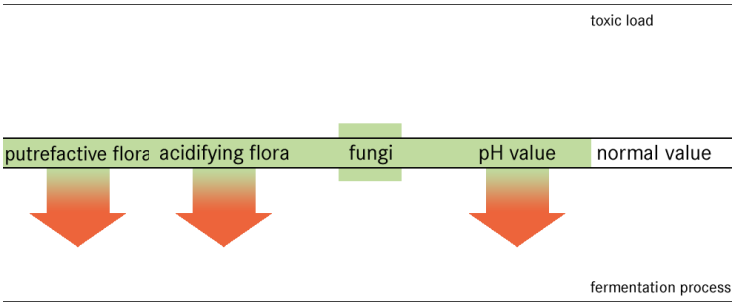
SAMPLE DATA

Intestinal health check

Summarised evaluation of the flora

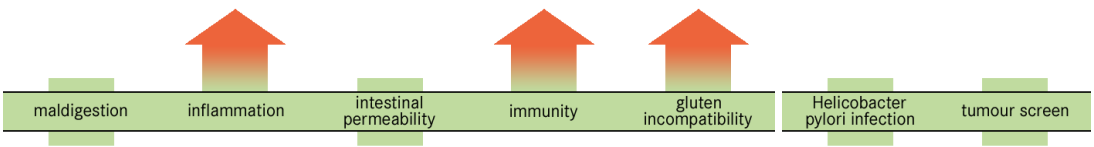


flora index = 6

1 - 5:	mild dysbiosis
6 - 12:	intermediate dysbiosis
> 12:	pronounced dysbiosis

The analysis of the stool flora shows a reduction in the acidifying flora. The antagonistic putrefactive flora is, due to a reduction in Escherichia coli, also reduced. The decreased stool pH may be attributable to an accelerated gastrointestinal passage, e.g., due to a carbohydrate intolerance (lactose, fructose or sugar substitutes).
Decreased bacteroid and enterococcus counts are generally of no pathological relevance.

Summarised evaluation of the biochemical parameters



Maldigestion
- exclusion of maldigestion

Inflammatory parameters
- evidence of inflammatory changes in the mucous membrane

Intestinal permeability
- no evidence of an increased intestinal permeability

Intestinal immunology
- decreased level of activity of the mucosal immune system together with reduced secretory lgA
- suspected microbial infection of the intestinal mucosa together with increased B-defensin-2 levels

Gluten incompatibility
- suspected gluten incompatibility

Helicobacter pylori infection
- Exclusion of a Helicobacter pylori infection

Early detection of colorectal carcinomas
- No evidence of occult faecal blood.

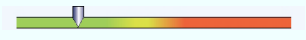
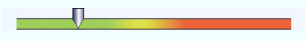
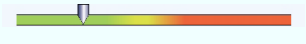
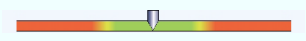
Summarized evaluation of parasites and diarrhoea-associated pathogens

pathological germs (diarrhoea)

Diarrhoea-associated pathogens
- no evidence of clostridium difficile in stool

Detailed results

stool flora

	result in CFU/ g stool	assessment	norm
putrefactive flora aerobic			
E.coli	< 10^5		10^6 - 10^7
E.coli-Biovare	< 10^4		< 10^4
Proteus species	< 10^4		< 10^4
Klebsiella species	< 10^4		< 10^4
Pseudomonas species	< 10^4		< 10^4
Citrobacter species	< 10^4		< 10^4
Enterobacter sp.	< 10^4		< 10^4
Serratia species	< 10^4		< 10^4
Hafnia alvei	< 10^4		< 10^4
Morganella morganii	< 10^4		< 10^4
Kluyvera species	< 10^4		< 10^4
Providencia species	< 10^4		< 10^4
putrefactive flora anaerobic			
Clostridium sp.	< 10^5		< 10^5
acidifying flora anaerobic			
Bifidobacterium sp.	< 10^8		10^9 - 10^11
Lactobacillus sp.	< 10^5		10^5 - 10^7
acidifying flora aerobic			
Enterococcus sp.	< 10^5		10^6 - 10^7
neutral flora			
Bacteroides sp.	< 10^8		10^9 - 10^11
quantitative fungi detection			
Candida albicans	< 10^3		< 10^3
Candida sp.	< 10^3		< 10^3
Geotrichum sp.	< 10^3		< 10^3
Mould fungi	negative		negative
general investigations			
pH value	5.5		6 - 6.5
stool consistency	soft & unformed		soft & unformed

Putrefactive bacteria and acidifying bacteria behave antagonistically in the intestine. E. coli is a physiological intestinal bacterium, whereas all other putrefactive bacteria can be transiently found and are facultative pathogenic. Lactobacilli, bifidobacteria and enterococci belong to the physiological acidifying flora and, due to their metabolic activity, contribute to a physiological intestinal mucous membrane barrier.

The **Escherichia coli** species is a physiological component of the intestinal flora. An enduring decrease in Escherichia coli can lead to an inadequate stimulation of the mucosal immune system (MlS). The level of activity and readiness for defence are reduced.

Enterococci belong to the obligate flora of the intestinal wall. As a result of their resistance to acids and bile, enterococci can also be found in the small intestine. Enterococci inhibit the growth of pathogenic germs by acidifying the intestinal environment and by the production of bacteriostatic or bacteriocidal substances.

Bifidobacteria belong to the anaerobic acidifying flora. With a count of up to 10"11 CFU/g faeces they make up a considerable portion of the obligate intestinal flora. Bifidobacteria are purely saccharolytic micro-organisms, i.e., they exclusively metabolise carbohydrates. Degradation products of the carbohydrate metabolism are short-chain fatty acids, which by means of their acidifying actions and antagonistic effects on diverse putrefactive bacteria, play an important role in the resistance to colonisation.

Lactobacilli are the functionally most important component of a physiological small intestinal flora. Lactobacilli are purely saccharolytic micro-organisms i.e. they exclusively utilize non-cleavable carbohydrate bonds as well as constituents of the intestinal mucous. This action leads, in the first place, to the production of lactic acid. Lactobacilli are responsible for an acidification of the intestinal environment. Various metabolic products have a direct inhibitory effect on foreign germs and putrefactive bacteria such as Clostridium spp. and enterobacteria such as Proteus spp., etc.

Bacteroides sp. forms the numerically greatest proportion of the obligate colonic flora. Bacteroides predominantly metabolise proteins, although in comparison to other aerobic micro-organisms, they are less metabolically active.

Maldigestion

	result	unit	assessment	norm
Fat in stool	2.6	g/100g stool		< 3.5
Protein in stool	1.1	g/100g stool		< 1
Sugar in stool	2	g/100g stool		< 2.5
Starch in stool	7.1	g/100g stool		9 - 13
Water in stool	81	g/100g stool		75 - 85
Pancreatic elastase	>500.0	µg/g		> 200
Bile acids	<1.7			< 1.7

Borderline increased fat and protein residues are inconspicuous.

Inflammatory parameters

	result	unit	assessment	norm
Calprotectin	<7.8	mg/l		< 50
alpha-1-antitrypsin	<4.1	U/ml		< 27.5
EPX	1894.1	ng/ml		< 360
Lysozyme	279.2	ng/ml		< 600

	result	unit	assessment	norm
PMN-elastase	<18.0	ng/ml Stuhl		< 62

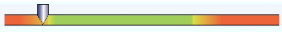
EPX is a glycoprotein which is released from activated eosinophils. This cytotoxic protein plays a significant role in the defence against pathogenic parasites. The release of this protein during eosinophil activation results in tissue destruction and inflammation.

The cause of an **elevated EPX (eosinophil protein X) value** can be a food allergy (lgE-mediated), parasitosis or a chronic inflammatory intestinal mucous membrane disease. ln such chronic inflammatory intestinal illnesses, EPX can serve as a marker of the disease activity and the course of the illness.

Intestinal permeability

	result	unit	assessment	norm
alpha-1-antitrypsin	<4.1	U/ml		< 27.5

Immunity

	result	unit	assessment	norm
Secretory IgA	418.9	µg/ml		510 - 2040
ß-defensin 2	60.8	ng/ml		< 23

Secretory immunoglobin A (sIgA) inhibits the invasion and colonisation of potentially pathogenic bacteria, viruses or fungi through the intestinal mucous membrane and neutralises antigens and toxins. The reduced concentration of slgA in the faeces suggests a decreased degree of activity in the mucosal immune system. A lasting reduction in the slgA value may be associated with an increased susceptibility to infections.

As a component of the inherited immune system, **.8-defensin 2** contributes, by means of its antimicrobial effect, to the barrier function of the intestinal epithelium. An increased production of B-defensin-2 can be induced by pro-inflammatory cytokines and by micro-organisms such as fungi (e.g., Candida), viruses or bacteria. An elevated value may also accompany a Helicobactor pylori infection. Raised values can additionally be found with ulcerative colitis and other chronic inflammatory intestinal diseases.

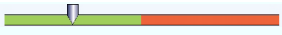
Gluten incompatibility

	result	unit	assessment	norm
Transglutaminase antibody	213.2	U/l		< 100
Anti-gliadin antibody	<8.3	mU/g		< 100

Up to 10% of patients suffering from a gluten-sensitive enteropathy have an undetected IgA deficiency. Because of this, in the case of a negative transglutaminase-IgA-antibody test in faeces and serum, together with persistent clinical symptoms, a determination of IgA and the IgA subgroups should be carried out.

An elevated faecal concentration of antibodies against transglutaminase was found. The high antibody concentration is indicative of gluten hypersensitivity.

Helicobacter pylori

	result	assessment	norm
Helicobacter pylori antigen	negative		negative

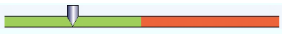
ln case of continuing gastric symptoms after exclusion of a Helicobacter pylori infection, a symptomatic therapy is recommended. An antibiotic eradication is not necessary. ln high-risk patients (over 45 years old, long-term therapy with non-steroidal anti-rheumatics), a biopsy should nevertheless be taken to exclude the presence of gastric or duodenal ulcers of other origins.

Early detection of colorectal carcinomas

	result	unit	assessment	norm
Haemoglobin-haptoglobin complex	<2.0	µg/g		< 2
Calprotectin	<7.8	mg/l		< 50

Besides the assessment of the haemoglobin-haptoglobin-complex in faeces, further sensitive parameters for the determination of colorectal carcinomas and adenomatous polyps are, above all, calprotectin, the proliferation marker M2-PK and haemoglobin. Through a combination of these parameters, the sensitivity and specificity for the detection of colorectal carcinomas can be distinctly increased.

Diarrhoea-associated pathogens

	result	assessment	norm
clostridium difficile	negative		negative

Therapy recommendation

Diet therapy

Raised values of a marker for inflammation are indicative of inflammatory mucous membrane alterations, which are, as a rule, associated with foodstuff incompatibilities. We recommend a mild and balanced diet.

The replacement of lost fluids and electrolytes is of the highest priority during **acute diarrhoea**. Until improvement is seen, solids should be avoided. Thereafter the diet should be gradually normalized.

ln the case of a suspected **gluten incompatibility**, the clinical relevance should be clarified. For this, we recommend that a gluten-free diet should be adhered to temporarily, since in 90% of cases of gluten incompatibility or coeliac disease a considerable alleviation of symptoms can be achieved.

With a life-long, gluten-free diet, the effects of malabsorption can be prevented (osteoporosis, vitamin-deficiency syndrome), as well as the long-term consequences which include the frequent occurrence of malignancies.

General recommendations for the prevention of colorectal tumours

Diet plays a decisive role in the development of colorectal carcinomas. A high-fat, low-fibre diet increases the risk of development. lncreased meat consumption is also associated with an elevated risk of colonic cancer. However, there are many foodstuffs which can have a protective effect, as for example, secondary vegetable matter. Antioxidants such as vitamins, mineral nutrients and secondary vegetable matter should be ingested with the diet in sufficient amounts. The use of a dietary supplement to substitute a certain amount of these substances is recommended.
lt is important to take preventive measures to avoid constipation in order to reduce the time over which carcinogenic substances remain in the intestine. For this, a high-fibre diet, adequate amounts of fluids and exercise are beneficial.

Body weight also plays a further important role. Being overweight leads to a considerable increase in the cancer risk.

Anti-inflammatory therapy

As an antiphlogistic measure following the measurement of raised inflammatory markers we recommend the following preparations.
These preparations are also suitable for the treatment of fermentative dyspepsia, since this, in 60% of cases, is accompanied by an inflammatory mucous membrane irritation.

The recommended doses are for adults. In children, they should be reduced corresponding to the child's age, or alternative preparations should be used.

Colibiogen®	Once daily, in the morning, in serious cases up to 3 times daily, 5 ml (= 1 teaspoon), 30 min before meals.
Myrrhinil intest®	3 times 4 dragees per day with fluids before meals ln children with Candida infections 3 times 3 dragees per day
MucoZink®	1 Tbsp. in 200 ml water per day

Due to components such as L-glutamine and dexpanthenol, MucoZink® promotes wound healing and mucous membrane reconstruction.
CAUTlON: MucoZink® contains fructose. ln case of a known fructose incompatibility, not to be recommended.

Milieu-stabilising measures

For the regeneration of a balanced intestinal flora and/or in the case of a high yeast count, milieu-stabilising measures may be meaningful. Through the administration of Bifidobacteria and/ or Lactobacilli preparations, an acidification of the intestinal milieu can be obtained and favourable conditions for the restitution of the body's own acidifying flora achieved.
Due to the spectrum of intestinal micro-organisms found (L. acidophilus, L. lactis, L. casei, B. bifidum) we recommend

The recommended doses are for adults. In children, they should be reduced corresponding to the child's age, or alternative preparations should be used.

proBiotik® pur dietary supplement	1 sachet (2.0g) per day mixed with water and taken with a main meal.

Immunomodulatory measures

ln the case of decreased immunoglobulin A (sIgA) together with high yeast counts, **glucans** can additionally be employed. They can contribute to a stabilisation of the immunological mucous membrane barrier due to their stimulating effects on macrophages.

The recommended doses are for adults. In children, they should be reduced corresponding to the child's age, or alternative preparations should be used.

nutriGlucan® (nutrimmun GmbH, Munster)	3 times 1 tablet per day

The immunomodulatory effect of live colibacteria by use of **AutoVACC-Oral E.c.®** can be employed with the following indications: atopical diseases, recurrent infections especially in the respiratory or urogenital tract. lnstructions for administration can be obtained from GANZlMMUN AG.

Mutaflor® can support the intestinal flora and also have an immunomodulatory effect. Through defined metabolic products, the energy supply to the cells of the colonic mucous membrane can be improved, while at the same time, the physiological effects of the intestinal flora can be supported. Mutaflor® inhibits the infiltration of pathogenic germs into the intestinal cells. Additionally, the body-s own immune system is trained and the production of secretory

The recommended doses are for adults. In children, they should be reduced corresponding to the child's age, or alternative preparations should be used.

immunoglobin A stimulated.

Mutaflor® mite	1 capsule per day for 8 days, thereafter 2 capsules per day.
Mutaflor® 100 mg	In the case of persistent constipation vcan subsequently be prescribed. A dosage increase of up to 4 capsules may be indicated, depending on the symptoms.

Further diagnostics

Further diagnostic measures should be anamnesis-orientated. Depending on the clinic, we recommend the following further diagnostic measures:

Allergy / Foodstuff incompatibility	- Prescreen Allergy
Detection of biogenic amines	- Histamine in urine
Carbohydrate intolerance	- bacterial cleavage of fructose, sorbitol, xylitol in faeces - hydrogen breath test fructose, lactose, sorbitol - genetic test fructose (ALDOB gene)/ lactose (LCT-gene) in EDTA blood
Parasites in faeces	- Parasites, worms, worm eggs

Many thanks for your investigatory assignment.

Yours sincerely,

Dr. med. Ralf Kirkamm