The basics of vertical farming

Farms often inspire awe thanks to their beauty and the serenity of the areas that surround them. Though no farms may inspire such feelings as strongly as those in the heart of the countryside, another type of farm can induce a sense of awe as well.

Vertical farms vary in size, but the largest ones mimic the appearance of skyscrapers if the skyscrapers were made from plants. According to the U.S. Department of Agriculture, increasing production of fresh greens and vegetables near urban populations will be a necessity in the decades to come. That's because estimates from the United Nations indicate the global population will exceed nine billion persons by 2050, by which time two-thirds of the world's people will live in urban settings. Vertical farming could be vital to meeting the demands for healthy foods by 2050, making it worth anyone's while to gain a basic understanding of this unique way to grow fresh fruits and vegetables.

What is vertical farming?
Vertical farming is a type of controlled environment agriculture (CEA). According to the New York State Energy Research and Development Authority, CEA combines engineering, plant science and computer-managed greenhouse control technologies to optimize plant growing systems. CEA systems enable stable control of the plant environment, making it possible for growers to control temperature, light and CO2 during the growing process.

Vertical farms grow foods in stacked layers, which gives large vertical farms their skyscraper-like appearance. Some vertical farms employ techniques similar to greenhouses, utilizing natural light when it's available and augmenting that with artificial lighting to ensure the plants grow regardless of the conditions outside.

What are some advantages to vertical farming?
Perhaps the biggest advantage to vertical farming is the potential for the practice to meet future food demands in a way that the USDA deems environmentally responsible and sustainable. Vertical farming operations in urban areas can offer lower emissions because fresh fruits and vegetables will not need to be transported from rural areas to urban locales.

The USDA also notes that vertical farming operations reduce water runoff by a considerable margin, helping to conserve water. The Vertical Harvest farm in Jackson, Wyoming, produces 100,000 pounds of vegetables per year and uses a fraction of the water of traditional farms with similar outputs. Utilizing hydroponics and moving carousels, Vertical Harvest consumes 90 percent less water than traditional farms.

Access to nutrient-rich foods is another benefit to vertical farms. As urban populations grow and climate change affects crop yields, city dwellers may struggle to procure healthy, nutrient-rich foods like fruits and vegetables. Vertical farming operations that are not vulnerable to climate change can eliminate that concern, ensuring urban populations access to healthy, nutritious foods.

Vertical farms can be awe-inspiring and figure to play a vital role in the future of agriculture.