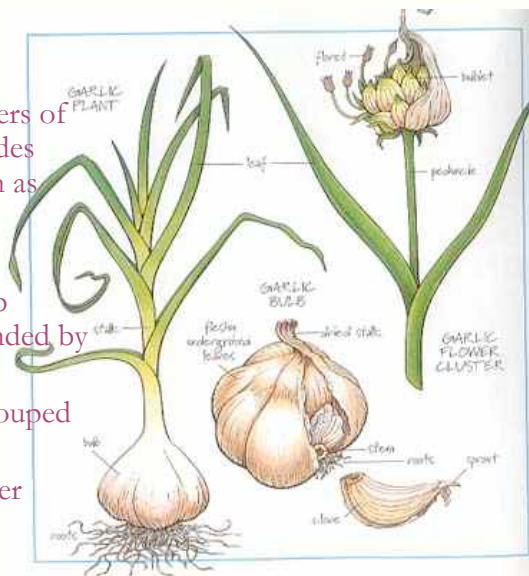




## Botany:

- *Allium sativum*
- There are around 500 members of the allium genus which includes other well known plants such as leeks, shallots and onions
- long grass like leaves
- subterranean compound bulb housing many cloves surrounded by a sac like scale
- pink clump of flowers are grouped together above the stalk
- bloom from July to September
- height of 2-3 feet

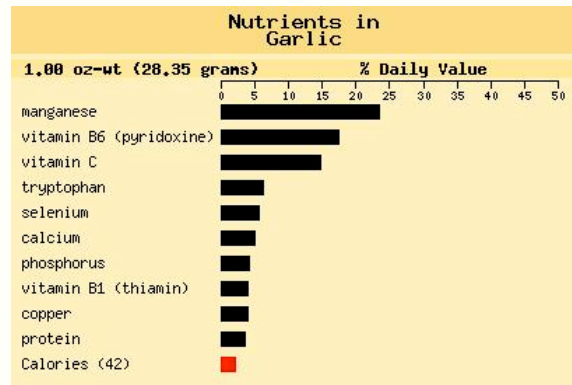


## Botany (cont.):

- The leaves of the garlic plant are pointed which is probably where it derived its name: "gaar" being an old gothic word for "spear" gives us "spear leek".
- The teardrop-shaped garlic bulbs range in size; however, they usually average around two inches in height and two inches in width at their widest point.



## What is the nutritional value of Garlic?



- This food is very low in Saturated Fat, Cholesterol and Sodium. It is also a good source of Calcium, Phosphorus and Selenium, and a very good source of Vitamin C, Vitamin B6 and Manganese.

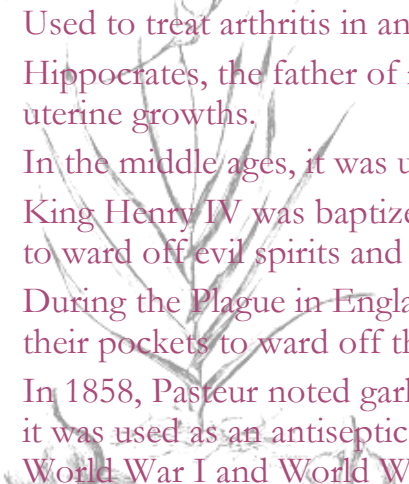


## History of garlic in medicine:

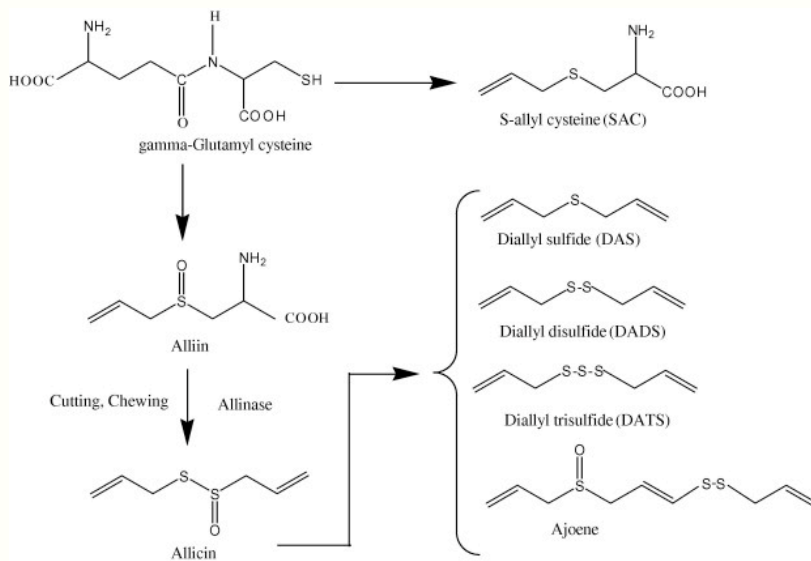
- The Egyptians used garlic for the working class to increase strength while building the pyramids. The *Codex* listed many uses for garlic ranging from abnormal growth to insect infestations.
- The Talmud, a Jewish religious text from the 2<sup>nd</sup> century AD, recommended the use of garlic to promote relations and procreation!
- In ancient China, it was used to treat depression and improve male potency.
- Garlic was given to athletes in the early Olympics; it was the original “performance enhancing” agent.



## Garlic in history (cont.)

- 
- Used to treat arthritis in ancient India.
  - Hippocrates, the father of medicine, used garlic for uterine growths.
  - In the middle ages, it was used to prevent heat stroke.
  - King Henry IV was baptized in water containing garlic to ward off evil spirits and protect his health.
  - During the Plague in England, doctors carried garlic in their pockets to ward off the stench of disease.
  - In 1858, Pasteur noted garlic's antibacterial activity, and it was used as an antiseptic to prevent gangrene during World War I and World War II.

## How does garlic work?



## Lipid Lowering effects

Recent meta-analysis of placebo-controlled trials using dried garlic powder showed significant reductions in:

Total cholesterol ----- 19.2 mg/dL

Low-density lipoprotein-----6.7 mg/dL

Triglycerides-----21.1 mg/dL

A European trial comparing garlic with a commercial lipid-lowering drug (bezafibrate, a fibric acid derivative not available in the United States) found them to be equally effective in decreasing lipids to a statistically significant extent.

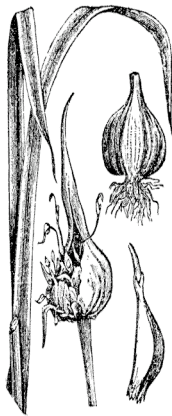
The exact mechanism of lipid lowering action is unknown.

## Garlic's effect on the cardiovascular system:

- The antihypertensive effects of garlic have been studied but remain controversial, it is thought involve Nitric Oxide, a potent vasodilator.
- One observational study showed that regular garlic powder intake weakened age- and pressure-related increases in aortic stiffness.
- Potentially reduce atherosclerotic plaque formation



## Antineoplastic effects:



- Epidemiologic evidence has shown a decreased risk of stomach, colon, and prostate cancer with the high consumption of garlic and other allium vegetables (onions, leeks, shallots, chives) possibly due to allyl mercaptan's histone deacetylase inhibition or organosulfur compounds found within the vegetable
- Thought to be due to stimulation of both humoral and cellular immunity and also increased selenium absorption which is shown to protect against tumorigenesis

Garlic modulates carcinogenic metabolism, inhibits cell cycle progression, and induces apoptosis.

## Antimicrobial actions:

- Small studies have shown that garlic exerts antimicrobial activity against gram-positive and gram-negative bacteria, viruses, fungi, and parasites.
- Garlic Oil is widely used in “green” food products as a natural preservative to ward off the overgrowth of yeast.
- Intense heat and exposure to ultraviolet light decreased the bactericidal effects, so it is recommended to use fresh garlic to attain full antimicrobial benefit.

## Diabetes mellitus



- A sulfur compound found in garlic has been shown in many studies to stimulate pancreatic B-cell release of insulin, increase insulin sensitivity, increase glycogen storage in the liver, and have a hypoglycemic effect.
- Garlic has been shown to improve kidney function in diabetic animals.

## Dosages:

- 4 g (one to two cloves) of raw garlic per day
- one 300-mg dried garlic powder tablet two to three times per day
- 7.2 g of aged garlic extract per day



*Using garlic in food that requires heating, microwaving, or drying the cloves can substantially reduce the allicin and alliin thus decreasing its healthy effects on the body.*

## Side effects:

- Antiplatelet effects through the action of thiosulfinates
- Bad breath and body odor, gastrointestinal upset, flatulence, and changes in the intestinal flora
- allergic dermatitis, burns, and blisters from topical application of raw garlic



*Garlic appears to have no effect on drug metabolism*

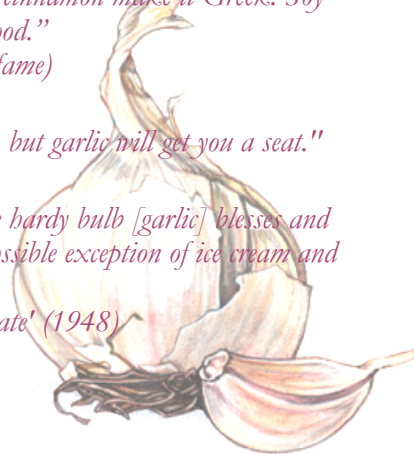
## How to incorporate more garlic into your diet:

- Marinate pressed garlic in olive oil and use this flavored oil in dressings and marinades.
- Purée fresh garlic, canned garbanzo beans, tahini, olive oil and lemon juice to make quick and easy hummus dip.
- Healthy sauté steamed spinach, garlic, and fresh lemon juice.
- Add garlic to sauces and soups.
- Purée roasted garlic, cooked potatoes and olive oil together to make delicious garlic mashed potatoes. Season to taste.



## Garlic quotes:

- *"Tomatoes and oregano make it Italian; wine and tarragon make it French. Sour cream makes it Russian; lemon and cinnamon make it Greek. Soy sauce makes it Chinese; garlic makes it good."*  
*Alice May Brock (of Alice's Restaurant fame)*
- *"Three nickels will get you on the subway, but garlic will get you a seat."*  
*New York (Yiddish or Jewish) Saying.*
- *"My final, considered judgment is that the hardy bulb [garlic] blesses and ennobles everything it touches - with the possible exception of ice cream and pie."*  
*Angelo Pellegrini, 'The Unprejudiced Palate' (1948)*







## Final Thoughts

- A diet rich in allium vegetables seems to be a good choice with low-risk antineoplastic potential, and good taste as a beneficial side effect.
- Large, long-term, fully blinded, and well-controlled studies using a standardized preparation of garlic with known active components are necessary. They will allow reliable evaluation of garlic's effect on cardiovascular risk and, more important, on the end points of heart attack and stroke.



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