

Vision of Future Foods

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Abstract

Technology interface in this modern era is of paramount importance for the sustainable Food Production. For Example, critical role of advanced sensor technologies to monitor crops, foods, and people throughout the food chain will be of paramount importance to optimize productivity as per future food requirement. The use of artificial intelligence, machine learning, and robots will be used to collect data and optimize the production, storage, transport, and marketing of our foods. These powerful methods may lead to a much more detailed understanding of the complex relationship between what we produce, what we eat, and our health status.

Keywords: *Vision; Future Foods; Food Production*

Future of food production

In coming future, it's very likely that a highly integrated system would be driven by the run by artificial intelligence and robots with minimal human interference. Another Example could be driverless tractors ploughing the fields and sowing the seeds at a time when conditions are deemed to be optimum based on a vast database of previous experience. These seeds will have been genetically edited to increase their yields, resilience, and nutritional value. Miniature sensors based system in the plants and soil will continuously monitor the crops and send out information about their nutrient and health status. Nano-enabled fertilizers and pesticides will be administered to the crops only when they are needed. Bee-sized drones will fly around and pollinate the plants. At just the right time, the crops will be harvested by robots and then transported under carefully controlled conditions to automated factories where they will be converted into foods by yet more robots. The foods will then be distributed to supermarkets, restaurants, and homes at precisely the time they are needed.

Future of food communication

Through supply chain, critical information about the health status, nutritional profile, and storage conditions of the final foods, as well as all their ingredients, will be recorded throughout so as to provide a detailed history. This information could be used that by factories, supermarkets, restaurants, and consumers to verify their origin and authenticity. This information will be accessed by consumers by scanning a food's label using their mobile phones. This system would increase consumer confidence in the providence of their foods and enable them to select foods that met their ethical and nutritional goals. Moreover, it would increase productivity, reduce waste, lessen pollution, and improve the sustainability of our food supply.

Examples of robotic farm

America's first autonomous robot farm (Iron Ox.) replaces humans with 'incredibly intelligent' machine. Iron Ox, based in California, aims to improve labor shortages and pressure to produce crops by using AI and heavy machinery. This farm has robots to plant, tend,

and harvest crops grown hydroponically. The robots are equipped with computer vision to recognize the plants and check on their health status, which they then report to an artificial intelligence program, known as the “Brain” which monitors and controls the whole process. Company claims that Robotic farm has an ability to “grow 30 times more produce than traditional farms” on the strength of AI software, year-round, soilless hydroponic processes, and moving plants as they grow to efficiently use space [1-10].



Figure 1: Representation of the Robotic Farm (Photograph taken from [10]).

Robotic farm will play key role to tackle challenges pertaining to the shortages in labor, variability in the weather pattern and ever-increasing demand and the need to grow more food. Powerful computers will store and process the vast amount of data collected. Artificial intelligence and machine learning will be used to optimize and control the entire food chain. Ideally, by finding connections between crops grown, foods consumed, and health outcomes the diet of the whole population could be improved. Robotic farm will improve food quality, reducing food waste, increasing sustainability, reducing pollution, and freeing up workers from arduous or tedious jobs. However, concern about the Job is still a matter to be discussed. Another concerns would be about the breakdown of computer? Would the benefits be equitably distributed to all sections of society?

Vegan or animal food?

The findings of the most advanced scientific research on a diverse range of topics, including nutrition, digestion, nutraceuticals, the microbiome, and global sustainability, support the dietary advice Graham advocated more than a century and a half ago: Eat plant-based foods; don't eat foods that are too highly processed; don't eat too much (Refer figure below). Rearing livestock for food is one of the major strains on our natural resources and environment [3]. For this reason, the focus of this chapter will be on replacing traditional animal products with more sustainable alternatives. In developed countries, animal products, such as meat, eggs, and milk, are consumed because of their taste and versatility, but also because they are a major source of nutritious proteins, vitamins, and minerals.

In response to rising consumer demand for meat alternatives, many food companies are developing innovative meat-free products. This may involve creating foods with similar properties to existing meat products, such as veggie burges or sausages, or developing alternative protein-rich products, like tofu or tempeh. We focus on the science behind the development of meat alternatives, but first, we must consider what gives real meat its unique characteristics. By deconstructing meat, we are in a better position to build healthier, more ethical, and sustainable alternatives that also taste great.

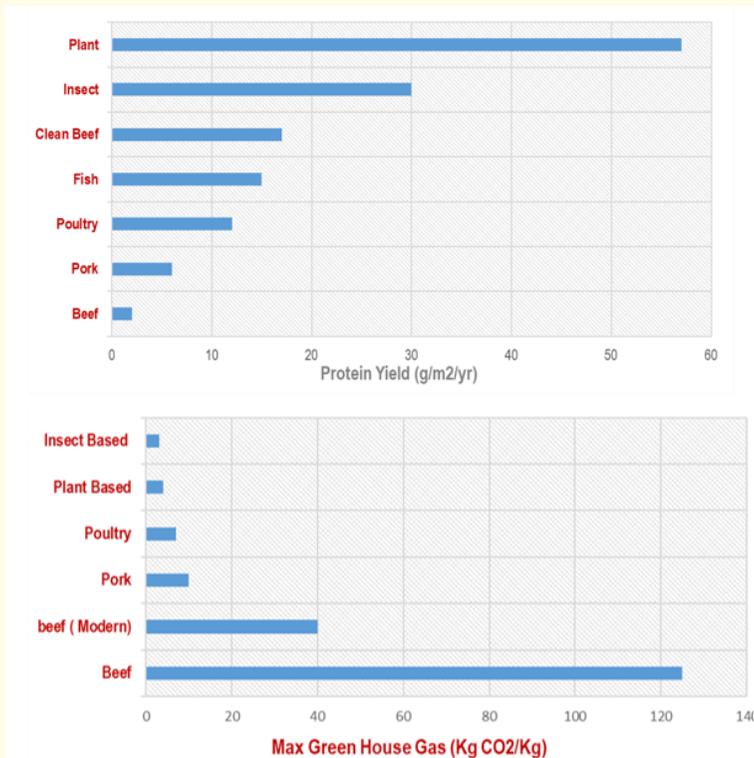


Figure 2: Graph depicting the dependence of annual protein Yield per unit area and Green House Gas Emission used from different source. Data adopted from [2].

Future Outlook

The Internet of Things (IoT) and Artificial Intelligence (AI) have been employed in agriculture practice along with the integration other much advanced computing technologies. The emergence of new advanced IoT technologies as well as robotic farms has the potential to monitor the agricultural environment to ensure high-quality products. However, we need to invest in research and development so as to have smart and sustainable agriculture production.

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