

Good Bacteria in Food

Most people would think bacteria in or on food can only be harmful. True, food poisoning caused by bacteria and their products is a serious problem, and how to ensure [food safety](#) is treated in a different exhibit. However, certain bacteria are safe in food, and are required for the desired taste and texture. This exhibit describes some of the applications of bacteria and their products in the food industry.

Bacteria are commonly used in **dairy products**. Sour cream and Creme fresh ([make your own! Creme fresh](#)) (Source: Splendid Table) are both the products of cream after bacteria were allowed to grow in it. The difference in flavor, texture, and behavior (sour cream will curdle when heated, creme fresh will not) all result from the differences in bacteria required to produce the two products. [Buttermilk](#) (Source: DB Frankhauser) is low in fat, [cheese](#) comes in many variations (Source: Franceway.com). [Yogurt](#) (Source: Life.ca) is probably one of the oldest forms of fermented milk.

Is it not dangerous to eat food containing bacteria? Certainly not, as long as they are the right kind of bugs. It may even be [beneficial to eat dairy products with living cultures](#), although the evidence is still controversial (Source: NewYork Times Sciene Q&A). True or not, fermented milk products are often [suitable for people with a lactose intolerance](#) (Source: Regional Health Science Center) though the product should not be heated after fermentation.

Fermented milk products are not completely fluid because [casein, the major protein in milk, is insoluble in acid](#) (Source: DB Frankhauser). Casein is also the protein that makes cheese solid. Fermented dairy products taste different due to the bacteria used to make them. So what kind of bacteria are used for these [different dairy products](#) (Source: IDFA)? Most manufacturers will not release their magical strain of bacteria, producing just the right flavor, but here are their general characteristics:

- [Table on dairy bacteria and their products](#) (Source: Science-projects.com)
- What makes Limburger cheese so smelly? [Isolate Brevibacterium linens](#) (Source: Indiana Lab).
- [How Propionibacter shermanii makes the holes in Swiss cheese](#) (Source: NewYork Times Science Q&A)
- [View the yogurt bacteria](#) Lactobacillus delbrueckii bulgaricus and Streptococcus salivarius thermophilus (Source: SCIMAT)
- [More images of L. bulgaricus](#) (Source: Minnesota Microscopy Society Web Pages).

Vegetables can be fermented too. [Read about an ancient tradition](#) (Source: FAO). For instance, bacteria are the working lot to produce **sauerkraut**. The word 'sauerkraut' is German and means sour cabbage. And that is what it is: finely cut white cabbage leaves, left fermenting by lactic acid bacteria. Believe it or not: kraut only contains cabbage and salt. It doesn't taste salty because of the acid produced by the lactic acid bacteria, and the salt prevents fouling bacteria to grow. The bacteria used for sauerkraut is [Leuconostoc mesenteroides](#) (Source: FAO). The same principle is used with pickling other foods, such as onions, olives, or meat. Almost always lactic acid bacteria do their little jobs to [pickle to](#)

[perfection'](#) (Source: FoodProductDesign).

Did you ever imagine that bacteria were used to produce **chocolate and coffee**? Although bacteria are not present in the final products containing [chocolate](#) (Source: ScienceNews online), yeasts and [bacteria degrade the pulp that covers fresh chocolate beans](#). (Source: International Cocoa Org.) Did you know that [chocolate may not be bad for you](#) in contrast to what your mother made you believe? (Source: Manbir-Online).

Another example of bacteria helping to produce food products is **vinegar**. Whether good or bad depends on what the product should be. Wine makers will do their best to inhibit Acetobacter fermenting their grape juice. In order to produce wine, yeast should grow but not bacteria. However, if the desired product is vinegar, bacteria have their chance. Read more about [wine and vinegar making](#) in our special feature file.

Fermenting bacteria are also used in the production of **sausage**. Again, lactic acid bacteria do their job. [All you want to know about sausage](#) (Source: L. Poli). Don't worry, you can still enjoy your [meat snacks](#) (Source:FoodProductDesign) since bacteria used in sausages are not at all related to E. coli or Salmonella, the enemy of every butcher. In fact, [lactic acid bacteria are able to kill Listeria](#), a newly discovered ability that supports the safety of cured meats (Source: INRA).

And, finally, if you want to be active yourself, get started!

- [Make your own cheese](#) (Source: DB Frankhauser).
- [Make your own yoghurt](#) (Source: NebGuide).
- [Observing Bacteria cultures in Yoghurt](#) (Source: GreatScopes)
- [Make your own kraut](#) (this is a PDF) (Source: ME Mennes)

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