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GutWell®

Gut Microbiome Analysis Report

Before looking at your results

Our gut microbiome report is based on the latest scientific and medical knowledge available in the respected scientific and medical journals. You can learn about your gut microbiome in different sections of the report.

Human gut is inhabited by different microorganisms, mostly bacteria, but also fungi, viruses etc. Those microorganisms all together make up a gut microbiome. Most microorganisms in the gut are beneficial and play an important role in maintaining body's health. The diversity, richness and composition of the microbiome is essential for a healthy gut and also in maintaining healthy state in the whole body. The gut microbiome community depends mainly on lifestyle and environmental factors. A long-term absence or imbalanced quantity of certain bacteria can lead to different health problems like obesity, digestion problems and autoimmune diseases.

Our gut microbiome analysis allows us to study your gut bacteria – to identify, which bacteria live in your gut, how abundant they are and how they affect your body. The DNA of your bacteria is analyzed in lab, using the latest technology to provide quick and accurate results. Microbiome analysis can show whether your nutrition and gut ecosystem are well balanced or if you need to make changes in diet to influence your bacterial composition and to improve your health.

Keep in mind, that only persistent healthy eating habits can lead you to an improved gut microbiome composition.

The gut microbiome analysis report consists of the following chapters:

- **Summary of the report** provides you with conclusive information about the test results. Results are based on comparison of bacteria abundances with the percentiles calculated on the basis of the reference group.
- **Conclusions** of your gut microbiome test report section provides answers about your microbiome. The results represent a cumulative assessment of the characteristics analyzed for each question.
- **Results of specific bacteria abundances** section includes information about specific bacteria abundances compared to the reference group. In addition, it contains a brief introduction about the bacteria.
- **Your gut microbiome community charts** include charts of the phyla and genera of your gut microbiome.
- **Table of nutrients in food.**
- **Table of recommended amounts of food.**
- **Explanation of Terms** provides the definitions of specific terms used in the report.
- **The list of scientific references** used in the report.

This assay is based on the sequencing of the VS-V4 regions of the 16S rRNA genes. This technology enables us to classify bacterial taxonomies up to the species level. At the species level, the accuracy and sensitivity of the classification is lower than in the case of higher taxonomy levels.

It should be taken into consideration that the result of a microbiome test and its interpretation may be incomplete. The amount of detected microorganisms is not conclusive and other microorganisms, that are not detected by this test may be present in the microbiome. The current interpretation of the microbiome test may be subject to change in the future due to the publication of new scientific studies. Any inaccurate or missing information, likewise any action that does not comply with the manual, may result in a misleading interpretation.

This report is provided to you for informational and educational purposes only, and does not replace a visit to a physician, nor does it replace the advice or services of a physician.

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Name:	Jane Smith	Sample type:	Stool
Date of birth:	01.01.1990	Collection date:	31.08.2021
Order ID:	00010	Reporting date:	02.09.2021
Sample ID:	0000_1_ENG		

Summary of the report

Overall diversity of your microbiome is slightly low.

Your microbiome does not favour obesity.

Your microbiome does not favour inflammatory condition of the gut.

An increased abundance of pathogenic bacteria was not detected in your microbiome.

The abundance of fibre degrading bacteria in your microbiome is within optimal range.

You get slightly more than recommended amount of protein and fat from your diet.

The abundance of vitamin producing bacteria in your microbiome is within optimal range.

The abundance of probiotic bacteria in your microbiome is within optimal range.

Emma Johanna Sova MSc
Researcher/Project manager

Conclusions of your gut microbiome test results

Is my gut microbiome rich and diverse?

No, your gut microbiome overall diversity is slightly low. The diversity of gut microbiome is estimated by the Shannon index. Your Shannon index is 2.69 and the optimal Shannon index based on the reference group is >2.75. The diversity of gut microbiome is one of the indicators to estimate the risk of disease development. A diverse microbiome provides the body with all the important compounds and protects the gut from pathogens.

Recommendations:

- Significantly increase the amount of whole grains, vegetables, fresh salads and fermented vegetables in your menu.
- Eat different colored vegetables and fruits to ensure a variety of phytonutrients.
- Prefer organic products.
- Avoid one-sided nutrition.
- Avoid prolonged cooking of vegetables to ensure nutrient preservation.
- Avoid excessive use of antibacterial cleaners.

Do I get optimal amount of protein and fat from my diet?

No, you get slightly more than recommended amount of protein and fat from your diet as the abundance of genus *Bacteroides* is slightly higher.

A healthy daily protein intake for an adult is 0.8-1.5g / kg of body weight, depending on physical activity. Foods with too high protein can cause production of harmful protein metabolites by bacteria that contribute to the inflammatory processes in the intestine.

Healthy dietary fat intake for an adult is 25-30% of your daily calorie intake. Diets that are too high in fat, especially saturated and trans-fats, contribute to obesity, metabolic syndrome and gastrointestinal disorders.

Recommendations:

- Eat only one animal source of protein per meal.
- For example, when eating meat or fish, do not add eggs or dairy products.
- At least once a day replace animal protein with plant-based source (beans, peas, lentils).
- When consuming fats, prefer foods that contain more unsaturated fatty acids such as fish, avocado, olive oil and various nuts and seeds.

Does my gut microbiome favour obesity?

No, your gut microbiota does not favour obesity. This is indicated by phyla *Firmicutes:Bacteroidetes* low ratio and optimal *Akkermansia muciniphila* abundance. However your microbiome overall diversity is slightly lower than recommended.

Gut bacteria influence the energy use from ingested food and play a crucial role in development of obesity.

Recommendations:

- To maintain microbiome balanced state eat fibre-rich foods such as fruits and vegetables, berries, and whole grains.
- Prefer eating "slow" carbohydrate foods and reduce the proportion of energy-rich "fast" carbohydrates in your diet.
- Eat products that contain healthy fats (nuts, seeds and their oils, fish) 4-5x a week.
- Exercise actively at least 3 hours a week.

Do I get enough various fibres from my diet?

Yes, you get enough various fibres from your diet, despite having slightly lower microbiome overall diversity, the abundance of fibre-degrading bacteria is within optimal range. Your fibre-degrading bacteria abundance is 63.26%. Optimal abundance is >32.37%.

Fibre-rich foods help to maintain a diverse and balanced microbiome. Fibres speed up the passage of food through the intestines, help prevent constipation, and promote cholesterol excretion from the body.

Recommendations:

- Eat high-fibre foods such as vegetables and whole grains.
- Add bran and ground flaxseed to your breakfast porridge or smoothie as they contain useful fibre.
- Prepare dishes from Jerusalem artichoke, which is high in inulin. Inulin as a prebiotic promotes the growth of good bacteria and increases the uptake of Ca and Mg. Inulin as a fibre helps to lower cholesterol.

Conclusions of your gut microbiome test results

Does my gut microbiome have enough various probiotic bacteria?

Yes, your gut microbiome has optimal amount of various probiotic bacteria.
Various probiotic bacteria play an important role in healthy gut microbiome by supporting the digestion process and stabilizing the gut ecosystem. Principal probiotic bacteria belong to the genera *Lactobacillus* and *Bifidobacterium*. Consumption of prebiotics (e.g. inulin) help to promote proliferation of probiotic bacteria.
Recommendations:

- Eat fermented dairy products (sour milk, kefir, yogurt) and vegetables (sauerkraut, pickles, kimchi).
- Eat prebiotic-rich foods such as chicory, Jerusalem artichoke, onion, garlic, banana, apple with peel, asparagus, legumes, flaxseeds and barley.

Does my gut microbiome favour inflammation?

No, your gut microbiome does not favour intestinal inflammation, because you have optimal amount of butyric acid producing bacteria in your gut and the abundance of species *Akkermansia muciniphila* is within optimal range. However, your microbiome overall diversity is slightly lower than recommended.
Inflammation can be caused by bacteria and toxins leaking from the gut interior to exterior, where your immune system recognizes them as a foreign particles. Therefore it is important that the gut epithelial cells and mucin layer form a tight gut barrier. Butyric acid induces mucin synthesis and tightens the junctions between epithelial cells and therefore prevents inflammation.
Recommendations:

- To keep your microbiome balanced enrich your diet with foods containing butyric acid (butter, ghee, cow's milk, parmesan cheese).
- Eat foods that contain fibre, fructooligosaccharides, polyphenol, and resistant starch (banana, cranberries, barley, chick peas, beans, onions, boiled and cooled potatoes and rice, and raw or roasted oatmeal).

Does my microbiome contain enough vitamin-producing bacteria?

Yes, the amount of bacteria in your gut microbiome that synthesize vitamins is within optimal range. Vitamins play a crucial role in metabolism, immune system and in nervous system functioning. In addition to food intake, our body can get vitamins from gut microbes that produce vitamin K and different kinds of vitamin B (biotin, folate, niacin, cobalamin, nicotinamide, riboflavin, thiamine, etc.). Important vitamin producers are bacteria from genus *Bacteroides* and probiotic bacteria that belong to genera *Lactobacillus* and *Bifidobacterium*.
Recommendations:

- To maintain the abundance of vitamin producers in your gut, eat fermented milk products like kefir, sour cream, cheese (especially Brie and Gouda) and fibre-rich full-grain cereals.
- Eat fermented vegetables.
- Eat prebiotic-rich foods.

Have pathogenic bacteria been detected in my gut?

No, an increased abundance of pathogenic bacteria was not detected in your microbiome compared to the reference group.

NB! This analysis is not suitable for diagnostic use. There may be pathogenic bacteria in the microbiome that were not detected or not tested in this analysis.

Results of specific bacteria abundances

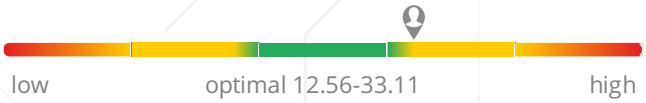
PHYLUM *FIRMICUTES* 46.73 %

Abundance is optimal.
One of the most abundant phylum in gut microbiome. They affect the absorption of fatty acids and lipid metabolism. High abundance of *Firmicutes*, compared to *Bacteroidetes* abundance, has been associated with lipid accumulation and obesity.

PHYLUM *BACTEROIDETES* 45.07 %

Abundance is optimal.
Another abundant phylum in gut microbiome. Higher abundance of *Bacteroidetes*, compared to *Firmicutes*, has been associated with leanness.

GENUS *BACTEROIDES* 33.72 %



Abundance is slightly high.
One of the most dominant genera in gut microbiome. They break down fibre, but their higher abundance, compared to *Prevotella*, has been associated with fat- and protein-rich diet.

GENUS *PREVOTELLA* 0.20 %

Abundance is optimal.
Prevotella breaks down indigestible fibres to beneficial compounds that support weight loss. High level of *Prevotella* compared to *Bacteroides* has been associated with plant-based and fibre-rich diets.

GENUS *BIFIDOBACTERIUM* 0.31 %

Abundance is optimal.
Bifidobacterium is another main probiotic bacteria that can produce vitamins, break down indigestible carbohydrates and protect the gut from pathogenic microbes.

GENUS *LACTOBACILLUS* 0.005 %

Abundance is slightly low.
Lactobacillus genus is one of the main probiotic bacteria. They are able to ferment indigestible carbohydrates into beneficial compounds and produce vitamins. They also protect the gut from pathogenic microbes. They form major part of lactic acid bacteria, which ferment carbohydrates to lactic acid.

Results of specific bacteria abundances

AKKERMANSIA MUNICIPHILA 0.06 %

Abundance is optimal.
A. muciniphila degrades mucins and is used as an indicator to assess if the intestinal epithelium is covered by a sufficient amount of intestinal mucus to protect it against leakage. Lower abundance is associated with obesity, diabetes, and inflammation. Polyphenols (grapes, cranberries etc) promote the abundance of this bacterium.

OXALOBACTER FORMIGENES -

No bacteria detected.
O. formigenes metabolizes oxalate in the intestinal tract. The absence of *O. formigenes* could lead to increased colonic absorption of oxalate, and the subsequent increase in urinary oxalate could favour the development of kidney stones. Oxalate-rich plants are e.g. spinach, beetroot, rhubarb, chives, turmeric, and almond.

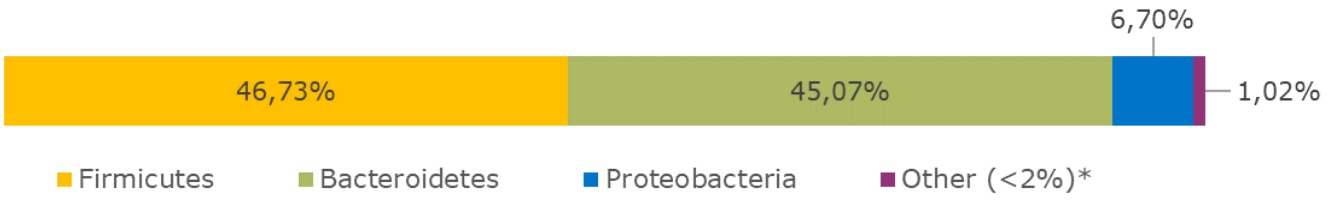
BUTYRIC ACID PRODUCING BACTERIA 13.25 %

Abundance is optimal.
These bacteria (genera *Anaerostipes, Flavonifractor, Faecalibacterium, Pseudobutyrivibrio, Roseburia, Subdoligranulum* etc) produce butyric acid, which is considered to have anti-inflammatory effect. In addition butyric acid is an important signal molecule that has a crucial role in our metabolism and immune system function.

FIBRE-DEGRADING BACTERIA 63.26 %

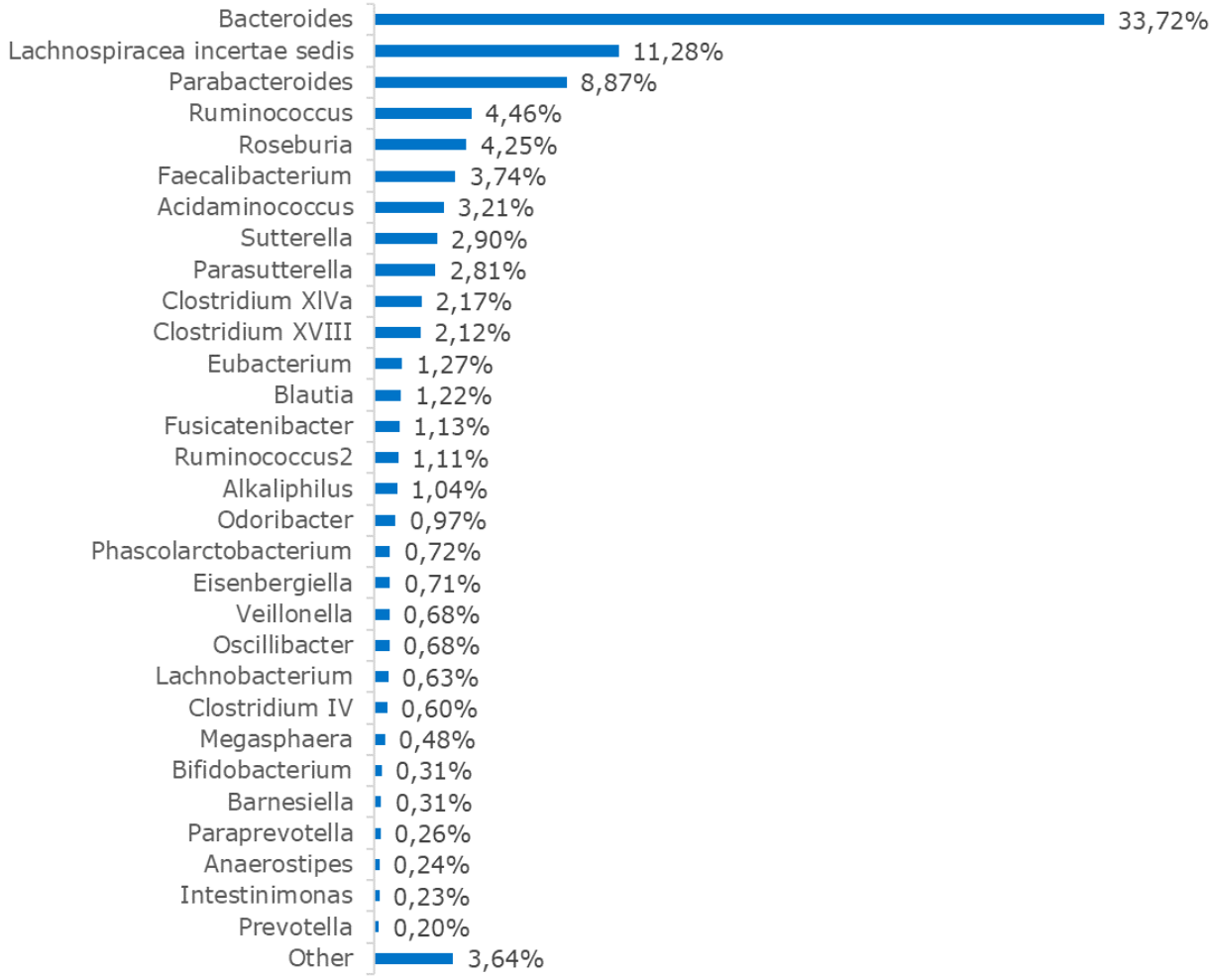
Abundance is optimal.
Bacteria that degrade complex carbohydrates indigestible to humans. These include bacteria from genera *Prevotella, Bifidobacterium, Lactobacillus, Bacteroides* and others. They produce important beneficial compounds to host and help to keep the digestive tract healthy.

The most abundant phyla in your microbiome



*Includes all the phyla, which abundance is lower than 2%

The most abundant genera in your microbiome



The abundance of the 30 most abundant genera is presented, the rest of the genera are summed up in the column „Other".

Nutrients in foods

"Slow" carbohydrates	g/100g	"Fast" carbohydrates	g/100g	Fibre	g/100g
Whole cereals (wheat, oats, barley, rye, buckwheat, etc.)	60-70	White sugar	99,8	Carob powder	40
Sour dough bread	56	Corn	77	Wheat bran, rye bran	38
Rye bread	46	Candies	56-80	Flax seeds	28
Brown rice (boiled)	28	White wheat flour	64	Oat bran	17
Whole wheat pasta (boiled)	20	Deep fried chips	50	Nuts, seeds and almonds	5-15
Fruits (apple, pear, etc.)	8-15	White bread	45	Cereals (quinoa, oats, brown rice, barley, buckwheat, rye)	5-10
Berries (strawberry, raspberry, etc.)	7-14	White rice	27	Dark chocolate	8
Vegetables (carrot, tomato, etc.)	4-10	Pasta	20	Legumes (lentil, pea, red bean, chick pea, black bean, field bean, etc.)	6-8
		Soft drinks	10	Berries (strawberry, raspberry, blueberry, blackcurrant, etc.)	2-7
Vegetable protein	**g/100g**	**Animal protein**	**g/100g**	Jerusalem artichoke	3
Algae products (Spirulina)	57	Meat (beef, pork, chicken, turkey, etc.)	23-27	Vegetables (carrot, beet, broccoli, artichoke, Brussels sprout, spinach, tomato, etc.)	1-5
Hemp seeds	25	Fish (tuna, salmon, etc.)	20-30	Fruits (pear, avocado, apple, banana, etc.)	1-3
Soybean products (tofu, tempeh, edamame, etc.)	15-18	Cheese (cream cheese, ricotta, cottage cheese, feta, mozzarella, etc.)	17-26		
Quinoa	13	Curd	13		
Lentils	9	Egg	12		
Peas (green pea, chick pea, etc.)	8	Yogurt	3-7		
Beans (red, black, pinto bean, etc.)	7-8	Milk	3		
Unsaturated fats	**g/100g**	**Saturated fats**	**g/100g**		
Olive oil	81	Coconut oil	86		
Nuts (walnut, pistachio, cashew, pecan, etc.)	40-50	Butter	48		
Almonds	45	Cheese	17-32		
Seeds (pumpkin, sesame, sunflower, etc.)	35-40	Salami	15		
Flax and chia seeds	25-27	Chicken skin	14		
Avocado	11	Fatty meat (pork, sheep, etc.)	6-9		
Fish (tuna, salmon, etc.)	2-4	Processed meat products (sausage, frankfurter, etc.)	7-8		

Recommended amounts of food

Vegetables	Recommended serving	1 portion contains
Carrot, turnip, beet, cucumber, tomato, cabbage, broccoli, zucchini, Jerusalem artichoke, etc. Lettuce, spinach, rucola, iceberg, etc.	3-5 servings a day	½ glass of vegetables ½ glass fresh vegetable juice 1 glass of leafy vegetables
Fruits and berries		
Fruits (pear, avocado, apple, banana, etc.) Berries (strawberries, raspberries, blueberries, blackcurrants, etc.)	4-5 servings a day	½ glass of chopped fruits or berries½ glass of freshly squeezed juice
Legumes and germs		
Lentils, peas, red beans, chick peas, black beans, field beans, beans, etc.	1 serving at least 3x a week	½ glass of beans, peas or lentils 30 g broad bean 30 g of germs
Whole grain products and potatoes		
Cereals (quinoa, oats, rice, millet, barley, buckwheat, rye, wheat, etc.)	4-7 servings a day	1 slice of bread ½ glass cooked cereals 1 tbs of flour
Bran (wheat, rye, oats)	1 serving a day	1 tbs
Potatoes, sweet potatoes, corn	1 serving a day	1 small corn cob 1 medium potato 70 g sweet potatoes
Milk and dairy		
Milk, kefir, sour milk, buttermilk Plain yogurt Cheese (cream cheese, feta, mozzarella, parmesan) Sour cream Curd, cottage cheese, ricotta	1-3 servings a day	1 glass of milk, kefir, yougurt 30-40g cheese 30-40g sour cream 100-130g curd, cottage cheese
Meat and fish		
Meat (beef, pork, lamb, wild animal) Poultry (chicken, turkey, duck)	1-2 servings a day	35 g fatty meat 60 g lean meat
Light fish (zander, pike, cod, silver hake, etc.) Fatty fish (salmon, trout, herring, Baltic herring, sprat, mackerel, sardine, eel, etc.)	1 serving at least 3x a week	75 g light fish 30-35 g fatty fish
Eggs		
Eggs	1 serving at least 3x a week	1 chicken egg 5 quail eggs
Nuts, seeds and almonds		
Pistachio, cashew nut, coconut, etc. Flaxseeds, chia seeds, pumpkin seeds, etc.	1 serving a day	10 g or 1 tbsp
Fats		
Cold-pressed oils (olive oil, rapeseed oil, camelina oil) Butter, lard, coconut fat	1 serving a day	5 g

Explanation of terms

Autoimmune disease – condition in which your immune system mistakenly attacks your own body.

Carbohydrates – substances that can be divided:
- simple carbohydrates, like glucose, fructose, sucrose and lactose. They are mainly found in fruits, vegetables, honey and table sugar.
- complex carbohydrates, like starch, glycogen and cellulose. They are mainly found in cereals, legumes, nuts, seeds, potato, corn and sweet potato.
- fibres.

„Fast" carbohydrates – carbohydrates that quickly increase your blood sugar level after eating. Measured by Glucemic Load (GL > 20 is considered to be „fast" carbohydrate).

Fibre – substance that is indigestible to human body. It enters the large intestine in indigestible form, where it feeds certain gut bacteria. Consists of cellulose, lignin and pectin.

Fructooligosaccharides – certain carbohydrates that contain fructose. These are found in many plants.

Genus – taxonomic rank used in the biological classification of organisms. Covers a wider range of organism than in the species level.

Lactic acid bacteria – bacteria that produce lactic acid during the fermentation of carbohydrates.

Microbes or microorganisms – living organism that is too small to be visible to the naked eye. Includes bacteria, archaea, fungi, protists and microscopic animals.

Microbiome – ecological community of microorganisms. Sometimes terms microbiome and microbiota are used separately, in which case microbiota refers to the group of microbes themselves and microbiome refers to the genomes of these microbes. In this report term microbiome is used for both cases.

Pathogen or pathogenic bacteria – bacteria that can cause disease.

Phylum – third highest taxonomic rank used in the biological classification of organisms. Other taxonomic ranks in descending order are class, order, family, genus, species.

Polyphenol – organic chemicals that occur in plants. Considered beneficial, mainly because of antioxidant properties.

Prebiotics – compounds that serve as food for probiotic bacteria. These include mainly fibres.

Probiotic or probiotic bacteria – live microorganisms intended to provide health benefits.

Reference group – comparison group of healthy people (BMI 18-26), whose results give the optimal or suggested range of value for the indicator.

Saturated fatty acid – substance where all fatty acid chains have single bonds. Claimed to raise cholesterol levels and may support the development of heart diseases.

„Slow" carbohydrates – carbohydrates that increase your blood sugar slowly. Measured by Glucemic Load (GL < 10 is considered to be „slow" carbohydrate).

Unsaturated fatty acid – substance that has at least one double bond within the fatty acid chain. Considered to improve cholesterol profile by lowering the so-called „bad" cholesterol and increasing the „good" cholesterol.

References

- Brown, C. T., Davis-Richardson, A. G., Giongo, A., Gano, K. A., Crabb, D. B., Mukherjee, N., … Triplett, E. W. (2011). Gut Microbiome Metagenomics Analysis Suggests a Functional Model for the Development of Autoimmunity for Type 1 Diabetes. PLoSONE, 6(10), e25792.
- Dao, M. C., Everard, A., Aron-Wisnewsky, J., Sokolovska, N., Prifti, E., Verger, E. O., … Clément, K. (2016). Akkermansia muciniphila and improved metabolic health during a dietary intervention in obesity: relationship with gut microbiome richness and ecology. Gut, 65(3), 426–436.
- Diether, N.E., Willing, B.P. (2019). Microbial Fermentation of Dietary Protein: An Important Factor in Diet- Microbe- Host Interaction. Microorganisms, 13;7(1).
- Duncan, S. H., Richardson, A. J., Kaul, P., Holmes, R. P., Allison, M. J., & Stewart, C. S. (2002). Oxalobacter formigenes and its potential role in human health. Appl Environ Microbiol., 68(8), 3841–3847.
- El Kaoutari, A., Armougom, F., Gordon, J. I., Raoult, D., & Henrissat, B. (2013). The abundance and variety of carbohydrate-active enzymes in the human gut microbiota. Nature Reviews Microbiology, 11(7), 497–504.
- Fu, X., Liu, Z., Zhu, C., Mou, H., & Kong, Q. (2019). Nondigestible carbohydrates, butyrate, and butyrate-producing bacteria. Critical Reviews in Food Science and Nutrition, 59(0), S130–S152.
- Hamer, H. M., Jonkers, D., Venema, K., Vanhhoutvin, S., Troost, F. J., & Brummer, R.-J. (2007). Review article: the role of butyrate on colonic function. Aliment Pharmacol Ther., 27(2), 104–119.
- Hemarajata, P., Versalovic, J. (2013). Effects of probiotics on gut microbiota: mechanisms of intestinal immunomodulation and neuromodulation. Therap Adv Gastroenterol., 6(1):39-51.
- Huttenhower, C., Gevers, D., Knight, R., Abubucker, S., Badger, J. H., Chinwalla, A. T., … White, O. (2012). Structure, function and diversity of the healthy human microbiome. Nature, 486(7402), 207–214.
- Le Chatelier, E., Nielsen, T., Qin, J., Prifti, E., Hildebrand, F., Falony, G., … Pedersen, O. (2013). Richness of human gut microbiome correlates with metabolic markers. Nature, 500(7464), 541–546.
- LeBlanc, J. G., Chain, F., Martín, R., Bermúdez-Humarán, L. G., Courau, S., & Langella, P. (2017). Beneficial effects on host energy metabolism of short-chain fatty acids and vitamins produced by commensal and probiotic bacteria. Microbial Cell Factories, 16(1), 79.
- LeBlanc, J. G., Milani, C., de Giori, G.S., Sesma, F., van Sinderen, D., Ventura, M. (2013). Bacteria as vitamin suppliers to their host: a gut microbiota perspective. Curr Opin Biotechnol., 24(2):160-8.
- Ley, R. E., Backhed, F., Turnbaugh, P., Lozupone, C. A., Knight, R. D., & Gordon, J. I. (2005). Obesity alters gut microbial ecology. Proc Natl Acad Sci U S A., 102(31), 11070–11075.
- Ley, R. E., Turnbaugh, P. J., Klein, S., & Gordon, J. I. (2006). Microbial ecology: Human gut microbes associated with obesity. Nature, 444(7122), 1022–1023.
- Liebman, M., Al-Wahsh, I.A. (2011). Probiotics and other key determinants of dietary oxalate absorption. Adv Nutr., May;2(3):254-60.
- Magnúsdóttir, S., Ravcheev, D., De Crécy-Lagard, V., & Thiele, I. (2015). Systematic genome assessment of B-vitamin biosynthesis suggests cooperation among gut microbes. Frontiers in Genetics, 6(MAR).
- Mailing, L. J., Allen, J. M., Buford, T. W., Fields, C. J., Woods, J.A. (2019). Exercise and the Gut Microbiome: A Review of the Evidence, Potential Mechanisms, and Implications for Human Health. Exerc Sport Sci Rev., 47(2):75-85.
- Makki, K., Deehan, E.C., Walter, J., Bäckhed, F. (2018). The Impact of Dietary Fiber on Gut Microbiota in Host Health and Disease. Cell Host & Microbe, 23(6):705-715.
- Morowitz, M.J., Carlisle, E.M., Alverdy, J.C. (2011). Contributions of intestinal bacteria to nutrition and metabolism in the critically ill. Surg Clin North Am., 91(4):771-85.
- Rowland, I., Gibson, G., Heinken, A., Scott, K., Swann, J., Thiele, I., Tuohy, K. (2018). Gut microbiota functions: metabolism of nutrients and other food components. Eur J Nutr., 57(1):1-24.
- Schneeberger, M., Everard, A., Gómez-Valadés, A. G., Matamoros, S., Ramírez, S., Delzenne, N. M., … Cani, P. D. (2015). Akkermansia muciniphila inversely correlates with the onset of inflammation, altered adipose tissue metabolism and metabolic disorders during obesity in mice. Sci Rep., 5(1), 16643.
- Senghor, B., Sokhna, C., Ruimy, R., & Lagier, J.-C. (2018). Gut microbiota diversity according to dietary habits and geographical provenance. Human Microbiome J., 7–8, 1–9.
- Singh, R. K., Chang, H.-W., Yan, D., Lee, K. M., Ucmak, D., Wong, K., … Liao, W. (2017). Influence of diet on the gut microbiome and implications for human health. J Transl Med., 15(1), 73.
- Song, S. J., Amir, A., Metcalf, J. L., Amato, K. R., Xu, Z. Z., Humphrey, G., & Knight, R. (2016). Preservation Methods Differ in Fecal Microbiome Stability, Affecting Suitability for Field Studies. mSystems, 1(3).
- Soto-Martin, E. C., Warnke, I., Farquharson, F. M., Christodoulou, M., Horgan, G., Derrien, M., … & Louis, P. (2020). Vitamin biosynthesis by human gut butyrate-producing bacteria and cross-feeding in synthetic microbial communities. MBio, 11(4), 1–18.
- Wu, G. D., Chen, J., Hoffmann, C., Bittinger, K., Chen, Y.-Y., Keilbaugh, S. A., … Lewis, J. D. (2011). Linking Long-Term Dietary Patterns with Gut Microbial Enterotypes. Science, 334(6052), 105–108.
- Zhang, N., Ju, Z., & Zuo, T. (2018). Time for food: The impact of diet on gut microbiota and human health. Nutrition, 51–52, 80–85.
- Zhang, N., Yang, X. J. (2016). Effects of a high fat diet on intestinal microbiota and gastrointestinal diseases. World J Gastroenterol., 28;22(40):8905-8909.