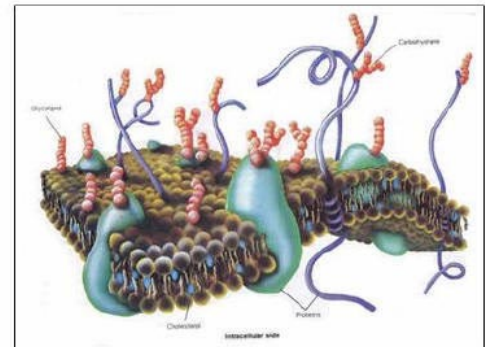
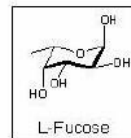




Fucose

Fucose is one of the eight essential sugars the body requires for optimal function of cell-to-cell communication. The L form is the only common form of the sugar, while the D form is a synthetic galactose analogue. Fucose should not be confused with Fructose, which is a monosaccharide found in fruits and honey.



Many proteins at the cell surface are decorated with carbohydrates such as L-Fucose

Xylose/Xylitol

Xylose has a similar name to the sugar substitute called Xylitol, a sugar alcohol. Xylitol is generally made by using yeasts to ferment the sugar into alcohol. Manufacturers often substitute Xylitol for sucrose and corn sweeteners in chewing gum and toothpaste since it does not contribute to tooth decay. However, Xylitol is still several steps away from the original and cannot be used interchangeably with the natural sugar.

Absorption

When taken orally, Fucose is readily absorbed from the small intestine and incorporated either directly or after metabolism into glycoproteins. Unabsorbed Fucose is metabolized by friendly intestinal bacteria.

Excretion

In humans, Fucose is excreted mainly in the urine at a rate of approximately 17 micrograms per minute. Nursing mothers also eliminate Fucose from the breast milk. During the latter stages of pregnancy, excretion of Fucose in the urine is markedly increased, which is consistent with fetal development and the transfer of immunity to the newborn.

Functions

- It is now known that Fucose glycoconjugates (glycoproteins and glycolipids) are an essential part of eliminating or reversing such disease processes as cancer, inflammation, and immunity.
- Fucose concentrations are found in such areas as:
 - a) at the junctions between nerves, implying that a deficiency could affect synaptic

transmissions;

b) in the proximal tubules of the human kidney, indicating the vital need for this saccharide for proper kidney function;

c) in the testes, suggesting that it plays an important role in reproduction;

d) in the outer layer of skin, where it may be involved in maintaining skin hydration.

- Fucose is a powerful immune modulator. It is distributed in macrophages, which are critically important to immune function. There have been numerous well-documented benefits for its necessity in immune function, especially that of an overactive immune system, the cause of autoimmune disorders. Fucose is showing promise in its ability to normalize immune function.
- Fucose is particularly active in inflammatory diseases and has the ability to suppress such allergic skin reactions as contact dermatitis.
- Fucose and another essential sugar, Mannose, have the ability to kill bacteria and to help fortify resistance to infection. This is particularly true of respiratory cells. New studies reveal that, because bacteria have lectins on their surfaces that stick to the host's saccharide receptors, supplying the body with these essential sugars can help deflect host-binding so that an infection can either be foiled or lessened.
- Researchers who injected Fucose into lab animals found a possible treatment for breast cancer. U-fucoidan, a complex polysaccharide found in brown seaweed, was able to kill cancer cells in vitro within 72 hours. Interestingly, the destruction was self-induced (apoptosis), suggesting that the sugars were able to break down the DNA within each cancer cell through enzyme action.
- Fucose can be found in blood cell antigens, which are involved in determining blood type.

Cancer

Fucose studies are also showing that it plays a significant role in many diseases, including cancer and its spread. Research is still ongoing but showing promise in the areas of inhibiting and reversing leukemia and breast cancer, including the suppression of tumor growth. Some studies have concluded that Fucose and Mannose appeared to be the most effective of the essential sugars when it came to slowing the growth of cancer cells.

Rheumatoid Arthritis

Levels of Fucose are low in those with rheumatoid arthritis, and supplementation is showing promise as a harmless but surprisingly effective treatment.

Other Diseases

Fucose metabolism appears to be altered in various diseases. Several studies have concluded that Fucose metabolism is abnormal in those with cystic fibrosis, diabetes, and during episodes of shingles, which is caused by a herpes virus. These studies go on to suggest that the sugar is active against other herpes viruses. In addition, the saccharide guards against respiratory tract infections and inhibits allergic reactions. Liver function and serum protein levels were also affected by a deficiency of Fucose. All these disorders, as well as many others, go back to immune function where fucose is showing to play a significant role.

Future Use

In other studies, Fucose proved that it can be incorporated into certain areas of the body where and when it is most needed. For instance, Fucose incorporated into the photoreceptor layer of the retina, may help with the biosynthesis of rod cell glycoproteins. In psoriasis, fucose may

play a significant role in the disease process because of altered glycoprotein distribution. Normally, skin keratinocytes and non-psoriatic cells have most of their fucose on the plasma membrane, whereas psoriatic cells retain most of their fucose within the cytoplasm. The list is endless for connecting the reversal and prevention of disease and the use of Fucose and other essential sugars.

Out of the 400 or so species of intestinal microbes found in the human intestine, one has been studied as being of particular interest in its relation to Fucose E" *Bacteroides thetaiotaomicron*. Present from birth, this bacterium survives in the lower part of the gut and feeds on Fucose. Cells lining the intestine manufacture it and post it on the surface of the cell. During weaning, Fucose production stops but begins again if *B. thetaiotaomicron* is present, leading researchers at Washington University School of Medicine to conclude that the bacterium is able to communicate to the intestine that it requires Fucose for its food. Understanding this communication between microbes and human cells may help provide treatment when friendly intestinal bacteria are destroyed after the use of antibiotics, for instance.

Safety

Studies have shown that, when Fucose is given in extraordinarily high amounts, there were no side effects. The only remotely related oral toxicity that was found was from animals ingesting a diet composed of 20% Fucose. This amount appeared to reduce nerve conduction velocity as well as collagen production. What similar effects would be in humans has yet to be determined. However, microscopic examination of the liver, kidney, pancreas, and the sternal bone marrow of Fucose-treated rats revealed no abnormalities. According to available studies, it appears that oral doses as great as 34 grams in a healthy 150-pound adult is considered safe. Maximum blood levels would be expected one hour after ingestion and would be eliminated from the bloodstream eight to twelve hours later. Therefore, twice daily doses of any amount are recommended to maintain sufficient blood levels.

Dietary Sources

Fucose is readily found in several medicinal mushrooms, such seaweeds as kelp and wakame, and beer yeast.

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Study Suggests Boning up on Copper While Dieting

People who are overweight or obese are vulnerable to losing unhealthful amounts of calcium from their bones when they go on weight-loss diets. But a study by Agricultural Research Service (ARS) scientists suggests that consuming about three times the recommended amount of dietary copper may help women retain calcium in their bones when dieting.

The study was led by ARS physiologist Henry C. Lukaski and was reported in abstract form at a meeting sponsored by the American Society for Clinical Nutrition. Lukaski is assistant director of the Grand Forks Human Nutrition Research Center in Grand Forks, N.D.

Of the women who completed the study, in addition to the copper present in the foods they ate, just under half received daily supplements of 3 milligrams (mg) of copper. The others received supplements of only 1.2 mg. All participants--who ranged in age from 25 to 35 years old--were then put on a weight-loss diet for 4 months.

During the study, the researchers tracked the participants' loss of calcium with isotopes. The study showed that the women who were given 3 mg of additional copper were more likely to retain calcium in their bones.

The current Recommended Dietary Allowance (RDA) for copper is 0.9 mg for women older than 19 years. ARS findings provide science-based data to experts who establish and update the RDAs.

This study suggests the current RDA for copper may not be adequate during weight loss.

Good sources of copper include green vegetables, mushrooms, seafood, liver, nuts, seeds, wheat bran, some cereals and whole grains.

ARS is the U.S. Department of Agriculture's chief scientific research agency.

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Dried figs



Although dried figs are available throughout the year, there is nothing like the unique taste and texture of fresh figs. They are lusciously sweet with a texture that combines the chewiness of their flesh, the smoothness of their skin, and the crunchiness of their seeds. California figs are available from June through September; some European varieties are available through autumn.

Figs grow on the Ficus tree (*Ficus carica*), which is a member of the Mulberry family. They are unique in that they have an opening, called the "ostiole" or "eye," which is not connected to the tree, but which helps the fruit's development by increasing its communication with the environment. Figs range dramatically in color and subtly in texture depending upon the variety. The majority of figs are dried, either by exposure to sunlight or through an artificial process, creating a sweet and nutritious dried fruit that can be enjoyed throughout the year.

Health Benefits

Help Lower High Blood Pressure

Figs are a good source of potassium, a mineral that helps to control blood pressure. Since many people not only do not eat enough fruits and vegetables, but do consume high amounts of sodium as salt is frequently added to processed foods, they may be deficient in potassium. Low intake of potassium-rich foods, especially when coupled with a high intake of sodium, can lead to hypertension. In the Dietary Approaches to Stop Hypertension (DASH) study, one group ate servings of fruits and vegetables in place of snacks and sweets, and also ate low-fat dairy food. This diet delivered more potassium, magnesium and calcium. Another group ate a "usual" diet low in fruits and vegetables with a fat content like that found in the average American Diet. After eight weeks, the group that ate the enhanced diet lowered their blood pressure by an average of 5.5 points (systolic) over 3.0 points (diastolic).

A Sweet Way to Lose Weight

Figs are a good source of dietary fiber. Fiber and fiber-rich foods may have a positive effect on weight management. In one study, women who increased their fiber intake with supplements significantly decreased their energy intake, yet their hunger and satiety scores did not change. Figs, like other high fiber foods, may be helpful in a weight management program.

An Insulin-Lowering Leaf in Diabetes

You probably do not think about the leaves of the fig tree as one of fig's edible parts. But in some cultures, fig leaves are a common part of the menu, and for good reason.

The leaves of the fig have repeatedly been shown to have antidiabetic properties and can actually reduce the amount of insulin needed by persons with diabetes who require insulin injections. In one study, a liquid extract made from fig leaves was simply added to the breakfast of insulin-dependent diabetic subjects in order to produce this insulin-lowering effect.

Bone Density Promoter

Figs are a fruit source of calcium (79 milligrams in an 8 oz-wt serving), a mineral that has many functions including promoting bone density. Additionally, figs' potassium may also counteract the increased urinary calcium loss caused by the high-salt diets typical of most Americans, thus helping to further prevent bones from thinning out at a fast rate.

Cardiovascular Effects

In animal studies, fig leaves have been shown to lower levels of triglycerides (a form in which fats circulate in the bloodstream), while in *in vitro* studies, fig leaves inhibited the growth of certain types of cancer cells. Researchers have not yet determined exactly which substances in fig leaves are responsible for these remarkable healing effects. Besides their potassium and fiber content, figs emerged from our food ranking system as a good source of the trace mineral manganese.

Protection against Macular Degeneration

Your mother may have told you carrots would keep your eyes bright as a child, but as an adult, it looks like fruit is even more important for keeping your sight. Data reported in a study published in the Archives of Ophthalmology indicates that eating 3 or more servings of fruit per day may lower your risk of age-related macular degeneration (ARMD), the primary cause of vision loss in older adults, by 36%, compared to persons who consume less than 1.5 servings of fruit daily.

In this study, which involved over 100,00 women and men, researchers evaluated the effect of study participants' consumption of fruits; vegetables; the antioxidant vitamins A, C, and E; and carotenoids on the development of early ARMD or neovascular ARMD, a more severe form of the illness associated with vision loss. Food intake information was collected periodically for up to 18 years for women and 12 years for men.

While, surprisingly, intakes of vegetables, antioxidant vitamins and carotenoids were not strongly related to incidence of either form of ARMD, fruit intake was definitely protective against the severe form of this vision-destroying disease. Three servings of fruit may sound like a lot to eat each day, but by simply tossing a banana into your morning smoothie or slicing it over your cereal, topping off a cup of yogurt or green salad with a couple of diced figs, and snacking on an apple, plum, nectarine or pear, you've reached this goal.

Nutritional Profile

Figs, fresh 8.00 oz-wt 167.83 calories				
Nutrient	Amount	DV (%)	Nutrient Density	World's Healthiest Foods Rating
dietary fiber	7.48 g	29.9	3.2	good
potassium	526.18 mg	15.0	1.6	good
manganese	0.29 mg	14.5	1.6	good

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Research for a Better Old Age:

Launch of the 'New Dynamics of Aging'

Medical News Editors

The New Dynamics of Ageing Programme (NDA), the most ambitious research programme on ageing ever mounted in the UK, was launched 30-Oct-2006 in partnership with the UK Funders Forum for Research on Ageing and Older People, at a conference entitled The Future of Ageing Research.

Increased lifespan is one of the great success stories of our time with people reaching the traditional age of retirement, 65, being expected to live for another 20 years. The New Dynamics of Ageing programme is a collaboration between five of the UK's Research Councils - the Arts and Humanities Research Council, the Biotechnology and Biological Sciences Research Council, the Engineering and Physical Sciences Research Council, the Economic and Social Research Council and the Medical Research Council - which will see the injection of around 20 million pounds into the vital area of ageing research.

The increase in life expectancy is mainly due to public health measures, such as interventions ranging from routine vaccinations to improved sewage disposal, the control of formerly fatal or debilitating childhood diseases, advances in medical knowledge and medical technology, improved diet and higher standards of living. Research has been at the heart of the improvements in life expectancy and is now focussed on improving the quality of people's lives as they age.

With more people in the UK aged over 60 than below 16 years of age for the first time, according to the 2001 census, the NDA programme aims to ensure that ageing research has the maximum beneficial impact to both the economy and society through enhancing the quality of life, productivity and self-sufficiency of the older generation. .

The Future of Ageing Research conference brings together all of the disciplines associated with ageing, all of the research funders, key policy makers and practitioners, and representatives of older people. This is a once in a generation opportunity to focus attention on ageing research and its potential, as well as setting the research agenda for the next five years. The conference is being supported financially by a contribution from Help the Aged.

Ageing is a global fact of life: average life expectancy in the world today is 66 years compared with 46.5 years only 50 years ago. Not only are people living longer but the way we age is also changing and becoming more dynamic. The age barrier between employment and retirement is no longer static with some people leaving work before and some later than pension ages. Older people are redefining their roles as consumers and citizens.

Professor Alan Walker, Director of the New Dynamics of Ageing Programme commented: "It is vitally important that we understand the changes taking place in the ageing process. This programme of research will target resources to look at all dimensions of ageing, from biology to social and cultural aspects, ensuring that this much needed knowledge is available as quickly as possible for policy makers, practitioners, product designers and anyone in a position to improve the quality of later lives."

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