature ranging from 78°-100°F

ACTIVE INGREDIENT:	
Alkyl (50% C_{14}, 40% C_{12}, 10% C_{16}) dimethyl benzyl ammonium chloride	10.0%
INERT INGREDIENTS:	90.0%
TOTAL:	100.0%

KEEP OUT OF REACH OF CHILDREN

DANGER

See right panel for additional precautionary statements

First Aid

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice

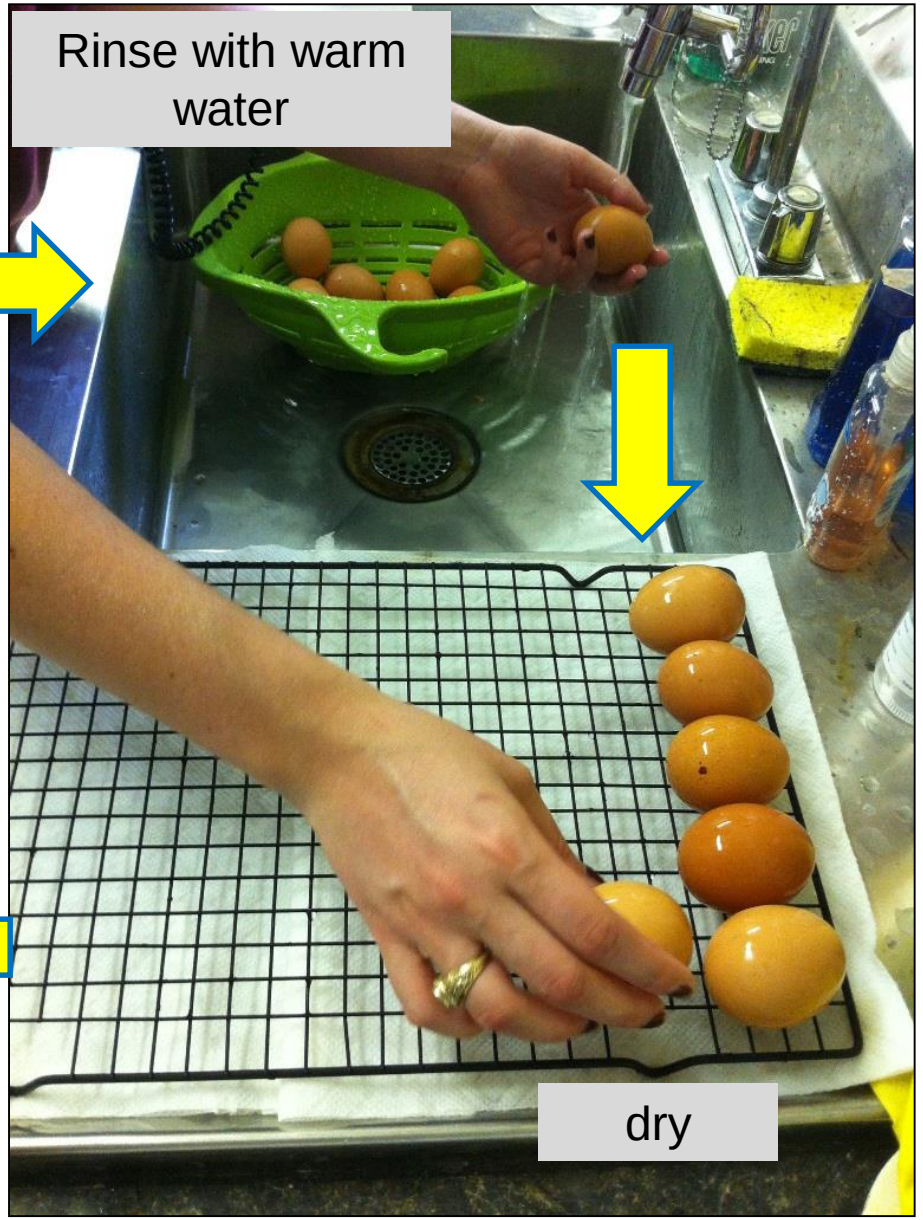
IF SWALLOWED: Call a poison control center or doctor [illegible] rinsing mouth. Do not induce vomiting unless told to do so by a [illegible] glass of water if able to swallow. Do not induce

Storage of Eggs

- Eggs should be refrigerated as quickly as possible after cleaning and grading to preserve quality and reduce the potential for bacterial growth.

- FDA, TDA and DSHS regulations:
  - **Must** be maintained at **45 °F** or less at all times

Best bet for home egg cleaning

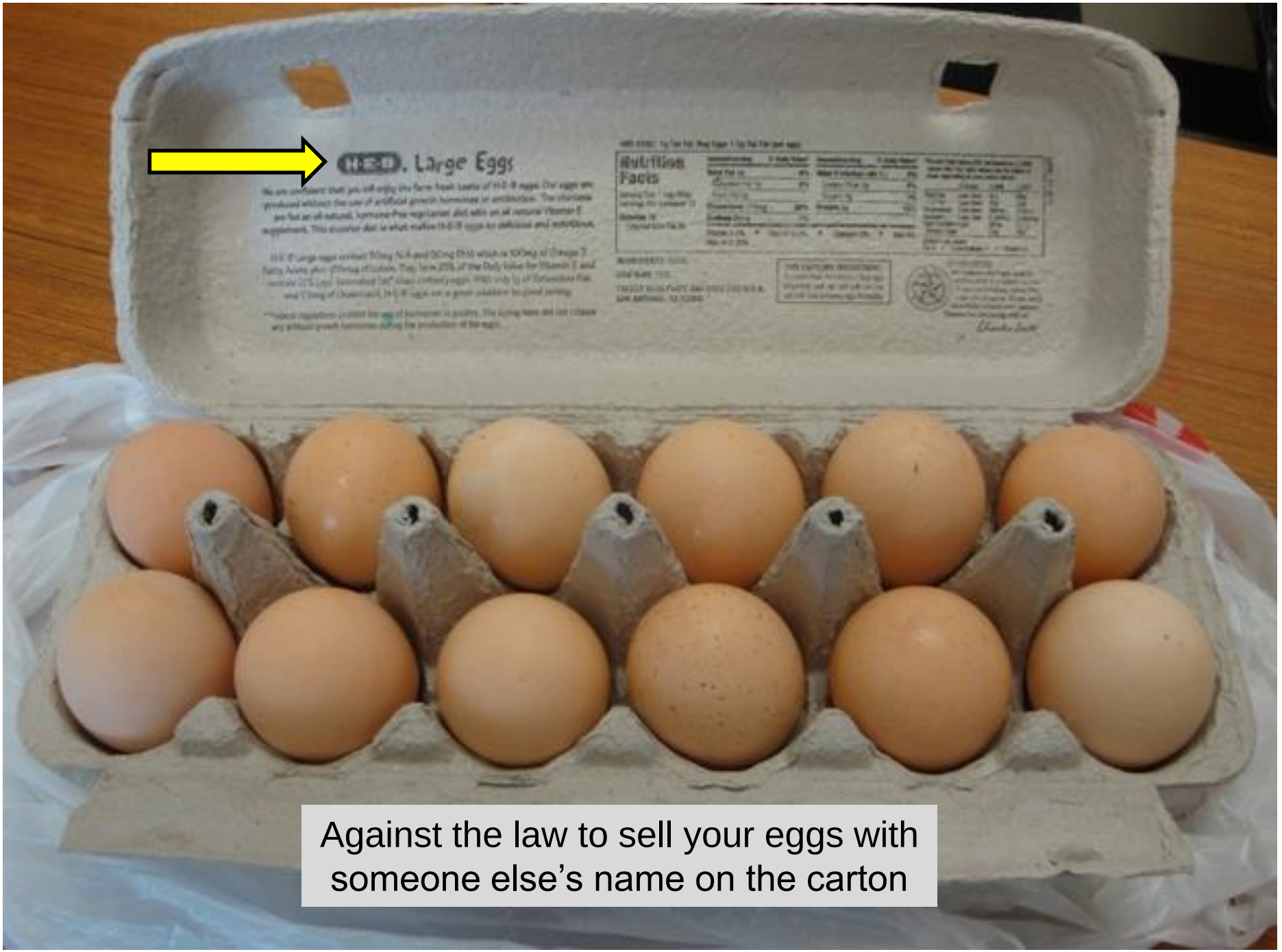


Sale of Table Eggs (Ungraded)

- Directly to consumer
  - required to obtain **food establishment license** and meet the structural requirements for a food establishment
    - licensed by local health authority (city, county or district) or DSHS if no local authority exists
  - eggs must be labeled as “ungraded”
  - eggs must be labeled with producer’s name and address
- Farmers’ Markets - may have additional requirements, so check with local authorities

Eggs bought at roadside stand

What is wrong with this picture?


H-E-B. Large Eggs
Nutrition Facts
Against the law to sell your eggs with someone else's name on the carton

Retail Sale of Table Eggs

- Retail food establishments (stores, restaurants, food trucks, etc.) are not allowed to use or sell ungraded eggs
  - must be received from an approved source that is **licensed** by the regulatory authority
    - Texas Egg License = Texas Department of Agriculture (TDA)
      - additional rules for packaging, labeling and inspection
  - eggs must be clean, sound and at least **Grade B**
  - must be delivered in refrigerated equipment at **45°F** or less

Sale of Table Eggs (Graded)

- TDA contact for egg licensing
  - Howard Pieper
    - Coordinator for Fuel Quality and Egg Quality Programs
    - 512-463-6477
- TDA Organics program
  - Mary Ellen Holliman
    - Coordinator for Organic Certification
    - 512-936-4178

Any Questions?

TEXAS A&M AGRILIFE EXTENSION