

Small Flock Poultry Webinar Presentations

Wednesday

- Module 1 – Introduction to small flock poultry
- Module 2 – Types and breeds of chickens
- Module 3 – Sourcing eggs, chicks and adult chickens
- Module 4 – Reproduction in chickens
- Module 5 – Incubation and embryonic development


Thursday

- Module 6 – Digestion in chickens
- Module 7 – Feeds and feeding
- Module 8 – Housing needs
- Module 9 – Biosecurity (T. Girard)
- Module 10 – Poultry Health (T. Girard)


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Turkey Terminology

Poult: a juvenile turkey
Hen: an adult female turkey
Tom: an adult male turkey
Broody hen: a turkey that wants to sit on eggs and stops laying



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Introduction to Small Flock Poultry Production

F. E. Robinson, University of Alberta

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Alberta Poultry Commodities

Supply managed poultry commodities:

- Broiler chickens (Alberta Chicken Producers)
- Turkeys (Alberta Turkey Producers)
- Broiler hatching eggs (Alberta Hatching Egg Producers)
- Table eggs (Egg Farmers of Alberta)

Non-supply managed poultry commodities:

- Ducks
- Geese
- Quail
- Pheasants

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Chicken Terminology

Chick: a juvenile chicken
Pullet: a juvenile female chicken prior to laying (specifically less than 19 weeks old in the table egg industry)
Cockerel: a juvenile male chicken
Hen: an adult female chicken (specifically 19 weeks old, or more in the table egg industry)
Rooster: an adult male chick
Table egg: an egg sold for human consumption
Hatching egg: a fertile egg used to reproduce stocks by incubation

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Alberta Poultry Marketing

- Producers must have quota to be registered producers.
- New producers must purchase quota before they can market.
- Exemptions for annual production without having quota are:
 - 2000 broilers
 - 300 turkeys
 - 0 broiler breeders
 - 300 table egg layers

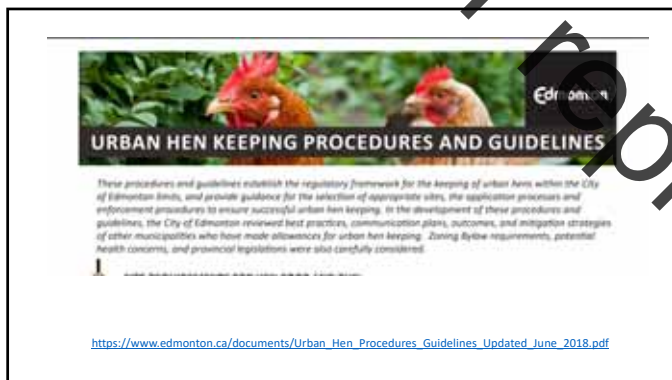
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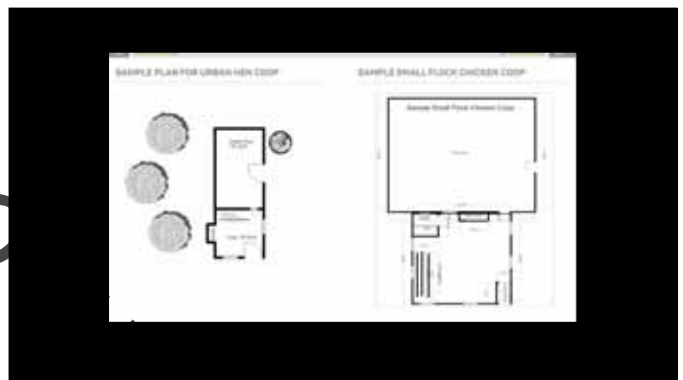
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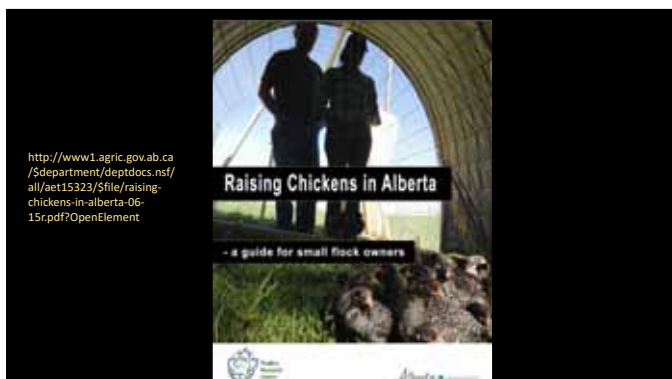
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CONSIDERATIONS

If a community is considering permitting residents to keep urban chickens, the following should be taken into consideration:

- Is there a local veterinarian who can provide support and treat poultry?
- Are there trained municipal representatives who can process applications and licenses, deal with concerns that they arise, conduct noise inspections, etc.?
- Does the area have a high number of adults and children?
- Does the municipality have a designated area where poultry owners can dispose of chicken-manure/slacking, manure, and any mortalities?
- Is there a poultry professional nearby who can provide an educational workshop to residents on keeping urban chickens, and provide ongoing expertise and support? (highly recommended)




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Commercial Meat-Type Chickens

- Are released annually as “new” models
- Produced from two primary breeders (Cobb, Aviagen)
- Very rapid growth rate
- Market weight of 2 kg achieved in 35-37 days
- Both males and females used
- Very poor egg production (must be feed restricted)

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Types and Breeds of Chickens

F. E. Robinson, University of Alberta

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Commercial Meat-Type Chickens



https://www.arboracres.com/assets/Tech_Center/AA_Broiler/AA-BroilerHandbook2018-EN.pdf

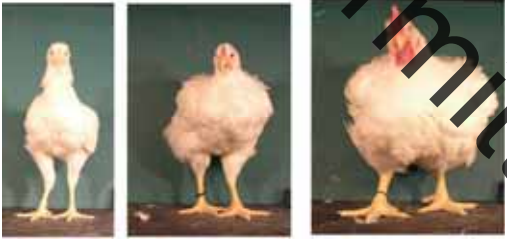
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Types of Chickens

- Commercial Chickens**
 - Meat-Type
 - Egg-Type
- Heritage Chickens**
 - Usually had a role in historical commercial agriculture
- Fancier Chickens**
 - Breeds selected for plumage, size or egg color for hobby purposes

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Broilers: 55 Days of Age



1957 1977 2005

18

Broilers: 55 Days of Age

1957 1977 2005

FCR=2.85 FCR=2.14 FCR=1.92

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Heritage Chickens

- Typically breeds that played a former role in small-farm poultry production
- Not productive by modern standards
- Dual purpose (produced some eggs and some meat but not great at either)
- In the past hens were kept for egg production and males were butchered in the fall

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Commercial Egg-Type Chickens

- Are released annually as “new” models
- Produced from a few primary breeders (Hy-Line, DeKalb, Bovens)
- Based on Leghorn breed
- Prolific egg layers (320-330 eggs per year)
- White egg or brown egg
- Small birds – big eggs
- Can be “flighty”
- Only females available

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Heritage Chickens

Barred Plymouth Rock

- Brown egg layer
- Hardy

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Commercial Egg-Type Chickens

Hy-Line W-80
 Robust, Prolific, Strong Performance in Alternative Systems, Long Single-Cycle Lay

The Hy-Line W-80 is a robust white egg layer for all housing systems and environments. This bird delivers prolific egg numbers, excellent egg shell strength, and strong performance under challenging environments and low-density feed rations. The W-80 is adaptable to alternative production systems and remains calm for easy management. For markets requiring a larger egg size, the W-80 Plus gives producers the same great traits with an egg weight profile 1.5 grams heavier its persistently for long cycles of lay means more eggs or five grams less feed. Producers gain more profitability with a feed savings of approximately two kilograms per bird per year versus competing breeds.

<https://www.hvline.com/french/filesimages/Hy-Line-Products/Hy-Line-Product-PDFs/W-80/80%20PS%20ENG.pdf>

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Heritage Chickens

Light Sussex

- Pale brown egg layer
- Tend to be fat

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Heritage Chickens

New Hampshire
- Brown egg layer



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Heritage Chickens

Cochin
- Brown egg layer
- Well feathered
- Feathered feet and legs



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Heritage Chickens - Others

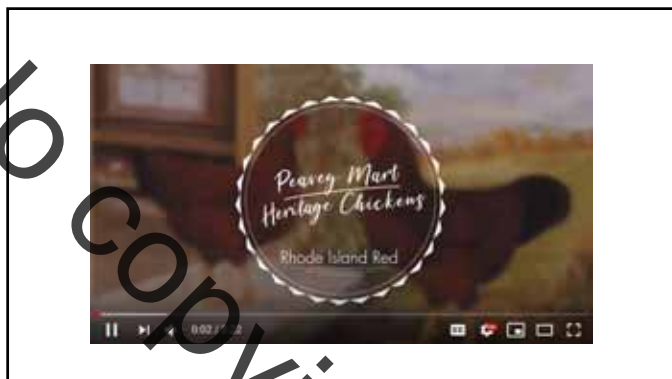
Orpington
Wyandotte
Brahman
Chantecler (?)
Jersey Giant
Rhode Island Red
White Rock

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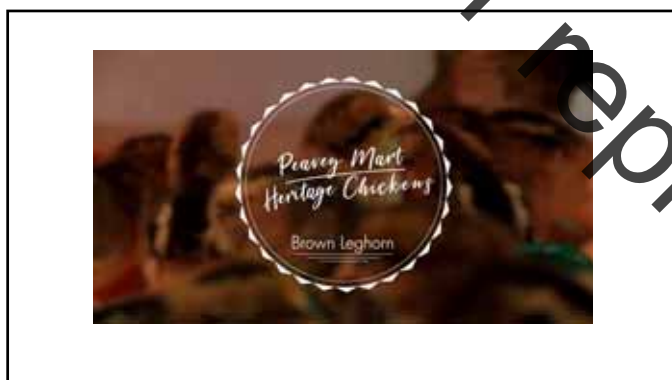
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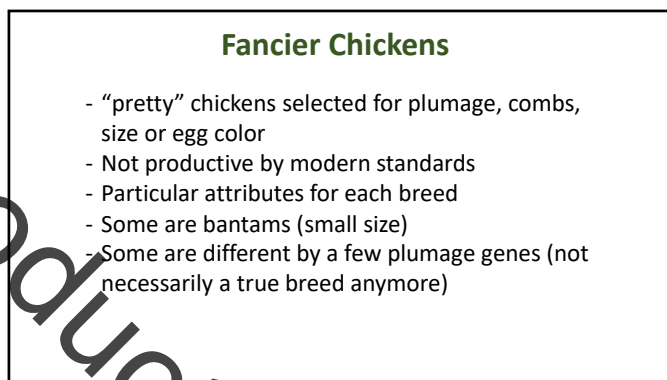
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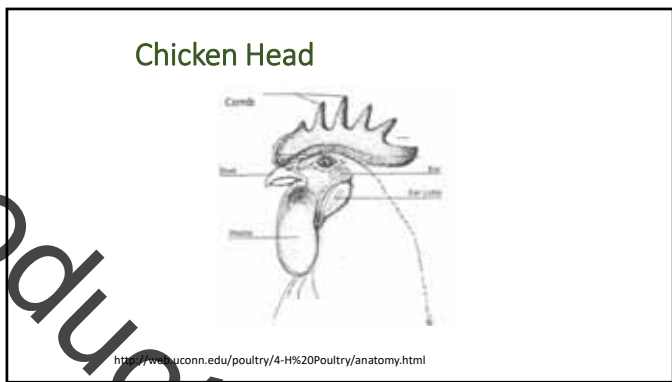
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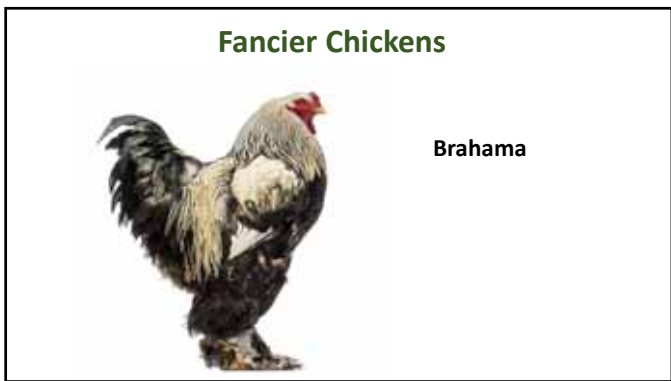
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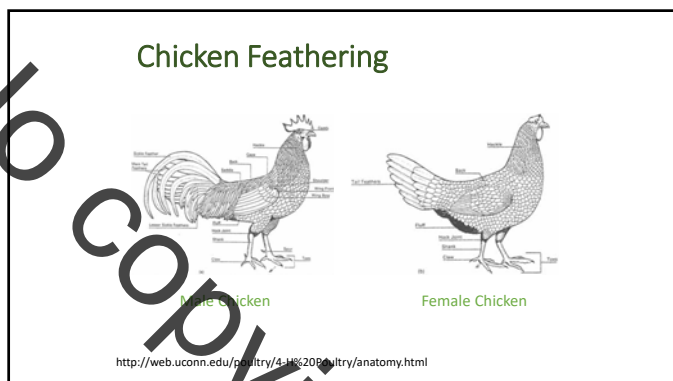


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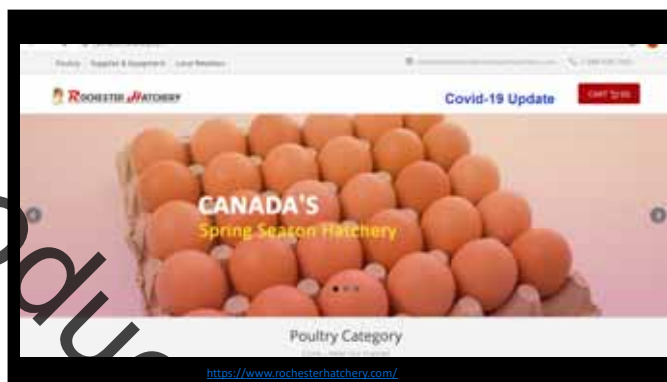
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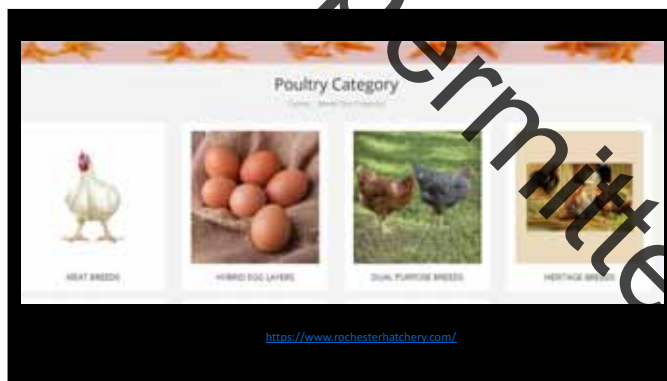
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Barred Plymouth Rock

200000 The Barred Plymouth Rock is one of the oldest pure breeds. There are today, 600,000 birds, descended by a male & 200,000 eggs. They are easy to raise and breed, hardy, have a good record for the production of meat.

Blue-washed birds available in special colors - Hello girl!

Shipping: \$10.00

	Price List					
Quantity	1 - 24	25 - 49	50 - 99	100 - 499	500 - 999	1,000 +
Pullets	\$9.00	\$8.20	\$5.19	\$3.00	\$4.50	\$4.00
Cockens	\$9.00	\$8.20	\$5.19	\$3.00	\$2.40	\$2.40
Unsexed	\$5.00	\$4.00	\$3.00	\$2.70	\$3.00	\$3.00

Send us: _____ Quantity: _____

<https://www.rochesterhatchery.com/>

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Manitoba CA

<https://www.breezybirdfarms.com/>

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BREEZY BIRD farms

OFFERING HATCHING EGGS AND CHICKS YEAR ROUND!!

POULTRY

<https://www.breezybirdfarms.com/>

50

Manitoba CA

<https://www.breezybirdfarms.com/>

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Manitoba CA

BEEFEEZER FEMME KUHIN

WHITE BRESSE

BARRED PLYMOUTH ROCK

SWEDISH FLOWER HEN

ORPINGTON

CRAD LANGSHAY

<https://www.breezybirdfarms.com/>

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Missouri USA

Cackle Hatchery
Hatchery & Shipping Since 1952

417-532-4583

HOME / ABOUT US / CONTACT / BROWN EGG LAYERS / WHITE EGG LAYERS / SPECIALTY BREEDS

BROWN EGG LAYERS

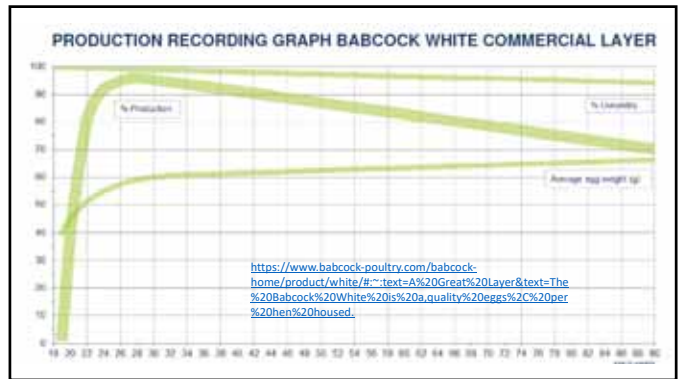
WHITE EGG LAYERS

<https://www.cacklehatchery.com/>

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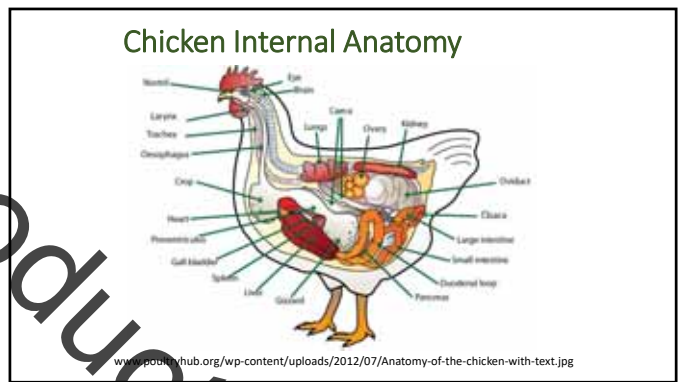
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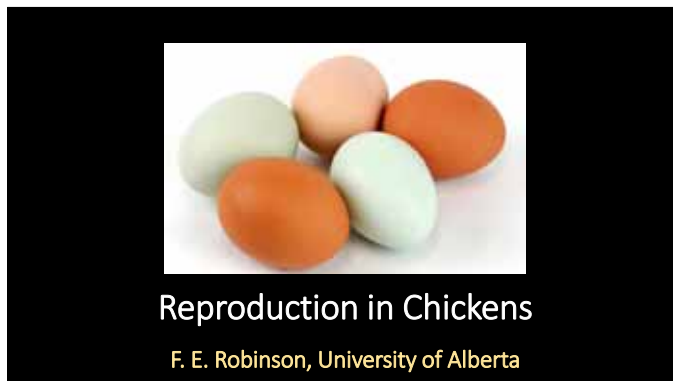
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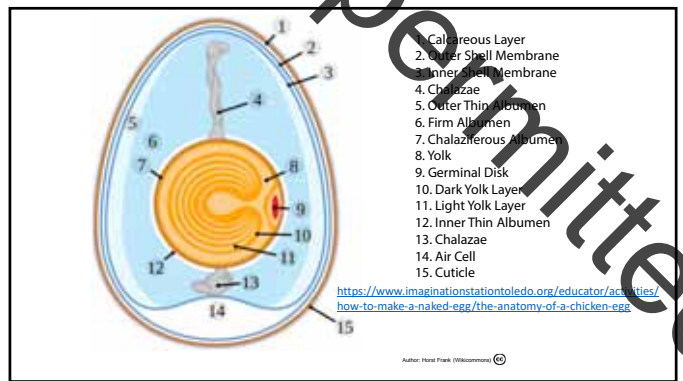
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Ovary

- All of the follicles (ova/yolks) a female bird will ever require for egg production are present as very tiny follicles (immature ova) at the time she hatches
- Chickens and turkeys have only one ovary (left one)
- A laying hen has follicles of varying sizes from very small immature ova up to mature yolk size
- Mature follicles are released from the ovary (ovulation)




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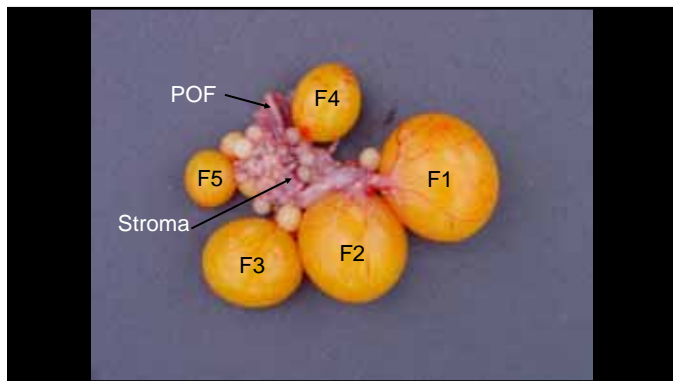
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Oviduct

- A cylindrical tube which accepts egg yolks ovulating from the ovary at one end to the formation of a hard shelled egg delivered out the other end 24-26 hours later
- Birds normally have only one oviduct but sometimes a rudimentary, non-functional right oviduct can be found in some birds



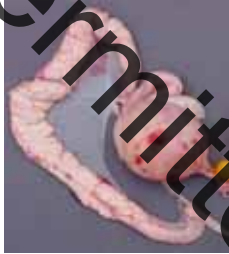
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Sections of the oviduct


- **Infundibulum** is the funnel shaped entry point for an egg yolk to be picked up as it ovulates from the ovary. It takes about 15 minutes for the yolk to pass through the infundibulum.



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Sections of the oviduct


- **Magnum** is where the albumen (egg white) is deposited over about 3-4 hours.



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Sections of the oviduct


- **Vagina** is a passage way for the egg from the shell gland to the cloaca. A waxy cuticle film (bloom) is applied here to seal egg pores to prevent the egg from dehydration.



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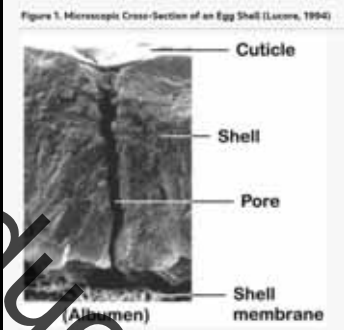
Sections of the oviduct

- **Isthmus** is where two shell membranes are applied around the albumen and yolk. This process takes approximately one hour.



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Figure 1. Microscopic Cross-Section of an Egg Shell (Lucore, 1994)




<https://thepoultrysite.com/articles/contamination-of-hatching-eggs>

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Sections of the oviduct

- **Shell gland** is where the shell including any pigmentation on the shell is added. Complete shell formation takes about 20 hours.



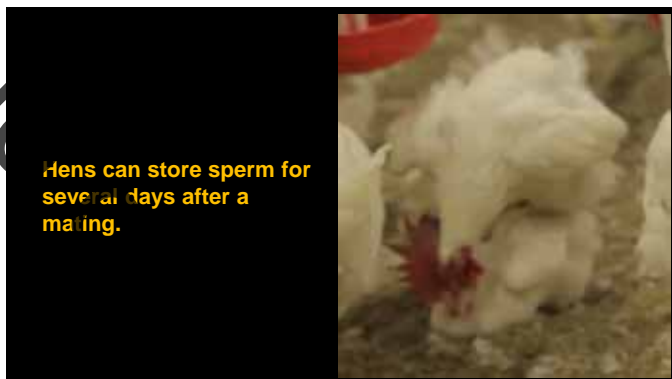
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20 COMMON EGG SHELL QUALITY PROBLEMS



<https://store.alltech.com/blogs/poultry/20-common-egg-shell-quality-problems-and-causes>

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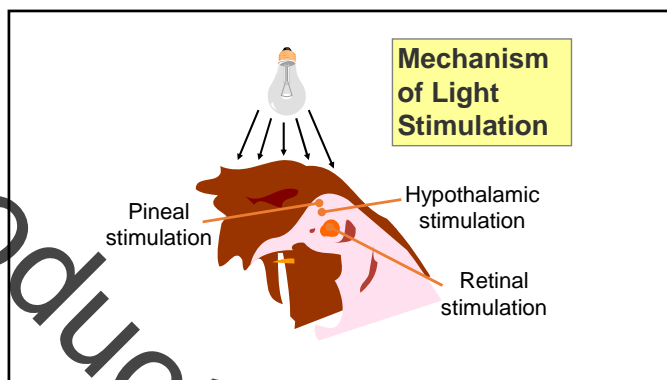


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Times of Egg Laying

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
9:05	13:30					
8:44	11:26	15:15				
8:01	10:00	12:03	15:23			
7:24	9:22	10:26	11:46	15:05		
7:33	9:20	10:34	11:30	12:34	15:40	
7:45	9:12	10:10	10:51	11:39	12:38	15:26

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- Laying Sequence (Clutch)**
- A period of 1 or more days of consecutive egg laying.
 - Each egg in a sequence occurs slightly later each day.
 - Each sequence is separated by a period of about 40 to 44 hours

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- Photoperiod**
- The number of hours of daylight and darkness that birds are exposed to in a day
 - Short days (8L:16D)
 - Long days (15L:9D)
- Photophase**
- The illuminated period of the photoperiod
- Scotophase**
- The dark period of the photoperiod

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Rearing Photoperiod (short days)

- A day length that limits sexual maturation
- Typically 8 hours
- May be constant or decreasing
- Must not be increasing

Critical Day Length


The minimum photoperiod needed to stimulate sexual maturation (11-12 hours)

Laying Photoperiod (long days)

A day length that meets the critical day length

- Typically 14-16 hours
- May be constant or increasing
- Must not be decreasing

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Incubation and Embryo Development

F. E. Robinson, University of Alberta

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Key Points about Photostimulation

- Birds increase egg production in increasing day length
- Birds decreases egg production in decreasing day length
- Consider a light bulb and a time clock in your poultry house for winter management

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Hatching Egg Selection



https://www.cobb.com/assets/bulkUpload/aac1ddbe7a/Hatching_Egg_Selection.pdf

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Detection of Non-Laying Hens

Laying Period Comb and wattles

- Layer: large, bright red and shiny
- Non-Layer: small, pink, dry and shriveled

Eye

- Layer: bright, prominent
- Non-Layer: Dull, sunken

Abdomen

- Layer: Deep, soft pliable
- Non-Layer: Shallow, tough, tight

Pubic bones

- Layer: Flexible, wide apart (three finger width)
- Non-Layer: Stiff, close together (1 finger width)

Vent

- Layer: Large, moist
- Non-Layer: Small, dry, puckered

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Peavey Mart

<https://www.peaveymart.com/>

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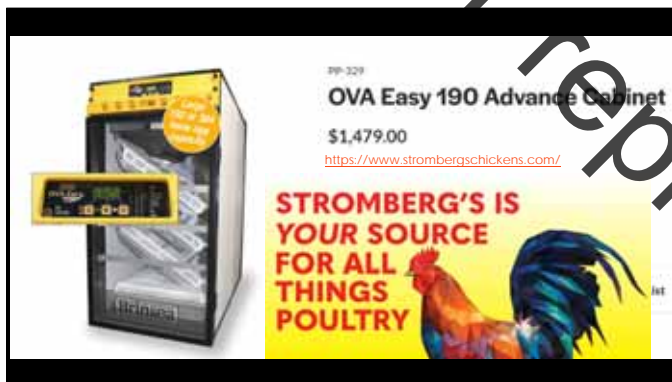


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Incubation Periods

Chickens: 21 days
 Turkeys: 28 days
 Ducks: 28 days
 Geese: 28 days

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Incubation Requirements

1. Optimum temperature
2. Optimum humidity
3. Adequate ventilation (O2 and CO2)
4. Regular turning of eggs

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Extra-Embryonic Membranes

Yolk sac:

- Surrounds egg yolk
- Secretes enzymes to help in digestion of yolk material
- Is drawn into body cavity prior to hatching
- Residual yolk sac remains after hatching

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Fertilization

- Takes place within 15 minutes of ovulation of the follicle (yolk)
- First cell division starts about 5 hours after fertilization
- At 256 cells 4 hours after entering the shell gland
- Embryo is at the 30,000 cell stage at oviposition
- *(26 hours of incubation occurs in the hen's reproductive tract)*

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Egg Weight Loss During Incubation



Cobb-Vantress. Hatchery Management Guide

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Google: chicken embryo Australia

www.youtube.com/watch?v=PedajVADLGw

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Reasons for an Early Hatch

- Extended pre-heating periods
- Setting eggs too early (to long incubation period)
- Too high setter/hatcher hatcher temperature and humidity
- Uneven air flow in incubator or hatcher
- Very high fertility (too much heat production fro incubator)
- Small egg size

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Embryo Heat Production



Cobb-Vantress. Hatchery Management Guide

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Reasons for a Late Hatch

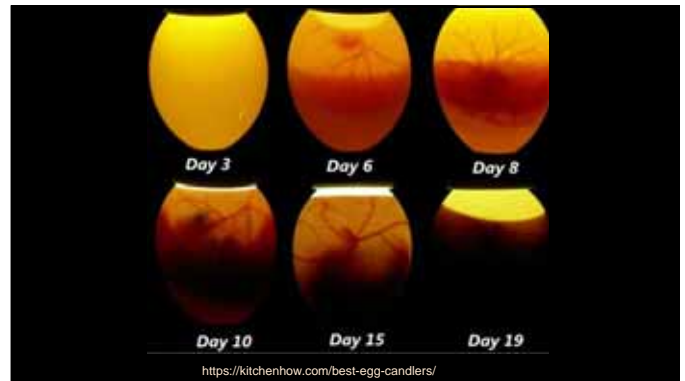
- Eggs set too late
- Eggs stored for a long period
- Eggs stored too cool
- Too low setter/hatcher hatcher temperature and humidity
- Uneven air flow in incubator or hatcher
- Incorrect egg placement in multi stage machines
- Low fertility (not enough heat production)

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Reasons for a Late Hatch

- Eggs set too late
- Eggs stored for a long period
- Eggs stored too cool
- Too low setter/hatcher temperature and humidity
- Uneven air flow in incubator or hatcher
- Incorrect egg placement in multi stage machines
- Low fertility (not enough heat production)

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Egg Candling



- Early dead embryo
- Distinct blood ring circling the egg

<http://www.theeggfarm.com/blog/2014/01/17/candling-chicken-eggs/>

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Fertility

$$= \frac{\text{The number of fertile eggs}}{\text{The number of egg set}} \times 100$$

Breeder age	Target Hatchability
25 – 33 weeks	>96%
34 – 50 weeks	>97%
51 – 68 weeks	>90%

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Egg Candling – Day 5



- Viable embryo
- Distinct blood vessels apparent

<http://www.theeggfarm.com/blog/2014/01/17/candling-chicken-eggs/>

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Fertility

Farm Factors

- Breeder nutrition
- Breeder health
- Fertility (mating activity)

Hatchery Factors

- none

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Hatchability

= $\frac{\text{The number of saleable chicks}}{\text{The number of egg set}} \times 100$

Breeder age	Target Hatchability
25 – 33 weeks	>86%
34 – 50 weeks	>89%
51 – 68 weeks	>80%

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Hatch of Fertile

= $\frac{\text{The number of saleable chicks}}{\text{The number of fertile egg set}} \times 100$

Breeder age	Target Hatch of Fertile
25 – 33 weeks	>90%
34 – 50 weeks	>92%
51 – 68 weeks	>89%

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Hatchability


Farm Factors

- Breeder nutrition (egg quality)
- Breeder health
- Fertility (mating activity)
- Egg handling and sanitation
- Egg storage


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Feather Sexing

Female Chick



Male Chick



http://www.extension.org/pages/65471/sex-linked-traits-in-poultry#_VRQ2r1FDUJ

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Hatchability

Hatchery Factors

- Incubator /Hatcher management
- Egg handling and sanitation
- Egg storage
- Chick Handling

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0:02 / 2:59

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