FUNCTIONAL AND FERMENTED FOOD

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DEFINITIONS

Functional foods can be defined as dietary items that, besides providing nutrients and energy, beneficially modulate one or more targeted functions in the body, by enhancing a certain physiological response and/or by reducing the risk of disease.

Other additional considerations have been proposed to define a functional food, including three additional conditions in particular:

1. it is a food (not a capsule, tablet, or powder) derived from natural ingredients;
2. it can and should be consumed as part of the daily diet;
3. it has a particular function when eaten, serving to regulate a particular body process, such as:
    - enhancement of biological defense mechanisms
    - prevention of specific diseases
    - recovery from specific diseases
    - control of physical and mental disorders
    - slowing of the aging process.

Fermentation is also used as a way of preserving food, it has been used by humans to make foodstuffs and beverages for at least 10 000 years!

DIFFERENT WAYS OF PRODUCING FUNCTIONAL FOOD

➢ *Adding microelements, vitamins and fibers*

Micronutrients are one of the major groups of nutrients your body needs. They include vitamins and minerals.
This is because micronutrients are part of nearly every process in your body.
The best way to get the vitamins it's from food, specially on fruits and vegetables.
The vitamins helps prevent broken bones in older adults.
Vitamins are organic substances produced by plants or animals. They often are called "essential" because they are not synthesized in the body.

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Vitamins are divided into two categories:

- **water soluble**which means the body expels what it does not absorb
- **fat soluble** where leftover amounts are stored in the live and fat tissues as reserves.

Fiber is simply a type of carbohydrate found naturally in plant-based foods that is not digestible in humans.
Although fiber cannot be digested, it is being moved down the digestive tract as nutrients are being digested, and can do some great things that positively impact our health.

There are two types of fiber:

- **Soluble fiber** is a type of fiber that attracts water and forms a gel. This gel causes a slowing of the digestion process, which can be beneficial for weight loss. Foods high in soluble fiber include oats, legumes, edible plant skins, and nuts.
- **Insoluble fiber** repels water. Its primary benefit is to provide bulk to stool and aid in the movement through the digestive tract.You can find insoluble fiber in foods such as veggies, fruits, nuts and seeds.

➢ *Adding pro- and prebiotics*

One of the common names for probiotic and prebiotic products is functional nutrition.
These are products whose components affect those functions of the body whose purpose is to improve health.
Prebiotic and probiotic products can help alleviate digestive organs and support the immune system associated with the digestive organs. Live microbes contained in probiotic products can be used with prebiotic products. This combination is called symbiotics.

In addition to food, probiotics and prebiotics can also be obtained from dietary supplements. As probiotics, sour-milk bacteria related to humans or dairy products are used in the preparations.

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The final products of their metabolism - milk and acetic acid - reduce the intestinal pH which helps to neutralize pathogens and their toxins.
As probiotics in the composition of the preparations, mainly the nuclei of the bacteria Lactobacillus or Bifidobacterium are used. In addition, the product must contain not only bacteria, but also prebiotics, such as inulin.
Examples of probiotic products are yogurt, kefir, sauerkraut, mushrooms and dark chocolate. Prebiotic products are more like fruits and vegetables, especially banana, onions, spinach.

- ***By Removal of ingredients***

-Eliminating a component that has an adverse physiological effect, such as an allergenic, toxic or mutagenic compound-

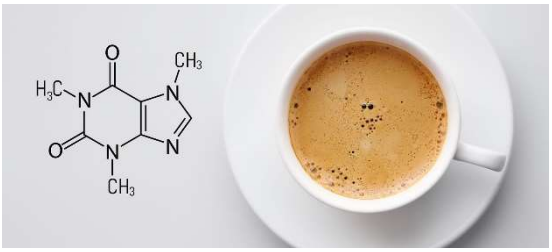
How are these ingredients removed?

Refined products Separation processes used in the production of refined products comprise four sequential steps :
1. Removal of insolubles, for example filtration or centrifugation.
2. Isolation of the fractions, for example by extraction or adsorption.
3. Purification of components or fractions, for example, molecular separation technologies, like supercritical extraction.
4. Refining a product, for example by removing water, solvent or traces of impurities by drying or crystallisation.
5. (Eventually) partially replacing a negative component with a positive entity in a processed food

PRACTICAL EXAMPLE: CAFFEINE FREE COFFEE

Decaf Coffee: Good or Bad

Coffee is one of the world's most popular beverages.
Many people enjoy drinking coffee, but want to limit their caffeine intake for some reason.
For these people, *decaf* coffee is an excellent alternatiive.
Decaf coffee is just like regular coffee, except the caffeine has been removed.



What is Decaf Coffee and How is it Made?

Decaf is short for *decaffeinated* coffee.It is coffee from coffee beans that have had at least 97% of their caffeine removed.

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There are many ways to remove caffeine from coffee beans, most of them include water, organic solvents or carbon dioxide.
Coffee beans are washed in the solvent until the caffeine has been extracted into it, then the solvent is removed.
Caffeine can also be removed using carbon dioxide or a charcoal filter — a method known as the Swiss Water Process.
The beans are decaffeinated before they are roasted and ground.
The nutritional value of decaf coffee should be almost identical to regular coffee, apart from the caffeine content.

Benefits

After the removing process, the taste and smell may become a little milder and the color may change, depending on the method used.This can make decaf coffee more pleasing to those who are sensitive to the bitter taste and smell of regular coffee.The effects of decaf coffee on liver function are not as well studied as those of regular coffee. However, one large observational study linked decaf coffee with reduced liver enzyme levels, which suggests a protective effect.Drinking decaf coffee has also been linked with a small but significant reduction in the risk of premature death, as well as death from stroke or heart disease.

Who Should Choose Decaf Over Regular Coffee?

There is a lot of individual variability when it comes to tolerance for caffeine.
For some people, one cup of coffee can be excessive, while for others this may be six or more cups.
Excess caffeine may overwhelm the central nervous system, cause restlessness, anxiety, digestive problems, heart arrhythmia or trouble sleeping in sensitive individuals.
People who are very sensitive to caffeine may want to limit their intake of regular coffee, or switch over to decaf or tea.Those with certain medical conditions may also require caffeine-restricted diets.
This includes patients taking prescription medications that can interact with caffeine.Additionally, pregnant and breastfeeding women are advised to

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limit their caffeine intake. Children, adolescents, and individuals suffering from anxiety or trouble sleeping are advised to do so as well.

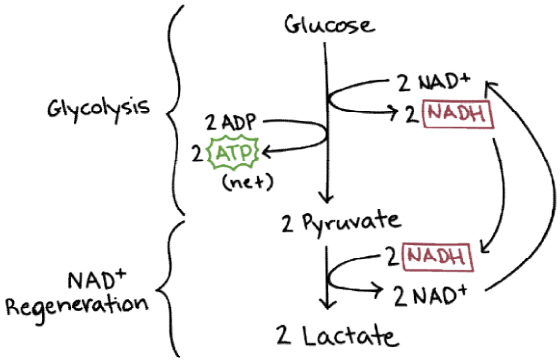
FERMENTATION

➢ *What is fermentation?*

Metabolically,it is a process that produces chemical changes in organic substrates through ezym-activity.

In biochemistry, it is defined as the extraction of energy from carbohydrates anaerobically. To be more precise, carbohydrates such as glucose are being broken down in the absence of oxygen. During this reaction, ADP is being transformed into ATP, and NADH becomes NAD+. This science is known as zymology.

Fermentation is also used as a way of preserving food, it has been used by humans to make foodstuffs and beverages for at least 10 000 years!



Louis Pasteur was the first one to use the term "fermentation" to describe the changes brought about by yeasts and other growing microorganisms . Nowadays, it is usually used to refer to any process in which the activity of microorganisms brings wanted changes to foods or drinks.

➢ *Why fermented foods are good for us?*

Fermented food helps our body because it consists of many things we need.

Historically it was very practically for humans. They used it to make food durable.
Experts say that fermented foods help against illnesses like cancer and chronic inflammation. Research suggests that it is also good for blood pressure and diabetis.
Fermented food is high in vitamins, proteins, iron, calcium, magnesium etc. Fermented food develops lots of different bacteria which are very important for our body health.

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Examples of fermented food:

- **Kefir:**rich in vitamins and minerals
- **Sauerkraut:**iron. magnesium calcium, fibre, vitamins
- **Kimchi**:vitamins, iron, calcium, selenium
- **Yogurt:**live bacteria

SUMMARIES

- Micronutrients are one of the major groups of nutrients your body needs. They include vitamins and minerals.

- Vitamins are organic substances produced by plants or animals.Vitamins are divided into two categories: water soluble and fat soluble.

- Fiber is simply a type of carbohydrate found naturally in plant-based foods that is not digestible in humans. There are two types of fiber: soluble and insoluble fiber.

- One of the common names for probiotic and prebiotic products is functional nutrition, whose components affect those functions of the body whose purpose is to improve health. In addition to food, probiotics and prebiotics can also be obtained from dietary supplements.

- *Decaffeinated* coffee it is coffee from coffee beans that have had at least 97% of their caffeine removed.There are many ways to remove caffeine from coffee beans. Most of them include water, organic solvents or carbon dioxide.

- The effects of decaf coffee on liver function are not as well studied as those of regular coffee. However, one large observational study linked decaf coffee with reduced liver enzyme levels, which suggests a protective effect.

- Fermentation is a chemical process that involves the breakdown of carbohydrates by bacteria and yeast. It results in a distinctive flavor and is used to make foods like yogurt, cheese, beer and wine.

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