

Eggs

Shell
Calcium carbonate

White
Albumin (protein)
Thick and thin

Yolk
Fat
Lecithin (emulsifier)

<http://www.youtube.com/watch?v=DkL-Npm3-cl>

CROSS-SECTION OF AN EGG

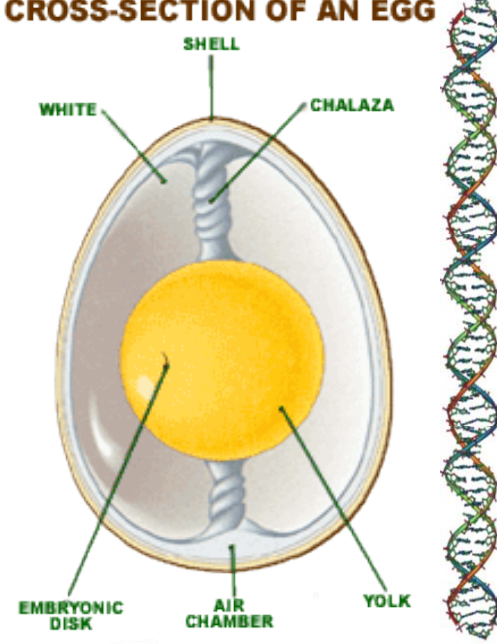


Image: <http://victoriapackaging.com/egginfo.html>
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Eggs

Fresher Eggs
Thick albumen
Prominent chalazae
Sink in water

Ageing...
Albumen & chalazae
break down
Air bubble grows...

CROSS-SECTION OF AN EGG

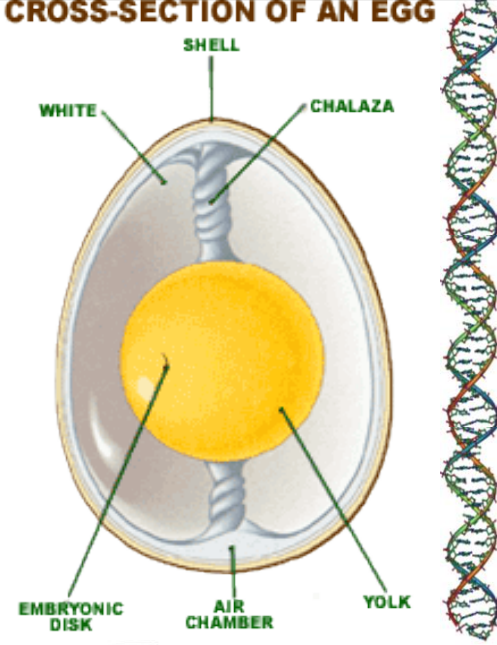


Image: <http://victoriapackaging.com/egginfo.html>
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White or brown?

Shell color is largely meaningless

Indicates breed

Pinks, greens, etc



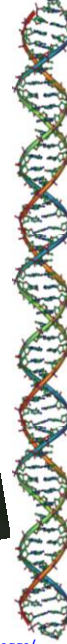
Image: <http://www.whitmorefarm.com/eggs>



Image: <http://www.theinnovationdiaries.com/613/how-to-raise-chickens-to-lay-eggs/>



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Eggs and Chickens

“Indeterminate layers”

~25 hour cycle (industrial)

200-300 eggs per year

2-3 year laying “lifetime”

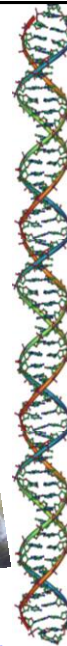


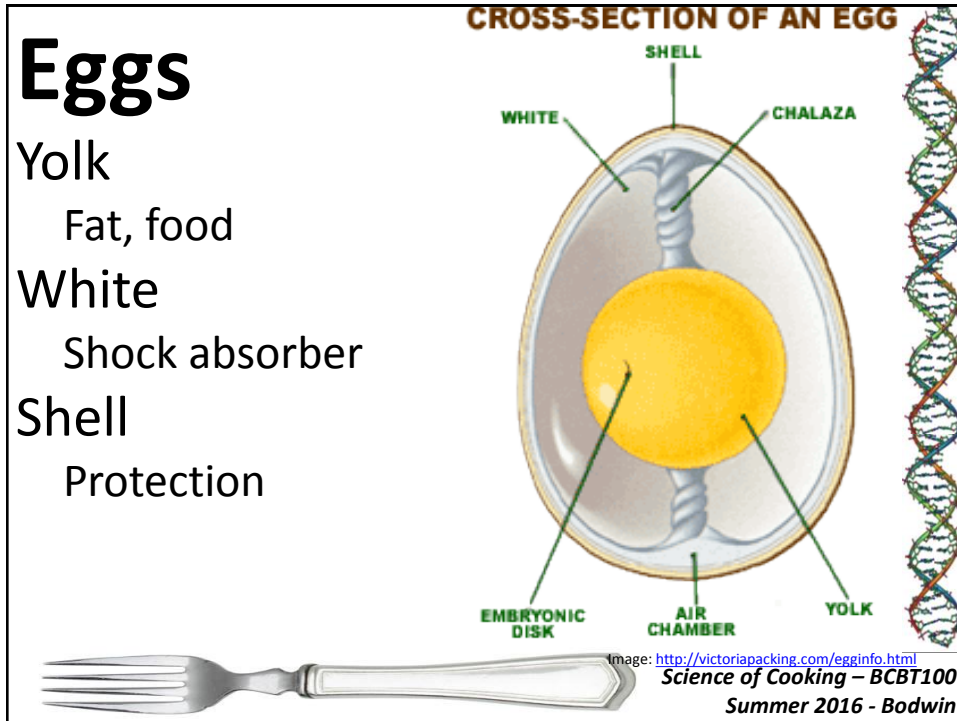
Image: <http://www.motherearthnews.com/Sustainable-Farming/Best-Chicken-Breeds-For-Backyard-Flocks.aspx>

Image: <http://organicconnectmag.com/wp/are-there-drugs-in-your-chicken-dinner/#.UG2MCU3yrPA>



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Cooking with Eggs

Consider composition

White = protein + water
 “Cooking” denatures protein

Yolk = protein + fat
 and all the other nutrients...

Image: <http://whatscookingamerica.net/Eggs/BoiledEggs.htm>
 Image: http://lukehoney.typepad.com/the_greasy_spoon/2008/07/perfect-fried-e.html
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Egg Whites – Whip It!

Foams – Meringue (albumin only)

Review micelles – water/air interface

Similar in concept to whipped cream or yogurt curdling

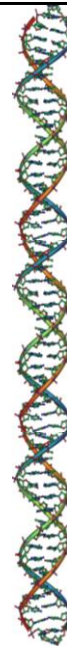
Mechanical shearing of protein bundles

Soft foam – water lubricates bubbles

Hard/Stiff/Dry peaks – protein bubble walls squeeze out excess moisture



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Cream of Tartar

Potassium tartrate – adds acid

Prevents disulfide bond formation

Proteins need to interact, but not TOO strongly

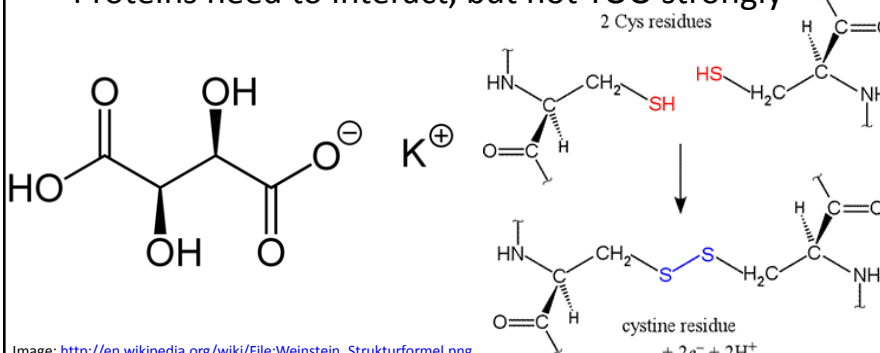


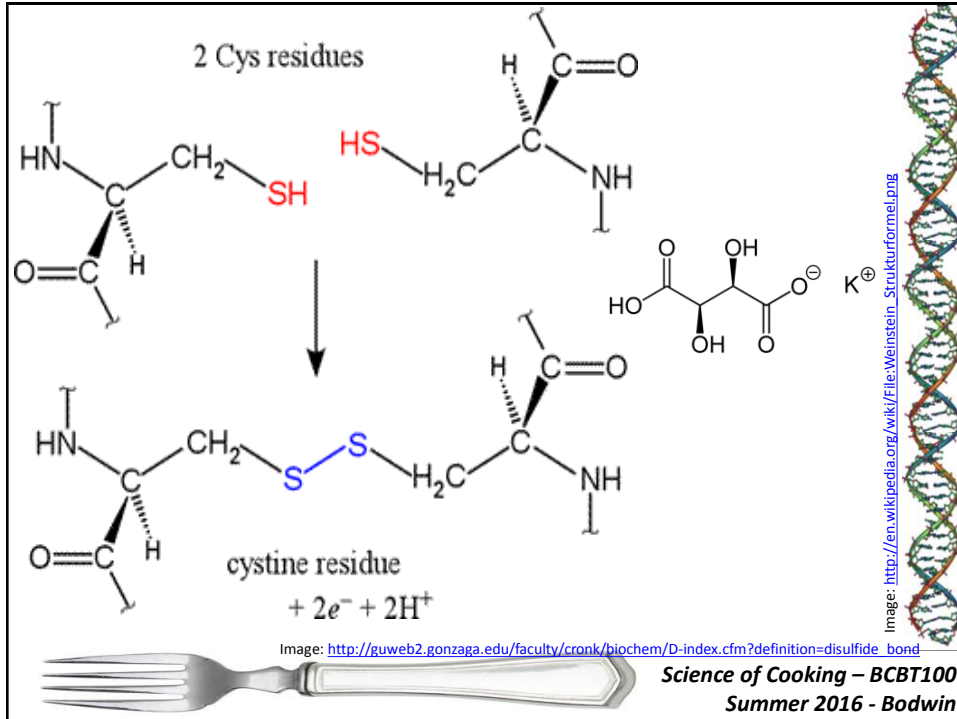
Image: http://en.wikipedia.org/wiki/File:Weinstein_Strukturformel.png

Image: http://guweb2.gonzaga.edu/faculty/cronk/biochem/D-index.cfm?definition=disulfide_bond



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Setting White Foams

Heating dehydrates

Ovalbumin denatures at higher T

Secondary network, reinforces

Role of sugar

Strengthens “cages” with sugar strands

Delays dehydration (ovalbumin denature)



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Whipped yolks

Fat prevents foam

A little yolk ruins a meringue

Air bubbles lighten color

Low “free” water content

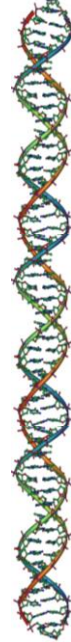
The beginnings of a custard

Network of egg proteins

Suspends milk fat



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Whipped Whole Eggs

Not as fluffy as whites

Not as silky as yolks

Will they foam?



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Cooking Eggs

Balance of fat, protein, water, air

Water – high heat capacity

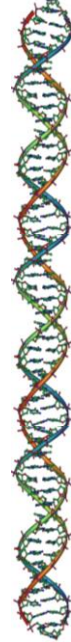
Fat – solidifies, liquifies, separates

Protein – denatures or not?

Air – excellent insulator {Why?}



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Custard

Crème caramel

Crème brulee

Cheesecake

Kuchen

Quiche

“Egg Bake”



Image: <http://gwenskitchencreations.blogspot.com/2011/04/creme-brulee.html>



Image: <http://raefrazier.blogspot.com/2011/04/q-quantum-physics.html>



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