

# Fermentation

## Yogurt

Bacteria “digestion” of lactose

Impact on lactose intolerance?

Produces lactic acid

Impact on properties?

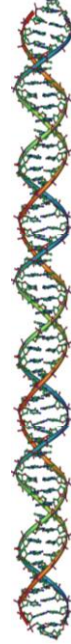
*Streptococcus salivarius* – thermophilus

More active at lower acid concentration (higher pH)

*Lactobacillus delbrueckii* – bulgaricus

More active at higher acid concentration (lower pH)

High acetaldehyde production – green apples



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# Yogurt properties

Stabilizes milk for storage

Lactoglobulin (a whey protein)

facilitate casein networks

Similar to fat globules in whipped cream

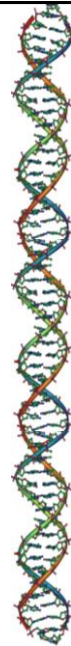
Casein networks hold aqueous phase rather than air

Probiotic bacteria

Contributes to and enhances intestinal flora

Aids digestion

Read the label!



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# What should yogurt contain?



Image: <http://cheeseforum.org/forum/index.php?topic=546.0>

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# What should yogurt contain?



Image: <http://ronjones.org/CurrentComments/GutCheck/June-08.htm>

**INGREDIENTS:** MILK (SKIM MILK, MILK SOLIDS), WATER, FRUIT 7.5% (STRAWBERRY), HALAL GELATINE, MODIFIED STARCH (1442), FRUCTOSE, NATURAL COLOURS (120,163), FLAVOURS, SWEETENERS (951,950), ENZYME (LACTASE), PRESERVATIVE (202), FOOD ACID (331), LIVE YOGURT CULTURES (CONTAINS ACIDOPHILUS AND BIFIDUS CULTURES).  
**PHENYLKETONURICS:** CONTAINS PHENYLALANINE

**STRAWBERRY  
LOW FAT FRUIT  
YOGURT** 200g



Image: <http://www.nestle.com.au/Nutrition-Health-Wellness/Fact-Sheets/Decoding-Food-Labels>

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# What should yogurt contain?

**INGREDIENTS: CULTURED GRADE A MILK. CONTAINS ACTIVE YOGURT AND L. ACIDOPHILUS CULTURES.**

**\*\* MEETS NATIONAL YOGURT ASSOCIATION CRITERIA FOR LIVE AND ACTIVE CULTURE YOGURT**

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**KEEP REFRIGERATED**

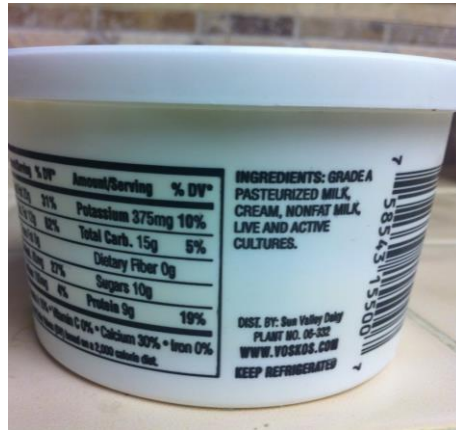


Image: <http://bare5.com/grocery-labelingredients-guide/>

Image: <http://gourmandgrammarians.blogspot.com/2011/07/greek-yogurt.html>



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# Why all the thickeners?

Texture

Smoother

Limit separation

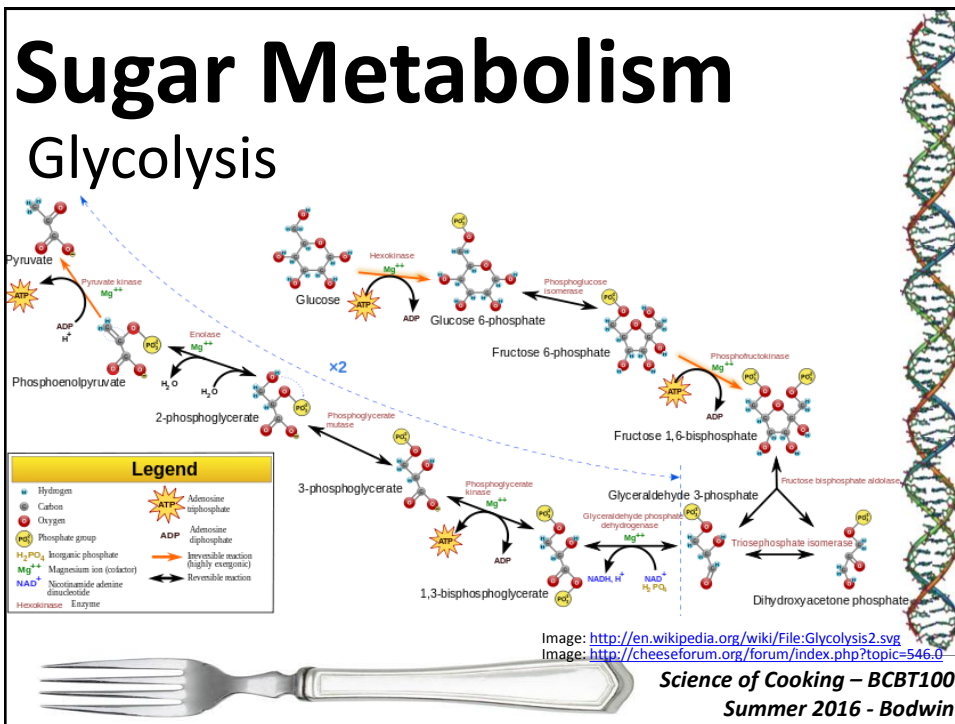
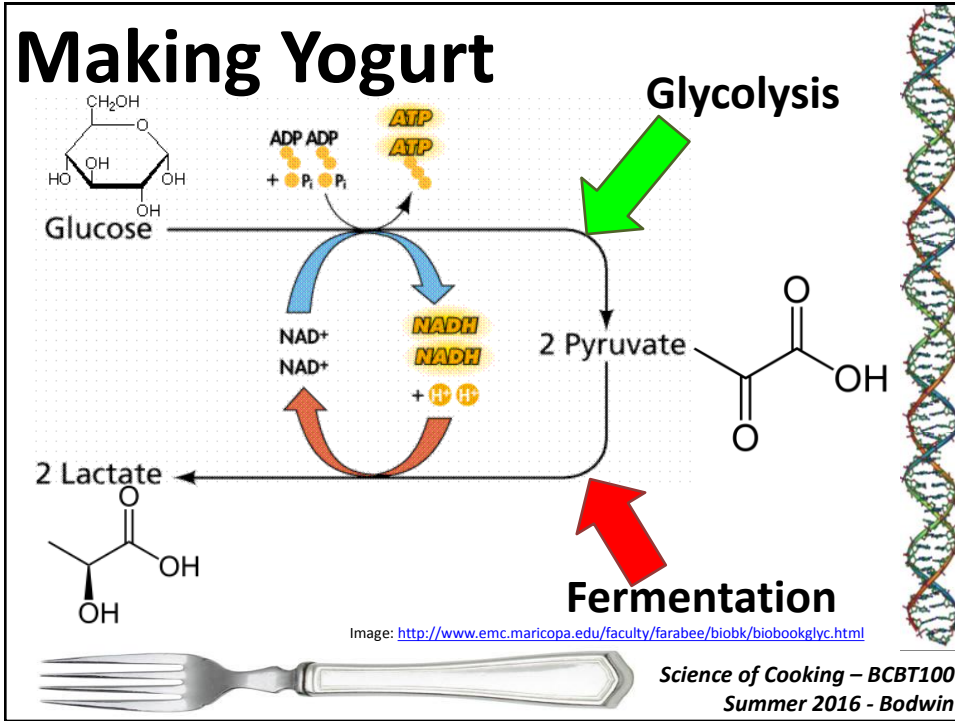
Fat replacement



Image: <http://cheeseforum.org/forum/index.php?topic=546.0>



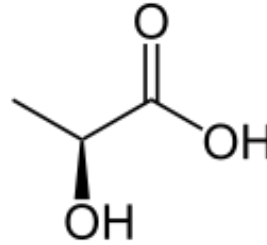
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# Making yogurt

## Role of Lactic Acid

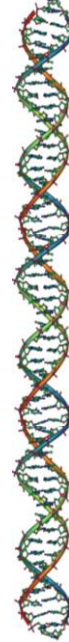
- Denatures casein micelles
- Re-form as protein networks
- Acidifies
- Preservative
- Sour flavor



{figure on p45 of McGee}



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# Yogurt or Sour Cream?



## Mesophilic

*lactococci, leuconostoc*  
"particles of pasturage"  
~85°F/30°C

## Thermophilic

*lactobacilli, streptococci*  
More lactic acid  
~113°F/45°C



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