

From Last Time:



Science of Cooking – BCBT100
Spring 2014 - Bodwin

“Browning”

Different meaning in different foods



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Browning Reactions

Many foods “brown”
Reactions differ by molecules



Images: <http://theculinarybutler.blogspot.com/2010/09/how-to-bake-freezing-bread-baking-bread.html>
<http://www.davidlebovitz.com/2011/05/chili-recipe-with-chocolate/>
<http://www.freshchocolate.com/2012/09/19/lebanese-maple-brown-sugar-cream-butter/>
<http://www.foodinfo.net/uk/colour/maillard.htm>
<http://www.freshchocolate.com/2012/09/19/lebanese-maple-brown-sugar-cream-butter/>

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Maillard Browning

Proteins (+ reducing sugars)
Produce color and flavors
250°F/120°C



Louis Camille Maillard
(1878-1936)



Images: <http://www.telegraph.co.uk/foodanddrink/8426388/White-bread-falls-from-favour-as-shoppers-prefer-brown.html>
<http://www.foodinfo.net/uk/colour/maillard.htm>



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Encouraging Maillard

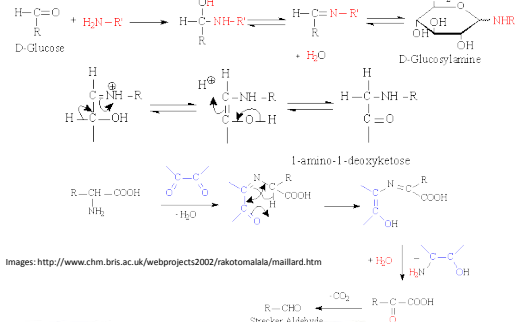
High heat, little water
Browning before stewing



Images: http://weilfed.typepad.com/weil_fed/2005/12/mahogany_beet_s.html
<http://www.onceuponachef.com/2012/09/roasted-tomato-salsa.html>

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Maillard Reaction



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Sugar Browning

Sugar pyrolyzes (burns)
Flavor development
Caramelization
330°F/165°C



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Enzymatic Browning

Phenol oxidase
Polymerizes phenols
Usually undesirable

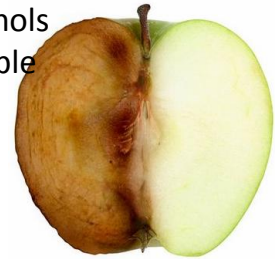


Image: <http://www.oneresult.com/articles/nutrition/what-are-antioxidants-and-how-do-they-help>



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Enz Brown

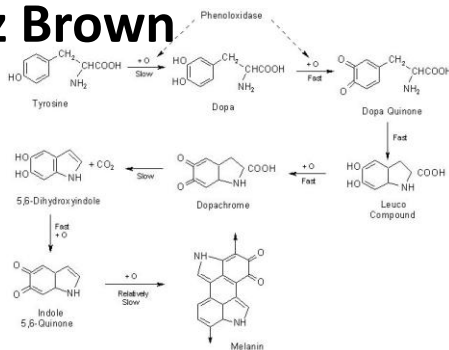


Image: <http://www.food-info.net/uk/colour/enzymaticbrowning.htm>



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Balanced Browning

Control heat
Sugar browning @ higher Temp
Control water
Keeps Temp low



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Cooking Methods

Boiling
Steaming
Pressure cooking
Baking
Frying
Grilling



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Heat Management

Specific Heat Capacity –
the amount of heat energy required to
raise the temperature of 1 gram of a
substance 1°C.
For water, 1 calorie per gram °C
“Dietary Calorie” vs. calorie

http://www.engineeringtoolbox.com/specific-heat-capacity-food-d_295.html



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