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A CRITICAL ASSESSMENT OF HEALTH BENEFITS OF CONSUMING ONIONS AND GARLIC: AN EMPIRICAL STUDY OF THE BENEFITS TO HUMAN HEALTH

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Abstract:

The study aimed to analyze a critical assessment of the health benefits of consuming onions and garlic: an empirical study of their perceived effects on human health. Garlic and onion are among the oldest of all cultivated plants and are now used as food and for medical purposes. Onions, when combined with garlic, could have greater benefits. Together, the two are known to be effective antidepressants, painkillers, anticoagulants, and anti-inflammatory agents. For the purpose of increasing the level of resilience of onions, good preservative measures are needed. These will help reduce the perdition level during shipping and other areas of transit. The distribution of large quantities of onion bulbs has promoted large consumption of the products worldwide as they have been accommodated in many dishes, traditions, and cultures. Consequently, the study examined the concepts of onions, garlic, human health, the health benefits of consuming onions and garlic, the method of onion consumption, the method of garlic consumption, the adequate quantity of onions per day, and the adequate quantity of garlic per day. The study concludes that the health benefits of onions and garlic cannot be overemphasized. Even though it has not yet been acclaimed globally as a functional food, especially due to regulatory and legislative issues, the many health benefits of garlic have been documented. They are highly nutritious and have been associated with several benefits, including improved heart health, better blood sugar control, and increased bone density. One of the recommendations made was that there should be public enlightenment and awareness programs on the health benefits of garlic and onions, especially in work places, television, print media, and other avenues where such information could be transmitted to stimulate purchase decisions and ensure adequate use of them in foods.

Keywords: Health Benefits, Onions, Garlic and Human Health

INTRODUCTION

In the past, foods were primarily recognized for their essential nutrients for normal body activity and function. In recent years, however, consumers have begun to switch emphasis from mere satisfaction of hunger to the promising use of foods to promote well-being, which includes the prevention or reduction of disease risks. The growing interest of consumers in diet and health issues is connected to the increasing scientific evidence (and awareness) about the nexus between food, nutrition, and health, advances in food science and technology, and changes in food regulations (Agriculture and Agri-Food Canada, 2009). Thus, encouraging consumption of food products known to have more health functions is important for maintaining people's health for productivity and national economic prosperity.

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Garlic is a food item whose many health benefits are often understated. Even though it has not yet been acclaimed globally as a functional food, especially due to regulatory and legislative issues, the many health benefits of garlic have been documented. These include, among others, antimicrobial activity, anti-carcinogenic effects, antioxidant activity, the ability to reduce cardiovascular diseases, improving immune functions, and anti-diabetic activity. More specifically, garlic contains sulfide (Diallylsulfide, diallylthiosulfinate, and allylmethyltrisulfide), which may enhance detoxification of undesirable compounds compounds, support maintenance of heart, immune, and digestive health; prebiotics (Inulin, Fructooligosaccharides, and Poly-dextrose), which support maintenance of digestive health and calcium absorption; as well as selenium, which neutralizes free radicals that may damage cells and supports maintenance of immune and prostate health (IFICF, 2011). Garlic and onion are among the oldest of all cultivated plants and are now used as food and for medical purposes (e.g., garlic for hypercholesterolemia and hypertension). Onions, when combined with garlic, could have greater benefits. Together, the two are known to be effective antidepressants, painkillers, anticoagulants, and anti-inflammatory agents. For the purpose of increasing the level of resilience of onions, good preservative measures are needed. These will help reduce perdition levels during shipping and other processes of transit. The distribution of large quantities of onion bulbs has promoted large consumption worldwide as they have been accommodated in many dishes, traditions, and cultures.

Studies have shown that a significant portion of non-communicable diseases stem from bad nutrition. For instance, dietary patterns are associated with an increased risk of several chronic diseases such as coronary heart disease, cancer, stroke, diabetes, hypertension, overweight, and osteoporosis. It is estimated that healthier diets might prevent $71 billion per year in medical costs, lost productivity, and premature deaths associated with these conditions. The global awareness of the role foods could play in enhancing human health has fueled considerable public interest in the notion of functional foods.

STATEMENT OF PROBLEM

The lack of understanding and awareness regarding the health benefits of onions and garlic, despite their widespread culinary use, necessitates the need for scientific evidence to support their consumption as part of a healthy diet. Anecdotal evidence and traditional medicine acknowledge the potential therapeutic properties of onions and garlic, but evidence-based research is needed to substantiate these claims and provide clear information on their specific health benefits. The limited dissemination of scientific findings and the absence of practical dietary recommendations hinder the integration of onions and garlic into everyday diets. To address this, comprehensive research studies, clinical trials, and systematic reviews are necessary to explore and validate their health benefits. Additionally, effective communication strategies are crucial to disseminating this knowledge to the general public, healthcare professionals, and policymakers, facilitating informed decisions on dietary choices and potentially including onions and garlic in public health initiatives.

OBJECTIVE OF THE STUDY

The main objective of the study is to assess the health benefits of consuming onions and garlic to the human beings. Specifically, the study seeks:

1. To examine the numerous health benefits of consuming onions.
2. To find out the numerous health benefits of consuming onions
3. To find out the various methods of consuming onions
4. To examine the various methods of consuming garlic

Research questions

The following research questions will be answered:

1. What are the numerous health benefits of consuming onions?
2. What are the numerous health benefits of consuming onions?
3. What are the various methods of consuming onions?
4. What are the various methods of consuming garlic?

Concept of onions

Onion (Allium cepa L., from Latin cepa meaning "onion"), also known as the bulb onion or common onion, is a vegetable that is the most widely cultivated species of the genus Allium. The shallot is a botanical variety of the onion, which was classified as a separate species until 2011. Its close relatives include garlic, scallions, leeks, and chive (Wikipedia, 2023). This genus also contains

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several other species variously referred to as onions and cultivated for food, such as the Japanese bunching onion Allium fistulosum, the tree onion Allium × proliferum, and the Canada onion Allium canadense. The name wild onion is applied to a number of Allium species, but Cepa is exclusively known from cultivation. Its ancestral wild form is not known, although escapes from cultivation have become established in some regions. The onion is most frequently a biennial or perennial plant, but it is usually treated as an annual and harvested in its first growing season. The onion plant has a fan of hollow, bluish-green leaves, and its bulb at the base of the plant begins to swell when a certain day length is reached. The bulbs are composed of shortened, compressed underground stems surrounded by fleshy, modified scale (leaves) that envelop a central bud at the tip of the stem. In the autumn (or in the spring, in the case of overwintering onions), the foliage dies down and the outer layers of the bulb become drier and brittle. The crop is harvested and dried, and the onions are ready for use or storage. The crop is prone to attack by a number of pests and diseases, particularly the onion fly, the onion eelworm, and various fungi that can cause rotting. Some varieties of acepa, such as shallots and potato onions, produce multiple bulbs.

The common onion has one or more leafless flower stalks that reach a height of 75–180 cm (2.5–6 feet), terminating in a spherical cluster of small greenish-white flowers. Some flower clusters produce bulbils, tiny secondary bulbs that can be used to asexually propagate new plants. The concentric leaf bases of the developing plant swell to form the underground edible bulb. Most commercially cultivated onions are grown from the plant's small black seeds, which are sown directly in the field, but onions may also be grown from small bulbs or from transplants. Onions are very hardy and can survive in a wide range of growing conditions. The bulbs vary in size, shape, color, and pungency, though warmer climates generally produce onions with a milder, sweeter flavor than do other climates. The onion's characteristic pungency results from the sulfur-rich volatile oil it contains; the release of this oil during peeling or chopping brings tears to the eyes (Britannica, 2021). Onions are among the world's oldest cultivated plants. They were probably known in India, China, and the Middle East before recorded history. The ancient Egyptians regarded the spherical bulb as a symbol of the universe, and the concentric spheres of the Aristotelian cosmos were also likened to an onion. Its name is probably derived from the Latin unus, meaning "one." The Romans introduced the onion to Britain, and, in the New World, Native Americans added a highly pungent wild onion (Allium canadense) to their stews. Curative powers have been attributed to onions throughout the centuries; they have been used in folk medicine for such varied ailments as colds, earaches, laryngitis, animal bites, burns, and warts. Onions are cultivated and used around the world. As a food item, they are usually served raw, as a vegetable, or as part of a prepared savory dish, but they can also be eaten cooked or used to make pickles or chutneys. They are pungent when chopped and contain certain chemical substances that may irritate the eyes.

Concept of Garlic

Garlic means the bulb or cloves of the plant Allium sativum L. and includes fresh garlic (garlic with a green stem and with the outer skin layers of the bulb still fresh), semi-dry garlic (garlic with the stem and outer skin layers of the bulb not completely dry), and dry garlic (garlic in which the stem, outer skin layers of the bulb, and the skin layers surrounding each clove are completely dry). Garlic (Allium Sativum), a perennial plant of the Amaryllis family (Amaryllidaceae), is grown for its flavorful bulbs (Law Insider, 2023). The plant is native to central Asia but grows wild in Italy and southern France and is a classic ingredient in many national cuisines (Encyclopedia Britannica, 2023). The bulbs have a powerful onion-like aroma and pungent taste and are not usually eaten raw. The botanical name for garlic is Allium Sativum. Garlic plants grow about 60 cm (2 feet) tall. Depending on the variety, the long leaves typically arise from a short, hard stem above the bulb or emerge from a softer pseudostem made up of overlapping leaf sheaths. The bulb is covered with membranous skin and encloses up to 20 edible bulblets called cloves. The spherical flower cluster is initially enclosed in a pair of papery, tapered bracts; the bracts split open when the green-white or pinkish flowers bloom. Flower stalks sometimes arise bearing tiny bulbils (tiny secondary bulbs that form in place of flowers) and sterile blossoms. Garlic is usually grown as an annual crop and is propagated by planting cloves or top bulbils, though seeds can also be used. An onion-like plant (Allium sativum) of southern Europe has a bulb that breaks up into separable cloves with a strong, distinctive odor and flavor. (Science Direct 2023), Garlic extract exhibits antioxidant action by increasing the levels of cellular antioxidant enzymes such as superoxide dismutase, catalase, and glutathione peroxidase and scavenging reactive oxygen species (Collins Dictionary, 2023). The

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strong-smelling bulb of this plant, made up of small sections called cloves, is used as seasoning in meats, salads, etc. It has a very strong smell and taste. Vocabulary.Com (2023) describes it as a bulbous herb of southern Europe widely naturalized; the bulb breaks up into separate, strong-flavored cloves. Garlic is a vegetable that is very appreciated for its many therapeutic virtues. The species has adapted over the years to different ecological conditions but remains very sensitive to variations in temperature and photoperiod. Studies have revealed a great diversity in the shapes and colors of the bulb, its size, and its date of maturity. Ahboet, et al. (2021), The most commonly used markers for genetic analysis are morphological markers and molecular markers such as RFLP or RAPD. Garlic belongs to the genus Allium. In this genus, more than 750 species are identified and divided into 60 taxonomic groups. It is a bulbous plant whose domestication is very old. It is the primary center of Asia, while the Mediterranean and Caucasian regions are recognized as the secondary centers of garlic. The species is cultivated in many countries around the world, mainly for its bulb. In 2018, the world production of garlic was 26,638,081 tons per year. Garlic is consumed by much of the population to treat a variety of disorders, including fever, cough, ulcers, bronchitis, and other respiratory problems; rheumatism; tuberculosis; typhoid; arteriosclerosis; diabetes; hyperlipidemia; and the prevention of atherosclerosis (Jo, 2023). Garlic is known to be hepatoprotective and an antioxidant.

According to the Encyclopedia (2018), Garlic (Allium sativa) is a plant with long, flat, grass-like leaves and a papery hood around the flowers. The greenish-white or pink flowers are found grouped together at the end of a long stalk. The stalk rises directly from the flower bulb, which is the part of the plant used as food and medicine. The bulb is made up of many smaller bulbs covered with a papery skin known as a clove. Although garlic is known as the "stinking rose," it is actually a member of the lily family (Wikipedia, 2023). Garlic is a species of bulbous flowering plant in the genus Allium. Its close relatives include the onion, shallot, leek, chive, Welsh onion, and Chinese onion. It is native to South Asia, Central Asia, and northeastern Iran and has long been used as a seasoning worldwide, with a history of several thousand years of human consumption and use. It was known to the ancient Egyptians and has been used as both a food flavoring and a traditional medicine. China produces 76% of the world's supply of garlic.

Concept of Human Health

A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. The health of a whole community or population is reflected in measurements of disease incidence and prevalence, age-specific death rates, and life expectancy. Health is the level of functional or metabolic efficiency of a living organism. In humans, it is the ability of individuals or communities to adapt and self-manage when facing physical, mental, or social challenges. MA Glossary (2022). The World Health Organization (WHO) defined health in its broader sense in its 1948 constitution as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." This definition has been subject to controversy, in particular because it lacks operational value and because of the problem created by the use of the word "complete". Other definitions have been proposed, among which a recent definition that correlates health and personal satisfaction Classification systems such as the WHO Family of International Classifications, including the International Classification of Functioning, Disability, and Health (ICF) and the International Classification of Diseases (ICD), are commonly used to define and measure the components of health. The Editors of Encyclopedia Britannica (2023), Health in humans is the extent of an individual's continuing physical, emotional, mental, and social ability to cope with his or her environment. This definition is just one of many that are possible. What constitutes "good" health, in particular, can vary widely. The rather fragile individual who stays "well" within the ordinary environment of his or her existence may succumb to a heart attack from heavy shoveling after a snowstorm, or a sea-level dweller may move to a new home in the mountains, where the atmosphere has a lower content of oxygen, and suffer from shortness of breath and anemia until his or her red blood cell count adjusts itself to the altitude. Thus, even by this definition, the conception of good health must make some allowance for change in the environment.

According to Ergas (2014), Human health can be affected if nitrate from polluted drinking water is ingested. Nitrate oxidizes iron in hemoglobin in red blood cells to methemoglobin. Most people convert methemoglobin back to hemoglobin fairly quickly, but infants do not convert it back as fast. This hinders the ability of the infant's blood to carry oxygen, leading to a blue or purple appearance in affected infants—a condition called methemoglobinemia, or blue baby syndrome. Low blood

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oxygen in adults can lead to birth defects, miscarriages, and poor general health. Nitrate has also been linked to higher rates of stomach and esophageal cancer (Bowman et al., 2000). To protect human health, the US Environmental Protection Agency (USEPA) has set maximum contaminant levels for NO3 and NO2 in drinking water at 10 and 1.0 mg l1 (as N), respectively.

HEALTH BENEFITS OF CONSUMING ONIONS

Onions are highly nutritious and have been associated with several benefits, including improved heart health, better blood sugar control, and increased bone density. Allium and allyl disulfide, two phytochemical compounds in onions, have been found to lower the risk of several types of cancer, assist in regulating blood sugar, reduce inflammation, and heal infections (Dusenberry, 2023). One small onion contains about 28 calories and 7 grams of carbs. Onions are also rich in vitamins A, B6, B-complex, and C, as well as iron, folate, and potassium. They are excellent sources of sulfuric compounds, flavonoids, phytochemicals, and polyphenols.

❖ Fight Cancer

Red onions are the most effective in destroying breast and colon cancer cells. These onions have high levels of quercetin and anthocyanin, two compounds that contribute to this characteristic. Onions activate the pathways that provoke the cancer cells to kill themselves (Dusenberry, 2023). They make the environment unfavorable for cancer cells to communicate, and this inhibits their growth. It was also found that people with the highest consumption of onions had the lowest cancer rates. As a preventive measure, you can have your burgers garnished with red onions. Eating vegetables of the Allium genus, like garlic and onions, has been linked to a lower risk of certain types of cancer, including stomach and colorectal cancer. Moreover, a 2014 review of 16 studies in 13,333 people demonstrated that those with the highest onion intake had a 15% reduced risk of colorectal cancer compared to those with the lowest intake. These cancer-fighting properties have been linked to the sulfur compounds and flavonoid antioxidants found in allium vegetables. For example, onions provide onionin A, a sulfur-containing compound that has been shown to decrease tumor development and slow the spread of ovarian and lung cancer in test-tube studies (Kubala, 2022). Onions also contain fisetin and quercetin, which are flavonoid antioxidants that may inhibit tumor growth. Many kinds of onions contain a wealth of chemicals that help fight cancer. Onions are among the richest food sources of a nutrient called quercetin, which is known to prohibit the activity or creation of cancer-causing elements. A quercetin-rich diet has been associated with a lower risk of developing lung cancer (Paul, 2022).

❖ Improve Heart Health

The flavonoids in red onions can contribute to heart health. Onions are also rich in organosulfurs, which can help prevent heart disease. According to one Argentine study, intake of the organosulfur compounds found in onions can cut the risk of cardiovascular disease. Onions contain thiosulfinates that act as natural blood thinners and reduce the risk of heart attack and stroke (Dusenberry, 2023). The quercetin in onions also has the potential to fight heart disease. It offers both antioxidant and anti-inflammatory properties that promote heart health. Onions are also a part of the French Paradox – they are an important part of French cuisine and are thought to be responsible for the low incidences of heart disease among the French despite their high-calorie diet.Onions can also improve cholesterol levels, and this ultimately benefits the heart. As per a report by the Cambridge University Press, the flavonoids in onions help lower the levels of LDL (the bad cholesterol) in obese people. Onions also prevent the blood platelets from sticking each other, which can lead to clotting and eventually, heart attacks. They also can prevent high blood pressure, thereby averting heart danger. Another study on rabbits showed that onions could prevent atherosclerosisi. They achieve this by enhancing fibrinolytic (a process that results in the removal of small blood clots).A 2014 study in 54 females with polycystic ovarian syndrome (PCOS) found that consuming large amounts of raw red onions (80–120 grams per day) for 8 weeks reduced total and LDL (bad) cholesterol compared to a control group (Kubala, 2022).Onions contain organic sulfur compounds. These compounds are the reason why onions have such a sharp, strong taste and smell. Organic sulfur compounds help reduce the level of cholesterol in your body and may also help break down blood clots, lowering your risk for heart disease and stroke. You should eat onions raw rather than cooked to get the most sulfur compounds from them (Paul, 2022).

❖ Lower Blood Sugar Levels

Eating onions may help control blood sugar, which is especially significant for people with diabetes or prediabetes. Specific compounds found in onions, such as quercetin and sulfur compounds, also possess antidiabetic effects (Kubala, 2022). Quercetin has been shown to interact with cells in the small intestine, pancreas, skeletal muscle, fat tissue, and liver to control whole-body blood

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sugar regulation. A test was conducted on diabetic rats,and the results were encouraging (Dusenberry, 2023). One of the sulfur compounds in onions (S-methylcysteine) and quercetin can have beneficial effects on blood sugar. However, it was found that onions exhibited a positive effect only when taken along with metformin, the antidiabetic drug. Polyphenols (especially the ones in onions) were found to play a role in glycemic control.

- **Enhance Eye Health**

The sulfur in onions improves the health of the lens of the eye. It stimulates the production of a protein named glutathione, which acts as an antioxidant. Higher levels of glutathione mean a reduced risk of glaucoma, macular degeneration, and cataracts. The selenium in onions supports the vitamin E in the eye (which protects the cells in the eye); onions can inhibit the growth of normal eye flora (Dunberry, 2023). This highlights the possibility of onions being a potential cure for common eye infections like conjunctivitis and blepharitis. Onion extracts can also aid in preventing the development of corneal haze.

- **Improve Immune System**

Onions contain selenium, which stimulates immune function. The mineral also prevents excessive immune responses, which can have adverse effects. Immune cells are deficient in selenium and reproduce inefficiently, and here's where onions come into the picture. Such cells also have difficulty producing important proteins and transporting calcium. Onions are also considered herbal medicine in Russia, where they are used to treat colds and flu (Dunberry, 2023).

HEALTH BENEFITS OF CONSUMING GARLIC

Though it was not widely known, experts now understand that sulfur compounds in garlic are the primary cause of its beneficial effects on health (Spice World, 2022). By slicing, chopping, or crushing garlic bulbs, the thio-Sulfinite chemicals in them are converted into allicin. Allicin is a fantastic substance. A member of the Liliaceae family, garlic (Allium sativum) is highly regarded throughout the world for both its medicinal and culinary value. Early men of medicine such as Hippocrates, Pliny, and Aristotle encouraged a number of therapeutic uses for this botanical. Today, it is commonly used in many cultures as a seasoning or spice. Garlic also ranks as the second-most utilized supplement. With its sulfur-containing compounds, high trace mineral content, and enzymes, garlic has shown anti-viral, anti-bacterial, anti-fungal, and antioxidant abilities (Bongiorno, 2008). Diseases that may be helped or prevented by garlic's medicinal actions include Alzheimer's Disease, cancer, cardiovascular disease (including atherosclerosis, strokes, hypertension, thrombosis, and hyperlipidemias), children's conditions, dermatologic applications, stress, and infections. However, while this appears to be true in theory, what are the actual health benefits of using garlic?

- **Garlic Helps Boost Your Body's Immune System**

Spice world(2022), Your body's immunity is what keeps it from getting sick in the first place, and it also aids in the fight against illness when the situation calls for it. Garlic offers an immune system boost to help prevent colds and the flu virus. Children get six to eight colds each year, while adults get two to four. Eating raw garlic can protect against coughs, fevers, and colds. Eating two chopped garlic cloves every day is the best way to benefit. In some households around the world, families hang garlic cloves on a string around their children's necks to help them with congestion. In addition to making it harder for pathogens to take hold, garlic may also help fortify your immune system to fight them off by boosting the white blood cell response (Seaver, 2022). The sulfur content of garlic, in particular, is known to enhance our immune response.

- **Helps Reduce High Blood Pressure**

Strokes and heart attacks are two of the most significant health concerns worldwide. High blood pressure is a considerable risk factor for heart disease. It is thought to cause about 70% of strokes, heart attacks, and chronic heart failure (Spice World, 2022). High blood pressure is the cause of 13.5 percent of deaths worldwide. Garlic is a fantastic spice to include in your diet for those suffering from high blood pressure or hypertension.

- **May have anti-cancer properties**

The sulfurous compounds in garlic have been studied for their ability to inhibit cancerous cells and block tumors (Lewin, 2023). That said, much of the evidence for garlic in relation to colon, prostate, oesophageal, and renal cancer is observational. Due to its high amount of antioxidants, garlic protects the body from lung, prostate, bladder, stomach, liver, and colon cancers. The antibacterial properties of garlic prevent peptic ulcers (Singh, 2023).

- **Heart protection**

In experiments using laboratory mice, the team found that, after a heart attack, the mice that had received diallyl sulfide had 61 percent less heart damage in the area at risk, compared with the untreated mice (Butler, 2017). Cardiomyopathy is the leading cause of death among diabetes patients. It is a chronic disease of the

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myocardium (heart muscle), which is abnormally thickened, enlarged, and/or stiffened. The team fed diabetic laboratory rats either garlic oil or corn oil. Those fed garlic oil experienced significantly more changes associated with protection against heart damage, compared with the animals that were fed corn oil.

- **Help Lower Cholesterol**

Another potential perk of garlic for the heart: improving cholesterol levels. Garlic may help decrease the production of cholesterol by the liver, While more research is needed to determine the relationship between garlic intake and cholesterol levels, a meta-analysis and review of studies that was published in May 2018 in Medicine concluded that taking garlic supplements was effective in lowering both total cholesterol and high LDL cholesterol levels, which are two risk factors for heart disease (Laube, 2021).

METHOD OF ONIONS CONSUMPTION

Onions add texture and flavor to foods, either complementing them as the base of a soup, a rice or noodle dish, or as a main ingredient (Lim, 2012). Onions can have a spicy perk-me-up taste if eaten raw in a salad, or they may be very soft and sweet when caramelized and have turned a beautiful golden brown. Adding onions to your diet as natural fat burners is another method used by people.

Usefulness of onions

- Adding onions to your diet is that onions are NATURAL FAT BURNERS. Onions contain a blend of minerals and oils that work to breakdown deposits of fat and even speed up metabolism. They are low in calories too; just 60 calories in a cup of chopped onions.
- Onions can actually reduce inflammation in the body. Often time's inflammation in the body is caused by a buildup of oxidized fatty acids and there are various enzymes in onions that prevent the oxidation from occurring.
- Onions can also increase your bone density. Several of the flavanoids found in onions have been proven to help prevent the cells that are known to break down bones and even help stimulate bone building cells, thus increasing bone density.
- Onion intake helps reduce the bad cholesterol in your body as well as prevent blood platelets from clogging. Both of these can greatly improve your cardiovascular health.
- Onions have the potential to prevent or reduce risk of certain types of cancer. Medical studies have shown that onions can actually prevent the growth of cancerous tumors, most often those found in the stomach or digestive system.

There are several species and even more cultivars of onions, but most are grouped into three types based on color: yellow onions, red onions, sweet onions, or white onions. Yellow onions are the most common in the US, with a mild flavor that can be made sweet by caramelizing (NOA, 2021). Red and white onions are much less common in the US, although red onions are becoming more popular because of their distinct color, and white onions are commonly used in Mexican and Southwest cuisine. Onions are a versatile food that is often eaten raw, cooked in many ways, or pickled for extended storage. Over the past 20 years, onion consumption has steadily increased. In 2018, per capita consumption in the USA was 20 pounds a year, and global per capita consumption was 13.7 pounds a year (Food Source Information, 2018). Globally, onions are a very common addition to meat-based recipes.

METHOD OF GARLIC CONSUMPTION

It is recommended to take 2-3 cloves of raw garlic to confer various health benefits on those who include them in their diet (MehndirattaIts, 2019). Regular consumption helps with various respiratory problems like tuberculosis, bronchitis, lung congestion, asthma, and whooping cough. Garlic, belonging to the onion family, is frequently used in Indian kitchens to flavor curries, chutneys, snacks, and more. Known as 'rasona'(Uniyal, 2022). Garlic has been used as a food and as a medicinal herb for thousands of years. Based on current trends, garlic use can be expected to continue to expand. The unique flavor and aroma of garlic have inspired countless culinary dishes and remedies for treating numerous medical conditions. Garlic's sensory attributes are based on its remarkable sulfur chemistry, a biochemical system that is activated upon cellular disruption and that offers an expanding array of sulfur compounds with further processing (Charron, 2016). Garlic is most often used as a flavoring agent, but it can also be eaten as a vegetable. It is used to flavor many foods, such as salad dressings, vinaigrettes, marinades, sauces, vegetables, meats, soups, and stews. It is often used to make garlic butter and garlic toast. Garlic powder can be substituted if necessary; 1/8 teaspoon of garlic powder is equal to one medium fresh clove of common garlic.

- **Sautéing Garlic**

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Sautéing is the most common method used for cooking garlic. It will bring out the nutty but savory flavor of the garlic. Garlic can be sautéed in oil or butter but be careful is using butter because it will burn much faster than oil. Select a pan or skillet with a heavy bottom that will provide for even heating. Heat the oil or butter over medium heat and then add the garlic. The garlic should be stirred often to prevent burning. If cooking with other ingredients that take longer to cook, such as onions, start cooking the other ingredients and allow them to start to cook before adding the garlic.

❖ **Frying Garlic**

- Use a heavy bottomed deep pan, such as a saucepan and add oil.
- Heat oil on the stove until it is very hot but not smoking and then add garlic cloves.
- Fry cloves only until they turn a medium brown and the remove from the heat.
- Watch very carefully as they begin to brown to avoid burning them. Burnt garlic will have a bitter taste.

Cook with garlic. Raw garlic is the optimal way to get its benefits. However, you can still boost your health by cooking with garlic. If you are using garlic in a recipe, use at least 1-2 cloves per dish. As with raw garlic, make sure to crush, chop or mince it to release the compounds that boost health. Allow it to sit for 15 minutes to get maximum benefits from your garlic. Some ways to cook garlic in your meals include:

- Marinating meat or tofu in a garlic rub.
- Simmering a garlic soup.
- Whipping up a pasta dish with greens and garlic.
- Throwing garlic into a vegetable dish.
- Mashing garlic into potatoes.

❖ **Eat Raw Garlic**

Include at least one serving or a ½ clove in your meal plan every day. Many people like to cook garlic in their dishes, but raw garlic is just as tasty. Having a mixture of raw and cooked garlic is the best way to get the health benefits of this vegetable. Crushing, chopping, or mincing garlic can best release the compounds that benefit for your health. (Carberry, 2022), eating raw garlic can also have additional benefits to cooked garlic. This includes relaxing smooth muscles in your blood vessels, which in turn dilates them and may lower your blood pressure. Some ways to enjoy raw garlic include:

- Mixing chopped or minced garlic with fresh tomatoes and basil. Use this delightful mixture on top of pasta, bread, or a salad.
- Adding garlic to salsa or guacamole.
- Making pesto.
- Slicing garlic onto a salad.
- Spreading minced or crushed garlic on toast and topping it with a slice of tomato.
- Blending a tomato, lemon, and garlic juice.

❖ **Cook With Garlic**

Raw garlic is the optimal way to get its benefits. However, you can still boost your health by cooking with garlic. If you are using garlic in a recipe, use at least 1-2 cloves per dish. As with raw garlic, make sure to crush, chop or mince it to release the compounds that boost health. Allow it to sit for 15 minutes to get maximum benefits from your garlic. Some ways to cook garlic in your meals include:

- Marinating meat or tofu in a garlic rub.
- Simmering a garlic soup.
- Whipping up a pasta dish with greens and garlic.
- Throwing garlic into a vegetable dish.
- Mashing garlic into potatoes.

❖ **Try Garlic Oil**

Garlic is a great flavoring for any dish. You can bring more garlic and its flavor into your food by using garlic-infused oil to prepare dishes. Garlic oil can also have the added health benefit of reducing a pimple or relieving psoriasis when rubbed on the affected area. Get garlic oil in a food or health store. Consider infusing your own, which can ensure you get a high dose of garlic in the oil. Use whole cloves of garlic and cook at 350 degrees Fahrenheit (175 degrees Celsius) for 20-30 minutes. Then cook in the oil for 5 minutes before funneling the infused oil into a container. For maximum health benefits, lower the cooking temperature to 250 degrees Fahrenheit (121 degrees Celsius).

Adequate quantity of onions per day

Surprisingly, onion demonstrates significant blood sugar-modifying properties to be a real help in the fight against both type 2 diabetes and obesity. No, onion alone will not keep you in fine shape, but it will help. In addition to limiting your intake of fats and sugars, eating onions can get your blood sugar-and your weight-on the right track.Eat an onion every day. One medium-sized onion equals approximately one cup of onion when chopped. And while raw onions contain a whopping load of protective compounds, even cooked onions still weigh in heavily on the protective side. Chop onions into salads, cook them with vegetables, fish and meats, and find as many ways to eat them as possible (Chris, 2015), whatever has kept onion behind the curtains, while lesser

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fruits and vegetables are lauded, needs to change. The humble onion, with its tear-promoting pungency, is without question one of the healthiest things you can put in your body. Eat onions, and live better.An allergy to onions is rare, but some people do have sensitivity to them. As a result, those who are allergic may experience digestive issues, including heartburn and wind. Onions contain FODMAPs, a type of carbohydrate and fibre that some people find their digestive system cannot tolerate (WebMD2023), People use onion to prevent scarring. It is also used for obesity, hair loss, asthma, insomnia, high blood pressure. Warts, and many other conditions, but there is no good scientific evidence to support this uses.Garlic is a commonly used food and flavoring agent. When used as a food product, garlic is not likely to produce health benefits or side effects. When used as a medicinal product, garlic may produce both desired and unwanted effects on the Garlic taken orally (by mouth) has been used in alternative medicine as a possibly effective aid in treating high blood pressure, coronary artery disease (hardened arteries), stomach cancer, colon cancer or rectal cancer, and in preventing tick bites. Garlic applied to the skin may also be possibly effective in treating fungal skin infections such as ringworm, jock itch, or athlete's foot. Garlic has also been used to treat high cholesterol, stomach ulcers caused by H. pylori, cancer, or circulation problems in the legs. However, research has shown that garlic may not be effective in treating these conditions. Other uses not proven with research have included preventing the common cold, and improving urination problems caused by an enlarged prostate. It is not certain whether garlic is effective in treating any medical condition. Medicinal use of this product has not been approved by the FDA. Garlic should not be used in place of medication prescribed for you by your doctor, (Drugs.com 2022).

Adequate quantity of garlic per day

The best time of day to eat garlic is in the morning with an empty stomach is one of the most beneficial ways to kick start your day.According to Tufts University, there are no specific guidelines on how many cloves constitute too much garlic, but people who are having surgery or dental work, or people who have bleeding disorders, should consume garlic in moderation(Roche, 2020).In most cases, the worst thing that can happen if you eat too much garlic is that you will smell bad for the next few hours, but in a few instances there is indeed such a thing as too much garlic (Dharmatti, 2023).

RESULTS AND DISCUSSIONS

- You can eat 1-2 raw cloves of garlic per day to reduce LDL cholesterol.
- Consume 1 raw garlic before breakfast with a glass of room temperature or cold water.
- Consume 3-4 cloves of raw garlic to lower your blood sugar levels.
- Consume 3 garlic cloves before breakfast every alternate day.
- Consume at least 1 raw clove of garlic every day in the morning.
- Consume 1-2 raw garlic cloves per day to boost your immunity.
- Consume 1 clove of raw garlic every day to flush out the harmful free oxygen radicals.
- Consume pickled garlic to reduce or prevent heavy metal poisoning.
- Consume 2-3 cloves of raw garlic to prevent the risk or fight diabetes.
- Consume 3-4 cloves of garlic to prevent and fight UTI and kidney infections.
- Heat mustard oil with garlic and massage your body with this oil for treating cold. You can also consume 2-3 cloves of raw garlic to treat cold and asthma
- Consume 2-3 cloves of raw garlic to reduce inflammation and microbial infection. However, consult your doctor before you start taking garlic to reduce ear infection.

METHODOLOGY

The research design adopted for the study was a Descriptive survey design. The study was conducted in Uyo Metropolis. The population of the study comprised all home economists and nutritionists in Uyo Metropolis. The sample size that was used for the study consisted of 100 home economists and 50 nutritionists, making a total of 150 respondents in Uyo Metropolis. The main instrument used for data collection in the study was titled "Health Benefits of Consuming Onions and Garlic Questionnaire (HBCOGQ)". To ensure the face and content validity of the instrument, the HBCOGQ was given to one expert in test, measurement, and evaluation for assessment. In order to ensure the reliability of the research instrument, the HBCOGQ was trial-tested on 20 other students who were not part of the study, but the respondents had similar characteristics to those in the study area. The research questions 1 to 4 were answered using percentage analysis, as can be seen in the results subsequently.

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Research question 1
What is the health benefits of onions to human beings?

Table 1: Percentage analysis of the health benefits of onions to human beings

BENEFIT	FREQUENCY	PERCENTAGE
Onions fight cancer	24	16*
It improves health heart	36	24
It lowers blood sugar level	25	16.67
It enhances eye health	33	22
It improves immune system	32	21.33**
TOTAL	**150**	**100%**

** **The highest percentage frequency**
* **The least percentage frequency**

The above table 1 presents the percentage analysis of the benefits of onions to human beings. From the results of the data analysis, it was observed that the highest percentage of the respondents (21.33%) affirmed that onions improve the immune system. while the lowest percentage (16%) of the respondents stated that onions fight cancer. The result therefore means there is a remarkable high degree to which onions improve the immune system in human beings.

Research question 2
What is the health benefits of garlic to human beings?

Table 2: Percentage analysis of the health benefits of garlic to human beings

BENEFIT	FREQUENCY	PERCENTAGE
Garlic Helps Boost Immune System	31	20.67
Helps Reduce High Blood Pressure	34	22.67
It produces anti-cancer properties	21	14*
It helps in heart protection	37	24.67**
It helps Lower Cholesterol	27	18
TOTAL	**150**	**100%**

** **The highest percentage frequency**
* **The least percentage frequency**

The above table 2 presents the percentage analysis of the benefits of garlic to human beings. From the results of the data analysis, it was observed that the highest percentage of the respondents (24.67%) affirmed that garlic protects the heart. while the least percentage (14%) of the respondents stated that garlic may have anti-cancer properties. The result therefore means there is remarkable high extent that garlic protects heart in human beings.

Research question 3
What is the various methods of consuming onions?

Table 3: Percentage analysis of the various methods of consuming onions

BENEFITS	FREQUENCY	PERCENTAGE
One can add in rice or noodle dish, or whether they are used as a main ingredient	41	27.33*

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Onions add texture and flavor to foods as a main ingredient or complementing it as the base of a soup, a rice or noodle dish	40	26.67
Onions can have a spicy perk-me-up taste if eaten raw in a salad	32	21.33
They may be very soft and sweet when caramelized and have turned a beautiful golden brown	22	14.67
Adding onions to your diet as natural fat burners	15	10**
TOTAL	**150**	**100%**

**** The highest percentage frequency**
*** The least percentage frequency**

The above table 3 presents the percentage analysis of the various methods of consuming onions. From the results of the data analysis, it was observed that the highest percentage of the respondents (27.33%) affirmed that one can add it in rice or noodle dish, or whether they are used as a main ingredient. while the least percentage (10%) of the respondents stated that adding onions to your diet as natural fat burners. The result therefore means there is remarkable high extent that one can add it in rice or noodle dish, or they are used as main ingredient in dishes.

Research question 4

What is the various methods of consuming garlic?

Table 4: Percentage analysis of the various methods of consuming garlic

BENEFIT	FREQUENCY	PERCENTAGE
Garlic is cooked	43	28.67*
People sauté garlic	39	26
Garlic is fried	34	22.67
Garlic oil	27	18
garlic is eaten raw	7	4.67**
TOTAL	**150**	**100%**

**** The highest percentage frequency**
*** The least percentage frequency**

The above table 4 presents the percentage analysis of the various methods of consuming garlic. From the results of the data analysis, it was observed that the highest percentage of the respondents (28.67%) affirmed that Cooking with garlic. while the least percentage (4.67%) of the respondents stated that onions eating raw garlic. The result therefore means there is remarkable high extent in Cooking with garlic.

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CONCLUSION

The study concludes that the health benefits of onions and garlic cannot be overemphasized. Even though it has not yet been acclaimed globally as a functional food, especially due to regulatory and legislative issues, the many health benefits of garlic have been documented. They are highly nutritious and have been associated with several benefits, including improved heart health, better blood sugar control, and increased bone density. Allium and allyl disulfide, two phytochemical compounds in onions, have been found to lower the risk of several types of cancer, assist in regulating blood sugar, reduce inflammation, heal infections, reduce cardiovascular diseases, improve immune functions, and have anti-diabetic activity.

RECOMMENDATION

1. There should be public enlightenment and awareness programs on the health benefits of garlic and onions, especially in work places, television, print media, and other avenues where such information could be transmitted to stimulate purchase decisions and ensure adequate use of them in foods.
2. To promote consumption (and production) of healthier foods such as garlic and onions, the government should boost household's incomes and understand how they perform in the market.

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