




“Alternative nutrition”



Mgr. Zlata Kapounová, Ph. D., Mgr. Aleksandra Nikolić, Bc. Iuliia Pavlovská, Bc. Petra Ferenčuhová



“Alternative nutrition”

- General term
 - Types of diets, that differ from the nutritional habits of the majority of society and conventional recommendations from dietitians.
 - Usually based on the restriction of certain food groups, most often food of animal origin
- 



Why alternative nutrition?

- Health reasons
 - the need for change of lifestyle- obesity, gout, dyslipidemia, zoonosis
- Moral and ethical reasons
 - compassion for animals
- Ecological aspect
- Economic reasons
- Religion
- Social factors
 - peer pressure, fashion,...
- Taste preference

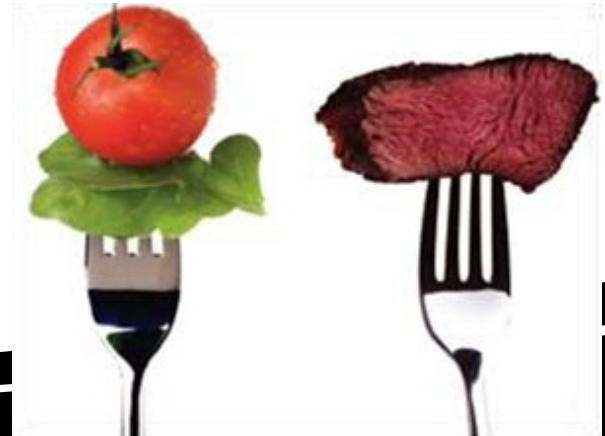


Types of alternative nutrition

- Vegetarianism
- Macrobiotic diet
- Marginal types:
 - Divided food diet
 - Diet by blood group (Adamo's Diet)
 - Paleo Diet (Paleolithic diet)
 - Diet based on pH (alkaline diet)
 - Detox diet
- Organic food

Vegetarianism

- The most widespread alternative way of eating in Czechia (about 2 % of the population - 200,000 people)
- Vegetarian - generally not consuming meat
- Types depending on restricted consumption of food of animal origin
 - semivegetarians (pulo-, pesco-) or flexitarians
 - lactoovovegetarians
 - lactovegetarians
 - vegans
 - fruitarians
 - vitarians - RAW food





Vegetarianism

- Origin in the Eastern religions of Buddhism and Hinduism
- The term dates back to the 19th century
- The Vegetarian societies:
 - The Vegetarian Society (1847 England)
 - IVU - International Vegetarian Union (1908 Dresden)
 - EVU - European Vegetarian Union
 - Czech Society for Nutrition and Vegetarianism
 - Czech Vegetarian Society
- Lifestyle - temperance, non-smoking, alcohol avoidance, regular physical activity
- Vegetarian pyramid, rainbow



Logos of vegetarian associations



Czech Society for Nutrition and
Vegetarianism
(*Česká společnost pro výživu a vegetariánství*)



International Vegetarian Union



European Vegetarian Union

Oils

2-3 Teaspoons

Nuts & Seeds

1-2 servings

Dairy

Vegan: Fortified Non-dairy Substitutes

3 servings

Vegetables

2-4 servings

And

Green Leafy Vegetables

2-3 servings



Vegan:

B-12 : 2.4 ug/d Vit D : 200 IU/d Calcium : 600 mg/d

Beans & Protein Foods

2-3 servings

Fruits

1-2 servings

And

Dried Fruit

1-2 servings

Breads, Cereals,

Pasta, Rice

6-10 servings



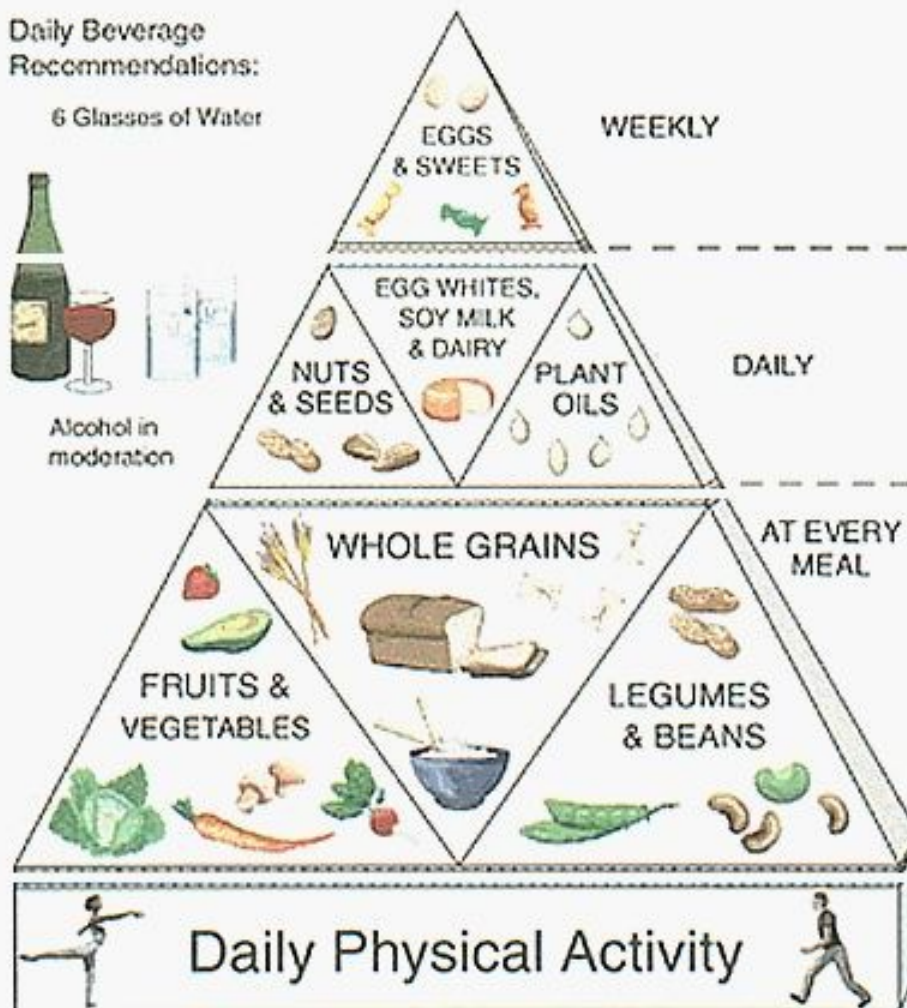
The Traditional Healthy Vegetarian Diet Pyramid

Daily Beverage
Recommendations:

6 Glasses of Water



Alcohol in
moderation



VEGAN FOOD GUIDE

DAILY PLAN FOR HEALTHY EATING

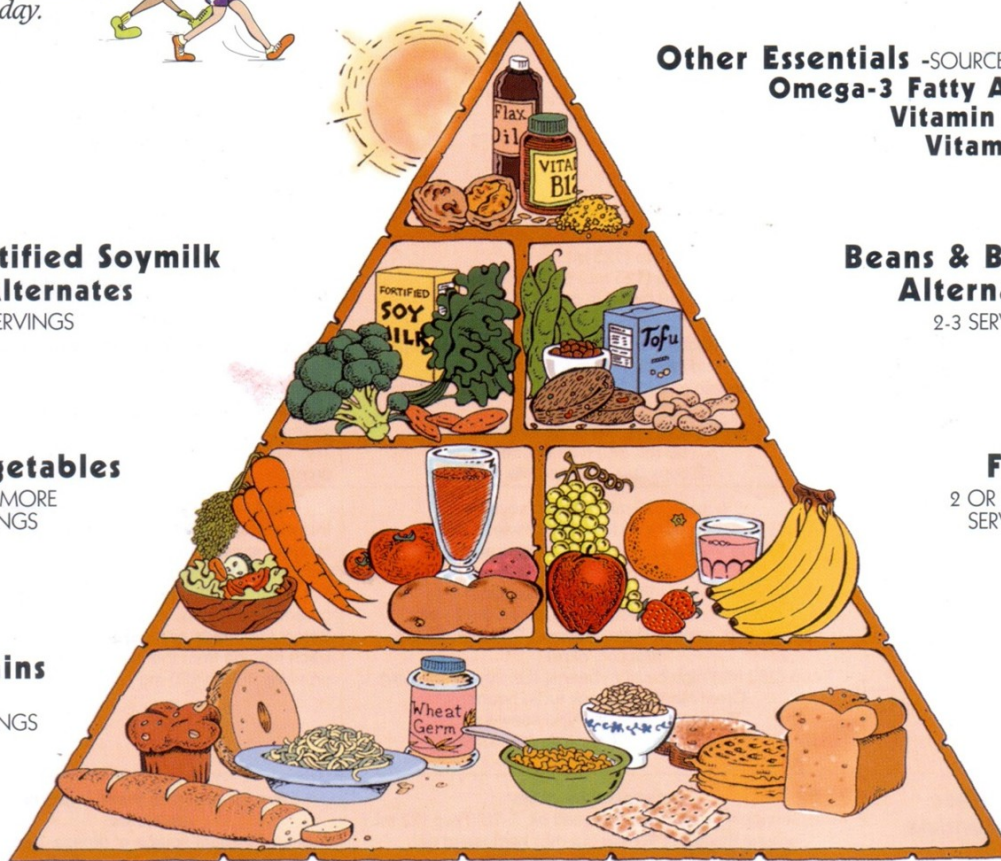
Get at least 60 minutes of physical activity each day.



Fortified Soymilk & Alternates
6-8 SERVINGS

Vegetables
3 OR MORE SERVINGS

Grains
6-11 SERVINGS



Other Essentials -SOURCES OF:
Omega-3 Fatty Acids
Vitamin B12
Vitamin D

Beans & Bean Alternates
2-3 SERVINGS

Fruit
2 OR MORE SERVINGS

Artwork by Dave Brousseau

Eat a variety of foods from each of the food groups.
Drink 6-8 glasses of water and/or other fluids each day.
Limit intake of concentrated fats, oils, and added sugars, if used.





Expert opinion on vegetarianism

Opinion of the Academy of Nutrition and Dietetics from 2016

- A **properly planned** vegetarian diet is:
 - Healthy, nutritionally balanced and has some health benefits in prevention and treatment of certain diseases
 - Appropriate for all stages of the life cycle
 - childhood including infancy
 - adolescence
 - pregnancy and lactation
 - old age (elderly)
 - Plant-based diets are more environmentally sustainable than diets rich in animal products because they use fewer natural resources and are associated with much less environmental damage.



The benefits of vegetarianism



- More frequent consumption of fruits, vegetables, cereals, sprouts, legumes, nuts, seeds, vegetable oils
- Lower intake of saturated fat, cholesterol, animal proteins
- Lower energy intake
- Lifestyle
- Diet based on food of plant origin predominant consumption may reduce the risk of developing certain diseases



It should be stressed out, that the risk of the disease affected by dietary intake is generally low if the person has a balanced diet, regardless of whether

The risks of vegetarianism



- Incorrect food composition (poor awareness)
 - Some nutrients may be missing or in reduced quantity in a plant based diet.
 - There are certain substances in diet from plants which may reduce absorption of certain vitamins and minerals.
 - Others
- ➔ **Inadequate intake of certain nutrients and the risks involved**



Rules for balanced diet

- Keep the variety and balance in the diet
- Food groups that should not be missing in your diet:
 - cereals and pseudocereals
 - vegetables and fruits
 - legumes and products thereof
 - milk, dairy products
 - eggs
 - nuts, seeds
 - vegetable oils
 - seaweed



Rules for balanced diet

- A balanced meal should consist of various sources of proteins during different meals of the day.
 - cereals with legumes (bean stew with bread, leguminous soup with cereal, cholent, etc.)
 - legumes with potatoes
 - plant protein sources with animal (cereal with dairy products - milk cereal slurry, etc.)
- Do **not** replace meat dishes with sweet and fried dishes.



Example of daily meal plan

- B: oatmeal with nuts and grapes
- S: bread with radish spread
- L: chickpeas cream soup, lasagna with spinach and mozzarella
- S: Banana cocktail
- D: baked cauliflower with eggs, potatoes, tomato salad



Examples of daily meal plan

- B: bread with egg spread, paprika
- S: apple
- L: vegetable soup with yeast dumplings, Mexican beans in tortilla with yoghurt dressing
- S: Pudding with fruit
- D: buckwheat risotto with vegetables, cheese



Raw food diet



- Vitarianism, consumption of raw food
- In Czechia, It's on the rise
- Eating food without heat treatment, in the most natural form
- Heat treatment of food at max. 42-45 ° C (107.6- 113 ° F)
- According to the supporters, there is no reduction in the nutritional value of the diet, destruction of enzymes, vitamins, etc.



Raw food diet



- The main ingredients of the diet are raw fruits and vegetables, raw nuts and seeds, legumes, various cereals, sprouts, seaweeds and it is predominantly supported by vegans.
- There are also subgroups of raw food diet that allow consumption of raw meat, eggs, unpasteurized milk.
- Types of food processing - dipping, mixing, drying, juicing

RAW FOOD PYRAMID

Sea Weed
Nutritional yeast



MEDICINAL FOODS
EAT SPARINGLY

Herbs, Microgreens
& Wheat Grass Juice



Nuts & Seeds
Flex, Hemp Seeds



PROTEINS, AMINO ACIDS
EAT MODERATELY

Sprouts & Legumes



Fruits & Vegetables



FOUNDATION FOODS
EAT GENEROUSLY

Leafy Greens





Example of meals



- Banana oatmeal with walnuts
- Miso soup with mushrooms
- Cucumber soup with basil
- Butter pumpkin noodles with sage sauce
- Vegetable rolls
- Guacamole with curry and vegetables
- Chia pudink
- Juices, cocktails, smoothie

The benefits and risks of raw food diet

- + There is no reduction in nutritional value by heat treatment
- + Lower intake of fat, sodium, cholesterol
- + Higher intake of fiber (sometimes too much), potassium and other substances
- Lack of some essential nutritional substances, energy (except for raw desserts)
 - there is a risk of deficiency in long-term aspect: B12, protein, iron, calcium, omega-3 use of dietary supplements
- Poor digestibility of raw food
- Lower absorption
- Microbial risk





Dietary Conclusion



- For diversifying our diet
- However it **can't** be recommended for long-term way of lifestyle



Macrobiotics

- A widespread lifestyle that is closely related to nutrition
- “The art of long life“
- Origins in Zen Buddhism, Taoism elements
- Effort to return to a natural way of life
- Founder **George Ohsawa** (1893-1966, Japan, Concept of Macrobiotic Learning)
- Macrobiotic teachings were further developed by Ohsawa's pupils



Macrobiotic diet

- According to macrobiotics, food differs from the content of YIN and YANG
- The yin / yang ratio is the "value" of each food
- Harmonic food - yin and yang in balance
- The most energy-balanced – cereals
- Ohsawa divided nutrition into ten degrees (-3 to +7)



Diet No.	Cereals	Vegetable Intake	Soup	Animal Food	Salad	Fruits	Dessert	Beverages
7	100%	-	-	-	-	-	-	(Only when thirsty)
6	90%	10%	-	-	-	-	-	"
5	80%	20%	-	-	-	-	-	"
4	70%	20%	10%	-	-	-	-	"
3	60%	30%	10%	-	-	-	-	"
2	50%	30%	10%	10%	-	-	-	"
1	40%	30%	10%	20%	-	-	-	"
-1	30%	30%	10%	20%	10%	-	-	"
-2	20%	30%	10%	25%	10%	-	5%	"
-3	10%	30%	10%	30%	15%	-	5%	"



Macrobiotic diet

- The basic rule of macrobiotic nutrition is to consume the food slowly, to chew it very well.
- The theory of so-called biological transmutation
- Emphasis is also put on:
 - Natural food from local sources or at least from the same climatic zone that corresponds to the season
 - Avoid eating meat, milk, dairy products, tropical fruit, refined sugar, eggs, potatoes, white flour,
 - Rejection of consumption of preserved, chemically treated, artificially colored, frozen or irradiated food,
 - Denial of drug use, alcohol and drug consumption



Macrobiotic diet by Michio Kushi

- It is mainly based on cereals, vegetables, legumes, fermented foods
- The smaller ratio is represented by seaweed, seeds, nuts, temperate berries and fish
- Macrobiotic plate
- Important Policy:
 - Eat only in case of hunger
 - Thoroughly chew (50 times or more one bite)
 - Eat seated, calmed and relaxed
 - Eat regularly 2-3 times a day, as much as needed, leaving satisfied, but not full
- Drink liquids sparingly, only when thirsty
- Last meal of the day should be at least 3 hours before sleep



Macrobiotic diet by Michio Kushi

- **50-60%** Wholegrain cereals and products of wholegrain flour
 - Daily - brown rice, barley, millet, wheat, oats, rye, corn, buckwheat
 - Occasionally wholegrain pasta, wholegrain sliced bread, wholegrain rye bread, bulgur, couscous, polenta
- **25-30%** vegetables - in each meal
- **2/3** Cooked, fried on a small amount of vegetable oil, **1/3** raw salads, pickles (fermented)
 - Daily - cabbage, Chinese cabbage, leek, broccoli, cauliflower, carrots, onions, pumpkins, radishes, kohlrabi, cress, parsley, dandelion ...
 - 2-3 times a week - cucumbers, celery, mushrooms, herbs
 - Not suitable - potatoes, spinach, red beet, peppers, tomatoes
- **5-10%** Legume (not more than once a day), seaweed

• **5-10%** Fruit (not more than once a day)

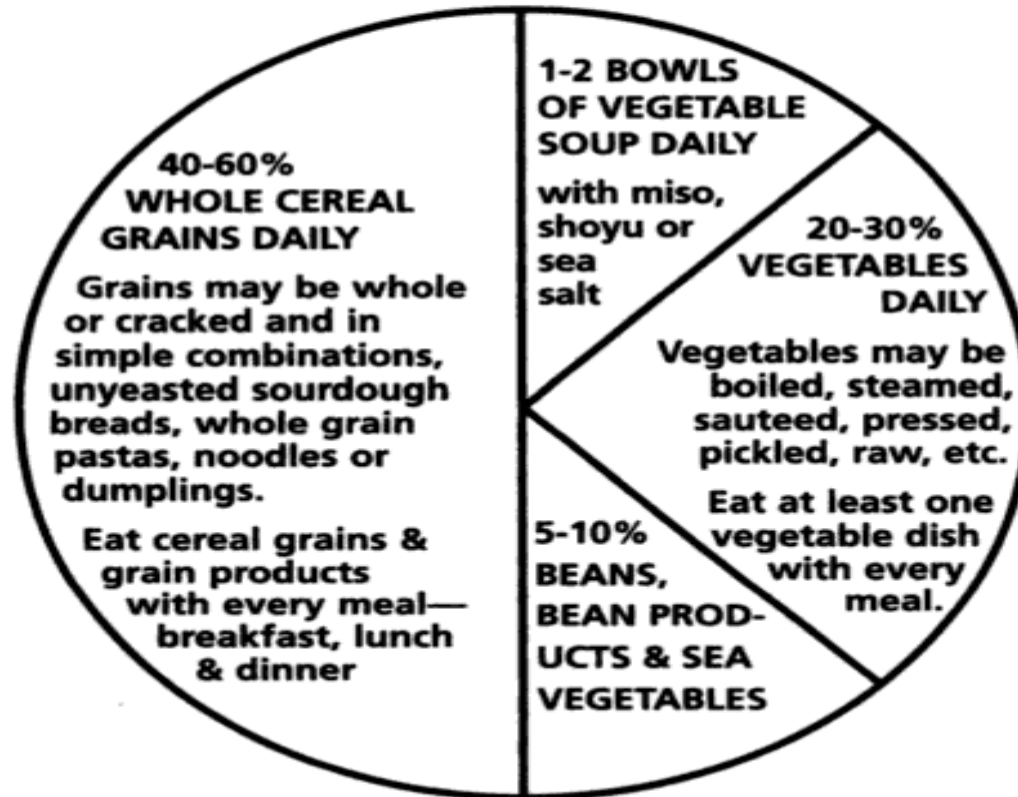


Macrobiotic diet by Michio Kushi

- Occasionally:
 - 2-3 times per week: fish, fresh or dried seasonal fruit
 - 1-2 cups per week: seeds (sesame, pumpkin, sunflower) and nuts (almonds, walnuts, pecans, chestnuts, peanuts, coconut);
 - sweetening - rice syrup, barley malt;
 - oil, preferably unrefined, corn or sesame
- Types of drinks: clean water, some types of tea
- Avoid:
 - meat, animal fat, eggs, milk and dairy products,
 - refined sugar, honey, molasses, chocolate, simple sugars and sweetened foods, tropical fruits,
 - artificial drinks, aromatic and stimulating teas,
 - technology processed grains, white flour and products of them
 - hot spices, aromatic stimulating foods, artificial sweeteners, and alcohol

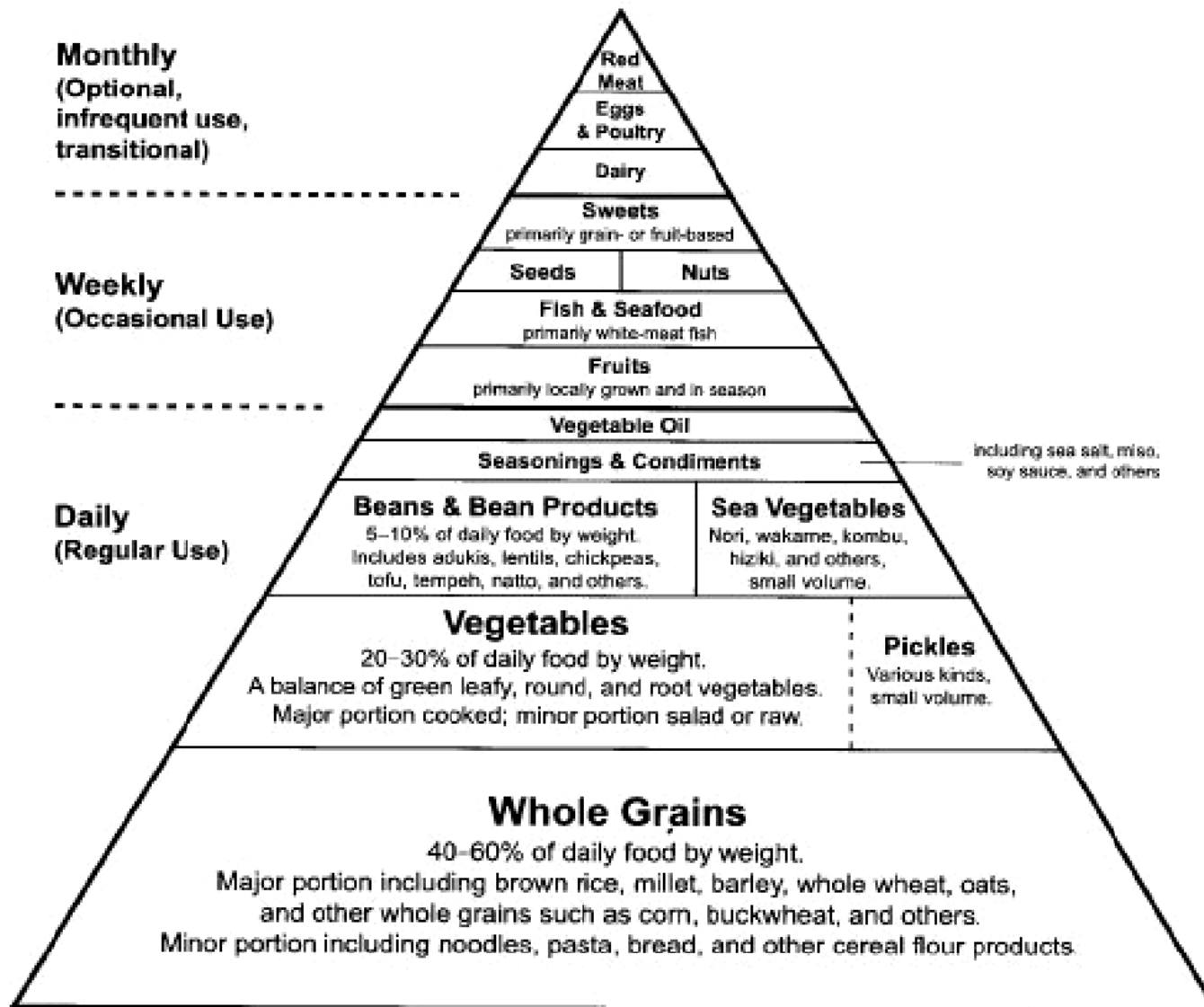
Macrobiotic plate

- 40% to 60% cereal grains
- 1 to 2 bowls of soup
- 20% to 30% vegetables
- 5% to 10% beans and sea vegetables
- Other foods revolving around the main ones, including condiments, seasonings, nuts, seeds, fruits, sweets, desserts, white-meat fish and beverages



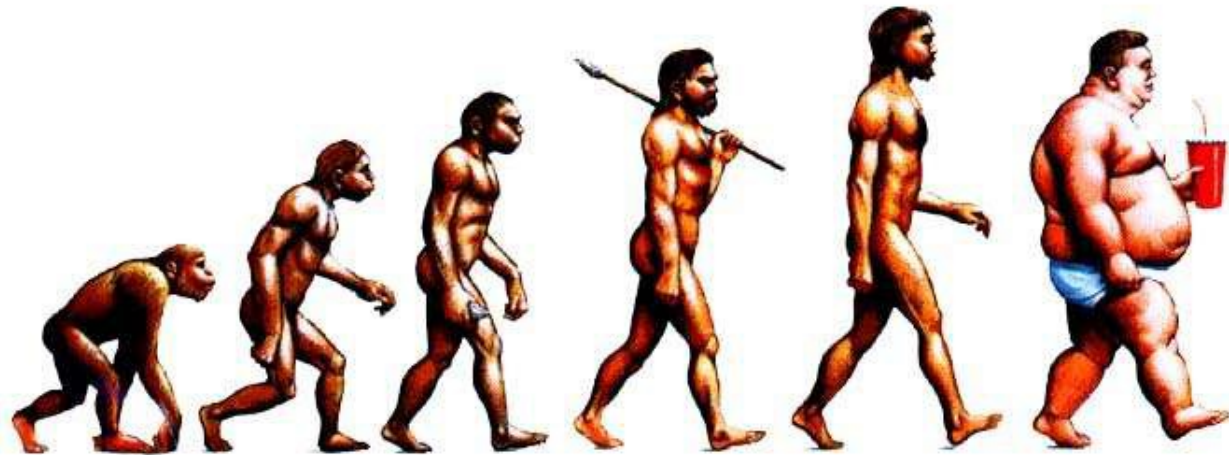
Great Life Pyramid

Macrobiotic Dietary Guidelines for a Temperate Climate



Paleo Diet

- Attempt to get closer to the diet from the Paleolithic period (Stone Age), choosing the resources from the current food
- Basis
 - Lean meat, fish, seafood
 - Eggs
 - Fruit, berries
 - Vegetables, especially root crops
 - Nuts
- Restricted
 - Cereals
 - Legumes
 - Potatoes
 - Refined oils
 - Sugar, salt
 - Milk and dairy



Divided food diet

- Founder William Howard Hay - a physician from New York
- Main principle - separate consumption of protein-rich foods and carbohydrate-rich foods
- Neutral foods - fats, sour milk products, fresh cheeses, curd, some vegetables, herbs, nuts and seeds
- Later attached policies
 - Do not combine protein with fruit
 - Fruits do not combine with vegetables
 - Keep drinking (2-3 liters daily)
 - Eat at rest
 - Consume three meals a day with a break of 3-4 hours



Diet by blood group (Adamo's Diet)

- Book Nutrition and Blood Groups by Peter J.D. Adam
- Individual diets by type of blood group
- The list of foods for each blood group
- 3 food categories:
 - Very beneficial
 - Neutral
 - Forbidden
- The reason for this diet is, according to the author, the presence of lectins in food and the human body's immune response to these substances that is affected by the blood group





Diet by Ayurveda

- Ayurveda is a traditional Indian medicine for over 5,000 years
- The aim is to achieve a balance between the body, soul, senses of man and the environment
- The main principle is the ratio of the 3 basic types of energy Vata, Pitta and Kapha - different for each person
 - Body constitution type
 - The activity of the human organism
 - Choosing the right food for each type
- Other recommendations
 - Prefer the plant diet as fresh as possible
 - Avoiding foods containing preservatives and other additives
 - Adaptation of diet to the season, climate, etc.



Detox Diets

- One of Fad diet
- Claim to facilitate toxin elimination and weight loss → promoting health and well-being
- Recommended consumption of “alkaline foods”
 - such as: vegetables, fruits, nuts, seeds and herbs
- Forbidden consumption of acidifying foods
 - such as: meat, fish, dairy products, bakery products (products made from white flour) and refined sugar
- Lobby of pharmaceutical firms, pharmacists, and practitioners of alternative medicine

NUTRITIONAL SCIENCES

**Detox diets for toxin elimination and weight management:
a critical review of the evidence**

Detox Diets

A. V. Klein¹ & H. Kiat²¹Faculty of Medicine and Health Sciences, Macquarie University, Sydney, NSW, Australia²Cardiac Health Institute, Sydney, NSW, Australia

- Some clinical studies have shown that commercial detox diets enhance liver detoxification, **BUT** they have **flawed methodologies and small sample sizes!**
- **NO randomised controlled trials** have been conducted to assess the effectiveness of commercial detox diets in humans!!!



Organic food



- Sometimes it's also classified under alternative nutrition
- Consumption of foods, that have been produced by methods that don't use pesticides, herbicides, fertilisers and which haven't been industrially processed
- Transformed into a lifestyle
- More friendly approach to nature and animals



Nutritional and health aspects



Nutritional and health aspects

- It's depending on the degree of restriction of food of animal origin and on the composition of consumed food
- Risks of alternative nutrition
 - Poor awareness
 - Improper diet composition
 - Some nutrients may be missing or in reduced quantity in a plant based diet.
 - The presence of inhibitors of the absorption of certain nutrients
 - Others
- Benefits of alternative nutrition
 - Higher consumption of fruit, vegetables, cereals, sprouts, legumes, nuts, seeds, vegetable oils
 - Lower intake of saturated fat, cholesterol, animal protein
 - Lower energy density
 -



General assessment

- The vast majority of epidemiological studies revolves around vegetarianism and its subgroups.
- **Vegetarians partially consuming food of animal origin**
 - With the right combination of foods, nutritional deficiency problems usually do not occur
 - Potential risks most often result from bad diet plan
- **Vegans**
 - Compliance with many rules
 - Your diet must be enriched with the missing ingredients in the form of dietary supplements or fortified foods - vitamins B₁₂, B₂, D, Ca, I
- **Vitarians**
 - Certain positive aspects
 - Negative - higher content of natural toxic and antinutritive substances, hygienic quality, digestibility
 - Not enough of all essential nutrients can be provided to the extent necessary
- **Fructarians**
 -



General assessment

- **Macrobiotics**
 - Lower levels can meet the nutritional needs of adult
 - Higher restrictive levels - inadequate from both nutritional and energy generation point of view
 - Lack of valuable proteins, Ca, Fe, PUFA, vitamins A, C, D and B₁₂
- **Divided food diet**
 - While adhering to its diversity and regularity, it can provide sufficient nutrients
 - The principles of separate consumption of carbohydrate and protein foods are unjustified and scientifically unsubstantiated
- **Diet by blood group**
 - The theoretical assumptions of this diet are not serious
 - By strict adherence to recommended guidelines, some blood groups may have a deficiency in vital nutrients
- **Ayurveda**
 - Recommendation of vegetarian diet
 - ...





Selected dietary components that are at risk

- Proteins
- Unsaturated fatty acids
- Iron
- Calcium
- Zinc
- Iodine
- Vitamin B12
- Vitamin D
- Carnitine
- Toxic metals – cadmium
- Advanced protein glycation end products (AGEs)
- Others - mycotoxins, nitrosamines



Proteins



- Lower biological value of plant proteins
- Lack of essential AAs (methionine and lysine)
- Reduced total percentage of essential AAs
- Worse digestibility
- To receive all essential AAs, it is necessary to consume multiple sources of vegetable protein during the day
- The quality of plant proteins is increased when combined with one another, or combined with milk, dairy products or eggs
- It is best to combine legumes with cereals and potatoes



PUFA



- Vegetarian, especially vegan diet is characterized by
 - Low intake of unsaturated long chain fatty acids - EPA, DHA, AA
 - High intakes of linoleic acid
- Vegetarians and vegans are reliant on the formation of EPA and DHA from alpha-linolenic acid
 - However, this conversion is not very effective: <5-10% EPA and 2-5% DHA
 - The conversion also inhibits high levels of PUFA ω -6 in the diet (up to 40%), lack of energy, protein, deficiency of pyridoxine, biotin, calcium, copper, magnesium and zinc, and excessive ingestion of transunsaturated fatty acids
 - Iron deficiency also has a negative effect

 **Increase intake of α -linolenic acid by incorporating sources with a low ω -6: ω -3 ratio such as crushed linseed, linseed oil (flaxseed), rapeseed oil, soybean oil and walnuts.**



Iron

Fe

- In plants present in non-haem form, absorption is about 3-5%, mostly depends on the overall composition of the diet
- Absorption is negatively affected by
 - absorption inhibitors - phytic acid, polyphenols, oxalic acid (?), Fiber
 - simultaneous high intake of calcium, zinc, magnesium and potassium
 - plant proteins in soybean and nuts
- Absorption is improved by
 - Vitamin C and organic acids in fruits and vegetables
 - presence of AAs
 - Soaking and germination of seeds, fermentation processes
- The adaptation to low iron intake through increased absorption
- Adult vegetarians have lower iron stores compared to consumers of meat, serum ferritin values are usually normal
- Iron deficiency affects the metabolism of DNA



Calcium

Ca

- In foods of plant origin, availability is reduced
 - The presence of phytates, oxalic acid and larger content of fiber
- Properly planned vegetarian diet can provide sufficient calcium intake, although in the case of vegans it is sometimes easier to use fortified foods or supplements.

Zinc

Zn

- Absorption is adversely affected by absorption inhibitors, as is the case with iron - phytic acid
- Soya, soy products, other legumes, grains, nuts, cheeses
- When comparing cereals and legumes, legumes are a better source of zinc
- Absorption is increased by seed soaking and fermentation



Iodine

I

- The content of iodine in food of plant origin in Czechia is low, because of its low concentration in soil
- Vegetarians (↑ vegans) are at increased risk of iodine deficiency
- Increased risk of mental, psychomotor and growth abnormalities
- Most sensitive to iodine deficiency are newborns, infants, adolescent girls, pregnant and lactating women
- The risk of deficiency is increased by the so-called goitrogens, which are found in cruciferous vegetables, soybeans and sweet potatoes

 **Consumption of seaweed, mineral water containing iodine, use of iodinated table salt**



Vitamin B₁₂

- Plant sources of foods do not contain vitamin B₁₂, unless they are contaminated with microorganisms that produce this vitamin
- The main food sources - meat, fish, eggs, dairy products, yeast, fortified foods (some soy drink substitutes, breakfast cereals)
- Soy products like miso, tempeh, tamari, shoyu and some algae products contain only **corinoids**, vitamin B₁₂ analogues, which do not normally have physiological effects comparable to those of vitamin B₁₂
- Vitamin B₁₂ deficiency in adults is most likely to occur after a long-term limitation of consumption of food of animal origin → rich endogenous stock up to 3 mg, unlike newborn infants → only about 25 µg
- Deficit - megaloblastic anemia, metabolic and neurological disorders



Vitamin D



- Vitamin D₃ - cholecalciferol → in foods of animal origin
- Vitamin D₂ - ergocalciferol – in foods of plant origin, according to some studies absorption is less effective (?)
- Absorption is negatively affected by high phytate content in the diet
- Fortification of food, supplements
- Most at risk are individuals consuming only foods of plant origin, refusing the intake of supplements and fortified foods, particularly in the winter months
- Children and the elderly are more prone to risks where the synthesis of vitamin D is less effective
- Infants fed according to macrobiotic believes- a higher prevalence of rickets



Carnitine

- Essential for the metabolism of long-chain fatty acid
- The amount of carnitine in the blood is partly dependent on food intake, about one-third of daily needs are due to endogenous synthesis.
- High carnitine content is found in meat, lower in dairy products, foods of plant origin contain very little or no carnitine.
- Individuals limiting the consumption of meat or all food of animal origin may be at risk of carnitine deficiency
 - in terms of its insufficient amount of food
 - possible reduction of endogenous carnitine



Cadmium

Cd

- Toxic metal (↑ kidney, liver) with a long biological half-life
- Accumulation in plants
- Higher content in cereals (grains, germ), seeds, legumes and leafy vegetables
- Increased levels of cadmium in vegetarians, especially vegans, correlation with length of practice
- ↓ Toxic effect - the presence of selenium, a high saturation of the organism with iron, calcium, zinc
- The role in detoxification - Glutathione



Advanced protein glycation end products *AGEs*

- The non-enzymatic reaction of reducing sugars with a free amino group.
- Formed during heat treatment of food
- Negatively affect the functional properties of proteins, lipids, DNA
- They play an important role in the process of atherosclerosis, complications of diabetes, aging and chronic renal insufficiency.
- For vegetarians measured higher values - cause higher intake of foods with a predominance of fructose compared to glucose which is more reactive due to a higher proportion of acyclic forms.
- AGEs may pose a certain risk, but the protective effect of eating enough fruit and vegetables is dominant from a nutritional point of view.



Health aspects

- Nutrition along with health style play an important role in protecting health and preventing chronic degenerative diseases and metabolic disorders.
- Mortality - for vegetarians, lower mortality rates from ICHS
- Cardiovascular disease
- ↓ Blood pressure values 5-10 mmHg, occurrence of hypertension
- ↓ Weight, BMI 1-2kg / m² lower ↓
- Lower total cholesterol, LDL and TAG, TNMK, higher HDL
- Type 2 diabetes mellitus
- Cancer - colorectal, prostate and breast cancer (?)
- Other disease - prevention of constipation, hemorrhoids



Risk population groups

- Children
- Adolescents
- Pregnant and lactating women
- Athletes
- Seniors



**Thank you for
attention**

