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GARLIC: “AL SHUM MAH?”

In the third month from the Exodus of the Children of Israel from Egypt, on this day, they arrived at the Sinai desert. (*Shemot*, 19:1)

Rashi explains the words “on this day” to teach us that one should consider that the Torah is given to us anew each day. The implication of this statement is that the Torah and its teachings are eternal and that new concepts may be found therein with each generation. Perhaps one of the most striking examples of this idea concerns health-related issues in the Torah that are only recently being discovered by the medical world.

The *Gemara*, completed in approximately 500 C.E., recounts the health benefits of garlic several times. In the late twentieth century, the scientific literature is just beginning to reveal the very same effects of garlic as discussed in the *Gemara*. The passing of each day brings with it continued discoveries of garlic’s positive health associations.

The *Gemara* in *Eruvin* (56a) discusses the general health effects of garlic. There, the *Gemara* states that garlic, being included in the vegetable family, is nutritious. Rashi on site refers to the *Gemara* in *Bava Kama* (82a), where there are more specific benefits of garlic listed. Writes the *Gemara*, “*Chamisha devarim ne'emru b'shum*”—“five things are said of garlic.” This paper will examine each of these five (according to one opinion in the *Gemara* there are actually six) items from the *Gemara*’s standpoint, as well as from the point of view of the medical literature.

The *Gemara* writes that garlic is “*matznil panim*”—“causes the face to shine or gleam.” The simple meaning of this statement is that garlic makes the face ruddier by improving circulation. The positive effects of garlic on the circulatory system have recently been established. Thrombosis is a

disease caused by an excess of blood clots, resulting in poor circulation. Thromboxanes are hormones that are produced in blood platelets and stimulate clot formation. A recent study showed that giving human subjects one clove of fresh garlic every day for four weeks resulted in a twenty percent decrease in thromboxane B₂ levels.¹ After sixteen weeks, there was almost a ninety percent reduction. Such a dramatic decrease in thromboxanes frequently reduces the risk of thrombosis.

High cholesterol levels can result in atherosclerosis, commonly termed hardening of the arteries. This same study investigated serum cholesterol levels and found that garlic intake was associated with a twenty percent decrease in these levels.¹ Another study² evaluated the compounds in garlic potentially responsible for its cholesterol lowering effect. Allicin, followed by its two degradation products, diallyl disulfide and allyl mercaptan, were the most effective inhibitors of cholesterol. Most likely, however, these three molecules are not entirely responsible for this effect, but rather the spectrum of multiple organosulfur compounds found in garlic may play a role in promoting proper circulation.

The *Gemara*'s list continues and includes "*marbeh hazerah*"—"increases semen." A similar effect of garlic has been observed experimentally. The odor generally associated with garlic is due to dimethyl selenide. Selenium, once thought to be a poison, is now recognized as a necessary nutrient. One positive health effect of selenium is to increase male fertility. Thus, in rats fed diets insufficient in selenium trace amounts of selenium subsequently provided were sent immediately to the testes, before any other tissues in the body. Selenium deficiency in the rats led to oligospermia, which includes both a reduction in the number of motile sperm and an increase in the number of abnormal sperm. These data, and others, indicate that spermatogenesis is either directly or indirectly related to the testes' selenium levels.³

Two more positive health associations of garlic are listed in the *Gemara*. It states that garlic "*horeg kinim she'bivnei meayim*"—"kills the bacteria in the intestinal tract." As a result of its diallyl trisulfide (DAT) content, garlic has antiparasitic and antiprotozoan activity. Research with *Giardia lamblia*, a protozoan that causes chronic gastrointestinal infections, and *Entamoeba histolytica*, also an intestinal protozoan, showed that when treated with DAT for two hours, the cell layer dissociated and the cells died. Human amoebas and bacterial dysentery and enteritis have all been

successfully treated with DAT.⁴ A similar antimicrobial effect of garlic has been shown with the bacterium *Helicobacter pylori*, the causative agent of gastric ulcers and possibly of gastric cancer.⁵

Gastrointestinal anaerobic bacteria may increase the incidence of tumor formation, as they activate gastrointestinal (GI) chemicals to mutagens and carcinogens, which may ultimately induce tumors. For example, cycasin is a beta-glucoside of methylazoxymethanol (MAM). Bacteria in the GI tract produce the enzyme beta-glucosidase, which removes a sugar from cycasin to generate MAM, which is a carcinogen and is specifically an inducer of cancer of the colon, liver, and kidney.⁶ Perhaps when the *Gemara* discussed the ability of garlic to destroy gastrointestinal microbes, it ultimately was pointing to garlic's anticarcinogenicity. It is this benefit of garlic that has received the most attention from scientists. Garlic is considered a chemopreventer. Chemopreventers are defined as "food entities that can prevent the appearance of some long-term diseases like cancer or cardiovascular disorders," and are thought to behave as antioxidants.⁷ Antioxidants scavenge free radicals, which are believed to react with DNA or lipids, resulting in an increased risk of cancer and organ injuries.

The relationship of garlic and other chemopreventers to colorectal adenomatous polyps has been studied. These polyps are outgrowths in the colon and are precursors to colorectal cancer. When garlic was given to human volunteers, an inverse association between garlic intake and the incidence of polyps resulted, suggesting that garlic could potentially inhibit colorectal cancer.⁸ Most researchers now believe that garlic's anticarcinogenic effects are a direct result of its antioxidant activity, specifically that of its organosulfur compounds.^{7,8} Studies on the effects of garlic on other types of cancers, including breast⁹ and lung cancer,¹⁰ have not found a relationship between garlic intake and decreased incidence of cancer. As the *Gemara* points out, it is specifically intestinal microbes that garlic destroys.

The *Gemara* writes further that garlic is "*masbiah*," which is translated as "satiated." This statement could be a further indication of the cancer-reducing effects of garlic. Vegetables rich in fibers, commonly termed "roughage," evoke a feeling of satiation or fullness. There are several studies indicating that garlic and fiber are linked. One study⁸ examining the anticarcinogenic effects of garlic, mentioned that satiation

may result from the high levels of dietary fiber present in garlic. Thus, it would appear that garlic might be a significant source of dietary fiber. The positive health effects of roughage have already been well documented. In addition to aiding the movement of fecal material through the intestines, roughage may adsorb carcinogens present in the intestines, thus reducing the risk of colon cancer.

The *Gemara*'s list of garlic's health effects concludes, "v'yesh omrim machnis ahava umotzi es hakinah"—"there are those who say that it causes love to enter and jealousy to leave." Rashi explains the *Gemara* to mean "m'sameach es halev," which is translated, "makes the heart happy." Taken in its most literal sense, Rashi's explanation focuses on the biological effects of garlic, rather than its emotional or mystical effects, as the *Gemara* would seem to indicate at first glance. Thus, it would appear that the *Gemara* is discussing the positive associations of garlic towards the cardiovascular system. As mentioned, several articles deal with the anti-atherosclerosis, cholesterol inhibiting, and anti-thrombosis effects of garlic. However, garlic has other more direct benefits to the heart. For example, garlic lowers systolic and diastolic blood pressure. Ajoene, a compound found in garlic, lowers the level of platelets and is beneficial in preventing coronary artery disease.^{7,11}

A health benefit of garlic that was listed in the *Gemara* and that has yet to be correlated with documented health benefits is "*mashchin*." Rashi explains this as "*m'chamem es haguf*"—"warms the body." At present, it is unclear what the *Gemara* means by this. Based on the unfolding of medical knowledge of the previous health benefits of garlic listed in the *Gemara*, however, it seems only a matter of time before scientists discover the positive health effects of this aspect of garlic.

Chazal tell us in *Masechet Avot* (5:26), "turn it around and turn it around, for everything is in it." The Torah contains all the wisdom of the world. The goals to which science and technology strive are, in fact, goals that were reached thousands of years ago. Our responsibility now is to uncover the secrets hidden within the Torah. As Shlomo *Hamelech* writes in *Kohelet* (1:4), "there is nothing new under the sun."

NOTES

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