

IMAGE AWARENESS HEALTHLETTER

THE IMMUNE SYSTEM

Intestinal Flora: Acidophilus and Yeasts

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Candida albicans

A yeast called *Candida albicans* has received considerable coverage in the media. While it is important not to underestimate the problems this organism can create, it is important to realize that this is simply one more opportunistic organism which attacks those with a weak immune system.

This plant is found in the intestines of almost everyone. A *Candida* skin test "is almost universally positive in normal adults. It is therefore used as an indicator of competent cellular immunity." (Jawetz)

Candida albicans belongs to a class of the fungi called Fungi Imperfecti. No mating type is known for imperfect yeasts. The name is from the Latin white (*albicans*) and candle (*candida*). In medical literature it is often called *Monilia*.

Candida albicans can exist as an oval budding yeast or in a form with germ tubes. The ability to form germ tubes under the right conditions is largely responsible for the disease causing characteristics of the organism. The germ tubes can penetrate into the lining of the intestine weakening it and contributing to allergies and illness.

Those with suppression of the immune system (AIDS), diabetes, or exposure to large quantities of antibiotics or birth control pills can develop serious infection with the organism.

Jawetz et al. write, "The most important preventive measure is to avoid interfering with the normal balance of microbial flora and with host defenses. *Candida* infection is not communicable, since most individuals harbor the organism under normal circumstances."

Since yeasts are nourished by sugar and carbon dioxide, one would expect both of these to contribute to



Notice

This newsletter is designed for educational purposes only. Any individual suffering from health problems which are mentioned or discussed should consult a physician for proper diagnosis and treatment.

Overview

The expression "intestinal flora" refers to the plants which live within the intestine. Some of these plants have the potential for creating health problems, although the majority contribute to health.

This issue of healthletter will look at two varieties of yeast. The first is the disease causing *Candida albicans*. The second will be the highly nutritious *saccharomyces cerevisiae* (brewer's yeast).

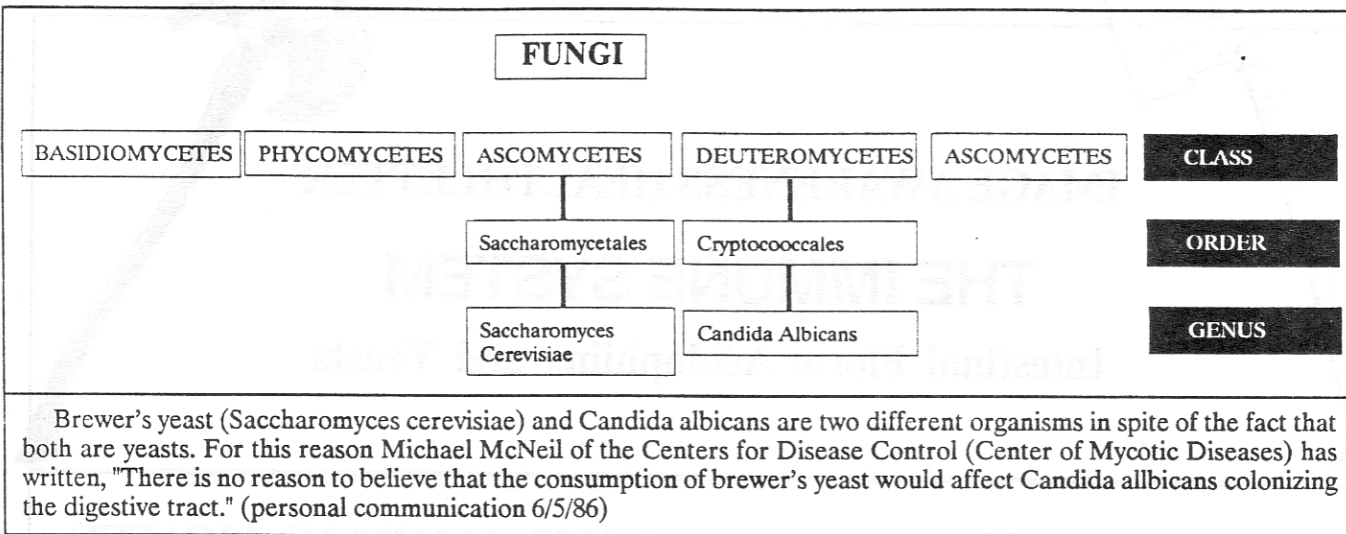
Brewer's yeast is not normally an inhabitant of the intestinal tract, but is often confused with disease causing yeasts such as *Candida albicans*.

We shall also discuss the beneficial bacteria of the *Lactobacillus* family including *acidophilus* and *bifidus*. These not only protect against disease causing yeasts, but also improve health in many other ways.

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problems with *Candida albicans*. If problems exist, it is probably best to avoid carbon dioxide (soda pop) and drastically reduce sugar intake.

Hardiness of yeast cultures is increased commercially by passing carbon dioxide through them. Sugar is a major food of yeasts.

References:

"Yeast," *McGraw-Hill Encyclopedia of Science and Technology*, Vol. 14, p. 685-686.

Jawetz, E., Melnick, J.L. and Adelberg, E.A., *Review of Medical Microbiology*, Los Altos, California: Lange Medical Publications, 1982, p. 297.

Brewer's Yeast

Saccharomyces cerevisiae is more commonly known as brewer's yeast. It belongs to what is called the perfect yeasts. The name brewer's yeast is not always accurate because the product is not always a byproduct of the brewing industry. Often it is grown specifically for its nutritional value. When this is done it is often called "primary grown nutritional yeast."

The term "biologically bound yeast" is used when yeast are fed a very rich nutrient media. In the growing process the nutrients are picked up and become part of the yeast.

It is of interest that brewer's yeast has shown itself beneficial for the diabetic. In one study twenty-four volunteers were divided into two groups. One group was fed torula yeast (*Candida utilis*) and the other brewer's yeast. (Torula yeast is closely related to *Candida albicans*.)

Both diabetic and nondiabetic experimental subgroups achieved an improvement in glucose tolerance

and decreased insulin output after supplementation with brewer's yeast. Average decrease in blood sugar was 13 percent. Cholesterol and total blood fats also fell. Torula yeast achieved none of these results.

Decrease in blood sugar is significant in regard to the problem of *Candida albicans*. If high blood sugar is a contributing factor to the problem, brewer's yeast might be expected to be helpful since it lowers blood sugar.

Brewer's yeast is also one of the finest natural sources of the amino acid lysine. Each tablespoon contains about 190 mg. of surplus lysine.

Reference:

Offenbacher, Esther and Sunyer, F. Xavier, "Beneficial Effect of Chromium-rich Yeast on Glucose Tolerance and Blood Lipids in Elderly Subjects," *Diabetes*, vol. 29, November 1980, pp.919-925.

Acidophilus and Candida Albicans

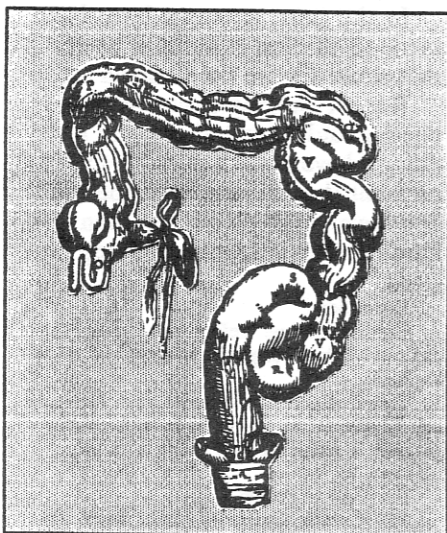
Under normal circumstances *Candida albicans* is not pathogenic. When it begins to form "germtubes" it may begin to cause disease. It is believed that these germtubes can penetrate tissue and create considerable tissue damage.

Studies have shown that *Lactobacillus acidophilus* in sufficient quantity has the ability to completely stop germtube formation of the *Candida albicans* yeast.

One report states, "*Lactobacillus acidophilus* inhibited the formation of germtubes maximally..." and concludes with the statement, "It is likely that inhibition of blastospore-germtube transformation by com-

Concentration of Acidophilus per ml	<i>Candida albicans</i> Germtubes per 100 cells
10 ⁹	0
10 ⁸	0
10 ⁷	2.1
10 ⁶	7.5
10 ⁵	11.9
10 ⁴	16.4
10 ³	20.7
0	62.1

Reference: Purohit, Bharati, et al., "The Formation of Germtubes by *Candida Albicans*, When Grown with *Staphylococcus Pyogene*, *Escherichia Coli*, *Klebsiella Pneumoniae*, *Lactobacillus Acidophilus* and *Proteus Vulgaris*," *Mycopathologia*, Vol. 62, No. 3, 1977, pp. 187- 189.



Beneficial bacteria live in the large intestine.

mensal bacteria may be responsible for prevention of clinical infection by *C. albicans*."

Suppression of the formation of germ tubes was directly proportional to the number of acidophilus organisms present. Nothing else came close to being as effective.

References:

Collins, E. B., and Hardt, Pamela, "Inhibition of *Candida Albicans* by *Lactobacillus Acidophilus*," *Journal of Dairy Science*, Vol. 63, No. 5, May 1980, pp. 830-832.

Purohit, Bharati, et al., "The Formation of Germ tubes by *Candida Albicans*, When Grown with *Staphylococcus Pyogene*, *Escherichia Coli*, *Klebsiella Pneumoniae*, *Lactobacillus Acidophilus* and *Proteus Vulgaris*," *Mycopathologia*, Vol. 62, No. 3, 1977, pp. 187-189.

Acidophilus and Cancer

Some research indicates that a healthy intestinal population of *Lactobacillus acidophilus* may reduce the risk of cancer.

A diet high in meat increases the risk of colon tumors and cancer. Supplementing the diets of rats on such a diet with acidophilus reduced colon tumors and delayed the onset of cancer.

In another study with humans, it was learned that vegetarians had fewer carcinogens than meat eaters with a low fiber intake. Removal of the meat or addition of fiber reduced the levels of one cancer causing agent, but did not affect three others.

Levels of these three cancer causing compounds were reduced in rats

by adding a supplement of acidophilus to the diet.

Researchers concluded, "These findings suggested that the metabolic activity of the fecal microflora was influenced by diet and could be altered by *Lactobacillus* supplements and to a lesser extent by dietary fiber."

References:

Goldin, Barry, et al., "Effect of Diet and *Lactobacillus acidophilus* Supplements on Human Fecal Bacterial Enzymes," *Journal of the National Cancer Institute* (1980), Vol. 64., pp. 255-261.

Goldin, Barry, et al., "Effect of *Lactobacillus acidophilus* Dietary Supplements on 1,2-Dimethylhydrazine Dihydrochloride-Induced Intestinal Cancer in Rats," *Journal of the National Cancer Institute* (Feb. 1980), Vol. 64., No. 2, pp. 263-265.

Other Beneficial Bacteria

Lactobacillus bifidus is the dominant bacteria in the intestine of the infant who has been breast fed. Formula fed infants have a change in intestinal flora and suffer from more intestinal problems than breast fed infants.

While *Lactobacillus acidophilus* is the most valuable of intestinal bacteria, it is worthwhile to replenish an impoverished digestive tract with others such as bifidus as well. Richard Passwater has written, "If antibiotics, disease or poor nutrition may have altered the bacterial balance in one's colon, it's wise to reestablish that balance with at least two species of friendly bacteria."

Reference:

Passwater, Richard, "Friendly' Bacteria Help Prevent Diseases," *Whole Foods*, July 1987, p. 13.

Destruction of Beneficial Bacteria

Favorable intestinal bacteria are destroyed by ingestion of antibiotics, lack of fiber in the diet, excess consumption of fat, and heavy intakes of sugar and alcohol. Restoration of these beneficial bacteria can prevent serious deterioration of health.

Fiber is of particular interest in regard to the flora of the intestine. Reuben points out that a low intake of fiber tends to favor the growth of cancer-causing bacteria in the intestine (*bacteroides* and *bifidobac-*

Suggested Benefits of Lactobacillus Bacteria:

- Manufacture and release of B vitamins like folic acid and vitamin B12 into the intestines.
- More complete breakdown of food components such as fat and protein.
- Production of natural substances which inhibit 23 pathogens. Two of these substances are called acidophilin and bulgarican
- Tumor and cancer inhibition, possibly by removing carcinogens or stimulating the immune system.
- Stimulate immune function. Apparent antiviral (herpes and flu) and anti-fungal (*Candida albicans*) activity.
- Detoxification of harmful chemicals such as nitrite.
- Reduction of cholesterol.
- Improved absorption of calcium.
- Restoration of beneficial bacteria destroyed by antibiotics.
- Improved resistance to disease.
- Alleviation of bad breath and intestinal gas.
- Inhibition of *Candida albicans* (yeast infection).
- Soothing of anxiety.
- Decrease in tendency to absorb large food molecules which contribute to allergic responses.

References:

Shahani, Khem and Fernandes, Custodio, "The Marvels of Lactobacilli and Intestinal Bacteria," *Professional Nurses Quarterly*, Summer 1986, p.4.

Friend, B. A. and Shahani, K.M., "Nutritional and Therapeutic Aspects of Lactobacilli," *Journal of Applied Nutrition*, (1984), Vol. 36: 125-133.

Shahani, K.M. and Ayebo, A.D., "Role of Dietary Lactobacilli in Gastrointestinal Microecology," *American Journal of Clinical Nutrition* (1980), Vol. 33:2448-2457.

Bienenstock, John, M.D., "Mucosal Barrier Functions," *Nutrition Reviews*, Vol. 42, No. 3, March 1984, p. 107.



teria). These break down bile acids into cancer causing compounds.

A high fiber intake tends to favor the growth of beneficial bacteria in the intestine (lactobacillus and streptococcus). These do not break bile acids into cancer causing compounds.

The importance of the beneficial bacteria is illustrated by the situation which most completely removes them from the human body--the use of antibiotics. To understand the value of these organisms one must understand a medical term called "superinfection." Long gives the following definition of the term:

"The development of a second infection that is superimposed upon an initial infection currently under treatment. The superinfection is caused by organisms that are not susceptible to the killing action of the drug(s) used to treat the original (primary) infection.

Superinfections usually occur during or immediately following treatment with a broad spectrum antibiotic--one that is capable of altering the customary balance of bacterial populations in various parts of the body. The disturbance of this balance permits the overgrowth of organisms that normally exist in numbers too small to cause disease."

Pathogenic yeasts are often resistant to antibiotics and are respon-

sible for superinfections. The phenomenon of a superinfection can be likened to plowing a field. Whatever seeds happen to be in the field will take root and grow. Supplementation with acidophilus and other beneficial microorganisms can be likened to planting seeds in the freshly plowed field. When enough of these "seeds" are planted, The number of weeds that can survive and multiply will be minimized.

References:

Long, James, *The Essential Guide to Prescription Drugs*, New York: Harper and Row, 1977, p. 703.

Reuben, David, *The Save Your Life Diet*, New York: Random House, 1975, p. 29.

"Dietary Fibre, Transit-time, Faecal Bacteria, Steroids, and Colon Cancer in Two Scandinavian Populations," *Lancet*, July 30, 1977, p. 210.

The Delivery Problem

The delivery of beneficial microorganisms to the intestine has been extremely difficult until recently. The stomach provides a gastric barrier destroying almost every bacteria that enters it. The stomach does not distinguish between those bacteria which might be beneficial and those which can cause serious disease. Thus if the "bug" population of the large intestine is upset by an antibiotic, it becomes very difficult to replenish the "good guys."

In the past, attempts have been made to develop cultures of bacteria that could survive the stomach acid.

Recent developments of enteric coating and "targeted delivery technology" have made it possible to supplement the intestine with the most beneficial bacteria rather than the hardiest. This is an immense step forward.

Definitions:

Enteric coating: refers to a coating that can survive the strong acid environment of the stomach.

Targeted delivery technology: A technology developed to deliver beneficial microorganisms to a specific part of the intestine.

For Further Study:

The 'Gastric Barrier' in *Healthletter*, Vol. 2, No. 1.

Sometimes Suggested for Yeast Problems:

- Use of Lactobacillus acidophilus on a regular basis.
- Consumption of garlic or garlic oil.
- Avoidance of antibiotics and birth control pills.
- Supplementation with good nutrition, especially zinc and vitamin A.
- Consumption of olive oil.
- Avoidance of sugars and excessive carbohydrates.
- Consumption of fresh foods.
- Avoidance of beverages with carbon dioxide (soft drinks and bottled water).
- Intake of adequate fiber.
- Exercise to increase the oxygen content of the blood and tissue.
- Moderate exposure to sunlight.

Reference:

Bland, Jeffrey, "Candida Albicans: An Un-suspected Problem," and other materials from Candida Research & Information Foundation, 31111 Palomares Rd., Castro Valley, Ca. 94552.

Image Awareness Healthletter is written by James McAfee, Director of Nutritional Research for the Image Awareness Corporation. To subscribe enclose \$39.95 (12 issues) and the following:

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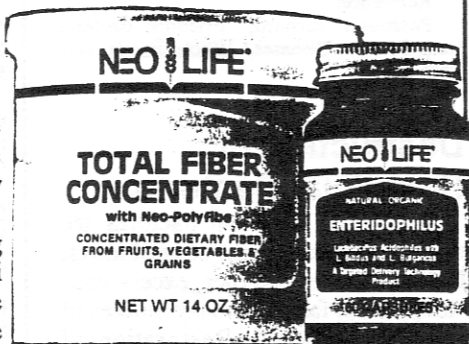


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