RESTAT
Recognition of Skills to Transform Accessible Tourism

MODULE 3: Individualized and Health-promoting nutrition provision

UNIT 1: Human health: Balance in the human body, acid-base balance and civilisation diseases, acidic and alkaline food, antioxidants, free radicals, flavonoids

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Balance in the human body

The preconditions for a good health are proper functioning of the body and keeping overall internal balance. Every day, the human body is exposed to factors that disturb this balance. Luckily, there are several mechanisms that take care of this, that maintain a dynamic balance.

But if the balance is disturbed for a longer time, problems begin to appear.

Our diet has a huge impact on the balance of the internal environment.

The **acid-base balance** is one of the components which provide the overall balance.

It is a process in which the internal mechanisms in a person‘s body ensure that bodily fluids (especially blood) are not too acidic or too alkaline. **The human body works properly only when bodily fluids are neutral.**

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1.1 Acid-base balance and civilisation diseases

Disruption of the acid-base balance – acidification of the organism

Factors which cause acidification of the organism:

- **Processes happening in the human body mainly after eating** – metabolism, during which sugars and fat are broken down to generate the energy needed for the body to function; acidic substances are formed as metabolites.
- **Mental conditions** – anger, aggression, anxiety, fear – they trigger the production of acidic substances. Mental stress is also a factor – a person usually breathes shallowly and fast, which leads to an increased CO2 concentration in the blood and carbonic acid begins to form.
- Polluted air, electro emissions, chemical drugs and/or dietary supplements, smoking, alcohol.
- **Our diet plays a big role and we can highly influence this factor. Sufficient salivation also helps alkalize what we eat.**

Symptoms of over-acidification: headache, fatigue, irritability, bad breath, stomach and intestinal problems, sensitivity to cold, cold feet, hair loss, reduced immunity.

These symptoms can eventually lead to more serious diseases.

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1.1 Acid-base balance and civilisation diseases

Acidity and alkalinity

Acidity and alkalinity are given in pH values (potential of hydrogen), which express the amount of free hydrogen ions H+. There is a pH scale from 0 to 14 to show the pH values:

- Acidic: 1pH–6pH
- Neutral: 7pH
- Alkaline: 8pH–14pH

Acid-forming chemical elements: sulfur (S), phosphorus (P), chlorine (Cl), iodine (I).

Alkaline-forming chemical elements: sodium (Na), calcium (Ca), potassium (K), magnesium (Mg), iron (Fe).

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1.1 Acid-base balance and civilisation diseases

Civilisation diseases

Inappropriate (too acidic) diet can be considered the standard diet of our civilisation. This diet leads to organism acidification, which can cause diseases – these illnesses are called the **civilisation diseases** (**modern society diseases**).

How does over-acidification work and what does it cause?

Elasticity of red blood cells is lost -> they become difficult to pass through capillaries -> worsened oxygen supply to organs, tissues -> walls of blood vessels solidify, form a cholesterol patch -> cells without oxygen can operate without it for a short time -> start producing acids -> capillaries narrow even more -> this cycle repeats -> leads to serious health problems such as heart attack, stroke, chronic inflammation, cancer, hypertension, allergies, atopic eczema, arteriosclerosis, diabetes mellitus, osteoporosis, osteoarthritis etc.

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1.1 Acid-base balance and civilisation diseases

How to maintain balance in the body ?

Our organism‘s mechanisms to regulate the acidification:

- Buffer mechanism
- **Respiratory mechanism** – one of the most important. Brings oxygen directly to the cells. That is why deep breathing during walks on the fresh air or sport are so helpful to keep the balance.
- Renal mechanism
- Liver mechanism
- Heart mechanism (myocardium)

How to influence the acidcity of the organism?

- **Choice of diet – more alkaline food.**
- **Physical activity** – faster breathing removes more CO2 from the blood.
- **Mental state** – the elimination of long-term negative mental states which would lead to acidification.

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1.2 Acidic and alkaline food

A healthy diet should be variable, rich in fruits and vegetables, legumes, light lean meats, fish, milk, cheese and high-density food.

Nutrition containing a lot of fruits and vegetables and food rich in fibre is an excellent prevention from contemporary civilisation diseases.

Ideal proportion of food in a diet:
80 % alkaline, 20 % acidic.

Very acidic	Very alkaline
- Sugar - Food that contain sugar - (chocolate, sweetened cereals, cornflakes, frozen desserts) - Artificial sweeteners - Meat (beef, pork, veal) - Bacon - Matured cheeses - Pasteurized milk - Sweetened dairy production - Sweetened drinks - Cocoa - Alcohol - Medicine - Canned food - Chips - French fries, pasta - Yeast - Yolk	- Fruits (citrus fruits - lemon, lime, orange, tangerine, grapefruit, pomelo, and other fruit - mango, papaya) - Vegetables (celery, parsley, turnip, broccoli, edible "weeds" such as dandelions, plantain, wild garlic. Garlic, onion, raw spinach, fennel - Nori seaweed - Ginger - Dried figs and dried dates - Pumpkin seeds - Olive oil - Apple vinegar
Moderately acidic	**Moderately alkaline**
- Brown sugar - Barley - Rye flour - White rice - Peanuts, cashews, Brazil nuts - Pork lard - Soybean oil - Meat (lamb, rabbit, chicken and turkey) - Soft cheese - Whole egg - Coffee - Wine - Rice milk - Popcorn	- Maple syrup - Fruit (apples, pears, bananas, blackberries, raspberries, strawberries) - Watermelon - Vegetable (radish, zucchini, leafy vegetable, sweet potato, pumpkin, watercress) - Lentil - Almonds - Flax seed - Linseed oil - Green tea - All spices
Slightly acidic	**Slightly alkaline**
- Sweetened honey (from shops) - Some fruits (cranberries, plums, pomegranate, raisins, almost all beans (except munga) - Soy milk - Brown rice - Butter - Margarine - Sunflower oil - Buttermilk - Cottage cheese - Goat milk - Whey - Yoghurt - Mayonnaise, ketchup - Fermented vinegar - Black tea - Tap water	- Molasses, honey, stevia - Fruit (apricot, peaches, nectarine, cherries, blueberry, pineapple, avocado) - Vegetable (carrot, cucumber, peas, tomatoes, cabbage, brussels sprout) - Mushroom - Mung beans - Amaranth - Buckwheat, bulgur, couscous, - Millet - Oat - Quinoa - Indian rice, whole grain rice - Sesame and sunflower seeds - Oils - avocado, coconut, rapeseed - Sea salt

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1.3 Antioxidants, free radicals and flavonoids

Free radicals – danger for the body:
Free radicals form naturally in the body as a **by-product of metabolism**. In addition, some external factors increase their production **(tabaco smoke, environmental pollution, radiation, drugs, alcohol, pesticides, ozone etc**.). We can limit the free radicals formation but cannot prevent it.

Antioxidants – neutralize free radicals:

- Thanks to neutralisation they protect cells, tissue, nervous system and more from damage.
- Protect the immune system, the organism‘s personal data.
- Have a preventive effect against heart and vascular diseases, decrease aging.

Flavonoids – fight free radicals in the body:

- Occur as a natural dye in fruits and vegetables.
- Have anti-inflammatory, anti-viral and antioxidant effects.
- Affect the permeability of blood vessels and capillaries, the formation of blood clots, which can help reduce heart attacks and cerebral stroke.

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