

PROBIKEHL® Capsules

NATURAL SUPPORT FOR YOUR INTESTINAL FLORA

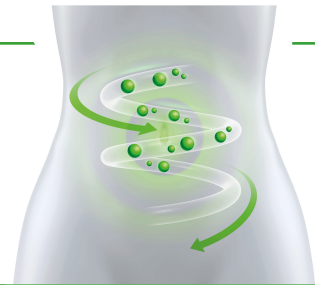


SMOOTH SUPPORT WITH SANUM

› The bacteria contained in PROBIKEHL® regulate the homeostasis of the intestinal flora. In this process, they stabilise the barrier function of the intestine and regulate the innate and humoral immune system. The food supplement PROBIKEHL® belongs to the preparations of BASE-REGULATION within the elements of SANUM therapy.

PROBIKEHL® AT A GLANCE:

- › for the support of the intestinal flora
- › for intestinal dysbiosis



THE INTESTINAL MICROBIOME

› The intestine is the most important part of the digestive tract and is 5.5 to 7.5 m long in humans. Due to the intestinal villi, the intestine has a surface area of 32 m² [1] and is thus our largest contact surface with the outside world (for comparison, the average body surface area is only 1.73m²).

The entire intestine is colonised by microorganisms and the totality of microorganisms is called the intestinal flora. The intestinal flora is mainly composed of bacteria and fungi, and according to the latest molecular

genetic studies, it is assumed that at least 500 - 1000 different species populate the human body [2].

However, the intestine is not evenly colonised. For example, the small intestine is more acidic and has a higher content of oxygen and antimicrobial substances (e.g. bile acids) than the large intestine [2]. The intestinal flora in the small intestine therefore preferentially contains bacteria that tolerate such factors, such as Lactoba-cillaceae and Enterobacteriaceae, with a bacterial count of about 10² to 10⁵ CFU/g faeces.

Bacterial growth is limited by the relatively fast passage and the antimicrobial substances. Only in the terminal ileum does bacterial growth in the small intestine reach values similar to those in the large intestine. The caecum and colon contain the greatest density and biodiversity of the body, with a bacterial count of approximately 10^{11} CFU/g faeces. The lower concentration of antimicrobial substances, the slower passage and the absence of simple carbon sources allow the growth of fermentative anaerobic bacteria, especially Bacteroidaceae and Clostridia [2]. The main products produced by these bacteria are short chain fatty acids (SCFAs) such as acetates, propionates and butyrates.

Butyrate is the main energy source for intestinal epithelial cells and influences cell proliferation / differentiation, mucus secretion and they have an anti-inflammatory and antioxidant potential [3].

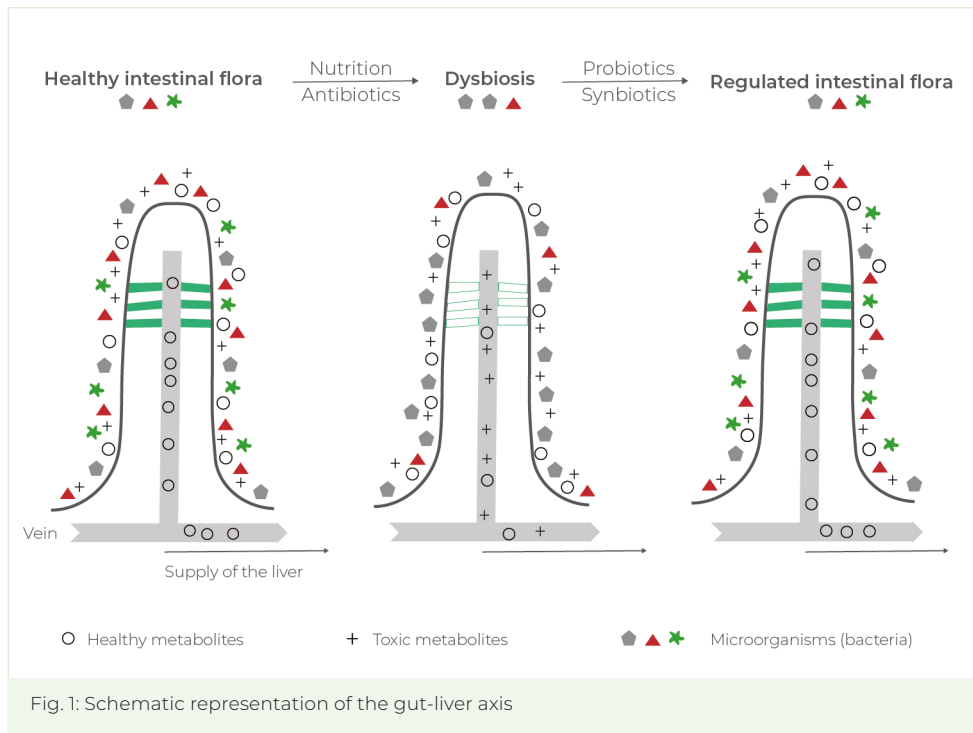
In the last few years, the importance of intestinal bacteria for human health has been increasingly recognised. Dysbiosis of the intestinal ecosystem is thought to be the trigger or at least involved in a whole range of diseases, such as inflammatory intestinal diseases (e.g. Crohn's disease, ulcerative colitis), obesity, asthma, atopic dermatitis and diabetes mellitus

INTESTINAL DYSBIOSIS

There are various factors that can lead to dysbiosis in the gut. Diet has a major influence [2], but the intake of antibiotics can also lead to dysbiosis in the intestine. Korpela and colleagues were able to show that the early use of antibiotics in children is associated with an increased risk of metabolic and immunological diseases [4]. In the children studied, there was a long-lasting shift in the composition of the intestinal flora after antibiotic use, with a severe reduction in *Bifidobacterium* spp. and a marked increase in *Enterobacteriaceae* and the genus

Clostridia [4]. This dysbiosis remained in some of the children for 6-12 months [4].

Dysbiosis in the intestine damages the intestinal epithelial cells over time. Due to the altered bacterial flora, the cells are no longer supplied with sufficient SCFAs and they become more susceptible to infections and inflammations. The intestinal mucosa suffers longterm damage and becomes permeable to "toxic" metabolites that enter the bloodstream ("leaky gut syndrome") and burden the liver.



Healthy intestinal flora: barrier function intact → no toxic burden on the liver.

Dysbiosis: barrier function not intact/permeable (leaky gut syndrome) → toxic metabolites enter the bloodstream and burden the liver

Regulated intestinal flora: barrier function intact again → relief of the liver [5].

NATURAL REGULATION OF THE INTESTINAL MICROBIOME

➤ To regain an intact intestinal flora, pre- and probiotics can be used. Various studies have shown the positive effect of different *Lactobacillus* spp. and *Bifidobacterium* spp. [3]. The first probiotics were usually mono-preparations,

but the probiotics of the next generation are multi-bacteria pre-preparations to which prebiotics are often added, such as PROBIKEHL®. The food supplement PROBIKEHL® contains the prebiotics inulin, fructooligosaccharides (FOS) and seven

probiotic bacterial strains:

Lactobacillus plantarum W21, Lactobacillus acidophilus W22, Lactobacillus paracasei W20, Lactobacillus salivarius W24, Lactobacillus lactis W19, Bifidobacterium lactis W51, Bifidobacterium lactis W52. The total number of bacteria in PROBIKEHL® is 1×10^9 CFU/g powder. The effect of probiotics is based on three mechanisms: antimicrobial effects, strengthening of the mucosal barrier and immunomodulation [3]. However, differences are seen between the individual strains. Prebiotics are indigestible oligosaccharides (e.g.

inulin, FOS) that can stimulate the growth of beneficial gut bacteria, e.g. lactobacilli and bifidobacteria [3]. Recent studies have shown that prebiotics are able to increase the formation of SCFAs. However, they also serve as a source of energy for the bacteria of the colon [3].

The prebiotics and probiotics contained in PROBIKEHL® can contribute to a normalisation of the intestinal flora. In this context, PROBIKEHL® can be used as a single remedy or in combination with other therapeutics, such as the SANUM medicines.

› ANTIMICROBIAL EFFECTS

Probiotic bacteria change their environment, they reduce cellular adhesion and invasion and some strains are able to produce antibacterial substances (e.g. Lactobacillus spp.) [3].

› REINFORCEMENT OF THE MUCOSAL BARRIER

Probiotic bacteria compete with pathogens for resources and for space on the intestinal epithelium. Some Lactobacillus spp. are known to improve barrier function [3].

› IMMUNE MODULATION

Probiotics influence many host cells involved in a local or systemic immune response (e.g. dendritic cells, T cells, monocytes and macrophages, IgA-producing B cells and natural killer cells). Probiotics often interact with the Toll-like receptors (TLR) TLR2 and TLR4, which is thought to result in the production of IL-10 and the TGFβ (transforming growth factor beta). Both factors prevent apoptosis of cells of the intestinal epithelium and promote regeneration [3].

EXPERIENCED APPLICATION FIELDS

OF PROBIKEHL®

- › Chronic inflammatory intestinal diseases
- › Treatment after antibiotics
- › Allergic diseases
- › Irritable bowel syndrome
- › Intestinal rehabilitation
- › Immune modulation



Recommended intake: Adults and children from 12 years 2 capsules taken twice daily before or with a meal. Children aged 3-12 take 1-2 capsules per day. Suitable during pregnancy and breastfeeding. Taking ProbiKEHL® is not a substitute for a varied and balanced diet and a healthy lifestyle.

| All our products are GMO free. | vegan | gluten free | lactose free | fructose free | sugar free | alcohol free |
|--------------------------------|-------|-------------|--------------|---------------|------------|--------------|
| | | X | X | | | X |

PROBIKEHL® Capsules

Available in 40 capsules or 120 capsules

REFERENCES

- [1] Helander H.F., Fändriks L. Surface area of the digestive tract - revisited. Scand. Journal Gastroenterology. 2014, Vol. June, 49(6):681-9.
- [2] Gregory P. Donaldson, S. Melanie Lee and Sarkis K. Mazmanian. Gut biogeography of the bacterial microbiota. Curr. Opin. Gastroenterology. 2015, Vol. Mar, 31(2):130-6.
- [3] Rachna Patel and Herbert L. DuPont. New Approaches for Bacteriotherapy: Prebiotics, New-Generation Probiotics, and Synbiotics. Clinical Infectious Disease. 2015 Vol. 60(S2):S108-121.
- [4] Korpela K, Salonen A, Virta L.J., Kekkonen R.A., Forslund K, Bork P, de Vos W.M., Intestinal microbiome is related to lifetime antibiotic use in Finnish pre-school children. Nat. Commun. 2016, Vol. 7:10410.
- [5] Sonntag, Dieter. Pro and synbiotics for liver diseases. SANUM Post. 2016, 114.
- [6] Timmermann, Harro M. Multispecies Probiotics - Composition and Functionality. Doctoral thesis. 2005.

IMAGES. Beautiful woman sitting with drinks and healthy green food at home. Vegan meal and detox concept. ©[rh2010] – stock.adobe.com

Sanfte Medizin im Verdauungstrakt - Infografik ©[ag visuell] – stock.adobe.com

Ingredients: Food supplement with seven probiotic strains and the prebiotics inulin and fructo-oligosaccharides.

Composition: Maize starch, hydroxypropyl-methylcellulose (capsule shell), maltodextrin, inulin, potassium chloride, magnesium sulphate, fructo-oligosaccharides, amylase, Lactobacillus plantarum W21, Lactobacillus acidophilus W22, Lactobacillus paracasei W20, Lactococcus lactis W19, Bifidobacterium lactis W52, Bifidobacterium lactis W51, Lactobacillus salivarius W24, vanilla powder, manganese sulphate. The total number of probiotic bacteria in Probikehl® is 1x 10⁹ CFU/g powder.

Fields of application: Stress factors, such as an unbalanced diet, infections and medication, which can unbalance the intestinal flora.

Properties: The pro and prebiotic Probikehl® is a food supplement. Probiotic cultures are known to support the development of intact intestinal flora.

Pack sizes: pack of 40 capsules (PZN 11160764), pack of 120 capsules (PZN 15386117). Keep out of reach of small children. Do not exceed the stated daily dose. Store in a cool dry place, no refrigeration necessary.

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