Topic 6 : Food Issues

learning objectives

1

Describe issues in food productions

contents

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INGREDIENTS AND ADDITIVES

definition ingredients

- Ingredients are the various raw materials, **such as fruits, vegetables, grains, meats, and spices,** that are used to prepare a dish or make a packaged food item. These components **contribute to the flavor, texture, nutritional content, and overall composition of the final product.**

- Ingredients can be natural or processed, and they are listed on product labels in descending order **by weight, with the primary ingredient listed first**.

definition additives

- Additives are **substances added to products during the manufacturing process to perform specific functions, enhance qualities, or extend shelf life**.
- Food additives can include **preservatives, colorings, flavorings, emulsifiers, stabilizers, and sweeteners**. These substances serve various purposes, such as **preventing spoilage, improving texture, enhancing flavor, or maintaining the appearance of the product**.
- Additives can be **natural or synthetic**, and they undergo strict regulatory scrutiny to ensure their safety for consumption.
- Food additives are assigned E numbers or other codes to facilitate identification and regulation. Additives must be listed on food labels, and regulations often specify permissible types and levels of use for each additive.

INGREDIENTS AND ADDITIVES ISSUES

NITRITES AND NITRATES

Some food additives and preservatives have been shown to have side effects in human and animal model

Frequently added to processed meats like bacon, ham, sausages and hot dogs.Helping to prevent the growth of harmful bacteria, improve salty flavour and increased the appearance of the meat products.

The nitrate binds to hemoglobin, and results in chemically-altered hemoglobin (methemoglobin) that impairs oxygen delivery to tissues, resulting in the blue color of the skin.

Exposure to higher level increased incidence of cancer in adults, brain tumors, leukemia, and nasopharyngeal tumors in children.

INGREDIENTS AND ADDITIVES ISSUES

MONOSODIUM GLUTAMATE (MSG) – is used in the food industry as a flavor enhancer with an umami taste that intensifies the meaty, savory flavor of food.

It is commonly used in Processed foods and drinks, soup mixes.

Destroy nerve cells in brain and linked with aggravating or accelerating Huntington's, Alzheimer's and Parkinson's diseases. Causes cancer, DNA damage and fetal abnormalities in animals, increases hyperactivity.

INGREDIENTS AND ADDITIVES ISSUES

ANATTO – is safe for most people when used in small amounts; however, it can cause rare allergic reaction for those who are sensitive to it.

- It has been linked to cases of food-related allergies.
- Anatto has accounted for 40 years of irritable bowel syndrome due to unrecognized sensitivity to anatto (Floch, 2009).
- Anatto dye is a potential rare cause of anaphylaxis (Stein, 2009).

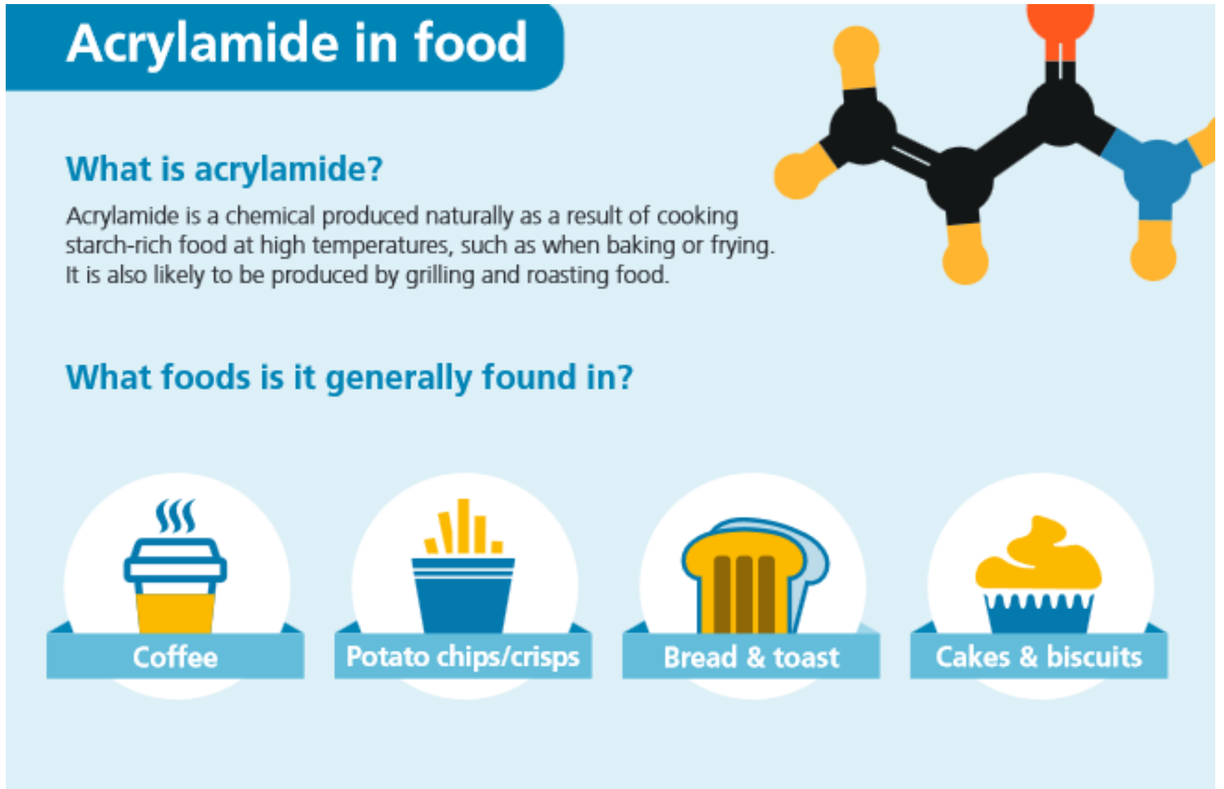
INGREDIENTS AND ADDITIVES ISSUES

ARTIFICIAL SWEETENERS – headaches are the common symptom that is being reported by consumers.

- One study confirmed that individuals with self-reported headaches after the ingestion of aspartame were indeed susceptible to headaches due to aspartame.

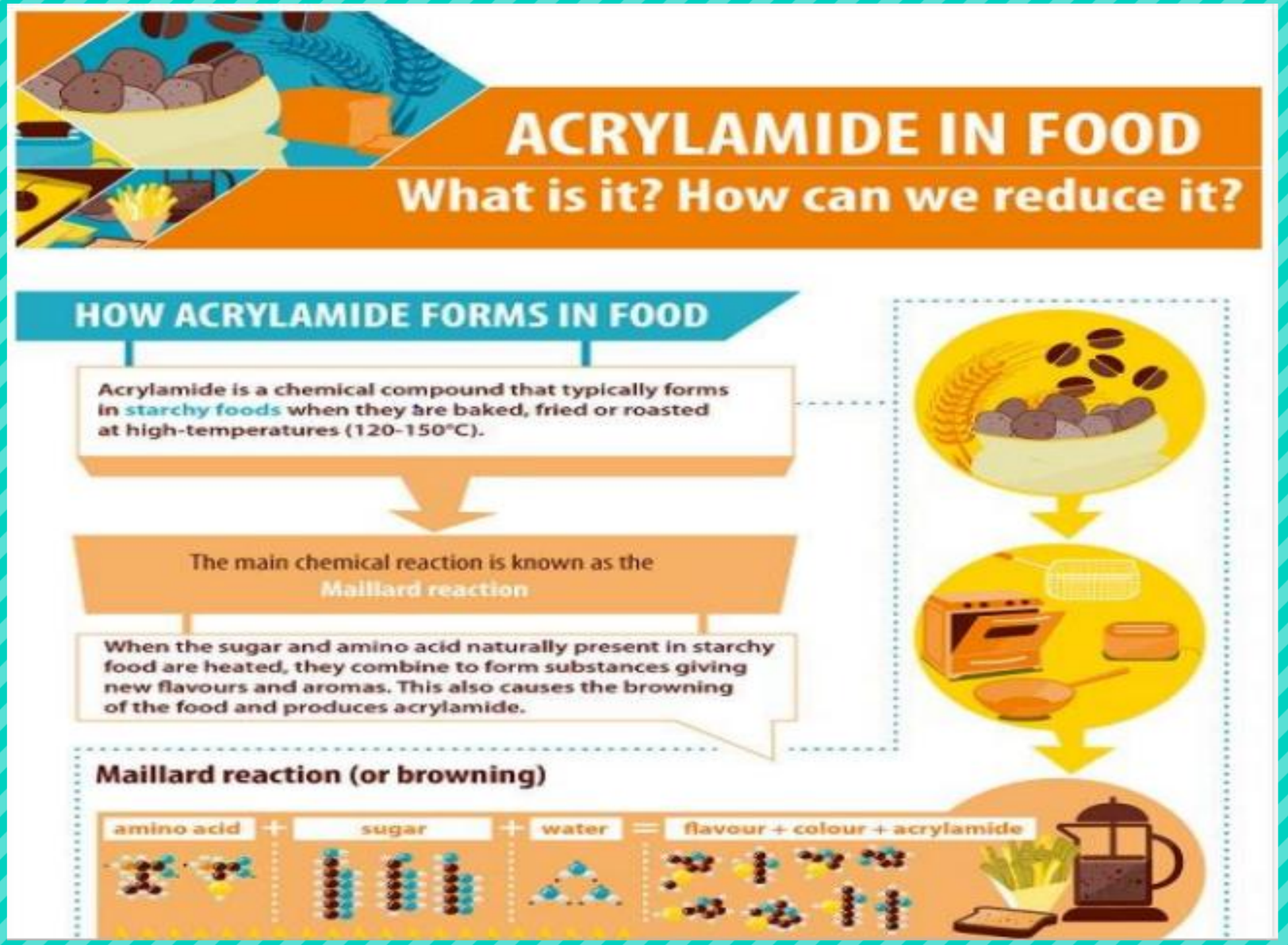
- Depression: In a study of the effect of aspartame on 40 patients with depression, the study was cut short due to severity of reactions within the first 13 patient tested. The outcome showed that individuals with mood disorders were particularly sensitive to aspartame and recommended that it be avoided by them (Kovacs, 2011).

INGREDIENTS AND ADDITIVES ISSUES



- Acrylamide is a chemical that can form in some foods during high temperature cooking processes, such as frying, roasting, and baking. Acrylamide in food forms from sugars and an amino acid that are naturally present in food; it does not come from food packaging or the environment.

INGREDIENTS AND ADDITIVES ISSUES



INGREDIENTS AND ADDITIVES ISSUES

Can acrylamide be avoided?

- Limit foods that might be high in acrylamide.
- Limit certain cooking methods, such as frying and roasting, and limit the time certain foods are cooked.
- Soak raw potato slices in water for 15 to 30 minutes before frying or roasting to reduce acrylamide formation during cooking.
- If frying potatoes or toasting bread, cook them to a lighter color (as opposed to dark brown), which produces less acrylamide.
- Avoid storing potatoes in the refrigerator, which can result in increased acrylamide levels during cooking.

INGREDIENTS AND ADDITIVES ISSUES

Avoid exposure to phthalate

- Avoid putting your food in or on plastic. Even BPA- or phthalate-free plastic may leach harmful chemicals,
- Option for glass food storage containers and choose bottles and sippy cups that are made of stainless steel, silicone, or glass.
- If you must use plastic, keep it out of the microwave and dishwasher. When plastic is heated, it leaches more chemicals, and phthalates are no exception.
- Eat more plants. People who eat diets rich in plant foods—fruits, vegetables, beans, grains, nuts, and seeds—have lower levels of phthalates in their blood than do people who eat more animal foods.

INGREDIENTS AND ADDITIVES ISSUES

- Eat organic and grass-fed produce, meat, and dairy. Phthalates are used in pesticides and herbicides, neither of which is permitted on certified organic produce.
- Choose low-fat meat and dairy. Unfortunately, foods that are higher in fat are particularly prone to chemical leaching.
- Invest in a water filter. If your water supply is tainted by industrial waste, phthalates may show up in your drinking glass.
- Avoid processed foods. Phthalate contamination is yet another reason to stick to whole foods as much as possible. The more opportunity your food has had to come in contact with plastic throughout the production process, the greater the chance that it will be tainted with phthalates.

EFFECTS OF INGREDIENTS AND ADDITIVES ISSUES

Health

- Health effects
- Artifial vs natural
- Allergens
- GMOs

Environmental

- Sustainability
- Animal welfare

Labelling

- Regulation and labeling
- Misleading marketing or labelling

foods issues 2

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ORGANIC FOODS

definition
organic foods

Organic foods are items that are produced, processed and packaged without using chemicals including items such as vegetables, fruit, milk, meat and cotton.

Organic foods are foods that are produced using methods that :

- do not involve modern synthetic inputs such as synthetic pesticides and chemical fertilizers,
- do not contain genetically modified organisms, and
- do not processed using irradiation, industrial solvents, or chemical food additives.

definition
organic foods

Organic farming doesn’t mean that they go back to methods used hundreds of years ago. They take modern scientific knowledge and combine them with useful traditional farming methods.

The key issues for concern are pesticide residues in and on food, agricultural practices that hurt the environment, and antibiotic use in animals. Many of the known pesticides are known to cause numerous serious health effects.

Organic farming isn’t just for vegetables, but animals as well.

Antibiotic use in animal production has been linked to antibiotic resistance in bacteria.

BENEFIT
organic foods

- Organic food produce contains fewer pesticides.
- Organic food is often fresher.
- Organic farming is better for the environment.
- Organically raised animals are NOT given antibiotics, growth hormones, or fed animal by products. It cannot create antibiotic resistant strains of bacteria.
- Organic meat and milk are richer in certain nutrients.
- Organic food is GMO-free.

ORGANIC FOOD ISSUES

Soil Quality and Style of Farming – Example;

Organic tomatoes are grown without synthetic pesticides, fertilizers or leading to potentially higher levels of beneficial compounds like antioxidants and flavonoids.

ORGANIC FOOD ISSUES

Very low Adoption of Organic Farming –

Local organic supply remains limited, more than 60% of organic food in Malaysia is imported.

Organic produce often fails to meet demand consistently.

ORGANIC FOOD ISSUES

High Costs & Price Barriers –

➢ This price gap due to higher production costs, labor-intensive practices, and opportunity costs from switching to organic farming.

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3

GMO FOODS

definition
GMO FOODS

Genetically modified foods (GM foods), also known as genetically engineered foods (GE foods), or bioengineered foods are foods produced from organisms that have had changes their DNA using the methods of genetic engineering.

Genetic engineering techniques allow for the introduction of new traits as well as greater control over traits when compared to previous methods, such as selective breeding and mutation breeding

WHY GMO FOODS ??

- Many processed foods use biotech crops
- Improved fat profile in oils - more stable for frying
- Delayed ripening - fresher produce
- More nutritious products to meet consumer demands
- Some oils may not require hydrogenation, and therefore be low or free of trans fatty acids

BENEFIT OF GMO FOODS

- Reduce production cost.
- Reduce chemical usage.
- Have chance to create plants that produce more nutrients or more resistant.
- It will enhance taste & quality.
- Reduce maturation time.

effect of GMO FOODS harmful

- Could produce higher levels of toxins. - dangerous to human
- GMO Plants mostly indigestible to human.
- Genetic engineering could potential introduce or create allergens.

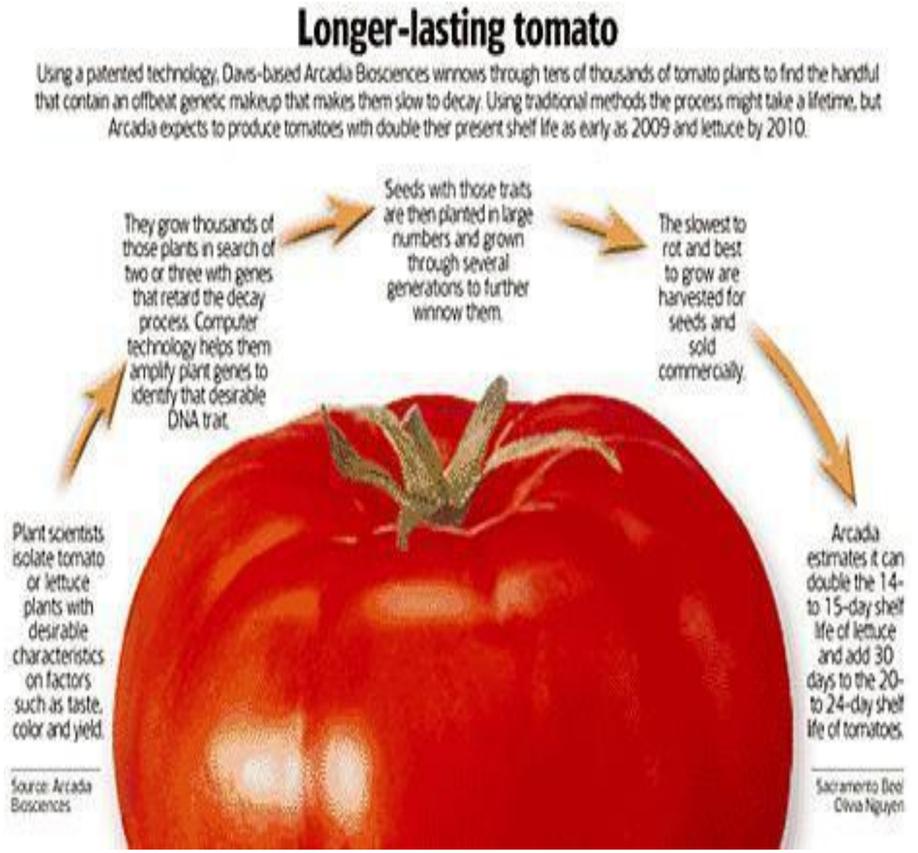
example of GMO foods

GMO	Description	Picture
Golden Rice	Rice modified with daffodil genes to have more beta-carotene, which the body converts to Vitamin A	
Flavr Savr Tomatoes	Tomatoes modified by the removal of genes responsible for the softening of fruit, meaning the tomatoes spoil more slowly	
Bt Corn	Corn modified with a bacterial insecticide gene so that it produces insect toxins within its cells, protecting it from pest species	
Aqua Advantage Salmon	Salmon modified with growth hormone regulating genes in order to grow to market sizes in significantly less time	

GMO FOODS

1) Extended Shelf Life: Long Shelf Tomatoes

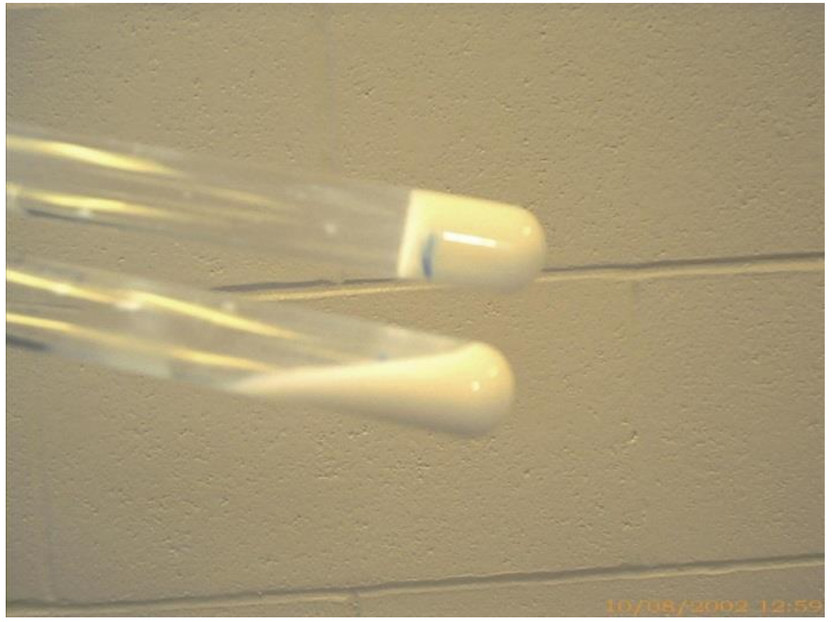
- These genetically modified tomatoes promise less waste and higher profits.
- Typically, tomatoes produce a protein that softens them after they have been picked.
- Scientists can now introduce a gene into a tomato plant that blocks synthesis of the softening protein.
- Without this protein, the genetically altered tomato softens more slowly than a regular tomato, enabling farmers to harvest it at its most flavorful and nutritious vine-ripe stage.



GMO FOODS

2) Efficient Food Processing – Rennin Production

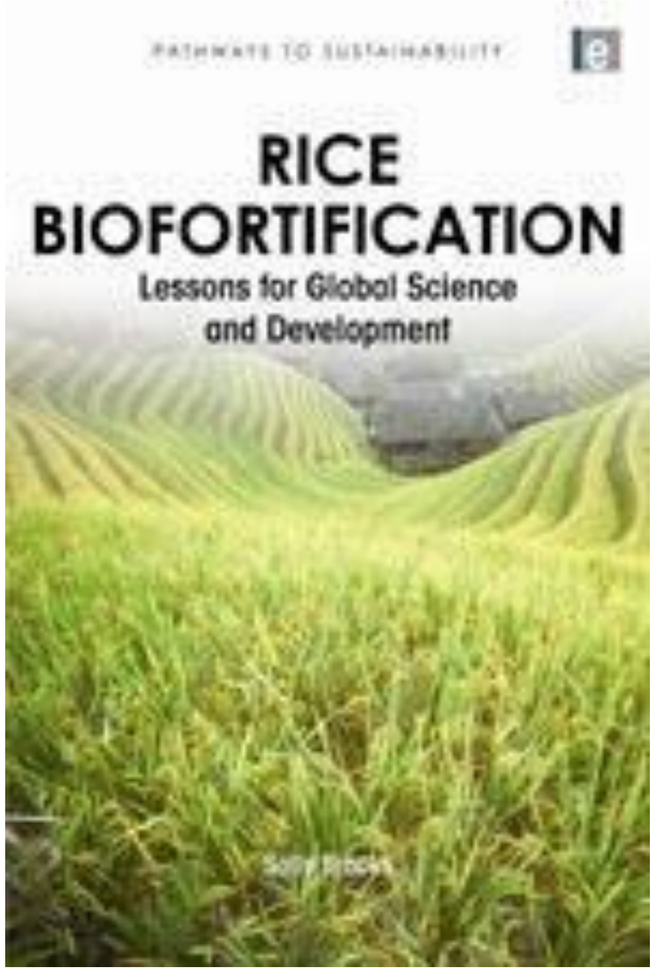
- The protein rennin is used to coagulate milk in the production of cheese.
- Rennin has traditionally been made in the stomachs of calves which is a costly process.
- Now scientists can insert a copy of the rennin gene into bacteria and then use bacterial cultures to mass produce rennin.
- This saves time, money, space and animals.



GMO FOODS

3) Better Nutrient Composition

- Some plants, during processing, lose some of the vital nutrients they once possessed.
- Others are grown in nutrient poor areas.
- Both these problems can be solved by introducing genes into plants to increase the amount or potency of nutrients.
- "Biofortification"



GMO FOODS

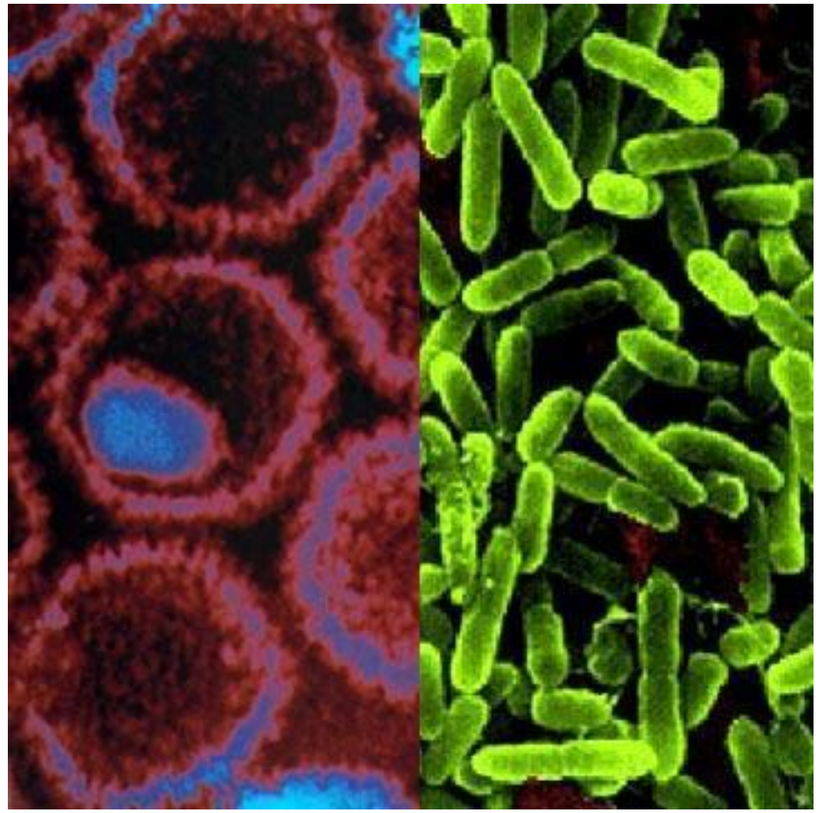
Potential Risk

- With every technology there is an associated risk involved.
- The following are some examples of potential problems associated with food biotechnology.

GMO FOODS

(1) Creating “Superbugs”

Since many of the “vectors” used to introduce genes to plants and animals are bacteria and viruses, it is realistic to think there is a chance they could undergo a mutation and prove harmful or become recombinant like the H1N1 virus and thus more virulent.



GMO FOODS

(2) Negative Affects on Human Health

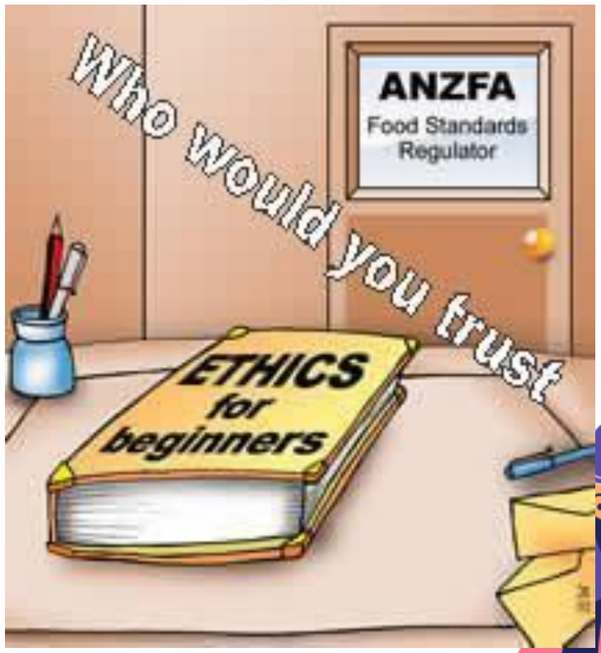
- Most of these food products undergo testing to see if any adverse health effects occur.However, allergies were not thought of in one case where a gene from a brazil nut was transferred to soy bean plants!
- Important to note that not all genes from a potential allergenic food will cause an allergy.

GMO FOODS

(3) Ethics

The following food types have a variety with human genes added:

- rice (immune system genes that prevent diarrhea),
- baby food (lactoferrin and lysozyme) and
- any farm animal (Human growth hormone).



HEALTH

Health Effects

- Some additives, such as artificial sweeteners, colors, and preservatives, have been linked to health issues.
- For example, some artificial colors may cause hyperactivity in children, and certain preservatives may be linked to allergic

Natural vs. Artificial

There is ongoing debate about whether natural or artificial additives are safer or more desirable in food products.

Allergens

Ingredients like nuts, soy, gluten, and dairy can trigger allergic reactions in some individuals. Proper labeling of allergens is crucial to prevent allergic reactions.

GMOs

Genetically modified organisms (GMOs) are plants or animals that have had their genetic material altered for certain traits. Some people are concerned about the long-term health effects and environmental impact of GMOs.

ENVIRONMENT

Sustainability

- The production of certain ingredients, such as palm oil, can lead to deforestation and habitat destruction.
- Consumers and companies are increasingly concerned about sourcing ingredients sustainably.

Animal Welfare

Ingredients derived from animals, such as meat, dairy, and eggs, raise concerns about animal welfare and the environmental impact of animal agriculture.

LABELING

Misleading Marketing

- Claims like "natural," "organic," or "low-fat" can sometimes mislead consumers about the healthfulness of a product.

Regulation and Labeling

Regulations vary by country, and some additives that are allowed in one country may be banned in another. Proper labeling is essential for consumers to make informed choices about the food they consume.

THANK YOU