

# From Last Time:



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Fall 2012 - Bodwin

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# Storing & Preserving

Storing food  
How to prevent spoilage  
Use quickly

Preserving food  
Early science  
Trial and error

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# Storage

Cold storage  
Kinetics – double every  $\sim 10^{\circ}\text{C}$   
Pasteurization  
Vacuum

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## Temperature Conversions

### Fahrenheit (historically)

0°F = Salt water freezing (colligative)

32°F = Water freezing

96°F = "blood heat"

### Celsius (historically)

0°C = Water freezing

100°C = Water boiling

### Adjustments over time...

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## Do the math

What is "body temperature"?

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## Absolute Scales

### Kelvins

1K = 1°C

"Zero" really means "zero"

0°C = 273.15K

### Rankine (rarely used)

1°R = 1°F

"Zero" is absolute zero

0°F = ??°R

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## Drying

Most “spoilage microbes” need water to survive  
Removing water concentrates flavor  
Food is slightly heated (130-160°F)  
Prunes, raisins, figs, apricots



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## Freeze-drying

Removes water while frozen  
Less heat-based deterioration  
Removes more water (usually)  
More shelf-stable



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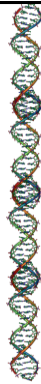
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## “Pickling”

Food is acidified  
Add acid (vinegar)  
Fermentation (low oxygen)  
  
Pickles, sauerkraut, kimchi, etc



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## Sugar Preserves

Too much sugar kills microbes!

Jellies and Jams:

Pectin extracted from cell walls

Negative charge in water

Sugar "dehydrates" solution

Acidify to allow pectin binding



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## Candied Fruits

Sugar is infused in fruit pieces

Fruit maintains more structure



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## Canning

Seal and heat

Pasteurization of shelf-stable milk

Food is cooked during canning

Safety...



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