

Table of contents

Production of food		3
Genetically modified food		4
Lab-grown meat		5
Vertical farming		6
35		
8	Eating habits in the future	
9	List of references	
12		

Production of food

The highest sales in Germany for the food industry are meat (21%) and milk as well as dairies (16%). The milk industry is big. Because of this the cow husbandry will grow up a lot. Cows produce a lot of methane and nitrous oxide and this is bad for the environment. After meat and milk come alcoholic drinks with about 9.6%.

Animal husbandry

The management from human to animal is called animal husbandry. Humans profit from it because they get meat and other products from animals like eggs or milk. The animal husbandry has grown up a lot in the last years because the population of the earth increases. The most useful animals are cows, which are responsible for the milk, yogurt or cheese, and pigs which are mostly responsible for “pork.”

Problems and solution

The animal husbandry will be a problem. Farmers don't come along with the production. Animals like cows will be a problem for the greenhouse effect in the future. Scientists are working on a lot of alternatives like lab-grown meat, plant-based food (for example egg yolk, mayonnaise, sauces) and more. Some grains like rice will be modified to produce vitamin A. The highest percentage of vitamin A have cow meat, pork and chicken. Rice is easier to produce and could be a good alternative, also to feed more people in the world. Another plant would be algae. Algae grow up in the ocean and is the fastest growing plant in the world. There are 10,000 types of algae and the taste can vary a lot.

Genetically modified food

Genetically modified food (GM foods) is today in about 70% of the food we eat. The sale of GM foods began in 1994 with delayed ripening tomato. To date, genetic modification of food is focused on soybean, corn, canola and cottonseed oil. With the modification they get for example resistance to pathogens and herbicides.



Production of GM foods

GM foods are generated in laboratories. This is done by adding genes to a plant's genome. Some other plant's can modified by cloning or removing of genes. After the plants are produced, they need a field test. If the field test is successful, the company need a admission to be marked. If all is done the seed can be produced in mass.

GM foods in Europe

The population is against GM foods. In Europe are 47 different plants allowed. Fruit and vegetables are not allowed. The GM products need a note on the package because of the non-acceptance.

Positive aspects of GM foods

GM foods have two big positive aspects. The product and the production. The end-product get a better quality, optimised form and taste. The production is faster, the plants are protected, more crop and a better grow of the plants. This all can be good for the dearth in the future. We all will eat GM food because there will be no other solution for the moment.

Lab-Grown meat

“Vitro meat” is lab-grown meat. The first vitro meat, made with a strip of muscle taken from a cow, was created by a dutch team. The meat has been eaten in a conference in London.

The meat costs 200.000 pounds to produce.



Production of meat:

The producing of vitro meat starts with taking muscle cells from an animal and applying a protein. The protein helps the cells to grow up. With this cells we would be able to produce endless meat without introduce new cells from animals. Theoretically we would be able to produce meat from all animals of the world.

Problems:

The lab-grown meat have still faces. The taster says that the mouthfeel is like normal meat but there is still missing the fad. Professors say it is a good start and it will take a while till the meat tastes 100% like normal meat.

Cost:

The costs of producing the burger with vitro meat are 200.000 pounds. The co-founder of Google spend 215.000 pounds for this project. In the future there will be more costs. It needs a lot of time till the burger will be in the supermarkets for a normal price.

Vertical farming

Problem:

In 2050 nearly 80% of the world's population will live in urban centers and the human population will increase about 3 billion people. To take care for so many people you need 109 hectares of new land (20% bigger than Brazil) to grow enough food to feed them, if they would use traditional farming practices as they are practiced today. To avoid this, Vertical Farming is a very good way to grow food in small areas.



What is Vertical Farming? :

General Informations:

Vertical Farming is an alternative to traditional farming. You grow plants in high-rise buildings.

It is like a multi-level green-house, because it also uses the natural sunlight. 1999 became the idea of Dickson Despommier. 2001 they developed the first draft for the building. 2009 they had the first mature concept. In 2011 they build a green-house in Suwon (South Korea)

Positive Aspects:

Another positive aspect (aside from the space it needs) is the protection of weather (hail, frost).

The plants never see chemistry, because the plants don't get in touch with the wildlife or have to resist to disease. Vertical farms could exploit methane digesters to generate a small portion of its own electrical needs. Methane digesters could be built on site to transform the organic waste generated at the farm into biogas which is generally composed of 65% methane

along with other gases. This biogas could then be burned to generate electricity for the greenhouse.

Negative Aspects:

The extra cost of lighting, heating, and powering the vertical farm may negate any of the cost benefits received by the decrease in transportation expenses. Vertical Farming isn't economical, because the costs for growing the plants are bigger than the profit. That's the reason why there are just few vertical farming buildings. A single Vertical Farming green-house with 60 hectare costs over \$100 million.

What is the Future for Vertical Farming?

We are at least 5 - 10 years away from such a concept. We still have enough land to feed the masses in most countries around the world, and we haven't reached crunch point just yet. However, I think that the concept needs to be given serious consideration, especially we don't depend on outlandish foods.

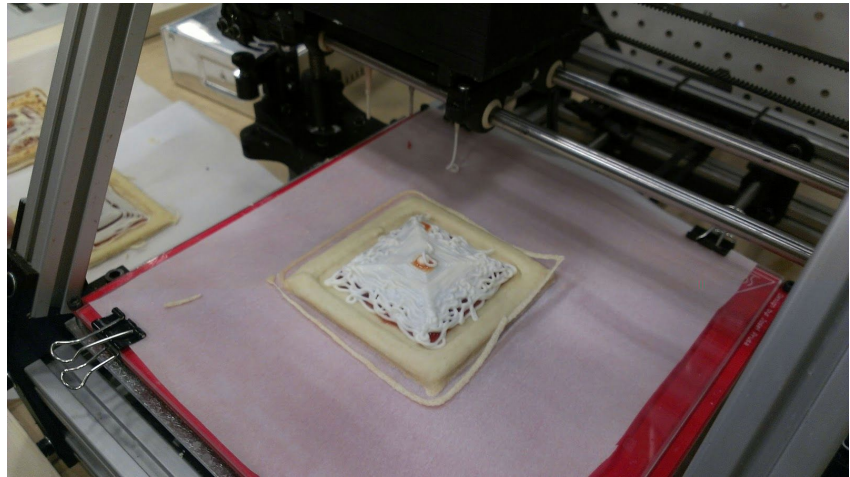
The Bottom line:

Vertical farms can effectually prove to be the alternative place for farming, only if certain inventive moves are taken. For example, vertical farms could produce their own power by using local renewable sources (solar, wind, tidal or geothermal) as well as by burning biomass from crop waste. One should remember that sustainable technologies should be employed in the first place to reduce the impact on overall energy consumption; and not the other way round.



3D - food printer

The idea of printing food, is based on an experiment of the NASA. In work with the Systems & Materials Research Corporation the NASA built the first prototype of a 3D-printer which can print food. The printer uses powdered food to create the things needed



for the meal. For example dough, cheese and sauce for a pizza. These ingredients get printed in layers. The storage life of the ingredients is up to 30 years. With this ability it is perfect for long space-missions.

Foodini

The Foodini is a 3D- food printer which was started in a kickstarter project. It's an 3D-printer which is just produced to print food. Its a very easy system. The owner has 6 container, where he can put in food-powder. The recipes for the meal can be downloaded from the website. The foodini will be available for around 1000€.



Eating habits in the future

How our future will look like, what are we going to eat? Especially on the question what we will eat, I will come closer in this text. As inhabitants of the earth we have only a limited space and a limited part of raw materials. Sometime the point will come that we have no more fossil raw materials, for example oil. What's than? For this time many labs look at the moment for solutions. Till 2050 the world population will increase by 3 billion people. That will create a new problem, because than we would need much more space to produce food. There are a few solutions which could help us solving these problems. I will concentrate on the changing eating habits of the people and the trends of vegetarianism and veganism.

Vegetarianism

Vegetarianism is a lifestyle which should give the people the feeling of being "alive". In this lifestyle they consume only such products which come from living animals, for example milk, eggs and honey. Meat and fish, and also the products which are made out of them, are avoided.

The both main forms of vegetarian food are the ovo-lacto and the vegan, while the lacto vegetarian and ovo vegetarian are not that popular. Ovo-Lacto vegetarians consume beside herbal food also eggs and milk. Lacto vegetarians avoid eggs. However, Ovo vegetarian consume eggs, but no milk. Vegan people avoid all products which are made from animals. This consumer behaviour often refers not only to food, but also to utensils, as for example leather goods, wool or silk.



Description: ▲	Avoidance from:
Lakto vegetarianism	Meat, fish and eggs
Ovo vegetarianism	Meat, fish and products out of milk
Ovo-lacto vegetarianism	Meat and fish
Vegan	All products of animals

But is veganism a good alternative and therefore a well-balanced feeding? I can't really answer this question with a clear "Yes" or a clear "No". There are too many criteria which are not sure at the moment. When you want to life vegan you have to take vitamins, because you don't get enough B12. B12 is a vitamin which is produced in the stomach. But the large intestine wall of humans is too thick to let the vitamin pass through it. The large intestine wall of animals isn't that thick, for example you can find B12 in meat and milk. For the daily need of 4 microgram vegans have to take products like VEG1. And here is the problem for me, I think a feeding isn't balanced when you have to take vitamins and stuff like this to get your daily need of vitamins.

Insects

Another solution could be insects, like locusts. They are very nutritious and can be bred easily in large quantities. In contrast to cows or other big animals, they don't need much space to raise them in large quantities. And a very important point, they need much less food to be raised than other animals need. These facts would make them to a perfect alternative for meat from cows, chicken and pigs.



But with insects, there is a big problem. A lot of people don't want to eat them because they combine them with bugs and trash. But that is just our prejudiced view. People who overcome their inhibitions say that they don't taste as bad as everybody thinks. Or another example, people who didn't know that they were eating insects. They were invited to a tasting in a restaurant. They thought that they would get served two normal burgers. It was a burger but out of locusts and one out of normal meat. After they finished eating they should rate and say which was the best. The insect burger won. With this example you can see that people more or less think before they do something, in this case we think too much. Little children are less complicated in this case. They try new things without all these thoughts older people have.



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