

FERMENTATION FOR FOODS

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Although it may be difficult to imagine how trillions of tiny organisms can act in a beneficial manner on the foods you eat every day, it is a fact that these small life forms which include bacteria, yeast, and fungi can improve the taste and nutritional qualities of food and make it more digestible and healthier.

Why are foods fermented at all, and especially when we hear all the talk about “fresh fruits and vegetables” being so good for us? This is an appropriate question, but one that has been answered in a very practical way for the past 5000 years of recorded history, and probably much longer.

Five thousand years ago the Sumerians who worshipped the Goddess of beer, Ninkasi, fermented grain to make beer which they drank for food.. Grains were and are non-digestible unless they are fermented or cooked, and the Egyptians recorded that workers were paid in bread or beer during the building of the pyramids. Since then, the practice of fermentation has been ubiquitous in virtually every country and cultural group. So to answer the question “why ferment,” it is to help preserve and safely store food, to improve or sharpen the taste, to change the character of food [i.e. grapes to wine], and to allow us to fully enjoy major drinks such as coffee, tea, and chocolate [cocoa].

Take, for example, the soybean plant grown in the Far East, especially China, for the past 5,000 years. It only became recorded as a food for humans when it began to be fermented into miso, tempeh, soy paste, and sauces. All of these forms are more digestible, more nutritious, and tastier than the tofu of raw soy form. Soy protein as it is eaten in this country interferes with the absorption of zinc, magnesium, calcium, and iron, and is not so well digested. The protein in soy beans is a complete protein, however, which is unlike that of other beans that must be eaten with complementary foods such as grains to build a “complete” protein which the body can use.

Fermentation is a chemical process which occurs in the presence and with the help of yeast, fungi, and [good] bacteria. Wine is made using yeast fermentation, buttermilk and cheese depend on bacteria, and fungi help in the fermentation of some meats and fish for storage. In the case of wines, yeast cultures are added to the “mash” of grapes and sugar is sometimes used to hasten the fermentation process and increase the yield of alcohol by “feeding” the yeast more food. This process has often been condemned because it dilutes the real mash which has all of the flavor and nutrients. In England this process of diluting the mash caused the perpetrator to be punished by prison or even death. In the making of champagne, sugar is added to the second stage of fermentation to increase the carbon dioxide and make it bubbly.

The history of the life of Louis Pasteur is closely tied to the development of knowledge about fermentation. He was first asked to solve the problem of deterioration of beetroot alcohol which caused it to turn into vinegar. He discovered that there were tiny microorganisms which caused this to happen, and if the mixture were heated or “pasteurized” this did not occur. He also helped the wine industry because the problem of wine which “goes off” was and is significant to wine shippers. He later applied the process to the pasteurization of milk which kills disease-causing bacteria.

Fermentation usually creates safe foods because the bacteria or yeast is helpful and not harmful to humans [i.e. probiotics, lactobacilli]. Milk sours into curds and whey under the fermentation process. When you eat yogurt, there are still millions of lactobacilli present. If milk is pasteurized first, the milk rots instead of souring and the odor is distinctly different. If it is not pasteurized, then the lactobacilli are present and the milk will curdle and sour.

Microbes also are responsible for making vitamins from food such as B12, folic acid, riboflavin, niacin, thiamin, and biotin right in your own GI tract. As noted, most of these microbes are good, but there have been a few cases of botulism poisoning from burying meats for a long time in the Arctic region.

Antiaging factors in fermented foods have been well documented. The Japanese and Chinese cultures have eaten fermented soy products for centuries, and the low incidence of breast and prostate cancer is attributed in part to this fact. Okinawan’s have the highest number of centenarians in their culture, probably because of the combination of decreased caloric intake and ingestion of healthy soy protein. One of the components of soy protein is genistin, a compound that is an estrogen blocker which prevents high levels of potentially cancer-inducing estrogen from stimulating abnormal cell growth in the breast or ovary. Fermented “live” foods such as buttermilk and yogurt add billions of probiotic “good” bacteria to the intestinal tract which helps digest your food and free up vitamins for absorption into your body. Fermenting of plant foods such as beets, grapes, corn, and sugar give usable alcohol for drinking, adding to foods, and even helping with the energy shortage by mixing with gas. Because of the added advantage of fermented foods in regards to digestion and improving the nutrient status of foods, this process has been beneficial to mankind for many centuries.

To summarize, many subcategories of food are made better by fermentation, and include breads, cheeses, tea, coffee, chocolate, pickles, kimchi, and yogurt. Select the more digestible and healthy foods for your diet when possible, and your health and your palate will benefit from this.