



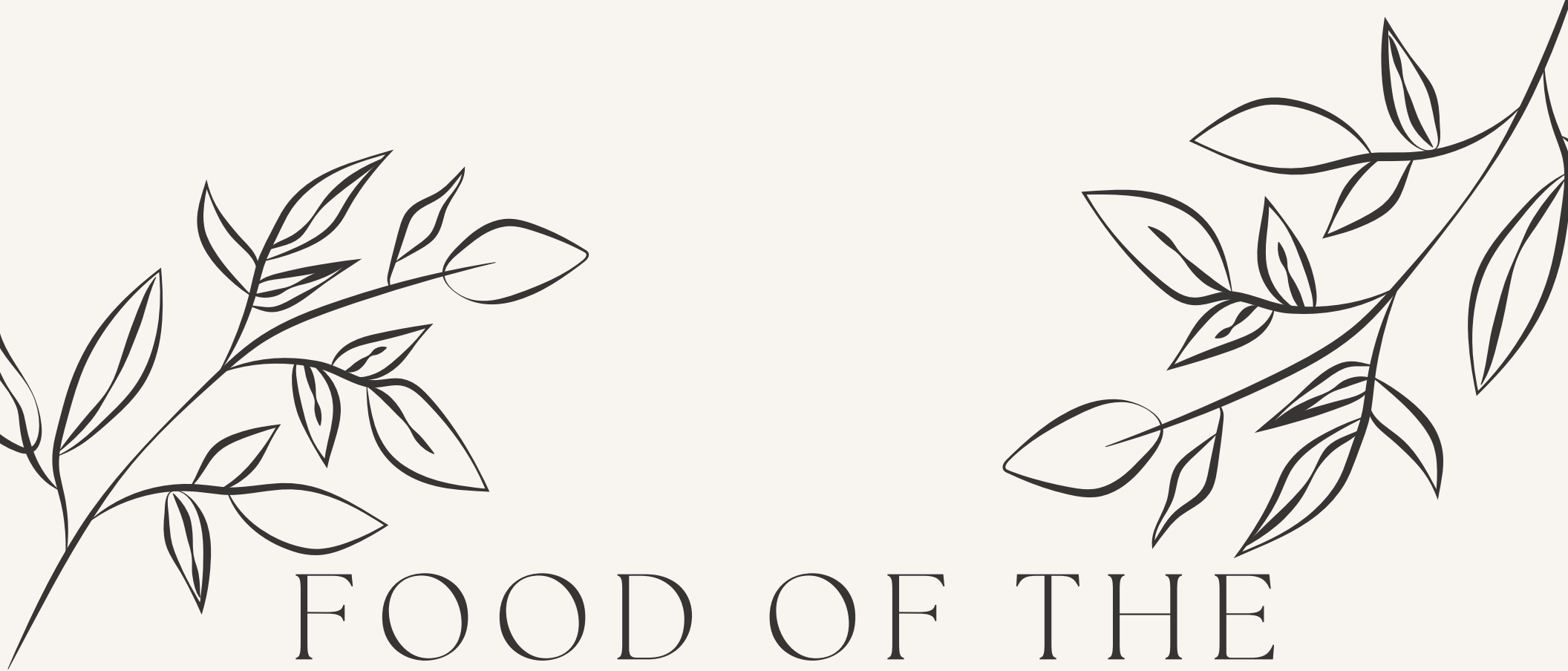
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FOOD OF THE FUTURE: WHAT'S ON THE MENU?

By Indra Brock-Fabel

In the future, human diets are predictably going to be adapted because of restraints on current food production that will only continue to worsen. All humans need a diet consisting of a variety of fats, minerals, carbohydrates, vitamins and protein to have a healthy lifestyle. Over time, humans have sourced these nutrients from the natural environment around them to create food. However, since industrial technology has evolved, so have these foods, as they become more processed for reasons of consumption, convenience and flavour. There are a number of issues affecting future food production, such as global warming, population increase, habitat loss, increased natural disasters as a result of climate change and the limitations of common foods consumed. Consequently humans, particularly in western cultures, will have to consider changing where crucial nutrients are sourced from. Additionally, in developing nations across the world, hunger is prominent even with the excessive amounts of food that is produced and ends up as waste in developed nations.

This menu will give an insight into what possible foods we should focus on cultivating for human health and the environment, as well as how we should enhance potential areas for food production.

INSECTS

Insects, while not a common cuisine, are one of the most promising foods for the future. As normal meats such as beef, pork, lamb and farmed fish are unsustainable for the environment with their water and land requirements as well as the greenhouse gas emissions that the animals or transportation make, insects are a successful alternative. Entomophagy, also known as the practise of consuming insects, is beneficial to the environment, economy, and the health of consumers. The nutritional value of insects is significantly higher than that of common meats derived from other mammals and birds, as they contain high amounts of protein, minerals, fibre and vitamins. Insects also have a higher conversion rate from feed to food, "every 10kg of feed provides 1kg of beef and 5kg of chicken, compared to 8-9kg of insects"(1). While insects may not seem to be the most appetising option of protein, the decreased space needed for farming is fundamental in improving food insecurity and to accommodate the growing population. Currently, the world uses 50% of habitat land for agriculture(2) and produces enough food to feed ten billion people(3) but is poorly distributed. Higher economically stable areas tend to consume large amounts of pasture fed meat, and as other countries become more developed, their diets will become similar. However, there is not enough area on the Earth to provide everyone with enough pasture fed meat, which is why our diet will have to adapt in the future.

Insect farming, compared to traditional livestock, uses an average of 40-80% less feed, 50-90% less land, 1000L less water and emit 2.7kg less greenhouse gases.



Image 1: photograph of edible crickets
(The Conversation, 2022)



Image 2: photograph of edible insects
(HPS 2021)

SEAWEED

Known as a vegetable of the sea, seaweed is plentiful in nutrients, including vitamins A, C and E as well as containing iodine, crucial for healthy thyroid function. What makes seaweed important for future diets is the fact that it is beneficial towards the environment and is one of the most sustainable types of agriculture. Seaweed is also known to absorb carbon dioxide but grows at a significantly faster pace of 30-60 times than most land plants. Additionally, plants like seaweed will contribute to lowering the acidity in the ocean which is a growing concern with the increasing amounts of carbon dioxide that is being absorbed. "If 9% of the world's ocean surface was used for seaweed farming, we would be removing 53 billion tonnes of CO₂ from the atmosphere" (4). Seaweed ocean farms require no resources such as fertiliser, fresh water or feed. Especially as factors such as poor waste management, over farming and deforestation are rapidly impacting the fertility of soil used for land crops, seaweed is a healthy alternative that needs to be incorporated into our diets more in the future.



*Image 3: photograph of a seaweed salad
(Healthline, 2021)*



*Image 4: photograph of edible seaweed
(Food and Nutrition, n.d.)*



*Image 5: photograph of traditional Japanese
Nori seaweed in dry, flat sheets, either unsalted
or as Ajitsuke (flavored)
(Japanese Food Guide, 2022)*

GENETICALLY MODIFIED ORGANISMS

Genetically modified organisms refer to organisms including animals, plants and microorganisms whose DNA has been altered artificially to benefit the environmental impact that it has, make it more nutritious or to make an organism more resistant to certain environments. Four types of genetically modified crops are already cultivated in Australia, including cotton, canola, Indian mustard and safflower(5). These have been modified mostly to withstand certain damaging insects and herbicides used in weed repellent to help farmers prevent a large loss in crop numbers. Genetically modifying a crop involves inserting new DNA into the plant cell's genome, which are then grown in tissue culture and developed into plants. Tissue culture refers to when tissue or cells are grown in an artificial environment of the right conditions where they can then be developed into a plant or animal.

GMO meat is not as commonly cultivated as crops, however there are a few examples of animals whose DNA has been modified. Most of these animals are used as "models" in labs to test certain gene functions as well as how they relate to diseases and health. However, some of these animals are modified for human consumption, an example being salmon. Some U.S brands sell GMO salmon that has been tested by the U.S Food and Drug administration to be safe to consume. The DNA in the salmon had been modified to mature faster, by making it produce an increased amount of growth hormones. This means every individual fish can be sold at full size after approximately 18 months compared to the average 3 years(6). GMO foods could become a common occurrence in our foods in the future or become more advanced for the many benefits that they hold, including being more sustainable for the environment by using less pesticides and transportation. Modifying our food could also be necessary with the changing environment and temperatures. However, this is a controversial food, as these modifications are not something that occur naturally.



*Image 6: photograph of a genetically engineered salmon and a farmed Atlantic salmon, both at 18 months old
(Living Oceans, n.d.)*



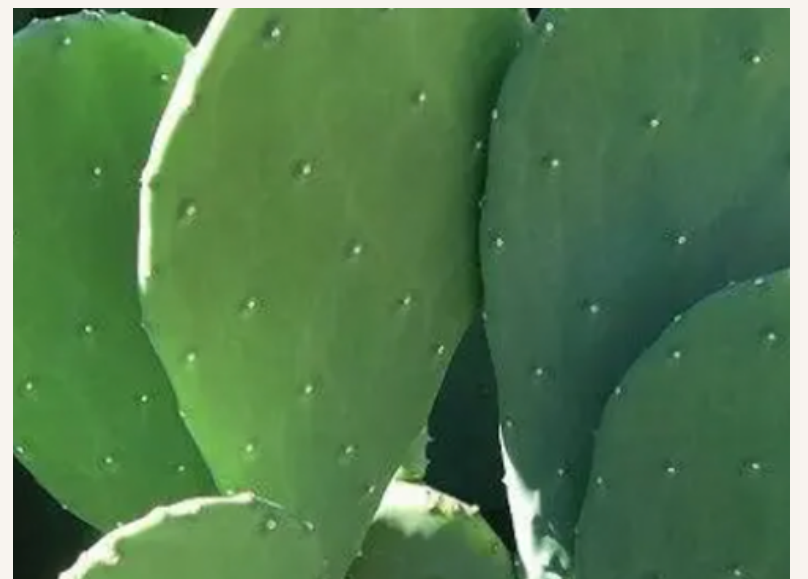
*Image 7: photograph of lab grown meat using biotechnology
(Live Science, 2022)*

CACTI

Cacti offer potential to contribute to our future diets for being sustainable, drought resistance and having nutritional value. Most cacti can be eaten raw or cooked, the most common species that is currently consumed is the leaves of the prickly pear cactus. Different parts of cacti can be utilised for consumption such as the “nopales” or pads of a cactus as well as some of the fruit that they produce. Cacti will also benefit making our diets more balanced and nutritious as they are known to contain fibre, vitamin C and minerals including magnesium and calcium. However, the most prominent reason to why this plant is needed for the future, is the arid desert environments that they thrive in. Climate change and limited freshwater resources means that the crops that we rely on for our meals are going to be challenged and is why cacti is an appealing food to produce. Therefore, resources such as irrigation, pesticides and fertilisers can be reduced, decreasing the overall environmental impact that agriculture causes. On the other hand, there are a few obstacles that would need to be overcome to make cacti a prevalent part in our diets including testing potential allergies towards certain species of the plant, increasing production and working out efficient farming techniques.



*Image 8: photograph of a prickly pear cactus
(Britannica, n.d.)*



*Image 9: photograph of a thornless edible
nopales prickly pear cactus
(Modern Farmer, 2022)*



FALSE BANANA

The close relative to the banana, known as the false banana or enset is found in Ethiopia and could be a potential superfood for the future. The fruit itself is not edible, but the starch from the stems and roots can be used to make bread and porridge when it is fermented. The plant is only farmed in Ethiopia but is currently used to feed 20 million people. This plant is needed for the future as it can be planted any time of the year and bear fruit any time of the year. If the plant is cultivated more, it is estimated to decrease world hunger rates across the rest of Africa, including Rwanda, Uganda, and Kenya. 60 of these plants can provide enough food for five people for one year(7). This plant is the key to ending food insecurity.



Image 10: photograph of fruit of the banana (left) and enset (right)
(BBC, 2022)



Image 11: photograph of false banana crops growing on a farm
(BBC, 2022)



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