ДЕНОВИ НА ПРЕВЕНТИВНА МЕДИЦИНА ВО РЕПУБЛИКА МАКЕДОНИЈА 2017

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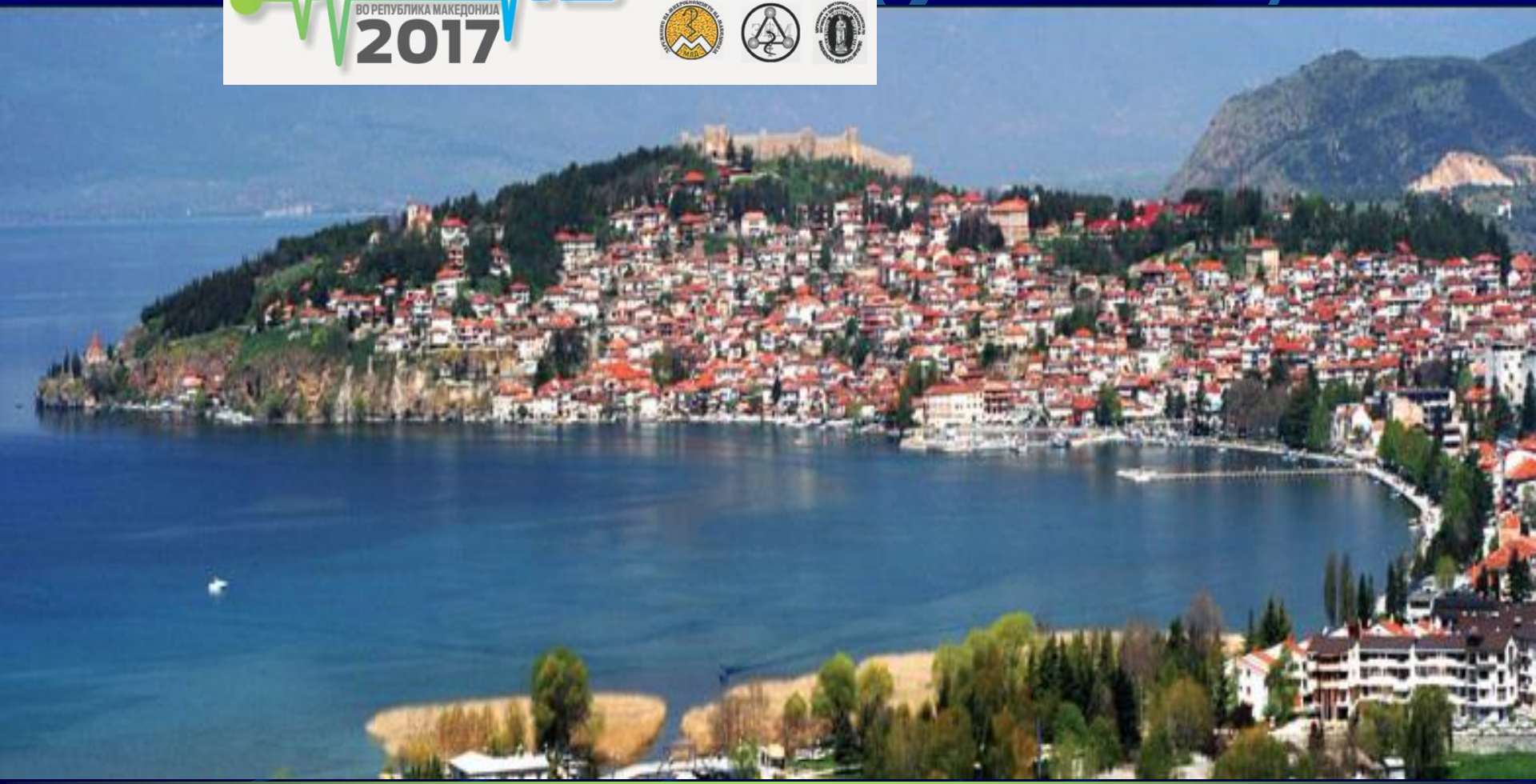

ОХРИД, 2 -4 Ноември, 2017

УЛОГА НА ПРОБИОТИЦИТЕ И ПРЕБИОТИЦИТЕ ВО ОДРЖУВАЊЕ НА ЗДРАВА ЦРЕВНА ФЛОРА

ROLE OF PROBIOTICS AND PREBIOTICS IN MAINTENANCE HEALTH GUT FLORA

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NOVEMBER 3 – EVENTS – Science events on November 3rd

SOS

(source)

In 1906, "SOS" was specified as the international distress signal, in a document signed by representatives of 27 nations at the second International Wireless Telegraph Convention in Berlin. It would replace the earlier Marconi call sign CQD. By 1904 many transatlantic British ships had wireless equipment. First used in England on landline wires, "CQ" preceded time signals and special notices as a sign for "all stations." The Marconi company suggested adding the "D" meaning distress. The code "CQD" was established as a distress signal on 1 Feb 1904, but was never chosen from such a phrase as "Come Quick Danger." The 1906 Conference proceedings do not detail the discussions about the choice of SOS. The likely reason is that it was speedy to tap out (not from "Save Our Souls").

Sputnik 2

(source)

In 1957, *Sputnik 2* was launched, with the first live animal sent into space - a Siberian husky dog, *Laika* ("barker" in Russian). By design, the craft was not planned for recovery, and *Laika* died in orbit. Biological data, the first data of its kind, was transmitted back to Earth while she lived. The data showed scientists how *Laika* was adapting to space - information important to the imminent planned manned missions. The 508-kg satellite remained in orbit 162 days. *Laika* was considered a hero in the Soviet Union. The first human to pilot a spacecraft, Yuri Gagarin, followed on 12 Apr 1961, aboard *Vostok 1*.« read more more

МИКРОБИОМ (Microbiota):

Човечкиот организам има околу 10^{13} клетки (околу 100 кг.)

Возрасен човек има 10^{14} клетки na m.o. (бактериии, вируси, археи) (10 пати повеќе од кл. на човек) = **МИКРОБИОМ (Microbiota)**:

> 5 милиони гени (150 пати повеќе од човечките гени),

> тежи 1-2 кг,

> **„Заборвен орган“**

Најголемиот број на м.о. се наоѓаат во **дебелото црево**, со огромна улога за здравјето и болестите на луѓето, со витални функции поврзани со:

- имунитетот
- хормонална и
- метаболна хомеостаза

на домаќинот.

HMP (Human Microbiome Project, 2007 NIH, USA)
MetaHIT (Metagenomics Project of the Human Intestinal Tract , EU Commission & China)

- HMP researchers now calculate that more than **10,000 microbial species** occupy the human ecosystem.

- Moreover, researchers calculate that they have identified between **81 and 99 percent** of all microorganismal genera in healthy adults.

- HMP researchers also reported the **human genome** carries some **22,000 protein-coding genes**,
- human **microbiome** contributes some **8 million** unique protein-coding genes or 360 times more bacterial genes than human genes.

- Genes carried by bacteria in the gastro-intestinal tract, for example, allow humans to **digest foods** and absorb nutrients that otherwise would be unavailable.

- Moreover, the microbes produce beneficial compounds, like **vitamins and anti-inflammatories** that our genome cannot produce."

- Our digestive tracts are critical to our health is because **80 % of entire immune system is located in digestive tract!**

- **Digestive systems** are the second largest part of our neurological system. It's called the **enteric nervous system** and is located in the gut (**called our second brain!).**

- Many people with **health issues**, such as thyroid imbalances, **chronic fatigue**, joint pain, psoriasis, **autism** and many other conditions don't realize that these illnesses originate in the gut.

- The components of the human microbiome clearly **change** over time.

- When a patient is **sick** or takes **antibiotics**, the **species** that makeup of the microbiome may **shift** substantially as one bacterial species or another is affected.

- Eventually, however, the microbiome **returns** to a state of equilibrium, even if the previous composition of bacterial types does not.

- **60 million to 70 million Americans are affected by digestive diseases.** (cost the U.S. over $100 billion per year)

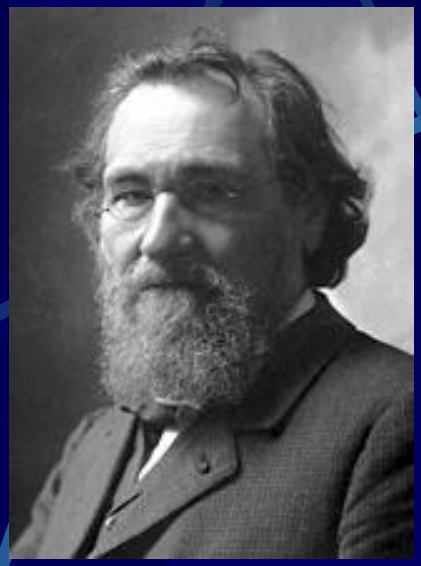
The History Of Probiotics

- Thousands of years ago, a Roman naturalist named Pliney the Elder recommended **drinking fermented milk to treat intestinal problems**. **Fermented foods** are also mentioned in the **Bible** and the sacred books of **Hinduism**.

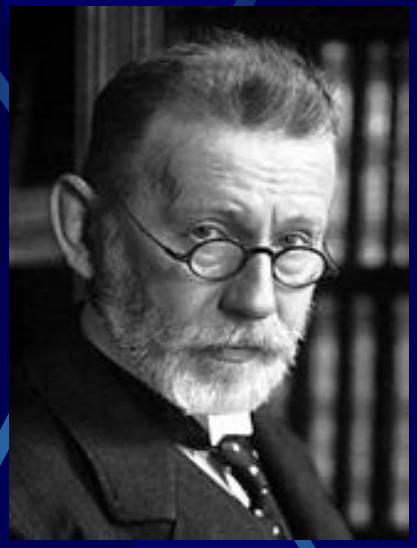
- In 1899, Henry Tissler, a research scientist at the Pasteur Institute in Paris, France, reported detecting a Y-shaped bacteria in the intestines of breast-fed infants. He called the organisms **"bifidobacteria"** (singular – bifidobacterium.)

- The quest to find a **fountain of youth** was a popular occupation for scientists and physicians of that era. Eli Metchnikoff , a Russian scientist at the Pasteur Institute in Paris, was **studying lactic acid bacteria**.

- Mitchnikoff had observed that rural dwellers in Bulgaria lived to very old ages, despite extreme poverty and harsh climate. He noted that they **drank fermented milk products**, surmised that the lactic acid bacteria associated with fermented milk products had **anti-aging** health benefits.



Ilya Ilyich Mechnikov



Paul Ehrlich

The **Nobel Prize** in Physiology or Medicine **1908** was awarded jointly to Ilya Ilyich Mechnikov and Paul Ehrlich *"in recognition of their work on **immunity**"*

Probiotics Today

- The word probiotics comes from the **Latin pro (“for”) and the Greek bios (“life”).**

The **WHO** and the Food and Agriculture Organization of the United Nations developed in 2001 a widely used **definition**:

- **Probiotics are “live microorganisms, which, when administered in adequate amounts, confer a health benefit on the host.”**
- **These microorganisms can be bacterial, viral, or yeast**.

- They’re also called **“friendly” or “good” bacteria**.

Најчести микроорганизми кои се употребуваат во пробиотички препарати за комерцијална употреба

Lactobacillus Spp.	*Bifidobacterium Spp.*	*Streptococcus Spp.*	*Saccharomyces Spp.*	*Други видови*
L. acidophilus	*B. bifidum*	*S. thermophilus*	*S. boulardii*	*Enterococcus faecium*
L.casei (rhamnosus)	*B. breve*	*S.salivarius subsp.thermophilus*		*Escherichia coli Nissle*
L. fermentum	*B. lactis*			*Bacillus cereus*
L. bulgaricus	*B. longum*			*Propionibacterium*
L. paracasei	*B. infantis*			*Freudenreichii*
L. salivarius	*B. adolescenti*			
L. reuteri				

Најчестите врсти на микроорганизми кои влегуваат во составот на пробиотиците се од родовите *Lactobacillus* и *Bifidobacterium*.

Lactobacillus

- Грам (+) факултативно анаеробни и микроаерофилни бацили.

- Припаѓаат на Млечно-киселинските бактерии (LAB) бидејќи ја претвораат лактозата и другите шеќери во млечна киселина.

- Кај луѓето ги има во вагината и гастроинтестиналниот тракт.

Lactobacillus

Order: Lactobacillales

Family: Lactobacillaceae

Genus: ***Lactobacillus*** Beijerinck 1901

Species

L. acetotolerans
L. acidifarinae
L. acidipiscis
L. acidophilus
L. agilis
L. algidus
L. alimentarius
L. amylolyticus
L. amylophilus
L. amylotrophicus
L. amylovorus
L. animalis
L. antri
L. apodemi
L. aviarius

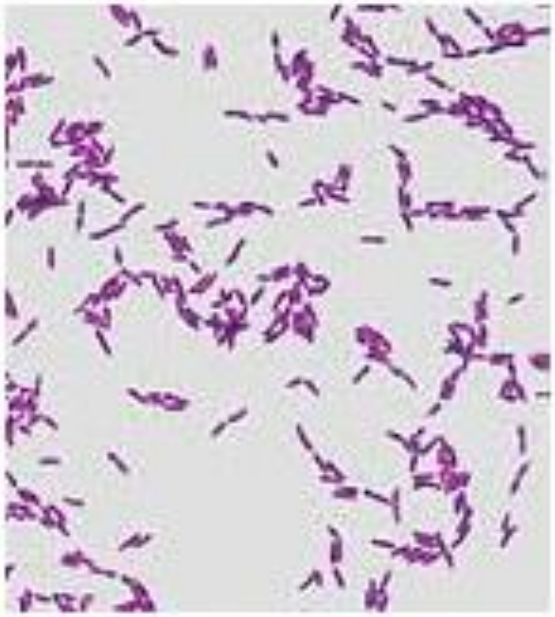
L. bifermentans
L. brevis
L. buchneri
L. camelliae
L. casei
L. catenaformis
L. ceti
L. coleohominis
L. collinoides
L. composti
L. concavus
L. coryniformis
L. crispatus
L. crustorum
L. curvatus
L. delbrueckii subsp. delbrueckii
L. delbrueckii subsp. bulgaricus
L. delbrueckii subsp. lactis
L. dextrinicus
L. diolivorans
L. equi

L. equigenerosi
L. farraginis
L. farciminis
L. fermentum
L. fornicalis
L. fructivorans
L. frumenti
L. fuchuensis
L. gallinarum
L. gasseri
L. gastricus
L. ghanensis
L. graminis
L. hammesii
L. hamsteri
L. harbinensis
L. hayakitensis
L. helveticus
L. hilgardii
L. homohiochii
L. iners

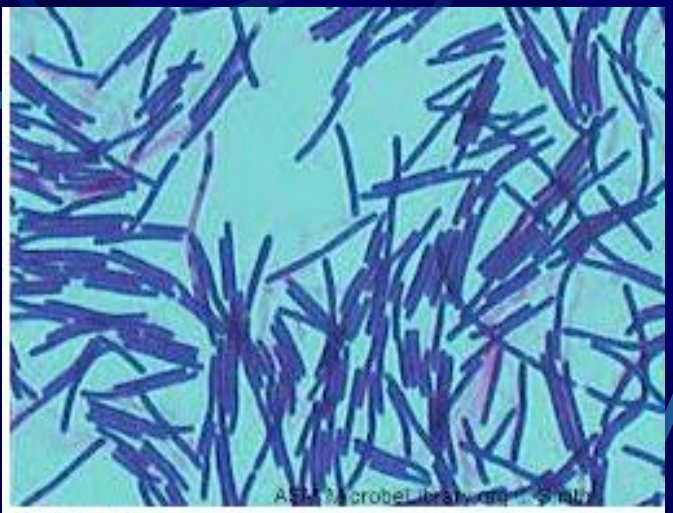
L. ingluviei
L. intestinalis
L. jensenii
L. johnsonii
L. kalixensis
L. kefiranofaciens
L. kefiri
L. kimchii
L. kitasatonis
L. kunkeei
L. leichmannii
L. lindneri
L. malefermentans
L. mali
L. manihotivorans
L. mindensis
L. mucosae
L. murinus
L. nagelii
L. namurensis
L. nantensis

L. oligofermentans
L. oris
L. panis
L. pantheris
L. parabrevis
L. parabuchneri
L. paracollinoides
L. parafarraginis
L. parakefiri
L. paralimentarius
L. paraplantarum
L. pentosus
L. perolens
L. plantarum
L. pontis
L. psittaci
L. rennini
L. reuteri
L. rhamnosus
L. rimae
L. rogosae

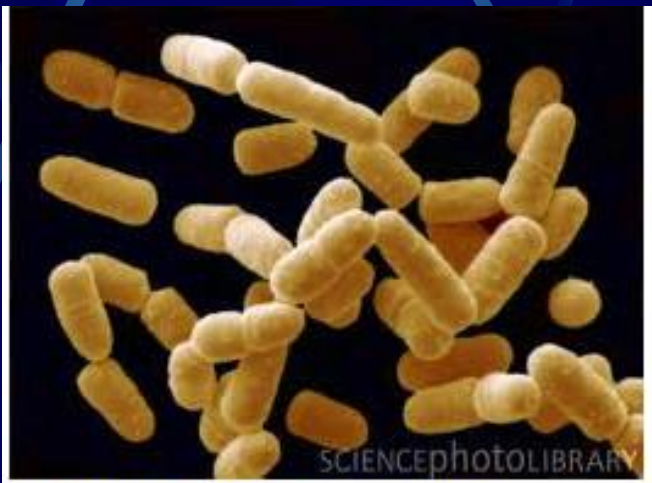
L. rossiae
L. ruminis
L. saerimneri
L. sakei
L. salivarius
L. sanfranciscensis
L. satsumensis
L. secaliphilus
L. sharpeae
L. siliginis
L. spicheri
L. suebicus
L. thailandensis
L. ultunensis
L. vaccinostercus
L. vaginalis
L. versmoldensis
L. vini
L. vitulinus
L. zeae
L. zymae



l1.jpeg
biotechscience.blogspot.com
181 × 200 - **Lactobacilli** as an PROBIOTIC
Similar More sizes



116-4.jpg
lib.jiangnan.edu.cn Share
640 × 480 - **Lactobacillus** species



Lactobacillus_salivarius-.jpg
probiotic-cn.com Share
350 × 262 - **Lactobacillus** salivarius (L. salivarius) is a gram-positive, ...

Bifidobacterium

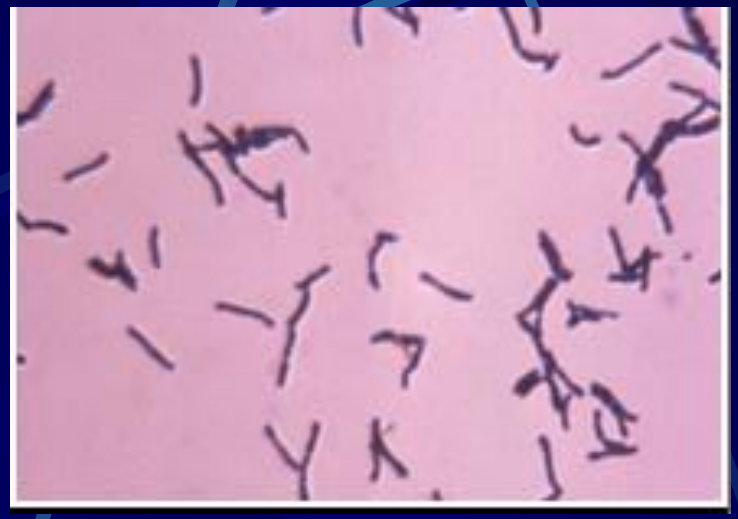
- род на Грам (+), неподвижни, често се разгранети, анаеробни бактерии
- Ги има во ГИТ (колон), вагината и устата

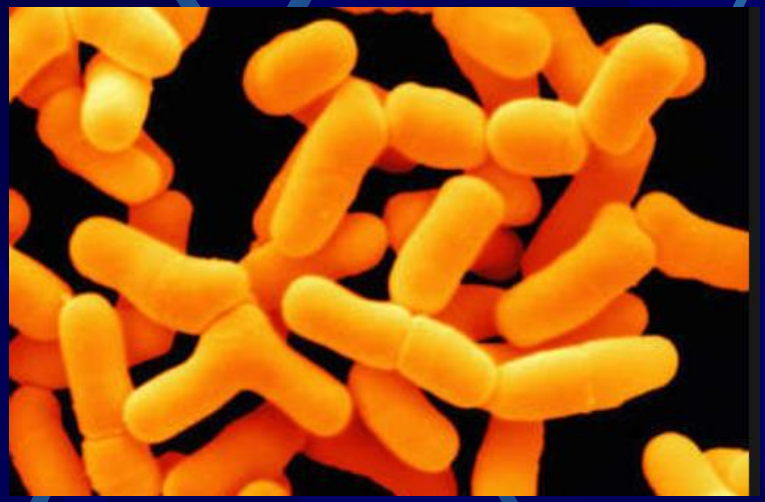
Kingdom:	Bacteria
Phylum:	Actinobacteria
Class:	Actinobacteria
Subclass:	Actinobacteridae
Order:	Bifidobacteriales
Family:	Bifidobacteriaceae
Genus:	***Bifidobacterium*** Orla-Jensen 1924

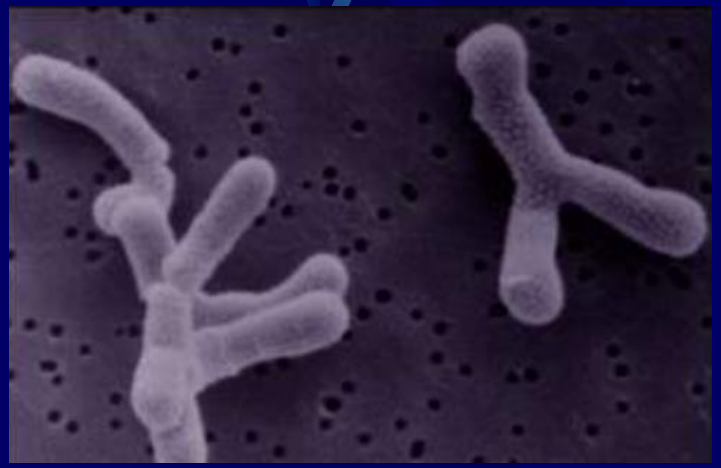
Species

B. adolescentis
B. angulatum
B. animalis
B. asteroides
B. bifidum
B. boum
B. breve
B. catenulatum
B. choerinum
B. coryneforme
B. cuniculi
B. denticolens
B. dentium
B. gallicum
B. gallinarum
B. indicum
B. inopinatum
B. infantis
(For *B. lactis* see *B. animalis*)
B. longum
B. magnum
B. merycicum
B. minimum
B. pseudocatenulatum
B. pseudolongum
B. pullorum
B. ruminantium
B. saeculare
B. subtile
B. thermacidophilum
B. thermophilum
B. tsurumiense

Bifidobacterium







A 2016 review stated that **prebiotics are**:

“**Food ingredients** that help support growth of probiotic bacteria" (bifidobacteria and lactic acid bacteria) or

“**Nondigestible substances** that act as food for the gut microbiota.

Извор	Научно име	Фруктозни единици
Банана	Musa spp.	2
‘Рж	Secale cereale	2
Аспарагус	Asparagus officianalis	2-4
Артичока	Heliantum tuberosus	2
Кромид	Allium cepa	2-4
Репка	Arctium lappa	2-4
Лук	Allium sativum	2
Праз	Allium ampeloprasmus	<4

Природни извори на пребиотици (фруктоолигосахариди)

Probiotics actions:

- May **compete** against pathogens for the same essential nutrients,
- May **bind** to adhesion sites, preventing pathogen colonization
- Signaling of immune cells by probiotics may result in the **secretion** of cytokines, targeting the pathogen for destruction
- May **attack** pathogenic organisms by releasing bacteriocins, killing them directly

According to the National Center for Complementary and Integrative Health, "Although some probiotics have shown promise in research studies, strong **scientific evidence** to support specific uses of probiotics for most health conditions **is lacking**."

- ???

- European Food Safety Authority (EFSA) rejects the WHO's definition because it contains a health claim which is not measurable.

- The EFSA states that, "the scientific evidence remains insufficient to prove a cause and effect relationship between consumption of probiotic products and any health benefit".

WINCLOVE PROBIOTICS

Press release
14-Mar-2017, Amsterdam

First Probiotic with EU Health Claim

The first probiotic with a European health claim is now a fact, according to Dutch probiotic researcher and manufacturer Winclove Probiotics. Winclove's upgraded *Propionibacterium freudenreichii* W200 contains adequate amounts of vitamin B12 to make an EFSA approved health claim.

Marco van Es, Director Business Development at Winclove: "*Stringent probiotic regulations drive the market to innovation. We have succeeded in optimizing the fermentation process of Propionibacterium freudenreichii W200 in such a way that it now produces substantial amounts of vitamin B12. It is the first probiotic in Europe that allows EFSA approved health claims. W200 opens up new opportunities for dietary supplement marketers to promote the health benefits of probiotics to health care professionals and consumers*".

Sales of probiotic products have a rising trend from 2010 to 2014, **increasing globally** by 35% from US$23.1 billion to $**31.3 billion**

- In 2014 were Western Europe ($8.3 billion),
- Asia Pacific ($7 billion),
- Japan ($5.4 billion),
- Latin America ($4.8 billion),
- North America ($3.5 billion),
- Eastern Europe ($2.3 billion).

Research into the potential health effects includes:

- ✓ immune function
- ✓ cancer
- ✓ antibiotic-associated diarrhea
- ✓ travellers' diarrhea
- ✓ pediatric diarrhea
- ✓ inflammatory bowel disease
- ✓ irritable bowel syndrome
- ✓ eczema
- ✓ bacterial vaginosis
- ✓ possible improvement of LDL/HDL ratio
- ✓ *Helicobacter pylori*
- ✓ *Lactose intolerance*
- ✓ *Lower risk of necrotizing enterocolitis and mortality in premature infants*

Probiotics **benefits**:

- Stronger immune system
- Improved digestion
- Increased energy from production of vitamin B12
- Better breath because probiotics destroy candida
- Healthier skin, since probiotics **naturally treat eczema** and psoriasis
- Reduced cold and flu
- **Healing from leaky gut syndrome** and inflammatory bowel disease
- Weight loss

Probiotic killers that can prevent your body from getting all the tremendous probiotics benefits it needs:

- **Prescription antibiotics**
- **Sugar**
- **Tap water**
- **GMO foods**
- **Grains**
- **Emotional stress**
- **Chemicals and medications**

Commercial probiotics

- European Commission placed a ban on putting the word "probiotic" on the packaging of products because such labeling misleads consumers to believe a health benefit is provided by the product when no scientific proof exists to demonstrate that health effect.

- In the United States, the FDA and Federal Trade Commission have issued warning letters and imposed punishment on various manufacturers of probiotic products whose labels claim to treat a disease or condition.

History and modern products

- The first commercially sold dairy-based probiotic was Yakult, a **fermented milk** with added *Lactobacillus casei* Shirota, in 1935.

- Since then many more probiotic foods have come on the market, mostly dairy products.

- Non-dairy and unfermented probiotics have been produced, including breakfast cereals and snack bars, in addition to traditional fermented products such as kefir, yogurt, kombucha, kimchi, and sauerkraut

Најчесто употребувани пробиотици во четири ординации на ниво на град Штип се:

- **Линекс Пробаланс**
- **Пролајф**
- **Дармфлора**
- **Хеликобаланс**
- **Биогаја**
- **Диастоп**

	Состав
Линекс	*Lactobacillus acidophilus (sp. L. gasseri); Bifidobacterium infantis; Enterococcus faecium.* **Помошни супстанции:** лактоза, компиров скроб, декстрин, магнезиум стеарат, желатин, титаниум диоксид (E171).
Пробаланс	*Lactobacillus acidophilus LA3, Bifidobacterium animalis ssp.lactis BLC1* и *Lactobacillus casei BGP93.* **Помошни супстанции:** инулин, цинк, апигенин, B6, екстракт од нане

Пролајф	*Bacillus coagulans, Lactobacillus acidophilus, Streptococcus thermophilus, Lactobacillus bulgaricus, Bifidobacterium bifidum*. **Помошни супстанции:** екстракт од квацес, вит.B1,B2,B6 и B12, тринатриум цитрат,лимонска к-на, малтодекстрин

Дармфлора плус	*Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus plantarum, Lactobacillus rhamnosus, Bifidobacterium bifidum, Bifidobacterium lactis Bifidobacterium breve, Streptococcus thermophilus*

Хеликобаланс	*Lactobacillus reuteri, Lactobacillus acidophilus, Lactobacillus casei, Bifidobacterium lactis*

Биогаја	**Капки:** *Lactobacillus reuteri* **Помошни состојки:** сончогледово масло, масло од палмово дрво. **Таблети:** *Lactobacillus reuteri,* масло од палмово дрво, лимонска киселина, изомалт

Диастоп	*Lactobacillus acidophilus; Streptococcus thermophiles; Bifidobacterium; Lactobacillus delbrueckii.* **Помошни состојки:** гликоза, магнезиум стеарат, хипромелоза, титан диоксид

Safety and Side Effects of Probiotics

- In people who are generally healthy, probiotics have a good safety record. Side effects, if they occur at all, usually consist only of **mild digestive symptoms such as gas**.

- There have been reports linking probiotics to severe side effects, such as **dangerous infections**, in people include critically ill patients, those who have had surgery, very sick infants, and people with weakened immune systems

- Most of knowledge about safety comes from studies of *Lactobacillus* and *Bifidobacterium*; less is known about other probiotics.

Можни несакани ефекти на пробиотиците

- Акни
- Анксиозност
- Констипација
- Подуеност
- Грчеви
- Дијареа
- Вртоглавица
- Симптоми слични на грип
- Гасови
- Гастроинтестинални инфекции

Future Uses For Probiotics

- Probiotics are already widely used to prevent the **side effects of antibiotics**
- The study was double-blind individuals diagnosed with **severe fatigue**. The results were similarly promising.
- The term “psychobiotics” has been coined for probiotics which show promise for the prevention and/or treatment of psychiatric illnesses, may open new possibilities for the treatment of **depression**.”

„Probiotic strains of *Lactococcus Lactis subsp. Lactis* produce neuroactive substances”

Lidia G. Stoyanova, Illy V. Vodolzov, Sara D. Dbar, Alexander V. Oleskin
Lomonosov Moscow state university, Moscow, Russia

Tested probiotic strains produce neuroactive substances should impact nervous and immune system of the host.

(Skopje, October, Food conference, 2017)

Instead of Conclusion:

What do the Experts say about Probiotics?

- *"Evidence from clinical research demonstrates that adding 'good' bacteria to the diet* ***promotes a healthy digestive and immune system."***

  — Dr. Allan Walker, Professor of Nutrition and Pediatrics, Harvard Medical School

- *"Compelling new studies are showing how probiotics* ***can*** *help* ***keep healthy people healthy****.*

— Dr. Mary Ellen Sanders, Probiotics Specialist

Instead of Conclusion:

What do the Experts say about Probiotics?

- *"With the level of evidence that probiotics work and the large safety margins for them, we see no good reason not to **prescribe probiotics when prescribing antibiotics**."*

— Dr. Benjamin Kliger, Associate Professor of Clinical Family and Social Medicine, Albert Einstein College of Medicine