

SMALL FISH, WATERMELON, CUCUMBER, LEEK, ONION, AND GARLIC

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Food availability was a complaint of *B'nei Yisrael* when traveling through the desert. “We remember the fish that we ate in Egypt free of charge; the cucumbers and the melons (Rashi: watermelons), the leeks, the onions, and the garlic” (Bamidbar 11:5). Interestingly, thousands of years later, Rabbi Ovadiah of Bartenura (*i.e.*, the “Jewish Marco Polo”) arrived in Cairo and noted, “The only inexpensive foods I saw in Cairo were fish from the Nile, onions, leeks, cucumbers, melons, and vegetables” [1]. Apparently, the Egyptian agricultural economy remained stagnant from when *B'nei Yisrael* was enslaved in Egypt to Bartenura’s visit in 1490.

That *B'nei Yisrael* missed fish was obvious, as they were in the midst of a desert and were far from rivers and the ocean. When in Egypt, fish were plentiful and easily available. The Nile River overflowed and small fish were carried within the floodwaters. Subsequently, these waters receded and the small fish, entrapped in the vegetation, were readily available (Toldos Yitzchak). Ancient Egyptians fished from papyrus boats on the Nile River. To catch fish they used nets, traps, and pens, made from woven willow branches, as well as harpoons. *B'nei Yisrael* worked on these Egyptian fishing boats and pulled in the nets loaded with ensnared fish. *B'nei Yisrael* was given the smaller, worthless fish (Ramban). A third fish source is mentioned in the Talmud that discusses Jewish women who drew water from the Nile River to bring to their husbands who were working in the fields under the hot sun. When drawing water from the river, small fish were drawn with the water into the jugs. The women cooked the small fish and brought them, along with drinking water, to sustain their husbands working in the fields (Yoma 75a). Rabbenu Bechayei suggested that the focus of the complaints of *B'nei Yisrael* was to denigrate the *manna*, rather than an actual longing for their favorite food items. The Egyptians gave *B'nei Yisrael* rotten, four-to-five day old fish and the agricultural products mentioned were the cheapest and least tasty, as the Egyptians kept the best produce for themselves.

As the specific type of small fish was not defined in the *chumash*, perhaps they were not one specific species. Over 800 different species of freshwater fish live in the Nile River. Tilapia (*Oreochromis niloticus*), a kosher fish, is abundant in the Nile River.

Other species include mullet, puffer fish, moonfish, mullets, carp, eel, elephant fish, and catfish. If so, care was needed to discern kosher, from nonkosher, species of fish. Only kosher fish have fins and scales (Vayikra 11:9).

Health benefits resulting from the consumption of small fish were noted in the Talmud.

Health benefits resulting from the consumption of small fish were noted in the Talmud. Those who regularly eat small fish do not suffer from intestinal disorders. Fish consumption strengthens the entire body (Berachos 20a), serves as an aphrodisiac (Berachos 40a), and facilitates a patient’s recovery from an illness (Berachos 57b; Sanhedrin 98a). Health benefits from fish consumption were recognized by the American Heart Association, which recommended eating fish at least two times per week. Fish are high in protein and low in fat, are rich in calcium, phosphorus, minerals, such as iron, zinc, iodine, potassium, and magnesium, vitamins D and B₂, and omega-3 fatty acids. The omega-3 fatty acids, eicosapentaenoic acid and docosahexaenoic acid, are particularly beneficial, as they lower blood pressure and help reduce the risk of a heart attack, of abnormal heart rhythms, and of a stroke. In addition, these fatty acids promote healthy brain function, may decrease the risk of depression, attention-deficit/hyperactivity disorder, Alzheimer’s disease, dementia, and diabetes, and may prevent inflammation, thereby reducing the risk of arthritis [2].

HaShem provided daily sustenance through the *manna*, which took on the taste of whatever food the person desired to eat (Rashi, Bamidbar 11:7). The physical appearance of *manna* was unchanging and the complaint of *B'nei Yisrael* to Moshe may have been based on the monotony of always visualizing the same food (Sifrei 89). *B'nei Yisrael* were tired of visualizing *manna* and craved brightly colorful watermelons with their green exterior and bright red interior and green cucumbers with their white or yellow interior. In addition, *B'nei Yisrael* were traveling through a desert and the thought of munching juicy, thirst quenching watermelons

and cucumbers was very appealing and tempting. Watermelons and cucumbers were often eaten as deserts (Chizkuni) and leeks, onions, and garlic were used to add zest to foods. Perhaps these foods reminded *B'nei Yisroel* of their varied home-cooked meals when in Egypt. Although *manna* had the potential to assume any taste, there were five exceptions. As cucumbers, watermelons, leeks, garlic, and onions were considered harmful to fetuses and to nursing infants, their tastes were excluded from the *manna* (Sifrei 87; Yoma 75a).

Mention of watermelons (*Citrullus vulgaris*) and cucumbers (*Cucumis sativus*) is peppered throughout the Talmud. Both are subject to tithes (Maasros 1:4) and *terumah* (Terumos 1:3) and care must be taken that the individual did not inadvertently designate bitter cucumbers or spoiled watermelon, both inedible, as *terumah* (Terumos 1:3). Differential health effects were attributed to the consumption of small, as compared to large, cucumbers. The consumption of large cucumbers was said “to return a sick person to his sickness,” with the recalcitrant illness being more severe. Rav Yishmael taught, “why are (large) cucumbers called “*kishuim*”?, because they are as severe (*kashim*) to the body as are swords. Conversely, the presence of small cucumbers at the dinner table was lauded. In describing the wealth of Antoninus and Rebbi (Rabbi Yehudah the Prince), it was noted that both individuals had lavish amounts of food, including small cucumbers, to serve guests at their table. Their extreme wealth was exemplified by affording seasonal produce, such as cucumbers, all year around (Maharsha). Cucumbers cause the intestines to expand, thereby facilitating digestive processes (Avodah Zarah 11a; Berachos 57b). The Rambam wrote that cucumbers are easily digested, relaxed the stomach, and promoted the easy intestinal elimination of metabolic wastes [3], probably attributed to their high fiber content. A reduced risk of gastric cancer was associated with the ingestion of vegetables, cucumbers in particular [4].

In Talmudic times, care was taken to avoid watermelons and cucumbers that were left uncovered, as a snake may have bitten into them and deposited venom inside these vegetables (Avodah Zarah 30b). A similar rationale applied to cucumbers and watermelons with tiny external holes, as it has been suggested that these punctures were made by a venomous snake (Chullin 94a). The problem of the consumption of bugs in vegetables is not a recent *halachic* issue and concern. The prohibition of consuming *sheratzim* directed consumers to carefully check cucumbers, even those still attached to soil, from contamination with worms (Chullin 58b).

Watermelon and cucumber are botanically related, as both belong to the family, Curcubitaceae. Both vegetables have many

health benefits. Watermelon, in addition to being a source of vitamin C and iron, is rich in lycopene, an antioxidant with a strong capacity to scavenge reactive oxygen species (ROS) which cause cellular oxidative stress [5]. ROS are the causative agents of many chronic diseases, including cancer, arthritis, cardiovascular disease, and aging. Shortly after consumption of watermelon juice, the blood plasma concentration of lycopene was shown to be elevated, indicating it was quickly absorbed [6]. Epidemiological studies have correlated diets with high consumption of lycopene-containing fruits and vegetables with reduced incidence of coronary heart disease and of types of kidney and prostate cancers [7]. Watermelon [8] and cucumber [5] are rich in the amino acid, citrulline, a strong antioxidant scavenger of hydroxyl free radicals and a precursor in the synthesis of arginine, another amino acid. Arginine has important biochemical roles in the proper functioning of the reproductive, pulmonary, renal, gastrointestinal, hepatic, and immune systems and facilitates the healing of wounds [5].

Cucumbers are a valuable source of vitamin C and beta-carotene and are rich in the flavonoid antioxidants, quercetin, apigenin, luteolin, and kaempferol, which scavenge ROS. Fresh cucumber extracts have anti-inflammatory properties. Cucumbers are rich in cucurbitacin triterpenes and in lignans, both of which have anticancer properties [9]. Studies with healthy rabbits showed cucumbers had anti-hyperglycemic activity, suggesting their inclusion in the menu for the control and prevention of diabetes mellitus [10].

As noted with the botanical similarity between watermelon and cucumber, *B'nei Yisroel's* cravings were directed to other vegetables within the same botanical family. Leeks (*Allium ampeloprasum* var. *porrum* (L.)), onions (*Allium cepa*), and garlic (*Allium sativum*) are botanically related (Nedarim 58b), and belong to the family Amaryllidaceae, subfamily Allioideae [11]. However, as garlic and onions can be stored, they are subject to the obligation of *pe'ab*. Leeks, and other such vegetables that cannot be stored, are not subject to *pe'ab* (Rashi, Shabbos 68a). A commonality in these three species is that they promote good health (Eruvin 56a), related, in part, to their large quantities of organosulfur molecules. Thus, many of the health benefits of one species are applicable to the others. In order of the sequence of scientific research, more studies have been conducted with garlic than with onions, and with onions more than with leeks.

Five health benefits resulting from the consumption of garlic were enumerated in the Talmud (Bava Kamma 82a): garlic (a) satiates, (b) keeps the body warm, (c) brightens the face, (d) increases semen, and (e) kills intestinal parasites. Thereafter, a sixth benefit was noted: (f) garlic has aphrodisiac effects, it instills love,

and eliminates jealousy (Bava Kamma 82a) [or it instills love and brings out desire (Yerushalmi Megillah 5:1)]. Ezra ordained garlic to be eaten on Fridays (Nedarim 31a, 63b). Many of the health benefits noted in the Talmud may refer to the overall positive health effects of garlic on the cardiovascular system, on preventing inflammation, and on controlling weight gain. “Garlic satiates” may refer to garlic inducing signals of satiation to the brain, thereby reducing the desire to eat. “Garlic keeps the body warm” may refer to garlic’s ability to increase the metabolic rate; the enhanced burning of calories keeps the body warm [12].

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Much research has focused on the positive health effects of the consumption of garlic, related primarily to the organosulfur molecules, allicin and ajoene. Diseases related to atherosclerosis, such as peripheral arterial diseases, stroke, and heart disease, are associated with elevated levels of oxidized low density lipoproteins (LDL) (“bad” cholesterol) in blood serum. Allicin has a cholesterol lowering effect, apparently by inhibiting the enzymes involved in the biosynthesis of cholesterol [13, 14]. Garlic, especially when consumed raw rather than cooked, is a potent inhibitor of abnormal aggregation of platelets, thereby, inhibiting the formation of blood clots [13]. The antiplatelet molecule in garlic is ajoene [15]. Garlic-derived organosulfur molecules are converted by red blood cells into hydrogen sulfide, which relaxes vascular smooth muscle, induces vasodilation of blood vessels, and reduces blood pressure. Garlic stimulates the generation of nitric oxide by endothelial cells comprising the walls of blood; nitric oxide induces the relaxation of the blood vessels and lowers blood pressure [16]. Garlic’s effect on the cardiovascular system to increase blood flow throughout the body may explain the Talmudic statement, garlic “brightens the face” [17].

Garlic has a positive effect on male semen (Bava Kamma 82a) and may induce a seminal emission (Yoma 18a). In one study, laboratory male mice were administered garlic extract in their drinking water for 3 months exhibited an increase in weight of their seminal vesicles and epididymides and a highly elevated sperm count [18]. In another study, rats were fed diets with differing protein levels and with or without garlic supplementation. After 28 days of feeding, the testosterone contents in the testis were higher in rats who were fed diets with garlic powder than

in those who were fed the same diet but not supplemented with garlic powder. In a further experiment, rats were administered diallyldisulfide (an organosulfur molecule in garlic) and the secretion of luteinizing hormone (LH) from the pituitary gland was analyzed; LH regulates testosterone production in the testis. The data showed the blood plasma levels of LH increased in response to increased administration of diallyldisulfide [19].

A fifth health effect noted in the Talmud (Bava Kamma 82a) was that garlic was lethal to intestinal parasites. This was confirmed in numerous scientific studies. Garlic extract was toxic to intestinal parasitic worms, including the tapeworm, *Taenia taeniaeformis*, and the intestinal fluke (*Echinostoma caproni*) [20]. Administration of garlic extract was an efficient and effective treatment for children infected with the parasitic intestinal protozoan, *Giardia lamblia*, or with the intestinal tapeworm, *Hymenolepis nana* [21]. Allicin is the active component in garlic extract that exerts toxicity to intestinal parasites [22].

Garlic has antimutagenic and anticarcinogenic activities, again related to the organosulfur molecules. Several modes of chemoprevention are suggested and include the effects of garlic on inducing detoxification enzymes, on scavenging free radicals, on inhibiting tumor cell growth by blocking cell cycle progression, on inducing apoptosis, and on stimulation the immune system to destroyed transformed cells [23, 24]. An epidemiological analysis of breast cancer in women in Eastern China showed that consumption of garlic was correlated with a reduced cancer risk [25].

Almost as an afterthought, the Talmud (Bava Kamma 82a) noted a sixth effect of garlic, that it has aphrodisiac effects. The positive health benefits of garlic include its antioxidant properties, anti-atherosclerotic and cholesterol- and lipid-lowering effects, antithrombotic activity, antihypertensive effects, anticarcinogenic properties, immunomodulatory activity, antimicrobial activity, and hypoglycemic effects [26]. As compared to individuals with health issues, it is not surprising that individuals in good health, attributable, perhaps, in part, to their consumption of garlic, would be primed to be exceedingly affectionate and passionate.

As garlic hinders clotting, it can be problematic for pregnant women [12]. This may explain the Talmudic statement that garlic, onion, and leeks are harmful to fetuses and to nursing infants (Yoma 75a). There is no scientific research on the effects of garlic on human fetuses. Mennella *et al.* [27] conducted a study of 10 healthy, pregnant women undergoing routine amniocentesis; 45 minutes prior to the procedure, five women were given a garlic extract-containing capsule and five were given a placebo-containing capsule. The odorous sulfur components of garlic were noted

in the amniotic fluid of those women administered the garlic extract, as compared to the controls. The effects of *in utero* exposure to garlic odors are unknown and may have an impact on the child's subsequent taste and flavor preferences. For example, infants whose mothers were randomly assigned to drink carrot juice during the last trimester of pregnancy enjoyed carrot-flavored cereals more than infants whose mother did not drink carrot juice or eat carrots [28].

Earlier research by Mennella and Beauchamp [29] evaluated garlic ingestion by nursing women and its effects on the baby. After one hour of ingestion of garlic, the intensity of milk odor increased, peaking after 2 hours of ingestion. These changes in the mother's milk were detected by the nursling, as these infants nursed longer and ingested more milk when the mother's milk smelled like garlic. In a follow-up study, Mennella and Beauchamp [30] compared infants who had no prior exposure to garlic volatiles in their mothers' milk with infants whose mothers repeatedly consumed garlic during the experimental period. The nursing response by the nursling was lessened if the mother had prior repeated ingestion of garlic, *i.e.* the novelty of a new flavor wore off.

Garlic consumption with the resulting bad breath was noted in an incident in the Talmud (*e.g.*, Berachos 51a). Rebbe, apparently very sensitive to the odor of garlic, detected the odor during a *shiyur* that he was presenting. He announced, "Whoever ate garlic, leave." Rav Chiya arose and left, to be followed by all the students. The next day, Rebbe's son, Rav Shimon, met Rav Chiya and inquired whether he was the one who irritated his father with his garlic-smelling, bad breath. Rav Chiya replied that it was not him. However, he left, knowing that all the students would follow him, thereby avoiding embarrassing the student who ate the garlic (Sanhedrin 11a). Garlic-breath is due to its organosulfur compounds.

The Talmudic uses the consumption of onions, a food staple (Pesachim 114a), as the example to lead a simple, not extravagant life style. The phrase, "eat onions and dwell in the protection of one's house (Pesachim 114a) means that one should not overspend on purchasing expensive foods, but rather should eat simpler food items so as to be able to afford one's house. Onion peels and garlic were applied to wounds (Tosefta Shabbos 6:3). In the medical literature a note is made that topical application of

onion extract depressed cutaneous inflammation and edema and that onion extract was particularly toxic to Gram positive bacteria and dermatophytic fungi [15]. A gel with onion extract was used to reduce the appearance of post-operative scars [31].

Although there was some dispute regarding its health effects, the conclusion apparently was that onions were good for the heart (Nedarim 26b, 66a). Onions, as with garlic, are rich in organosulfur compounds which account for much of their positive cardiovascular health effects. Studies with rats administered onion extract have shown prolonged bleed times, related to the inhibition of platelet aggregation [15]. This would explain the recommendation not to eat onions after bloodletting (Avodah Zarah 29a). In some women, onion or garlic consumption can induce menstrual bleeding. Apparently, some women have established a specific day of their monthly cycle in which their body reaction to consumption of these sharp vegetables is a menstrual emission (Niddah 63b). Burger [32], citing the 2004th edition of the Physicians Desk Reference, noted that many women throughout the 20th and into the 21st century ate onions to bring about the onset of menstruation. The idea that onion consumption stimulated profuse salivation (Yevamos 106a) may be related to its exacerbation of an already-existing condition of acid reflux [33].

Dried specimens of leeks were discovered in archaeological sites dating to ancient Egypt, as well as noted in wall carvings and drawings, indicating that leeks were part of the ancient Egyptian diet [11]. Leeks, which are abundant and grow speedily, are eaten on Rosh Hashanah as a symbol of fertility and prosperity (Horayos 12a; Kerisos 6a) and are recommended for patients with chronic fever (Gitin 67b). A molecule with anti-inflammatory property [34], immunologic-stimulating activity [35], and antimicrobial activity [36] was identified in leek bulbs and leaves. These biomedical properties of leek may explain the Talmudic recommendation of leek consumption to treat chronic fever, especially due to microbial infections.

The choice of food items that *B'nei Yisrael* longed for is most interesting. Watermelon and cucumbers are botanically related as are garlic, onions, and leeks. Little variety is seen in these foods and neither botanical group would serve as the main course of a dinner. Similarly, I doubt if anyone would long for small fish, such as sardines. These specific food items, apparently, were itemized only to denigrate the *manna*. ■

REFERENCES

- [1] Shulman, Y.D. (translator), 1992, Pathway to Jerusalem. The Travel Letters of Rabbi Ovadiah of Bartenura, CIS Publishers, NY, NY.
- [2] Washington State Department of Health, www.doh.wa.gov/.../Food/Fish/HealthBenefits.aspx, retrieved, July 20, 2012.
- [3] Shaouli, M.C. and Fisher, Y., 1999, Nature's Wealth, Feldheim Publ., NY, NY.
- [4] Graham, S. *et al.*, 1990, Diet in the epidemiology of gastric cancer, *Nutr. Cancer* 13:19-34.

- [5] Tarazona-Diaz, M.P. *et al.*, 2010, Bioactive compounds from flesh and by-product of fresh-cut watermelon cultivars, *J. Sci. Food Agric.*, 91:805-812.
- [6] Edwards, A.J. *et al.*, 2003, Consumption of watermelon juice increases plasma concentrations of lycopene and β -carotene in humans, *J. Nutr.*, 133; 1043-1050
- [7] Fraser, P.D. and Bramley, P.M., 2004, The biosynthesis and nutritional uses of carotenoids, *Prog. Lipid Res.*, 43: 228-265.
- [8] Collins, J.K., *et al.*, 2007, Watermelon consumption increases plasma arginine concentrations in adults, *Nutrition* 23:261-266.
- [9] WH Foods, Cucumbers, www.whfoods.com/genpage.php?tname=foodspice&dbid=42, retrieved July 20, 2012.
- [10] Roman-Ramos, R. *et al.*, 1995, Anti-hyperglycemic effect of some edible plants, *J. Ethnopharmacol.*, 48:25-32.
- [11] Wikipedia.Leeks, en.wikipedia.org/wiki/Leek, retrieved July 20, 2012.
- [12] Rayment, W.J., 2012, In Depth Info on Garlic, <http://www.indepthinfo.com/garlic/health-benefits.htm>
- [13] Ali, M., Thompson, M., and Afzal, M., 2000, Garlic and onions: their effect on eicosanoid metabolism and its clinical relevance, *Prost. Leuk. Essen. Fatty Acids* 62:55-73.
- [14] Gebhardt, R., Beck, H., and Wagner, K.G., 1994, Inhibition of cholesterol biosynthesis by allicin and ajoene in rat hepatocytes and HepG2 cells, *Biochim. Biophys. Acta*, 1213:57-62.
- [15] Griffiths, G. *et al.*, 2002, Onions - a global benefit to health, *Phytother. Res.*, 16:603-615.
- [16] Ginter, E. and Simko, V., 2010. Garlic (*Allium sativum* L.) and cardiovascular diseases, *Bratisl. Lek. Listy*, 111:452-456.
- [17] Rosenblum, T.A., 1998, Garlic: “*al shum mah?*” Derech HaTeva. *J. Torah Sci.* 2: 11-15.
- [18] al-Bekairi, A.M., Shah, A.H., and Qureshi, S., 1990, Effect of *Allium sativum* on epididymal spermatozoa, estradiol-treated mice, and general toxicity, *J. Ethnopharmacol.*, 29:117-125.
- [19] Oi, Y. *et al.*, 2001, Gastric supplementation increases testicular testosterone and decreases plasma corticosterone in rats fed a high protein diet, *J. Nutr.*, 131:2150-2156.
- [20] Abdel-Ghaffar, F. *et al.*, 2011, The effects of different plant extracts on intestinal cestodes and on trematodes, *Parasitol. Res.*, 108:979-984.
- [21] Soffar, S.A. and Mokhtar, G.M., 1991, Evaluation of the antiparasitic effect of aqueous garlic (*Allium sativum*) extract in hymenolepiasis nana and giardiasis, *J. Egypt. Soc. Parasitol.*, 21:497-502.
- [22] Anthony, J.P. *et al.*, 2005, Plant active components – a resource for antiparasitic agents? *Trends Parasitol.*, 21:462-468.
- [23] Butt, M.S. *et al.*, 2009, Garlic: nature’s protection against physiological threats, *Crit. Rev. Food Sci. Nutr.*, 49:538-551.
- [24] Izzo, A.A., Capasso, R., and Capasso, F., 2004, Eating garlic and onion: a matter of life or death, *Br. J. Cancer*, 91:194.
- [25] Yu, Z.G., *et al.*, 2012, The prevalence and correlates of breast cancer among women in Eastern China, *PLoS One*, 7:e37784.
- [26] Barnes, J., Anderson, L.A., and Phillipson, J.D., 2009, *Herbal Medicines*, 3rd edition, Pharmaceutical Press, Chicago, IL.
- [27] Mennella, J.A. *et al.*, 1995, Garlic ingestion by pregnant women alters the odor of amniotic fluid, *Chem. Senses* 20:207-209.
- [28] Beauchamp, J.A. and Mennella, G.K., 2011, Flavor perception in human infants: development and functional significance, *Digestion*, 83 (Suppl. 1):1–6.
- [29] Mennella, J.A. and Beauchamp, G.K., 1991, Maternal diet alters the sensory qualities of human milk and the nursing’s behavior, *Pediatrics* 88:737-744.
- [30] Mennella, J.A. and Beauchamp, G.K., 1993, The effects of repeated exposure to garlic-flavored milk in the nursing’s behavior, *Pediatr. Res.*, 34:805-808.
- [31] Draelos, Z.D., 2008, The ability of onion extract gel to improve the cosmetic appearance of postsurgical scars, *J. Cosmet. Dermatol.*, 7:101-104.
- [32] Burger, R., 2009, Onions, Derech HaTeva. *J. Torah Sci.*, 13:23-24
- [33] Allen, M.L. *et al.*, 1990, The effect of raw onions on acid reflux and reflux symptoms, *Amer. J. Gastroenterol.*, 85:377-380.
- [34] Adao, C.R., da Silva, B.P., and Parente, J.P., 2011, A new steroidal saponin with anti-inflammatory and antiulcerogenic properties from the bulbs of *Allium ampeloprasum* var. *porrum*, *Fitoterapia*, 82: 1175-1180.
- [35] Adao, C.R. *et al.*, 2012, Haemolytic activity and immunological adjuvant effect of a new steroidal saponin from *Allium ampeloprasum* var. *porrum*, *Chem. Biodivers.*, 9: 58-67.
- [36] Alamri, S.A. and Moustafa, M.F., 2012, Antimicrobial properties of 3 medicinal plants from Saudi Arabia against some clinical isolates of bacteria, *Saudi Med. J.*, 33:272-277.

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