I'm not a bot

Wheat is a member of the grass family that produces a dry, one-seeded fruit commonly called a kernel.More than 17,000 years ago, humans gathered the seeds of plants and ate them. After rubbing off the husks, early people simply chewed the kernels raw, parched or simmered.Wheat originated in the cradle of civilization in the Tigris and Euphrates river valley, near what is now Iraq.The Roman goddess, Ceres, who was deemed protector of the grain, gave grains their common name today cereal.Wheat, used for white bread, pastries, pasta, and pizza, has been the principal cereal crop since the 18th century.Wheat was introduced by the first English colonists and quickly became the main cash crop of farmers who sold it to urban populations and exporters. In colonial times its culture became concentrated in the Middle Colonies, which became known as the bread colonies.Wheat is the primary grain used in U.S. grain products approximately three-quarters of all U.S. grain products are made from wheat flour.Wheat is grown in 42 states in the United States.Six classes bring order to the thousands of varieties of wheat. They are: hard red winter (HRW), hard red spring (HRS), soft red winter (SRW), hard white (HW), soft white (SW) and durum.In 2008/2009, U.S. farmers grew nearly 2.4 billion bushels of wheat on 63 million acres of land.In the United States, one acre of wheat yields an average of around 40 bushels of wheat.About half of the wheat grown in the United States is used domestically.In 2008, the state of Kansas was the largest wheat producer in the United States with North Dakota a close second.Kansas is number one in flour milling in the United States.Kansas produces enough wheat each year to bake 36 billion loaves of bread and enough to feed everyone in the world, over six billion people, for about 2 weeks.An acre of Kansas wheat produces enough bread to feed nearly 9,000 people for one day.One bushel of wheat contains approximately one million individual kernels.One bushel of wheat weighs approximately 60 pounds.One bushel of wheat yields approximately 42 pounds of white flour OR 6onebushel0 pounds of whole-wheat flour.A bushel of wheat yields 42 one-and-a-half pound commercial loaves of white bread OR about 90 one-pound loaves of whole wheat bread.There is approximately 16 ounces of flour in a one-and-a-half pound loaf of bread.The first bagel rolled into the world in 1683 when a baker from Vienna Austria was thankful to the King of Poland for saving Austria from Turkish invaders. The baker reshaped the local bread so that it resembled the Kings stirrup. The new bread was called beugel, derived from the German word stirrup, bugel.The traditional bagel is the only bread product that is boiled before it is baked.Never refrigerate bagels or any bread product. Bread products go stale up to 6 times faster in the refrigerator. Leave these products at room temperature or freeze them.A bushel of wheat makes about forty-five 24-ounce boxes of wheat flake cereal.Per capita consumption of pasta in the United States was 22 pounds in 1996 and in 2005 was at 19.52 pounds.A bushel of wheat makes about 42 pounds of pasta or 210 servings of spaghetti.If you eat pasta three times a week, it would take 70 weeks to eat all the pasta made from one bushel of durum.Semolina is coarsely ground durum with a texture somewhat like sugar. It is the best product for pasta.There are more than 600 pasta shapes produced worldwide.Approximately 3 billion pizzas are sold in the United States each year.The early crackers, or biscuits as the English called them, were handmade, hard-baked products made from flour and a little moisture.Crackers main ingredient is unbleached flour from soft red or soft white wheat.Ancient traditional tortillas were made from ground corn by Mexican natives as long as 2000 years ago. Flour tortillas only started to become popular in the 19th century.In the U.S. in 2000, there were 85 billion tortillas consumed, not including tortilla chips. Written by Atli Arnarson BSc, PhD Updated on April 4, 2019Wheat is a cereal grain grown in many varieties worldwide. It provides antioxidants, vitamins, minerals, and fiber. Many baked goods contain white and whole-wheat flour. However, wheat products also contain gluten, which some people do not tolerate.Wheat is one of the worlds most commonly consumed cereal grains.It comes from a type of grass (Triticum) that is grown in countless varieties worldwide.Bread wheat, or common wheat, is the primary species. Other closely related species include durum, spelt, emmer, einkorn, and Khorasan wheat.White and whole-wheat flour are key ingredients in baked goods like bread. Other wheat-based foods include pasta, noodles, semolina, bulgur, and couscous.Wheat is highly controversial because it contains a protein called gluten, which can trigger a harmful immune response in predisposed individuals.However, whole-grain wheat can be a rich source of antioxidants, vitamins, minerals, and fiber for people who tolerate it.This article tells you everything you need to know about wheat. Share on PinterestWheat is mainly composed of carbs but also has moderate amounts of protein.Here are the nutrition facts for 3.5 ounces (100 grams) of whole-grain wheat flour (1):Calories: 340Water: 11%Protein: 13.2 gramsCarbs: 72 gramsSugar: 0.4 gramsFiber: 10.7 gramsFat: 2.5 gramsLike all cereal grains, wheat is mainly composed of carbs.Starch is the predominant carb in the plant kingdom, accounting for over 90% of the total carb content in wheat (1).The health effects of starch mainly depend on its digestibility, which determines its effect on blood sugar levels.High digestibility may cause an unhealthy spike in blood sugar after a meal and have harmful effects on health, especially for people with diabetes.Similar to white rice and potatoes, both white and whole wheat rank high on the glycemic index (GI), making them unsuitable for people with diabetes (2, 3).On the other hand, some processed wheat products such as pasta are digested less efficiently and thus dont raise blood sugar levels to the same extent (2).Whole wheat is high in fiber but refined wheat contains almost none.The fiber content of whole-grain wheat is 1215% of the dry weight (1).As theyre concentrated in the bran, fibers are removed during the milling process and largely absent from refined flour.The main fiber in wheat bran is arabinoxylan (70%), which is a type of hemicellulose. The rest is mostly made up of cellulose (4, 5).Most wheat fiber is insoluble, passing through your digestive system almost intact and adding bulk to stool. Some fibers also feed your gut bacteria (6, 7, 8).Whats more, wheat contains small amounts of soluble fibers, or fructans, that may cause digestive symptoms in people with irritable bowel syndrome (IBS) (9).By and large, though, wheat bran may have beneficial effects on gut health.Proteins make up 722% of wheats dry weight (1, 10).Gluten a large family of proteins, accounts for up to 80% of the total protein content. Its responsible for the unique elasticity and stickiness of wheat dough, the properties that make it so useful in breadmaking.Wheat gluten can have adverse health effects in people with gluten intolerance.SUMMARY Carbs are the main nutritional component of wheat. Still, this grain harbors significant amounts of fiber, which may aid your digestion. Its protein mostly comes in the form of gluten.Whole wheat is a good source of several vitamins and minerals.As with most cereal grains, the amount of minerals depends on the soil in which its grown.Selenium. This trace element has various essential functions in your body. The selenium content of wheat depends on the soil and is very low in some regions, including China (11, 12).Manganese. Found in high amounts in whole grains, legumes, fruits and vegetables, manganese may be poorly absorbed from whole wheat due to its phytic acid content (13).Phosphorus. This dietary mineral plays an essential role in the maintenance and growth of body tissues.Copper. An essential trace element, copper is often low in the Western diet. Deficiency may have adverse effects on heart health (14).Folate. One of the B vitamins, folate is also known as folic acid or vitamin B9. Its particularly important during pregnancy (15).Some of the most nutritious parts of the grain the bran and germ are absent from white wheat because theyre removed during the milling and refining process.Therefore, white wheat is relatively poor in many vitamins and minerals compared to whole-grain wheat.Because wheat accounts for a large portion of peoples food intake, flour is regularly enriched with vitamins and minerals.In fact, enrichment of wheat flour is mandatory in many countries (16).Enriched wheat flour may be a good source of iron, thiamine, niacin, calcium, and vitamin B6, in addition to the above nutrients. SUMMARY Whole wheat may be a decent source of several vitamins and minerals, including selenium, manganese, phosphorus, copper, and folate.Most of the plant compounds in wheat are concentrated in the bran and germ, which are absent from refined white wheat (4, 17).The highest levels of antioxidants are found in the aleurone layer, a component of the bran.Wheat aleurone is also sold as a dietary supplement (18).Common plant compounds in wheat include:Ferulic acid. This polyphenol is the predominant antioxidant in wheat and other cereal grains (17, 18, 19).Phytic acid. Concentrated in the bran, phytic acid may impair your absorption of minerals, such as iron and zinc. Soaking, sprouting, and fermenting grains can reduce its levels (20, 21).Alkylresorcinols. Found in wheat bran, alkylresorcinols are a class of antioxidants that may have a number of health benefits (22).Lignans. These are another family of antioxidants present in wheat bran. Test-tube studies indicate that lignans may help prevent colon cancer (23).Wheat germ agglutinin. This protein is concentrated in wheat germ and blamed for a number of adverse health effects. However, lectins are inactivated with heat and thus neutralized in baked goods (24).Lutein. An antioxidant carotenoid, lutein is responsible for the color of yellow durum wheat. High-lutein foods may improve eye health (25).SUMMARY Wheat bran, which is present in whole wheat, may contain a number of healthy antioxidants, such as alkylresorcinols and lignans. Notably, white flour and other refined wheat products do not contain these compounds.While white wheat may not be particularly beneficial to health, whole-grain wheat may offer several positive effects especially when it replaces white flour.Whole-grain wheat is rich in insoluble fiber, which is concentrated in the bran.Studies indicate that components of wheat bran may function as prebiotics, feeding some of the beneficial bacteria in your gut (8).However, most of the bran passes almost unchanged through your digestive system, adding bulk to stool (6, 7).Wheat bran may also shorten the time it takes undigested material to travel through your digestive tract (4, 26).One study found that bran can reduce constipation risk in children (27).Yet, depending on the underlying cause of the constipation, eating bran may not always be effective (28).Colon cancer is the most prevalent type of digestive system cancer.Observational studies link the consumption of whole grains including whole wheat to a reduced risk of colon cancer (29, 30, 31).One observational study estimated that people on low-fiber diets could cut their risk of colon cancer by 40% by eating more fiber (31).This is supported by randomized controlled trials, though not all studies have found a significant protective effect (6, 32).All in all, whole wheat is rich in fiber and boasts a number of antioxidants and phytonutrients that potentially reduce your risk of colon cancer (23, 33).SUMMARY Whole wheat and other whole-grain cereals may promote gut health and reduce your risk of colon cancer.Celiac disease is characterized by a harmful immune reaction to gluten.An estimated 0.51% of people in the United States and Europe have this condition (34, 35, 36).Celiac disease damages your small intestine, resulting in impaired absorption of nutrients (37, 38).Associated symptoms include weight loss, bloating, flatulence, diarrhea, constipation, stomach pain, and fatigue (36, 39).It has also been suggested that gluten may contribute to brain disorders in people with celiac disease, such as schizophrenia and epilepsy (40, 41, 42).Einkorn, an ancient wheat variety, causes weaker reactions than other varieties but is still unsuitable for people with gluten intolerance (43).Adhering to a gluten-free diet is the only known treatment for celiac disease. Although wheat is the main dietary source of gluten, this protein can also be found in rye, barley, and many processed foods.SUMMARY Gluten which is found in all wheat can harm individuals with celiac disease. This condition is characterized by damage to your small intestine and impaired absorption of nutrients.Although whole-grain wheat may have some health benefits, many people need to eat less of it or avoid it altogether.The number of individuals who follow a gluten-free diet exceeds those who have celiac disease.Sometimes, people simply believe that wheat and gluten are inherently harmful to health. In other cases, wheat or gluten may cause actual symptoms.This condition called gluten sensitivity or non-celiac wheat sensitivity is defined as an adverse reaction to wheat without any autoimmune or allergic reactions (36, 44, 45).Frequently reported symptoms of wheat sensitivity include abdominal pain, headache, fatigue, diarrhea, joint pain, bloating, and eczema (36).One study indicates that, in some people, the symptoms of wheat sensitivity may be triggered by substances other than gluten (46).Evidence suggests that wheat sensitivity is caused by fructans, which belong to a class of fibers known as FODMAPs (47).High dietary intake of FODMAPs exacerbates IBS, which has symptoms similar to those of celiac disease (9).In fact, approximately 30% of people with IBS experience a wheat sensitivity (48, 49).IBS is a common condition, characterized by abdominal pain, bloating, irregular bowel habits, diarrhea, and constipation.It is more common in people who experience anxiety and is often triggered by a stressful life event (50).Sensitivity to wheat is common among people with IBS (9, 46, 48, 51, 52, 53).Although FODMAPs which are found in wheat make symptoms worse, they are not considered the underlying cause of IBS.Studies indicate that IBS may be associated with low-grade inflammation in the digestive tract (54, 55).If you have this condition, it may be best to limit wheat consumption.Food allergy is a common condition, triggered by a harmful immune response to certain proteins.Gluten in wheat is a primary allergen, affecting approximately 1% of children (56).In adults, allergy is most often reported among those regularly exposed to airborne wheat dust.Bakers asthma and nasal inflammation are typical allergic reactions to wheat dust (57).Whole-grain wheat contains phytic acid (phytate), which impairs the absorption of minerals such as iron and zinc from the same meal (21).For this reason, it has been referred to as an antinutrient.While rarely problematic for people following a well-balanced diet, antinutrients may be a concern for those who base their diets on cereal grains and legumes.The phytic acid content of wheat can be reduced considerably by up to 90% by soaking and fermenting the grains (21, 58).SUMMARY Wheat has a number of potential downsides. These include allergy, worsened IBS symptoms, wheat intolerance, and antinutrient content.Spelt is an ancient variety of wheat closely related to common wheat.Grown for thousands of years, spelt has recently become popular as a health food (59).Common whole wheat and spelt have similar nutritional profiles particularly regarding their fiber and protein content. Still, this depends on which varieties of spelt and common wheat are being compared (59, 60, 61).That said, spelt may be richer in some minerals, such as zinc (61, 62).In fact, studies indicate that modern wheat may be lower in minerals than many ancient types of wheat (62, 63).Other than its higher mineral content, spelt is not clearly more beneficial than whole-grain common wheat.SUMMARY Spelt may have a higher mineral content than common wheat. However, this difference is unlikely to have any major health effect.Wheat is not only one of the worlds most common foods but also one of the most controversial.People who are intolerant to gluten need to eliminate wheat from their diet entirely.However, moderate consumption of fiber-rich whole wheat may be healthy for those who tolerate it, as it may improve digestion and help prevent colon cancer.Ultimately, if you enjoy breads, baked goods, and other wheat products in moderation, this ubiquitous grain is unlikely to harm your health. Want to know more about wheat but dont know where to turn? Youve come to the right place.Wheat 101 has the basic information about wheat facts, nutrition and health, and flour & baking. Youll find even more info throughout the site, but this is an excellent place to start. Hard Red Winter has its roots firmly planted in the Great Plains (Texas, Oklahoma, Kansas, Colorado and Nebraska) and is scattered a bit in other states, as well. It is great for bread and all-purpose flour. Versatile, with excellent milling and baking characteristics for pan bread, Hard Red Winter wheat is also a choice wheat for Asian noodles, hard rolls, flat breads, general purpose flour and cereal. Hard Red Spring comes primarily from the Northern States (Montana, South Dakota, North Dakota and Minnesota). The aristocrat of wheat when it comes to designer wheat foods like hearth breads, rolls, croissants, bagels and pizza crust, Hard Red Spring wheat is also a valued improver in flour blends. Soft Red Winter is found mostly east of the Mississippi River. For you cookie monsters out there, this is the wheat for you! It is a great, weak-gluten (low protein) wheat with excellent milling and baking characteristics for cookies, crackers, pretzels, pastries and flat breads. West Coast represent! Soft White Wheat calls the Pacific Northwest (Washington, Oregon and Idaho) its home. This low moisture wheat with high extraction rates creates a whiter product, making it ideal for mouth-watering cakes, pastries, Asian-style noodles andMiddle Eastern flat breads. This is the newest class of U.S. wheat! Hard white shares its territory with Hard Red Winter wheat, but is grown on a much smaller scale. This class is great for Asian Noodles (ramen, anyone?) tortillas and flatbreads. Hard White wheat receives enthusiastic reviews when used for whole wheat or high extraction applications, like white whole wheat pan breads. Look for labels that say whole wheat, but appear white in color. Durum is for you pasta lovers out there! Its grown primarily in Montana and North Dakota with a smidge grown in Arizona, California and South Dakota. This wheat has a high protein (aka gluten) content that is perfecto for pasta and couscous and some Mediterranean breads. Durum is the hardest of all wheats and has a rich amber color. The trigo plant, widely known as wheat, is one of the worlds most significant cultivated crops. This cereal grain is a fundamental dietary component for a substantial portion of the global population. Its widespread cultivation across diverse climates highlights its adaptability and profound influence on human civilization. What is the Trigo Plant?The trigo plant, or wheat (genus Triticum), is an annual herbaceous grass that typically grows to about 1.2 meters in height. Its slender, erect stems, known as culms, are generally hollow except at the nodes. Leaves emerge from these nodes, with a sheath wrapping around the stem and a long, flat blade. The uppermost leaf, the flag leaf, is important for photosynthesis and grain development.The plant develops a fibrous root system, with some varieties extending roots as deep as 2 meters. At the top of each culm, wheat forms a dense head or spike, often called an ear. This spike consists of numerous spikelets, each containing several small flowers called florets. After pollination, these florets develop into wheat grains.Wheat species are broadly categorized based on their genetic makeup. Common wheat (Triticum aestivum), a hexaploid variety (containing six sets of chromosomes), is widely used for bread. Durum wheat (Triticum turgidum), a tetraploid variety (with four sets of chromosomes), is primarily used for pasta production. These classifications reflect differences in characteristics and applications. Where Trigo Comes FromThe origins of the trigo plant trace back approximately 12,000 years to the Fertile Crescent, a region in the Near East. Early evidence suggests that wild emmer wheat (Triticum dicoccoides) was first domesticated here, marking a significant shift from hunting and gathering to settled agricultural communities. This area provided an ideal environment with wild grasses and a climate favoring cereal growth and storage.Following its domestication, wheat gradually spread from the Fertile Crescent across continents through trade routes, human migration, and exploration. It reached Greece around 6500 BCE and Germany by 5000 BCE, becoming a staple crop in ancient civilizations such as the Mesopotamians, Egyptians, Greeks, and Romans. This agricultural expansion laid the groundwork for the development of complex societies by providing a stable food supply and enabling population growth.Today, wheat is cultivated globally. Its historical journey highlights its remarkable adaptability and influence on dietary practices and agricultural systems worldwide. Growing the Trigo PlantCultivating the trigo plant requires specific environmental conditions and careful management. Wheat generally thrives in cool, sunny winters and temperate climates, with optimal growth temperatures ranging from 20 to 23C during vegetative growth and 23 to 25C during grain filling. It can grow in various soil types, but well-drained, fertile loam or clay-loam soils with a pH between 5.5 and 7.5 are ideal.Farmers typically choose between planting winter wheat in the fall (late September to early November in the Northern Hemisphere) or spring wheat in the spring (late March to early May), depending on the regional climate and specific variety. Winter wheat establishes a strong root system before cold weather, while spring wheat is sown as soon as soil temperatures reach around 10C. Seeds are commonly planted at a depth of 2.5 cm for spring wheat and 5 cm for winter wheat. Seeding rates typically range from 1.2 to 2.2 million seeds per acre for winter wheat.Crop management involves several practices to ensure a healthy yield: Soil preparation: Plowing and harrowing create a fine, uniform seedbed for aeration and water infiltration. Fertilization: Nitrogen, phosphorus, and potassium are adjusted based on soil tests, with nitrogen often applied in split doses to support growth and enhance grain protein. Water management: Wheat requires 380 to 635 millimeters of water, with irrigation important during tillering, flowering, and grain filling. Pest and disease control: Measures are implemented to protect the crop. Harvesting: Occurs when grain moisture content is around 13-15%, indicated by hard, crunchy kernels and bending stems.Wheat is a type of grass thats grown all over the world for its seeds, which we know as cereal grains. Its one of the most important foods globally. Common wheat is the most widely grown type. People began farming wheat way back around 9600 BC in the Fertile Crescent area. The wheat kernel is actually a kind of fruit called a caryopsis. Its grown on more land than any other food crop, covering about 220.7 million hectares or 545 million acres in 2021. Wheat is so popular that the world trades more of it than any other crop combined. In 2021, the world produced a whopping 771 million tonnes (850 million short tons) of wheat, making it the second most-produced cereal after maize (also known as corn in some places). Since 1960, wheat and other grain production has tripled, and its expected to keep growing until at least the middle of the 21st century. Wheat is in high demand because gluten, a protein found in wheat, is very useful in the food industry. Wheat is a big source of carbohydrates. Its also the top source of vegetable proteins for humans worldwide, containing about 13% protein. While wheat has more protein than other major cereals, its not the best quality protein. When we eat whole grains like wheat, we get lots of nutrients and dietary fiber. For some people, though, gluten can cause health problems. Conditions like coeliac disease, noncoeliac gluten sensitivity, gluten ataxia, and dermatitis herpetiformis can be triggered by gluten, which is the main protein in wheat. This Article is Part of our Series on Crop Production. Click Here for our Comprehensive Overview of Worldwide Crop Production Wheat is an incredibly versatile crop, and its uses are diverse and widespread. Some of the most common uses of wheat include: Wheat is a fundamental grain consumed worldwide. Raw wheat kernels can undergo various processes, such as grinding into flour or, if using hard durum wheat, milling into semolina. They can also be germinated, dried, and turned into malt, or crushed and cracked into cracked wheat. Parboiling, steaming, drying, crushing, and de-branning raw wheat produces bulgur, also known as groats. At the milling stage, wheat is often separated into different parts, with the outer husk or bran utilized in several applications.Wheat serves as a primary ingredient in a wide array of foods, including bread, porridge, crackers, biscuits, muesli, pancakes, pasta, pies, pastries, pizza, semolina, cakes, cookies, muffins, rolls, doughnuts, gravy, beer, vodka, boza (a fermented beverage), and breakfast cereals. In food manufacturing, gluten plays a crucial role in imparting viscoelastic properties to dough, enabling the creation of various processed foods like breads, noodles, and pasta, which facilitate wheat consumption. Wheat is also used as a feed grain for livestock such as cattle, pigs, and poultry. It provides essential nutrients and energy for animals in the form of grain or processed products like wheat bran and wheat middlings. Wheat can be processed into biofuels, such as ethanol, which can be used as a renewable energy source for transportation. Ethanol is typically produced from wheat grain through fermentation and distillation processes. Wheat straw, the stalks left over after harvesting wheat grains, can be processed into fiber and used in the production of paper, packaging materials, and even textiles. However, this use is less common compared to other crops like cotton. Wheat straw is also being explored as a renewable and biodegradable alternative to plastic in packaging materials, such as disposable plates, bowls, and cups. Overall, wheat is a crucial crop with diverse applications across various industries, making it one of the most important staple crops globally. The history of wheat is a fascinating journey that spans thousands of years, intertwining with the development of human civilization, agriculture, and the shaping of cultures worldwide. Heres an extensive overview of the history of wheat: Wheat (Triticum spp.) is believed to have originated in the Fertile Crescent, a region in the Near East encompassing parts of modern-day Iraq, Syria, Turkey, and Iran. The earliest evidence of wheat cultivation dates back to around 9600 BC in this region, making it one of the earliest domesticated crops in human history. Ancient grains such as einkorn (Triticum monococcum) and emmer (Triticum dicoccum) were among the first varieties of wheat to be cultivated by early farmers. These primitive wheats had tough husks surrounding the grains, which required processing before consumption. Wheat cultivation gradually spread from the Fertile Crescent to neighboring regions of the Middle East, North Africa, and Europe, facilitated by the movement of people, trade, and cultural exchange. Over time, different varieties of wheat were developed to suit various climates and growing conditions. Wheat played a crucial role in the rise of ancient civilizations such as Mesopotamia, Egypt, Greece, and Rome, where it served as a staple food and formed the basis of their economies. Throughout history, farmers selectively bred wheat to improve its yield, nutritional content, and adaptability to different environments. Hybridization and crossbreeding techniques were employed to develop new wheat varieties with desirable traits such as higher yields, disease resistance, and improved processing qualities. The advent of agriculture revolutions, such as the Neolithic Revolution and the Green Revolution, led to significant advancements in wheat cultivation, resulting in increased productivity and food security for growing populations. In ancient civilizations, wheat held immense cultural and religious significance. It was revered as a symbol of fertility, abundance, and divine providence, often featured in religious ceremonies, rituals, and mythologies. The ancient Egyptians worshipped the goddess Isis, who was associated with wheat and grain harvests. In ancient Greece, wheat was dedicated to the goddess Demeter, the deity of agriculture and fertility. The industrial revolution in the 18th and 19th centuries brought significant changes to wheat cultivation and processing. Mechanization, improved agricultural machinery, and the adoption of modern farming techniques revolutionized wheat production, leading to higher yields and increased efficiency. The development of steam-powered mills and later, roller milling technology, revolutionized wheat milling and flour production, making it faster, more efficient, and accessible to a wider population. In the modern era, wheat production faces numerous challenges, including climate change, soil degradation, water scarcity, pests, and diseases. To address these challenges, scientists and agricultural researchers are continuously developing innovative solutions, such as drought-tolerant wheat varieties, precision agriculture techniques, and sustainable farming practices. Biotechnological advancements, including genetic engineering and genome editing, hold promise for creating wheat varieties with improved traits, such as disease resistance, nutritional quality, and environmental sustainability. Today, wheat remains one of the most important cereal crops globally, serving as a staple food for billions of people. It is cultivated on vast expanses of land across six continents, with major producing regions including North America, Europe, Asia, and Australia. Wheat plays a vital role in food security, nutrition, and livelihoods for millions of farmers and communities worldwide, making it a cornerstone of global agriculture and human civilization. Wheat is classified into several types, each with unique characteristics, uses, and adaptations to different climates and geographical areas. Heres an overview of the primary types of wheat: Hard Red Winter Wheat: Grown primarily in the Great Plains of North America, this wheat is hardy and planted in the fall. It has a high protein content, making it suitable for bread-making and other baked goods. Durum Wheat: This is the hardest of all wheat types, with a high protein content and a golden color. Its primarily grown in the northern U.S. and Canada and is used to make semolina flour for pasta and couscous. Hard Red Spring Wheat: Known for its high protein content, this wheat is planted in the spring. Its primarily grown in the northern U.S. and Canada and is also favored for bread-making due to its strong gluten content. Soft Red Winter Wheat: This type has a lower protein content and is softer than hard red winter wheat. Its grown in the eastern and southern U.S. and is used for making cakes, pastries, flatbreads, and crackers due to its lower gluten strength. Hard White Wheat: Similar in protein content to hard red wheat but with a lighter-colored bran and milder flavor, hard white wheat is used for whole wheat and high extraction flour applications, favored for making whole wheat bread, Asian noodles, and tortillas. Soft White Wheat: With a lower protein content, soft white wheat has a sweet, mild flavor and is grown primarily in the Pacific Northwest of the U.S. Its used for bakery products that dont require strong gluten, such as pastries, cakes, and Asian-style noodles. Einkorn Wheat: An ancient wheat variety, einkorn is known for its nutritional qualities and is considered more digestible for some people with wheat sensitivities. It has a lower yield than modern wheat and is used in some artisan bread and pasta. Emmer Wheat: Also known as farro in Italy, emmer is another ancient wheat variety. It has a rich history of cultivation and is now enjoyed for its nutty flavor, used in specialty bread, pasta, and other dishes. Spelt Wheat: Spelt is an ancient grain that has gained popularity in recent years for its nutty flavor and nutritional profile. It can be used in many of the same applications as common wheat but is especially popular in health food products. Each type of wheat is suited to specific climates, growing conditions, and end-use applications, reflecting the versatility and global importance of wheat as a crop. In 2023, approximately 780 million metric tons of wheat were produced globally. Of these, China, India, Russia and the United States account for the largest producers. Wheat is also grown extensively in Europe with some of the most productive wheat yields found in the United Kingdom, France and Denmark. This table provides a snapshot based on the latest global production figures from the UN Food & Agriculture Organization in 2023: RankCountryWheat Production (Million Metric Tons)1China1362India1093Russia864United States455France406Pakistan267Ukraine258Germany229Canada2210Turkey2011Australia2012United Kingdom1413Kazakhstan1314Argentina1215Iran1216Poland1117Egypt918Italy819Spain720Romania7 Source: Food & Agriculture Organization Wheat production is highly dependent on various factors including weather conditions, farming practices, and geopolitical issues, which can cause fluctuations in the output of these countries from year to year. The average yield of wheat per acre can vary significantly depending on several factors, including the wheat variety, soil fertility, weather conditions, farming practices, and geographical location. Advances in agricultural technology, improved wheat varieties, and better management practices have steadily increased wheat yields over the years. As of my last update in April 2023, in the United States, the national average wheat yield for the 2022 crop year was about 46.3 bushels per acre according to the United States Department of Agriculture (USDA). However, this figure can vary widely. For example, in high-yielding areas with optimal conditions and intensive farming practices, yields can exceed 100 bushels per acre. In contrast, in regions with less favorable conditions or where minimal inputs are used, yields might be significantly lower. Internationally, average yields can also vary widely. Countries with highly developed agricultural sectors like those in Western Europe (e.g., France, Germany, and the UK) often report higher average yields, which can range from 60 to over 120 bushels per acre due to intensive farming practices, high soil fertility, and favorable climates. In contrast, in many developing countries where resources for inputs (like fertilizers and pesticides) and access to advanced farming technology are limited, yields can be considerably lower. Its important to note that wheat yields are expressed in bushels per acre in the United States and some other countries, but in kilograms per hectare or metric tons per hectare in many parts of the world. To convert bushels per acre to kilograms per hectare, you can multiply the bushels per acre by a factor (for wheat, its about 67.25 kg/bushel) and then by the conversion factor for acres to hectares (1 acre is approximately 0.404686 hectares). Wheat production involves several stages, from preparing the land for planting to harvesting and processing the grains. Heres an overview of the typical process: Land Preparation: Before planting, farmers prepare the land by plowing, harrowing, and leveling the soil to create a suitable seedbed. This process helps to break up soil clumps, remove weeds, and improve soil structure for optimal seed germination and root growth. Seed Selection and Planting: Farmers select wheat seeds based on factors such as yield potential, disease resistance, and suitability to local growing conditions. The selected seeds are planted in rows or broadcast across the field using various planting equipment, such as drills or seeders. Planting usually occurs in the fall (for winter wheat) or spring (for spring wheat), depending on the wheat variety and regional climate. Crop Management: Throughout the growing season, farmers monitor and manage the crop to promote healthy growth and minimize pest and disease pressure. This may involve applying fertilizers to provide essential nutrients, controlling weeds through herbicide application or mechanical methods, and protecting against diseases and pests using fungicides or insecticides as needed. Irrigation (if applicable): In regions where rainfall is insufficient or unreliable, farmers may irrigate their wheat fields to ensure adequate moisture levels for optimal growth and development. Irrigation methods vary and can include surface irrigation, sprinkler systems, or drip irrigation, depending on factors such as water availability and soil type. Crop Monitoring: Farmers regularly monitor their wheat crops throughout the growing season, assessing factors such as plant health, growth stage, and pest/disease incidence. This allows them to make informed decisions regarding crop management practices, such as adjusting irrigation schedules, applying additional inputs, or implementing pest control measures as needed. Harvesting: When the wheat plants reach maturity and the grains have fully developed, its time for harvest. Harvesting methods vary depending on factors such as crop size, terrain, and equipment availability. Common harvesting techniques include using combine harvesters equipped with cutting platforms to cut and thresh the wheat in one pass, or swathing the crop to allow it to dry before combining. Processing and Storage: Once harvested, the wheat grains are transported to processing facilities, where they undergo cleaning, drying, and milling to remove impurities and produce various wheat products such as flour, bran, and germ. The processed wheat products are then packaged and stored for distribution and sale to consumers, food manufacturers, and other end-users. Throughout the entire production process, careful management practices are employed to optimize yields, quality, and sustainability while minimizing environmental impact and resource use. Crop rotation, soil conservation techniques, and integrated pest management are among the strategies employed to ensure the long-term viability of wheat production systems. Wheat is susceptible to a variety of diseases caused by fungi, bacteria, viruses, and other pathogens. These diseases can significantly reduce yields and quality if not managed effectively. Some of the most common diseases affecting wheat include: Rusts (Stem, Leaf, and Stripe Rust): Rust diseases, caused by various species of the fungi Puccinia, are among the most damaging wheat diseases worldwide. They manifest as reddish-brown pustules on leaves, stems, and sometimes grains, leading to reduced photosynthesis, weakened plants, and yield losses. Fusarium Head Blight (Scab): Caused by species of Fusarium fungi, particularly Fusarium graminearum, Fusarium head blight affects wheat heads during flowering, leading to blighted grains, reduced yield, and mycotoxin contamination. It also affects grain quality, reducing its market value. Powdery Mildew: Powdery mildew, caused by fungal pathogens such as Blumeria graminis f. sp. tritici, appears as a powdery white growth on leaves, reducing photosynthesis and causing premature senescence. Severe infections can lead to yield losses and reduced grain quality. Septoria Leaf Blotch: Septoria tritici and Septoria nodorum are fungal pathogens that cause leaf blotches on wheat plants. These diseases affect lower leaves first, causing chlorosis, necrosis, and premature defoliation, leading to yield losses if left uncontrolled. Tan Spot: Caused by the fungus Pyrenophora tritici-repentis, tan spot manifests as tan lesions with dark borders on wheat leaves. It can reduce photosynthesis, weaken plants, and decrease grain yield and quality. Stagonospora Nodorum Blotch: Stagonospora nodorum (also known as Parastagonospora nodorum) causes a foliar disease known as Stagonospora nodorum blotch (SNB) or Septoria nodorum blotch (SNB). It affects wheat leaves, causing lesions with dark borders and reducing photosynthesis, yield, and grain quality. Take-All: Take-all, caused by the fungus Gaeumannomyces graminis var. tritici, is a root and crown disease that affects wheat and other cereals. It leads to stunted growth, root rot, and poor nutrient uptake, resulting in yield losses and poor stand establishment. Wheat Streak Mosaic Virus: This viral disease, transmitted by wheat curl mites, causes yellow streaking and mosaic patterns on wheat leaves, reducing photosynthesis and causing stunting and yield losses. Barley Yellow Dwarf Virus: Barley yellow dwarf virus (BYDV) is a viral disease transmitted by aphids that infects wheat and other cereal crops. It causes yellowing, stunting, and reduced tillering, leading to yield losses and poor grain quality. Ergot: Ergot, caused by the fungus Claviceps purpurea, infects wheat spikes, producing toxic alkaloids that contaminate grains. It poses risks to human and animal health and can lead to significant economic losses if contaminated grains are not detected and removed. Effective management of these diseases involves a combination of cultural practices, crop rotation, resistant varieties, chemical control methods (fungicides, bactericides, and insecticides), and integrated pest management (IPM) strategies to minimize their impact on wheat production. Regular scouting, timely diagnosis, and appropriate disease management practices are essential for maintaining healthy wheat crops and maximizing yields and quality. Food and Agriculture Organization of the United Nations U.S. Department of Agriculture Crop Acreage & Yield In the last few years, people have become increasingly concerned about eating wheat. Its been linked to wheat allergies, celiac disease, and more. Yet you may have also heard that wheat has many nutritional benefits. So is wheat really good for you?There are two main types of wheat. The most common type is bread or common wheat, also known as Triticum aestivum vulgare. Durum wheat, or Triticum turgidum durum, is the other type. Most pasta is made from durum wheat.Wheat flour is a key ingredient in many foods. These include pasta, noodles, bread, couscous, and baked goods like cakes and biscuits.Wheat can be problematic because of the gluten found in it. Gluten is a protein that can cause side effects in some people. But most people can eat gluten without any issues.Some conditions associated with wheat include:Celiac disease. This is an autoimmune condition. If you have celiac disease, your body launches an immune response in your small intestine when you eat gluten. This reaction eventually damages the lining of your small intestine, causing it to absorb fewer nutrients. Wheat allergy. This is an allergy to wheat and wheat products. Its more common in children than in adults.Non-celiac gluten sensitivity. Recently, more people have reported symptoms after eating wheat. These symptoms, such as headaches, fatigue, and muscle pains, are not allergy- or autoimmune-related.A 3.5 ounce serving of unenriched whole wheat flour contains:15 grams of protein10.6 grams of dietary fiber71.2 grams of carbohydrates38 milligrams of calcium136 milligrams of magnesium352 milligrams of phosphorus376 milligrams of potassium39 micrograms of folate5.5 milligrams of niacin0.5 milligrams of thiaminYouve probably heard that whole grains are better for you. But what are whole grains?Wheat kernels have three parts:Bran: the outer layerGerm: the core of the kernelEndosperm: the starchy middle layerTo make white flour, the wheat kernel is stripped of its bran and germ and left with just the endosperm. The layers that are removed are rich in fiber, B vitamins, antioxidants, phytochemicals, and minerals like iron, copper, zinc, and magnesium.The endosperm contains only protein, carbohydrates, and a small number of B vitamins and minerals.The 2020 to 2025 Dietary Guidelines for Americans recommend eating 3-5 servings of grain daily.Wheat is a good source of carbohydrates and some vitamins and minerals. Whole wheat, in particular, has many benefits for your health.High in carbohydrates. Carbohydrates are important to your health. Your body needs carbs to work properly. The Dietary Guidelines for Americans say that 45% to 65% of your total daily calories should be carbohydrates.Carbs have several functions in your diet. They:Provide energy: Your body breaks down the starches and sugars into glucose (blood sugar). It uses this glucose for energy.Help control your weight: The fiber found in many carbohydrates helps you feel full.Protect against some diseases: Whole grains can help lower your risk of cardiovascular disease. You also need fiber for digestion.Contains protein. Every cell in your body contains protein. Protein is made up of amino acids. Your body makes most of the amino acids it needs, but nine of them must come from the food you eat.Experts recommend that protein make up 10% to 35% of your total calories. You should try to get your protein from plants, such as legumes, nuts, seeds, and whole grains. Protein content differs among wheat types. Harder wheat like durum, which is used for pasta, contains more proteins. Protein can make up between 8.5% to 15% of wheats dry weight.An important source of minerals. Wheat contains many minerals. The concentration of minerals in wheat is determined by the type, soil, climate, and agricultural practices, such as organic farming. Whole wheat flour is richer in minerals and vitamins than white flour. Your body needs minerals for:Regulating enzyme systemsBuilding bones and teethHelping with muscle contractionsReleasing energy from foodMaintaining your bodys pH balanceResearchers say that eating certain types of whole-grain flour can provide you with more than 70% of your daily recommended intake of the following minerals:SeleniumIronMagnesiumManganeseZincCopperPhosphorusAntioxidants. Wh