



BLESSINGS FROM THE GUT

**ERIK NIELSEN'S ORGANIC
EM PROBIOTICS**

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Introduction

Contemporary science corroborates the ancient Eastern adage that disease is born in the intestines, yet the topic almost appears to be taboo. Doctors always used to inquire of their patients regarding evacuation, but nowadays one hardly ever talks about the area 'down there'. The intestines are mainly conceptualised as a 'discharge channel' which outputs anything but well-being. The first chapter of this text deals primarily with the dangers stemming from imbalanced intestinal biota (the old term for it is gut or intestinal flora).

The booklet *Blessings from the Gut* reveals that it is precisely sound intestines that can provide the source of life power. In its main part, it presents the results of studies about the extremely positive influence of good intestinal bacteria on the course and development of various diseases. Unfortunately, in the intestines of a modern-world average Joe, these are present in grossly inadequate numbers. In researching this field I was surprised to learn that there is virtually no disease in which good intestinal microbiota would not contribute to the recovery. Mostly animal studies prove it. As scientists find, the field of study of intestinal bacteria has been neglected (O'Hara, Shanahan 2006). Clinical studies on this topic are still few and far between, but their results and findings deserve serious consideration. The studies focussed on lactic acid bacteria (also called lactobacillales) – that is, microorganisms contained in probiotic yoghurts and other probiotic foodstuffs. So why is there no news about people curing their cancer, diabetes, Parkinson's disease and other severe illnesses by eating yoghurt?

The answer has probably to do with the concentration of beneficial microbes, which in scientific experiments is much higher than in probiotic yoghurts; also relevant seems to be the selection of suitable types of good bacteria and their combinations, as they do not all have the same effect on all diseases.

Particular success in combining beneficial bacteria has been achieved in Japan through the development of EM (Effective Microorganisms) technology, which gave rise to the development of the first EM-type probiotics in Denmark. Later, other EM-type probiotics appeared on the market. The central part of this booklet presents several testimonials by users of the original kind of these probiotics, the organically produced EM probiotics developed by Erik Nielsen from Denmark. This booklet does not cite their commercial names, but only the generally established name for them: Erik Nielsen's organic EM probiotics (or in short: EM bio probiotics).

The final part of the booklet offers a few recommendations for the use of organic EM probiotics.

The testimonials do not constitute scientific proof of the health effectiveness of a product. They are only published as information which I hope may encourage reflection upon and further research of the possibility of boosting health with the aid of probiotics. This booklet is thus provided for general educational purposes.

The author declines any and all responsibility for the utilisation of the published information in treatments based on any particular form of probiotics. Only physicians are competent to advise sick persons on nutrition.

My Daily Probiotic

The year 2001 started out well for the 68-year-old Mrs. A. She was happy that the previous year had brought the end of a long period of severe psychological stress. She hoped that from there on, everything would turn out for the better, but as often happens following great strains, her health

got in the way. It started with itchiness on her neck, which spread to her face and chest. The initially red skin eventually became covered with patches of crusting lesions. A check-up at a specialist and anti-allergy ointments did not help much. A bioresonance scanning with the late Dr. Medved revealed a fungal infection and intolerance to over 20 different foodstuffs.

Disease lurks in the intestines, according to an old Eastern saying. Such was precisely the case with Mrs. A. She followed a mostly balanced diet with lots of fruit and vegetables, based on official dietary recommendations that should have sufficed for maintaining a balanced intestinal biota, as the dietary fibres from fruit and vegetables are in fact probiotics – food for good digestive bacteria. Plus, she had been drinking FHES-revived water for three years. As Dr. R. Meyers reports (2005), FHES helps alleviate fungal infections and reduce their occurrence. But apparently, in specific living conditions not even this is sufficient to build an efficacious defence against pathogenic gut organisms. For a more optimal nutrition it is also necessary to regularly take probiotics - i.e., foodstuffs or dietary supplements containing an adequate amount of good intestinal bacteria.

	BACTERIA	pH	REDOX potencial (mV)	rH
stomach	Lactobacillus	1,5-3	+ 150	16.3
duodenum				
small intestine	Lactobacillus Streptococcus	6-7	- 50	18.5
small intestine				
small intestine	Lactobacillus Enterobacteria St. Faecalis Bacteroides Clostridia	7,5	- 150	16.8
large intestine	Peptostreptococcus Bifidobacteria	6,5-7,2	- 200	13.1 - 14.5

Fig. 1: Good intestinal biota protects, while also improving nutrition (source of the photo: Herman 2000)

The entire digestive system contains as much as 3 lb of microorganisms. 85% of them should be good microbes (antioxidant-producing bacteria) and only 15% of them bad ones (microbes generating free radicals and other toxins). The entire gastrointestinal tract is an antioxidative environment (with an rH lower than 28). Its antioxidant level is higher than that of the blood of young and healthy people (where it is approximately 22.5), which means that the intestines fuel the blood with antioxidants. The majority of beneficial bacteria can be found in the large intestine, followed by the end-part of the small intestine. In the circumstances of balanced intestinal biota, this is also where the level of antioxidants is the highest, with rH values around 13.1. This prevents the emergence of pathogenic bacteria, as these develop in the gut at rH 13.2 or higher. Such an antioxidant level effectively protects the immune system.

The good intestinal bacteria also improve the nutrition of the organism, as they help break down food into particles small enough to be absorbed through the intestines into the blood. They generate enzymes inhibiting the development of pathogenic organisms and participate in the absorption of iron, calcium and other minerals. They produce as many hormones as all the glands in the brain. They also help the synthesis of vitamin B₁₂ and other vitamins in the B group. In short, a balanced intestinal biota is vital to a quality nourishment of the body and defence against disease.

What Kind of Diet Is Best for a Healthy Gut Biota?

According to the latest findings, there are several thousand strains of microorganisms living in our intestines. Among the 'good' ones, the ones that support the functioning of our organism, the groups of lactobacilli and bifidobacteria are the most important (see Fig. 1). They feed on fibre food. According to official recommendations, an individual should consume daily at least 400g (five 80g portions) of fruit and vegetables. Only a handful of people in the developed world eat according to these recommendations (under 3%; Milton 1998). However, one would expect that at least a diet containing a sufficient amount of fruit and vegetables could be classified as optimal in terms of the development of a healthy gut biota. Well, contemporary studies state otherwise. Let me explain:

- A **mixed** healthy and balanced diet is **not optimal** in terms of the development of gut biota, because it contains meat. Many studies have confirmed that meat consumption is detrimental to cultivating good intestinal biota (Gorbach 1986, Van Fassen *et al.* 1987, Chung *et al.* 1989, Peltonen *et al.* 1994, Magee *et al.* 2000). This would suggest that vegetarian food is the best for the gut biota, but...
- Ordinary **vegetarian** or **vegan** balanced diets are **not optimal** for our gut biota either, as they contain thermally processed food, which is not beneficial to good bacteria. Ecologically conscious people know that cooked food should not go into compost, because it rots there rather than fermenting. Cooked foods promote the development of pathogenic putrefactive bacteria instead of the good ones. So one would then assume that exclusively raw vegetarian food would be the best option for a healthy gut, but...
- Although an exclusively **raw vegetarian** diet may be best for fulfilling the requirements necessary for beneficial intestinal biota, this type of nutrition **fails to meet** several other **essential needs** of the human organism. Koebnick and his team have studied 'rawists' in the urban areas of Germany who had been following a diet consisting of at least 70% raw food for at least three years (Koebnick *et al.* 1999). 18% of them consumed exclusively uncooked, unprocessed food. The research showed that approximately 31% of the individuals on an exclusively raw food diet suffered from chronic lack of energy, and 50% of women in this group were completely amenorrhoeic (the absence of menstruation) and therefore incapable of reproduction. Although there are people experimenting with the dietary practice of eating solely raw food, such practice is **inadequate** from the point of view of reproduction and conservation of the species (Ostan *et al.* 2010).

In searching for a type of nutrition that would be best for the development of good intestinal biota, we find ourselves in a predicament, as neither a healthy and balanced mixed diet nor a (classic) vegetarian or vegan diet are optimal for that. Let us face it: living beings, including man, are not optimally adapted to any type of natural food. The solution to this predicament lies in the intake of foodstuffs rich in good bacteria, namely probiotics. Whoever wishes to optimise their nutrition should regularly supplement their healthy and balanced diet, which should contain sufficient fruit and vegetables, with effective probiotic foods.

This is not to say, of course, that one cannot lead a healthy life without a daily dose of probiotics. Nowadays, hardly anyone follows a healthy and balanced diet, even without the added probiotics, and we can still live without any serious medical problems most of the time. But it helps to know what is best for our bodies. There may come a time in life when eating ordinary food – without probiotic supplements – is not enough to keep our body in good health. If not sooner, it happens during old age.

Ageing and Exhaustion Increase the Need for a Daily Consumption of Probiotics

Let us examine the case of Mrs. A. She mostly followed a healthy and balanced diet. Throughout her life she had thus managed to bear various burdens and distress. In her youth, her digestion was mostly regular, without winds and pungent smells. Since her digestion started slowing down with age, she stimulated it with a morning glass of warm mineral water rich in magnesium. Occasionally, she had winds; her stool developed a more offensive odour. This is a natural process, as with age the intestinal biota devitalizes. Instead of taking the stool's foul smell as an indication of serious intestinal troubles (see Fig. 2) and supplementing her diet by regularly taking effective probiotics, she accepted the situation. Also, back then, there was not much information available about these things. At the first exposure to prolonged and intensive stress loads her body could not muster up the right defence and the above-described diseases emerged for the first time in her life.



Fig. 2: An offensive smell of stool is an indication of serious intestinal problems

If the stool smells foul, this points to a preponderance of putrefactive bacteria and other pathogenic microorganisms in it, such as fungi. It is quite possible that worms (see the above photograph) and other parasites have invaded the gut. With age, the offensive odour is a more frequent occurrence, as the good intestinal biota weakens and allows the pathogenic organisms to proliferate. But even in younger people, the stool can smell. Once, as I was explaining the risks arising from this in a university lecture, a student related witnessing a 5-centimeter worm come out of his girlfriend's mouth (similar to the one in the picture). Such a type of infection is more frequent in the undeveloped world (Taylor-Robinson *et al.* 2012). Most people with such parasites are not even aware of them. Infections with parasite microbes are more frequent. Studies conducted in the US have shown that approximately 20% of people have had a *Giardia* infection at least once in their lives, and *Giardia* is just one of the many parasitic microbes. Infection with the *Giardia* microbe was confirmed in 46% of patients with chronic diarrhoea and constipation and in 20% of patients suffering from chronic fatigue (Galland 2011). In all patients with intestinal parasite infections the stool is foul-smelling. We should therefore take the necessary measures to prevent the stool from developing a smell or make it neutral again. This is most easily done by taking effective probiotics that stabilise the gut biota and eliminate the foul smell within days. Maintaining the hygiene of the large intestine is also important (read more about this in the book Ostan *et al.* 2001).

Stress, the everyday companion of modern man, has negative impacts on gut biota and the immune system. During periods of stress, in fact, the area of the abdominal cavity where 80% of the immune system resides, receives less blood, because the body, in an attempt to prepare itself for a normal stress response –fight-or-flight– redirects some of it into the extremities and the brain. Long-term stress thus enervates the organs in the abdominal cavity as well as the good intestinal biota.

The lack of oxygen promotes the development of certain pathogenic microbes, such as the *Candida Albicans* fungus (Fig. 3). A pathogenic intestinal biota results in digestive disorders, diseases of the digestive and other organs, and eventually in their degeneration. Research has shown (and I will explain more about this in the pages to follow) that bad intestinal biota also gives rise to diseases typical of modern civilisation, such as diabetes, cardiovascular diseases and cancer. The cancer of the intestines is one of the most lethal forms of cancerous diseases.

Unfortunately, the older population cannot completely avoid the increase of stress hormones, as the level of these gets higher with age (Reiter, Robinson 1995). To protect our immune system we therefore have to permanently supplement our daily diet with effective probiotics.

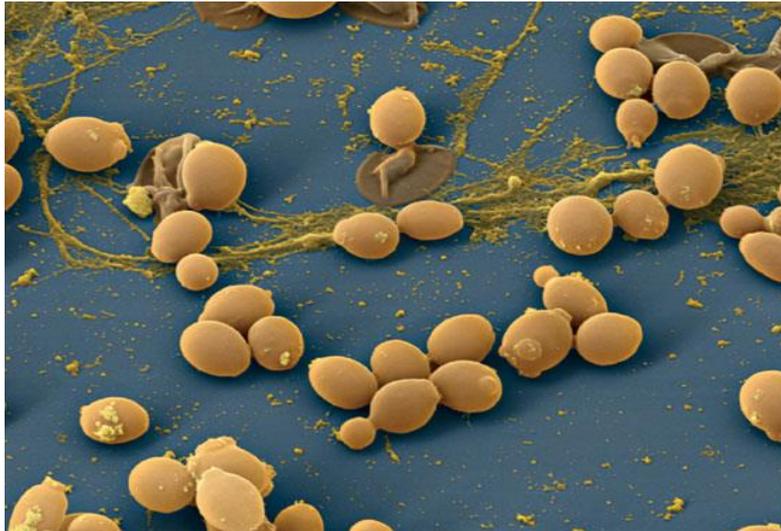


Fig. 3: Fungi and sugar cravings

Pathogenic intestinal microbes include fungi. One of the most widespread and dangerous fungi is candida (*Candida Albicans*; in the photo), which produces sixty types of toxins. It usually grows as yeast, which is an aerobe, but when deprived of oxygen, it turns into a filamentous form. This starts growing, its hyphae penetrate the intestinal walls and the spores spread around their host. They develop into fungal diseases, cysts and mouth ulcers. In the process of its reproduction, candida generates food for infection-causing viruses and bacteria. The functioning of the endocrine system is impaired, which results in problems with weight, obesity or excessive thinness. In women, it triggers premenstrual syndrome and menstrual problems. Other consequences include joint pains, hay fever, muscular and chronic fatigue. The accompanying conditions of these health problems are brain fog, migraines and depression. The activity of the fungi becomes especially destructive when they corrode the intestinal wall and larger food components start passing into the bloodstream. The immune system identifies them as foreign bodies, remembers them and reacts against them the next time we eat that type of food. This is how allergies develop, but also autoimmune diseases such as MS, rheumatoid arthritis, Crohn's disease, lupus, etc.

Fungi love to feed on sugars. Sugar cravings can be an indication of fungal infection.

Types of Probiotics and Their Antioxidative Properties

The basic types of probiotics include yoghurt, buttermilk, kefir, (raw) sauerkraut, sour turnip and other fermented foods (miso, tempeh ...), as well as concentrated probiotics (dehydrated probiotics in powder or capsules, drinks with a high-content of beneficial microbes, etc.).

Since probiotic foods contain the good, antioxidant-producing bacteria, we have measured the antioxidant levels of some of them: home-made tibicos, sauerkraut juice, a heavily advertised probiotic yoghurt and two concentrated probiotic drinks. Their rH ranged between 17.0 and 19.5,

confirming that these are indeed antioxidative foods (recall that an rH lower than 28 indicates antioxidant properties). They have greater antioxidant properties compared to young people's blood (22.5) and even greater compared to the blood of healthy 40-to-50-year-olds (25). For this reason alone, their consumption has a rejuvenating effect. However, they have less antioxidative power than freshly pressed juices made from organic fruits and vegetables (rH 13-15) and even less compared to FHES-revived water (rH 1-6). Is it really necessary, then, to eat probiotic food if we already drink antioxidant-packed live juices and living water?

Let me explain this using the example of Mrs. A., who drank FHES-revived water (and still does) as well as fresh juices. Such foods have great antioxidant properties indeed, but they pass into the blood through the walls of the small intestine in its upper part already, never actually reaching the large intestine. It can happen, then, as with Mrs. A., that while we strengthen our organism with the antioxidative power of living waters, the large intestine is still dominated by bad biota and the stool smells foul. The purpose of taking probiotics is to regulate this part of our body, too.

Its antioxidant level is thus not the principal criterion dictating the choice of a probiotic drink. Probiotic foods contain live organisms that multiply in the gut and perform numerous useful jobs. The decision regarding which probiotic food to select should primarily be based on the quality of their physiological effects.

The Criteria for Choosing a Probiotic

Today, the range of probiotics available on the market is quite diverse; plus you can make them at home too. There are tens of thousands of sites providing the most varied range of probiotic foods and probiotic dietary supplements. But how do you choose the ones that are safe enough and efficacious? Here I would only like to focus on the probiotics **allowed** (according to the recommendations of their manufacturers or by tradition) to be **taken continuously** as daily food. There are several probiotics of this kind. When choosing between them I rely on these criteria:

a) Results of clinical trials about the physiological effects

In 2002, the UN bodies responsible for health and nutrition drafted the Guidelines for the Evaluation of Probiotics in Food (FAO/WHO 2002). These criteria have not earned wide acceptance in practice, while controlled clinical trials are expensive and sparse. I prefer to base my choice of probiotic precisely on them, but in the absence of such clinical trials for the majority of probiotics I rely on two other quality indicators.

b) Number of CFUs per millilitre or gram of probiotic

The number of CFUs (Colony Forming Units) or live microorganisms per millilitre or gram of probiotic is a widespread indicator of its quality. Unfortunately, this indicator is only useful with industrially manufactured probiotics, as in homemade fermented foods there is normally no means of establishing the number. But even industrial probiotics do not always indicate how many microorganisms they contain. As a rule, the food should contain a *minimum of 1 million* CFUs per millilitre or gram to be allowed to use the label probiotic. But in truth some heavily advertised probiotic yoghurts do not contain even that many. Probiotics with at least 100 million CFUs per millilitre or gram are in my book referred to as **concentrated** probiotics.

For therapeutic purposes (e.g., against constipation) we should consume at least 100 million CFUs daily, for more persistent health problems associated with unbalanced intestinal biota even up

to 10 billion CFUs daily (Mullan 2002). There are no solid proofs for these criteria in science, there are only more or less prevailing opinions of science experts. However, the quality of a probiotic cannot be evaluated based only on the number of useful microorganisms contained, as the physiological effects also depend on their type and composition.

c) Efficiency in eliminating the foul smell of stool

A relevant, albeit non-scientific indicator of the quality of an individual probiotic is its ability to eliminate the foul odour of the stool. Alas, the majority of ordinary probiotic foods and beverages we prepare ourselves or purchase in stores (yoghurt, buttermilk, kefir and the like) are unable to improve the stool's smell in any significant way. It seems that to achieve this it is necessary to resort to concentrated probiotics. An efficient concentrated probiotic can eliminate the pungent odour of the stool in just a few days, even when we are on a mixed diet.

In the absence of more objective indicators of a probiotic's quality, the ability to neutralize the smell of the stool is for me the key indicator of the efficacy of a probiotic foodstuff.

Not Only Probiotics

Mrs. A. sought the help of an expert physician to treat her fungal infection. With bio-resonance therapy and an adequate diet she was cured in just three weeks, and afterwards she could eat the kind of food she had previously been intolerant to. Following this experience she made probiotics part of her regular diet.

But which probiotic should one choose to make the defence against fungi and other pathogens efficacious enough? In 2003, I started following posts with surprising testimonies by users of EM (Effective Microorganisms) probiotics, a special combination of lactobacillales. Among them there was this one about a fungal infection:

In 2004, the HISA Institute recorded a case of Mrs. N. R., who was suffering from a vaginal yeast infection and a skin inflammation on her arms and legs caused by fungi. After only three days of taking the EM probiotic she felt significant improvement. Soon the discharge, itchiness and all other signs of inflammation disappeared.

Testimonies do not constitute scientific proof about the efficacy of a tonic agent, but they can be an encouragement for us to try to learn more about it. Which is what I did.

In the following pages I will describe the development of EM technology, which led to the creation of EM-type probiotics. I will present the testimonies of the users of these probiotics and the results of scientific studies on the medicinal effects of consuming lactic acid bacteria, which are contained in EM and other types of probiotics. The main purpose of this text is to provide evidence on the significance of daily use of probiotics rich with lactobacillales.

Effective Microorganisms (EM) and EM Probiotics



Fig. 4. Dr. Teruo Higa (1941-)
Founder of EM technology

In 1982, Dr. Teruo Higa (1941-), a Japanese horticulture expert (Fig. 4), discovered a special, very effective combination of good microbes. He called it EM (Effective Microorganisms). It is a combination of powerful anaerobic and aerobic lactic acid bacteria, yeasts and photosynthetic bacteria, which sustain each other's activity and promote the proliferation and antioxidant activity of other bacteria as well. They particularly improve the quality of soil, increase crop yields, ensure the health of livestock and crops and maintain a clean environment (Higa 1996:31, 32). An internationally known case of their utilisation is that of the Japanese Seto Inland Sea, which was dead due to effects of industrialisation. After treatment with EM, initiated in 1997, shellfish have now been farmed there for over a decade, completely safe in terms of nutrition (Reviving 2003). At the 3rd World Water Forum held in March, 2003, which was attended by representatives from 160 countries, there was an action group dedicated exclusively to the theory and practical application of EMs (EcoPure 2003).



Fig 5. Seto Inland Sea in Japan

Dead due to pollution, the sea was revitalised through the utilisation of Efficient Microorganisms (EM).

With the help of fermentation processes triggered by the EMs, the Japanese also developed a food to be included in the human diet. Scientific experiments have proven that its consumption protects the neurons in Parkinson's disease (Datla *et al.* 2004), improves calcium absorption in osteoporosis (Ke *et al.* 2009) and destroys cancer cells (Chui *et al.* 2006). But this was only a

springboard for the EM probiotics development, which was carried to a greater extent later on in Europe.

In 1994, Erik Nielsen (Fig. 6), advisor to the Danish Ministry of Environment, met Dr. Teruo Higa at a scientific conference in Thailand. Dr. Higa invited him on a long visit to Japan that would allow him to become better acquainted with EM technology. Nielsen did that the following year and was authorised by Dr. Higa to develop the EM further. The latter even arranged for one of his colleagues to participate in Nielsen's project for a full year (Rosenthal 2005).



Fig. 6. Erik Nielsen,
Pioneer of EM probiotics
development

The first goal of the Danish project was to eliminate one of the weak points of the Japanese EM technology - the products' variability in quality. On the whole, the users achieved very good results with EM products, but sometimes there were none. After years of studies, Erik Nielsen discovered a fermentation process (with a different type of sugar – molasses) allowing higher levels of acidity (pH app. 3.5) than in the usual EMs (pH over 4.0). This enabled a more stable and safer preservation of good EM microorganisms.

At first they developed products intended for the use in crop farming and animal husbandry, and eventually, in 2000, a probiotic beverage for human use. The Danish Ministry of Food, Agriculture and Fisheries approved it as a foodstuff in 2001. The probiotic, which mostly contained lactobacillales, later underwent further research and development. Today, there exist several types of EM probiotics made by Erik Nielsen. They have become a veritable world hit. Up until 2016, their distribution included 35 countries around Europe, the Americas, Asia, Africa and Oceania. The head production centre is situated in Denmark, while production plants have expanded to Poland, Nepal, Costa Rica, Columbia, Bolivia, Argentina and New Zealand.

Later, other probiotics derived from EM technology appeared around the world. To avoid the trade names I will refer to all probiotics of this type as 'EM probiotics.' This group includes Erik Nielsen's probiotics. The latter differ from other EM probiotics in several characteristics, but mostly in that they are produced organically. For this reason, I will hereinafter refer to them as 'Erik Nielsen's organic EM probiotics' (or in short: 'organic EM probiotics'), and their trade names will not be mentioned. In the subsequent part of this text I will only deal with this type of EM probiotics.

The first experience with Erik Nielsen's organic EM probiotics was a genuine media sensation, particularly in northern Europe. The cases described in the present publication were published in the Danish newspaper *Aarhus Stiftstidende* and magazine *Hendes Verden*, in the Norwegian magazine *Hjemmet* and in the German magazine *BioLine*. I also draw on the recommendations on the use of EM probiotics cited by Dr. Carsten Vagn-Hansen in his book about the health of the digestive system (2005), in which much attention is given to the use of Erik Nielsen's organic EM probiotics in treating various diseases. Among other things, the book examines their utilisation with medical problems such as infections with candida and other intestinal parasites, infections with the *Heliobacter* bacteria, stomach ulcers, hyperchlorhydria, irritable bowel syndrome, LGS (leaky gut syndrome), ulcerous colitis, acid reflux, surgeries, constipation, hepatitis C, weakened immune system, pancreatic and oesophageal cancers, Crohn's disease, poor wound healing, eczema.

All cases of health improvement with the use of Erik Nielsen's organic probiotics refer to the period up to 2005. Contemporary Nielsen's organic EM probiotics are somewhat different from the

organic probiotics available in the first half of the past decade, as they have evolved through time¹. Therefore, the experiences described herein are not directly attributable to the contemporary forms of Nielsen's organic EM probiotics.

The Healing Power of the Good Microbes

The medical opinion is undivided: an unbalanced intestinal biota is at the root of many diseases. We could thus assume that balancing the intestinal biota by taking probiotics would contribute to the treatment of these diseases. But is that really true?

Many a patient suffering from osteoporosis, cancer, Parkinson's disease and other serious conditions regularly eat probiotic yoghurts, but we do not know of any case where one would be cured by eating a daily pot of ordinary yoghurt. Nevertheless, science has proven that good bacteria can considerably improve the treatment of numerous diseases. In this chapter I would like to cite especially the results of tests performed on animals, as this type of clinical trial (on people) has not been conducted yet. The examples are therefore provided for informational purposes only, as are the related experiences with the early version of Nielsen's organic EM probiotics (trade names withheld). I have included them to underline the importance of this field and the need for clinical trials studying the effects of consuming concentrated lactobacillales probiotics.

Osteoporosis

Osteoporosis is a persistent disease that causes the loss of bone mass. A group of Japanese experts led by Dr. Ke conducted an experiment on rats in which they treated osteoporosis with good bacteria. The animals were administered food that had been admixed into a foodstuff prepared with the help of efficient microorganisms (EM). The substances generated by the EMs caused an increase in bone density after a three-month diet enhanced by the EM foodstuff (Ke *et al.* 2009).

This foodstuff is prepared in Japan with the utilisation of efficient microorganisms – lactic acid bacteria, yeast and photosynthetic bacteria. It does not contain live microorganisms, only their metabolic products. The experiment thus suggests that the consumption of the metabolites of good microorganisms suffices for the treatment of osteoporosis.

Unfortunately, there have been no clinical trials of this kind conducted on people to date. There are, however, positive testimonies of the users of Erik Nielsen's organic EM probiotics, which

¹ The first variant of Erik Nielsen's organic EM probiotic contained 7 different strains, with a subsequent addition of another type of strain. The probiotic underwent a significant modification towards the end of 2015, when 4 of the 8 types of strains were changed. This latest version of Erik Nielsen's EM probiotic has been on the market since 2016.

The tests of pH and number of stains per millilitre have confirmed that the new version of EM probiotic is similar in efficacy to the previous one. In cooperation with Erik Nielsen's company, we tested the new version among 262 Slovene users who had had a positive experience with the old variant. Each participant in the test received a free 500 ml bottle of the new version of EM probiotic and took it in the same dosages as they had the old one. Our hypothesis was that the new version of Erik Nielsen's EM probiotic was equal to or better than the previous one. The majority of the participants in the test agreed that the new version of the probiotic was **equal or better** in overall efficacy (89.3 % agreement), in taste (93.5%), in rapidity of action (83.5 %), in neutralization of stool odour (81.5 %). A small percentage of them could not answer these questions and a negligibly small percentage (3.8 % or less) thought that, according to these criteria, the action of the new version of Erik Nielsen's organic EM probiotic was inferior to that of its previous version (Ostan, Ambrozius 2016).

represent further developed Japanese EM foodstuffs. As already mentioned, these probiotics were developed in Denmark. Let me relate the positive experience of an Israeli girl who tried it.

Edva C. (Eilat, Israel) suffered from osteoporosis since birth. Her body failed to absorb and retain enough calcium, although she took it in different forms. At sixteen, she had a severe case of Genu Varum, her legs forming a distinct 'O.' She was told at the Schneider Children's Medical Center that corrective surgery would not make any sense as the calcium absorption in her body was insufficient. Edva then started taking the organic EM probiotic and coral calcium. After only one week, her pains were alleviated and she felt more energetic. After a month, the doctors at the Medical Center were surprised to find that Edva's body had begun to retain calcium. Three months later, when it was undisputedly clear that the calcium absorption was stable, she was operated on one leg and eight months later on the other. The girl, formerly a social outcast, could finally live the life of her peers. She grew 14 centimetres.

Cancer and Chemotherapy

In 2003, I published in Aura magazine the following testimony by Mr. S. P. H. from Denmark (Ostan 2003). In 2000, he was diagnosed with initial stage prostate cancer. The value of the PSA (Prostate-specific Antigen) was 4.0; normal values are under 4.0. The check-ups in the following months showed increasing levels of this antigen, which in September 2001, reached as high as 182.0. That was when Mr. H. started taking Nielsen's organic EM probiotic. For the next two months the PSA value was constantly on the decrease. At the end of the two-month period of taking the probiotic, the value was still pathological, but already relatively low (13.8). Based on the normal urinary frequency and the improved feeling of general well-being of the patient, the physician recommended the discontinuation of Suprefact and other hormonal therapy medicines. Mr. H. continued to take the EM probiotic, and his PSA values continued to drop. In March 2002, after six months of drinking the EM probiotic, his PSA value was back to normal (3.6).

About six months after the publication of this news in Aura, a reader from Ljubljana called me and thanked me for it. He had had similar problems with the prostate. Once he started drinking Nielsen's organic EM probiotic, his condition improved considerably, as well.

Mr. W. M. from Hamburg was diagnosed with liver cancer in August 2000. He immediately started taking Nielsen's organic EM probiotic. In agreement with his physician, he continued to drink it even during the chemotherapy that he underwent a month later. On completing the round of chemo, he did not show any of its typical negative side effects: his bloodwork was stable, he was feeling fine.

In Japan, a team of scientists led by Dr. Chui conducted an experiment to test the efficacy of the Japanese EM foodstuff in treating cancer. The laboratory experiment showed that the EM foodstuff promoted cancer cell death (Chui *et al.* 2006).

All the bacteria contained in Nielsen's organic EM probiotic fall into the group of lactic acid bacteria in the broad sense of the term (since 1974, scientists have classified bifidobacteria in its own genus and, to be precise, they are actually just close relatives of the lactobacillales; Biavati *et al.* 2000). So what effect do lactic acid bacteria have on cancer development? Although they would be much needed, no clinical trials exist on the anti-carcinogenic action of lactobacillales, there are, however, some results of laboratory tests conducted on animals and cells, confirming such effect. Studies have demonstrated that lactic acid bacteria decompose potentially carcinogenic substances, while also inhibiting tumorous and metastatic growth (Hirayama, Rafter 1999; Rafter 2002).

Lactobacillales are also useful during chemotherapy. A defence against the bad side effects of chemotherapy requires antioxidants, as such treatment strongly oxidises the organism. According to the measurements performed at the University of Ljubljana, the rH of probiotic efficient microorganisms ranges between 17 and 19, which means that such beverages are highly antioxidative (rH values lower than 28 denote antioxidant properties). It has been proven that lactobacillales have a strong antioxidant impact even in physiological processes (Choi *et al.* 2006).

Parkinson's Disease

Dr. Datla and his team conducted an experiment on rats to test the efficacy of treating Parkinson's disease with the Japanese EM foodstuffs. The results showed that the neurons preserved better in the sick animals that had been administered EMs than in those that had not (Datla *et al.* 2004). Unfortunately, the effects of lactic acid bacteria from Nielsen's organic EM probiotics on the course of Parkinson's disease have not been tested.

Cardiovascular Diseases

One of the major risk indicators for cardiovascular diseases is a high level of cholesterol, particularly 'bad' LDL cholesterol. In animal testing it has been confirmed that lactic acid bacteria significantly lower the levels of total and 'bad' cholesterol, while increasing the level of 'good' HDL cholesterol (Lee *et al.* 2009). A high level of 'bad' cholesterol is one of the risk factors for atherosclerosis – hardening of the arteries and restriction of blood flow due to plaque build-up.

Dr. V. Baastrup gathered numerous testimonies on the use of Nielsen's organic EM probiotics. He also reports cases of people with cardiovascular conditions who experienced alleviation of chest pain – angina – when taking EM probiotics. Angina is caused by reduced blood flow to the heart muscle.

Diabetes

Dr. Honda and his team discovered through tests on mice that lactobacillales decrease the blood sugar level after meals. Allegedly, the flow of sugars from the intestines into the blood is reduced through the agency of these bacteria (Honda *et al.* 2012).

The positive experiences of individual users of organic EM probiotics, which contain a combination of lactic acid bacteria and bifidobacteria, are in line with these findings. Such was, for example, the case of H. E. (Vester Skerninge, Denmark), a diabetic patient. After a two-month regime of Nielsen's organic EM probiotic he was able to reduce his daily dose of diabetes medicines by 17%.

Mrs. G. S. (aged 73) from Germany described her positive experience with the organic EM probiotic in 2003. Seven years previously she had been diagnosed with diabetes II. She had to take insulin shots every day. As she was aware that diabetes was the consequence of bad functioning of her digestive system, she tried to boost it with an organic EM probiotic. She started taking 20 ml of this beverage three times a day. Within a short period of time she experienced malaise twice and found it was due to an excessive drop in her blood sugar level. After that she would regularly measure her blood sugar. In time she found that she did not need to receive her daily insulin shots anymore or follow the strict diet to the letter, and she could make exceptions to it. She decreased her daily dose of Nielsen's organic EM probiotic to 30 ml (with lots of water). She felt very well. Gone were the gases and the diarrhoea that had been, according to her observations, the side effects of the medicines she had been taking.

Rheumatism and Arthritis

Rat tests have suggested that lactic acid bacteria improve arthritic conditions (Baharav *et al.* 2004). Here's an anecdotal example of a person who used Nielsen's organic EM probiotic for arthritis:

The 47-year-old T. C. (Roskilde, Denmark) fell ill with arthritis at the age of 30. Doctors tried treating him with various medicines, including methotrexate, but over time his condition only worsened. All his joints were affected. He could only walk with crutches, but mostly he used a wheelchair. In May 2001 he started taking Nielsen's organic EM probiotic. After eight months he was able to walk without crutches and had more energy. He stopped taking medicines for his arthritis and had no need for painkillers any longer.

Crohn's Disease

An experiment on mice induced with Crohn's disease has shown that lactobacillales significantly improved the condition of the animals, presumably due to the influence of the antioxidants superoxide dismutase and catalase produced by select types of these bacteria (LeBlanc *et al.* 2011).

In April 1999, Mrs. E. K. (Glamsbjerg, Denmark) was diagnosed with Crohn's disease. Her condition worsened, so she was recommended a surgical procedure to remove part of her intestines and create a stoma (a pouch for collecting the waste). Three weeks prior to the date of the surgery, Mrs. K. started drinking Erik Nielsen's organic EM probiotic and her condition improved to the point where the surgery and the pouch were no longer necessary. She continued with the organic EM probiotic regime and her health continued to improve.

Food Allergies and Intolerance

Studies show that acid lactic bacteria have anti-allergic properties. The effectiveness of their action depends on the type of bacteria (Fujiwara *et al.* 2004). Many people suffer from lactose intolerance, as they lack the enzyme that breaks it down – lactase – and suffer from diarrhoea. With the help of lactic acid bacteria, which generate lactase, the intolerance to dairy products can be reduced (Salminen *et al.* 1993).

In July 2001, the newspaper Hjemmet published the following surprising recovery story: In 1985, the Danish vet V. B. was brought to the emergency department of an Aarhus hospital. He looked like skin and bones, as he had lost 55 lb. He suffered from intolerance to various foods, from diarrhoea and pain. The doctors discovered he had a chronic inflammation of the pancreas. They tried different drugs, but nothing helped. His condition grew worse by the year. In 1999, he was taken to the ER for what seemed like the last time. When he was later released from hospital into home care, he had reached – according to the hospital discharge letter – the end of his life path. However, it proved not to be true. Once home, Mr. B. read news about a Danish farm where the cattle were so sick that neither their milk nor their meat could be used, but the animals were cured completely by being sprayed with Erik Nielsen's beneficial EM bacteria. He ordered a bottle of such probiotic beverage from the manufacturer and two months later, to his surprise and to the astonishment of the doctors who ran thorough tests on him, he was completely cured and healthy.

Danish worker W. N. (Tarm) described the experience of his 70-year-old brother with Erik Nielsen's organic EM probiotics. His brother suffered from asthma and recurrent bronchitis. When he started taking the organic EM probiotic, his problems soon disappeared.

Infections and Inflammations

In studies of the effects of lactic acid bacteria it has been discovered that in an acidic environment (like that in the large intestine, when inhabited by balanced intestinal biota) lactobacillales display antibacterial properties, but when the pH in the environment rises to 7.0 or higher they lose their defensive power against pathogenic microbes (Olivares *et al.* 2006). EM probiotics create an acidic environment, therefore the lactobacillales in them should have an anti-inflammatory effect.

Mr. J. P. from Rostock (Germany) related the case of a patient with acute pressure ulcers (two open sores). He was admitted into medical care on March 27, 2002. The upper of the two sores was anointed with Nielsen's EM probiotic, the lower was treated conventionally. As the upper sore showed visible improvement in just three days and healed over in two weeks, they later applied Nielsen's organic EM probiotic on the lower sore, too. But the appearance of the healed skin at the site of the upper sore was more satisfactory.

Mr. W. N. suffered from sciatica and neuritis for several years. He was taking various drugs, but to no effect. By drinking Erik Nielsen's organic EM probiotic, he got rid of these problems within a relatively short time.

Digestive Disorders

As expected, digestive disorders are the most frequent consequence of intestinal dysbiosis. Scientists are unanimous in agreement that lactobacillales relieve problems with constipation, diarrhoea, irritable bowel syndrome and other digestive disorders (Salminen *et al.* 1993) which could otherwise develop into many other serious conditions. They can be treated with quality probiotics containing an efficient combination of lactic acid bacteria.

Mrs. S. M. (Slagelse, Denmark) related of her troubles with constipation beginning at the age of two. At the age of 50, her condition was chronic, as she only had a bowel movement every 4 to 5 days. After two to three weeks on the Nielsen's organic EM probiotic diet she started emptying her bowels more frequently. She continued taking the probiotic and her bowel movements became more regular and eventually daily (testimony from February 2003).

Mr. C. K. often suffered from heartburn accompanied by headaches. A dietary regime incorporating Erik Nielsen's organic EM probiotic eliminated the stomach problems, and his headaches became less frequent, too.

Mr. H. P. suffered from chronic diarrhoea for years. By drinking Nielsen's organic EM probiotic he eliminated this problem.

Co-occurring Health Conditions

We have not yet come across any report in scientific literature on attempts at treating co-occurring health conditions. When one is faced with several health problems at the same time it is, from our experience, best to start the path to recovery with efficient nutrients. This may not suffice to eliminate the health conditions, but it will strengthen the body and boost its ability to self-heal.

Some of the experience with the EM probiotic forms from a decade ago indicate that a dietary regimen incorporating lactic acid bacteria may help with problems of this kind:

In June 2003, the German magazine BioLine published news about the surprising recovery of a Mrs. M. B. The lady was hospitalised on January 4, 1999, due to a stroke, and after that another 25 times, no less. She had several health conditions. She was allergic to various types of food, medicines and to pollen. The hospital physicians discovered she was infected by fifteen strains of fungi, which kept her skin in a permanent state of inflammation. She was constipated and had a specially created stoma to drain her urine. Laboratory tests showed she was suffering from mercury, asbestos and remnants of anaesthetic agents poisoning. She had fibromyalgia. Due to a paralysis, which doctors could not explain, she was bound to a wheelchair, but could not even wheel herself. Her last hospitalisation left her completely worn out. She barely drank anything and she practically could not eat. She had no appetite at all, and the IV feeding she received did not restore her strength in any significant way. Then she started taking Nielsen's organic EM probiotic beverage. It probably would have been more prudent if she had started drinking it in small dosages, but in a desire for health she took 50 ml shots of it three times a day. A few days later she got diarrhoea, which exhausted her even more, but she continued taking the beverage at the same high dosage. She started feeling thirst and hunger again and she got her strength back, too, so at night she could get out of bed and get something to eat all by herself. The fungal infection abated, as did the allergies. Her skin was not irritated anymore and was finally rosy again. At the time of the interview she still had some health issues, but she hoped that by continuing to take the organic EM probiotic her health would improve even more (Pasche 2003).

For Serious Conditions Probiotic Yoghurt Isn't Enough

When browsing the scientific databases for information on the medicinal action of lactobacillales, we can really feel awed: there is hardly any disease in which they would not manifest therapeutic effects. Lactic acid bacteria are also present in probiotic yoghurt. So why their consumption with serious conditions normally does not register any significant improvement?

There are probably several reasons for that. The quantities of good bacteria used in scientific experiments are considerably larger than those contained in a pot of ordinary yoghurt. The best probiotic yoghurts contain up to 100 million microorganisms per millilitre, whereas in concentrated probiotics, including EM probiotics, the amount is over 100 million microbes per millilitre or gram. So in order to achieve a therapeutic effect, a **large enough amount** of good microbes has to be ingested. In his book, Dr. Vagn-Hansen (2005) states that with the use of Nielsen's organic EM probiotic it is possible to improve certain conditions already at daily doses of 20 ml to 40 ml, while with serious diseases, such as cancer, he recommends **from 75 ml to 100 ml** of this beverage a day. Such a dosage provides the body with some 10 billion good microbes per day, which is the amount generally accepted among scientists as ensuring therapeutic effects.

How long before you can start seeing improvement? Experiences with the earlier forms of EM probiotics, to which the descriptions in this chapter refer, can be taken as clues in orientation: based on a review of over 1,000 testimonies by users of Nielsen's organic EM probiotics, the HISA Institute has established that it usually takes a regimen of 2 to 15 days for a condition to improve; however, there were also cases in which improvement was only registered after 3 months of taking this beverage.

The **type** of lactic acid bacteria is also important. In describing the medicinal effects of lactobacillales I emphasised that with determinate diseases not all types of bacteria are equally

efficacious. If we suffer from a specific severe condition it is best to see an experienced physician for a recommendation on the right probiotic to use for this type of affliction.

I myself am not looking for such specialised probiotics, as I have had no serious health problems in the past decade. What I am looking for, though, is a probiotic safe enough to be used as daily food that is effective at the same time. Nielsen's organic EM probiotics possess such properties. I first tested them in 2003. I was very satisfied with them, as with a slightly increased dosage (50 ml daily) I was able to eliminate the foul smell of my stool in just a few days, despite the fact that I followed a mixed diet. Nielsen's organic EM probiotics have no known side effects and seem to be safe for children and nursing mothers to use.

The 3-month-old C. was not a cheerful baby. He suffered from acute constipation, moving the bowels only once every 7 to 10 days. His mother, Mrs. L. B., had similar problems with digestion. She felt quite unwell and was even losing her hair. A health visitor recommended she take Nielsen's organic EM probiotic. After a week of drinking this beverage, both mother and baby started having regular bowel movements and the well-being of the two visibly improved.

T. S. was born prematurely in 2003. In the first month of life, she battled many health problems. When she was one year old, her parents gave her Nielsen's organic EM probiotic for the first time. Initially, they would administer it in a very diluted form (5 drops in a litre of water); after a month they increased the daily dosage to one table spoon (10 ml). In the following year she developed into a lively and strong child. When in 2005 the parents described this experience, the 2-year-old girl's health was stable, she would rarely fall ill, usually only to infectious infantile diseases, which she would easily fight off.

When for a certain period Nielsen's organic EM probiotics were not available for purchase in Slovenia, I used other probiotics. I selected them according to my subjective criterion of the ability to normalise the odour of stool, as technically there are no hard scientific proofs about the efficacy of probiotics. In 2012, I returned to organic EM probiotics as they had proved very efficacious according to the mentioned criterion. I noticed no significant difference between the early and contemporary forms of Erik Nielsen's organic EM probiotics in this sense. And the price is affordable, which is not a negligible fact in current circumstances.

The Magnificent Queen of Life

I used to lie down, high up in the Julian Alps, watching the afternoon breeze of a late summer sunny day ripple the grassy slopes. Is there anything more beautiful? Higher up there were only rocks covered with moss and lichen, resembling those which ruled the dry land millions of years ago, when life was only just crawling out of the sea. A modest flora, but the foundations of all life on Earth. Birds, insects, chamois ... Everything in this world depends on it. Flora is a genuine queen of life.

Just as magnificent, if much less admired, is our intestinal flora, or, more accurately, intestinal biota. In fact, it is downright neglected. Despite its exceptional importance it is our 'forgotten organ' (O'Hara, Shanahan 2006). This is reflected in the modest range of terms available for describing its quality. There are actually only a couple of terms in use: 'imbalanced biota' or 'dysbiosis' to refer to an intestinal microbiota that is harmful to us, and 'balanced biota' or 'symbiosis' to refer to the microbiota in which the effects of the good intestinal bacteria prevail. But within the balanced intestinal biota we should distinguish between the ordinary 'good' intestinal microbiota and the 'excellent', which differs from its ordinary variant in its exceptional benefits for the host. In the human body, the 'excellent' kind of intestinal microbiota predominates in early

infancy, while with age it slowly shifts towards the ordinary or even harmful kind. To help you better understand the characteristics of the three quality types of intestinal biota, let me present the typical traits of the latter in a healthy baby, an adult and an elderly person.

The Splendid Intestinal Biota of a Healthy Baby

A healthy baby babbles happily and is bursting with energy. But one small digestive disorder already suffices to sap her vital power.

When a baby is born, she is practically 'sterile' - without any gut biota. She receives a shot of good bacteria at birth during the passage through the mother's birth canal and then with her mother's milk. These are almost exclusively bacteria producing lactic acid: as much as 90% of a baby's intestinal microbiota is composed of bifidobacteria (Collado *et al.* 2006), and the share of lactobacilli is also quite high (Olivares *et al.* 2006). Both can be understood as lactic acid bacteria or lactobacillales in the broader sense of the term.

The prevalence of lactobacillales that nature, alas, only bestows upon babies, is of exceptional importance to health and vital power. According to the findings of Dr. M. Kaum, lactic acid bacteria create an environment with a pH ranging between 5.0 and 5.5. This quite acidic environment (pH 7 is neutral) increases the antioxidant activity in the intestines significantly. In circumstances of common redox potential in the large intestine (200 mV: Herman 2000), the rH of the large intestine in an infant is probably somewhere between 10.1 and 11.1. The importance of the rH value for physiological processes has been treated extensively in the papers on living waters (see the booklet on Hunza water, Ostan 2015). Let me just summarise that an rH lower than 28 denotes antioxidant properties. A low rH of liquids enables the achievement of three important physiological benefits: defence against pathogenic bacteria requires an rH of 13.2 or lower, complete protection of DNA against free radicals is enabled at rH 12.6 or lower, and a significant increase of energy production in the mitochondria is only possible at rH 10.2 or lower. An ideal intestinal biota with an rH value around 11.1 would thus probably achieve all three of these important physiological goals, even the most difficult one in terms of antioxidant activity – an efficient production of cellular energy. This is probably one of the most important factors to the youthful vital energy of healthy babies. By virtue of such an excellent assistance to our lives, the intestinal biota of this kind is rightfully called 'splendid'.

Chronic Fatigue

There can be several causes for chronic fatigue and one of them seems to be intestinal dysbiosis. The HISA Institute preserves many testimonies by individuals who restored their normal life energy by drinking Erik Nielsen's EM bio-probiotic:

Mr. S. B. was constantly feeling tired and without energy. In 2004, he started taking Nielsen's EM bio-probiotic. Within two weeks, he felt invigorated. By continuing to take the probiotic regularly he regained his lost mental and physical strength and was again as 'lively' as he used to be.

The Good Intestinal Biota of Healthy Adults

300 to 1,000 types of microbes can be traced to the gut of an adult person (Guarner, Malagelada 2003, Sears 2005), but an individual would commonly host some 500 types of them (Steinhoff 2005, O'Hara, Shanahan 2006, Gibson 2004). There exist around 80 types of good (i.e., antioxidant producing) microbes (Higa 1998b:26), which should represent over 80% of all gut biota. But what share of intestinal bacteria actually produces antioxidants and is beneficial to us cannot be ascertained by simply establishing how many different types of microbes there are in the gut. Indeed, Dr. Higa discovered that the microorganisms are for the large part 'weak', displaying opportunistic behaviour: they follow the minority of dominant microorganisms (EM Technology 2003). If dominant

bad microbes are the prevailing force, even microbes that are in principle good produce free radicals and other toxins in their midst, whereas if the prevailing force is that of the leading good microbes, even weak bad microbes start generating antioxidants (Higa 1998). According to Dr. M. Kaun, the exclusively good intestinal bacteria include the *lactobacilli*, the *bifidobacteria* and the *eubacteria*.

Let me stress the importance of lactobacillales in particular, the 'strike brigade' of good bacteria, as they create the living space for other good bacteria. In fact, by secreting lactic acid they increase the acidity of the environment, which impedes the reproduction of putrefactive bacteria (clostridia), but suits the good bacteria very much (Salminen *et al.* 1993). As we have seen, the share of lactobacillales in the gut biota of a newborn baby is over 90%. How about in a healthy adult?

A much smaller percentage. Different scientific sources cite different numbers. If we go with the lower numbers, their share would be somewhere between 10% and 15%, of which 1% to 3% would be lactobacilli and bifidobacteria; according to the most modest estimates, between 7% (Collado *et al.* 2006) and 12% (Kaun). During the transition from childhood to adulthood, the 'strike brigade' of good bacteria has shrunk to a 'troop'. But even depleted, the good bacteria still manage to create a slightly acidic intestinal environment with a pH in the 6.5-6.9 range, and that is precisely thanks to the power of the lactic acid (Herman 2000); the rH value of such an environment can be 13.1 at best (at ORP -200 mV; Herman 2000).

Such an intestinal biota is useful to the organism of the host, but of the three important physiological benefits that we mentioned, only one can still be achieved – inhibition of the development of pathogenic bacteria (the rH value is lower than 13.2). The antioxidant level of such an environment is simply too weak for effective protection of the DNA and promotion of energy production in the mitochondria.

A simple, yet important indicator of a balanced biota is a non-offensive smell of stool. A neutral odour indicates a good intestinal biota with at least a minimum of balance. Ideally, the absence of an offensive smell would be an indicator of the highest quality of biota, but unfortunately it is not so. A splendid intestinal biota does not smell either.

This description of the characteristics of gut biota in an adult is attributable to individuals leading a healthy life: those who eat the recommended five daily portions of fruit and vegetables (fibre is food for the good intestinal biota), are not exhausted by stress or other strains, are not taking antibiotics or other substances harmful to the gut microbiota... There are not many people like that in the modern world. According to research, a very small population in the developed world follows a healthy and balanced diet (Milton 1998), which is the reason why the majority of people in the modern world do not have balanced intestinal biota.

The Imbalanced Intestinal Biota of the Elderly and Weakened Individuals

In advanced age, diseases are more frequent. But let's not be pessimistic! Rather, let us take a look at what kind of gut biota we can expect in an average healthy elderly person.

Although people can live much longer, old age in the physiological sense begins around forty-five, when the childbearing period in women gradually comes to an end and the signs of physiological ageing also intensify in men. That is when the digestive tract starts undergoing considerable changes, too.

One of the essential characteristics of the stomach is the elevated acidity of its juices. The normal pH level in it ranges from 1.5 to 3 (Herman 2000). This is the basis for multiple physiological processes and for an efficacious defence against the invasion of the body by pathogenic microbes. In

such an acidic environment even many good bacteria cannot reproduce, but they do survive. Lactobacilli stop growing at pH values under 3.0 (Adamič *et al.* 2003) and bifidobacteria (with the exception of *thermoacidophilum*) at a pH lower than 4.5 (Biavati *et al.*, 2000). This is how the organism screens the ingested bacteria in the stomach, separating the good ones from the bad ones.

But after the age of forty-five, the level of hydrochloric acid in the stomach drops, and the pH rises (Minkoff 2006). More pathogenic organisms start breaking into the intestines than in the organism's youth. The share of pathogenic microbes increases, the 'strike troop' of lactobacillales is decimated. Although the lactic acid bacteria hold a position of power within the community of microorganisms, they can only succeed in asserting their dominance if their concentration is high enough. When the share of the bifidobacteria and lactobacilli falls under 8% (according to some estimates even at some higher percentages) the microbiota in the intestines is thrown into dysbiosis. When the pH in the large intestine rises to 7.0 and higher, the lactobacilli lose their antibacterial power (Olivares *et al.* 2006). At this pH value, rH rises to 14.0 and higher, reaching the level when the environment becomes favourable to the reproduction of pathogenic bacteria (Howard 1998). An external sign of this is the foul-smelling stool, as the processes of rotting are spreading in the intestines.

However, age and an unhealthy diet are not the only factors ruining our good intestinal biota. Lactic acid bacteria may be very powerful with respect to other bacteria, but they are sensitive to many circumstances. Pollutants and drugs are highly detrimental to them, the same is true of stress. When we are cold, overtired or too hot, our good intestinal biota suffers as a result. Injuries, diseases, surgeries and recovery periods also affect it. Any circumstance of our weakness has an effect on our lactobacillales, which react very quickly to this kind of influence. The first hints of a cold can worsen the state of our intestinal biota **in but a few hours**, finds Dr. Vagn-Hansen (2005). Supplementing our diet with quality probiotics in such events is highly recommended.

Quality Probiotics – One of the Pillars of Dietary First Aid

Let us return to the cold or some other frequent form of infection. There are many dietary substances and herbs which can help us with infections. Two of them I have described myself in my system of dietary first aid for the elderly and the weakened: the MAP-type protein dietary supplement (for more about it see Ostan 2012) strengthens the activity of our immune system, while FHES-revived water (for more about it see Ostan 2012 b) creates within the organism an environment which hinders the development of pathogenic bacteria and boosts the power of our own cells – including those of the immune system. Both these dietary agents have many other beneficial effects on our entire organism. A critical mind would rightfully question the need to take probiotics when these nutrients cover the greater part of the nutrient deficit.

In part, such thinking is justified. Water composes 70% of the human organism, and living water optimizes its need for water. 60% of the remaining 30% of the cell structure is protein, and the MAP-type ideal protein can optimise a further 18% of the organism. Spirulina or some other type of cyanobacteria can provide the organism with at least part of the missing minerals, vitamins and essential fatty acids. It would seem then that with these foodstuffs we have managed to optimise over 88% of the structure of our cells. But that is not exactly true.

The MAP-type proteins, fresh pressed juices or FHES pass into the blood from the small intestine, which means they do not change the situation in the large intestine at all. If bad microorganisms prevail in there, they generate free radicals and other toxins, which penetrate the body and constantly erode the antioxidative environment that we have created by means of antioxidant-packed beverages. The MAP optimal combination of amino acids does allow our cells to

produce the complete range of proteins they are able to produce themselves, but if the amount of good bacteria in our gut is insufficient, we fail to receive a mass of specific proteins (hormones and enzymes) that the good intestinal biota generates. We fail to benefit from the important participation in calcium and iron absorption and in the production of vitamins in the B-group, which in a biological community called the human being is the responsibility of the good bacteria.

There is 3.3 pounds of bacteria in our digestive system. This may sound little compared to the entire mass of our body, but this community of bacteria is actually an organ of ours, performing tasks that are important to the functioning of our whole organism. Their number is perhaps more telling of their true significance. Microbiologists have estimated that our intestines contain ten times more microbes than there are cells composing the entire human body. If we step away from our proud and egocentric point of view we can see that the human being is in truth an organised community of our cells and of microorganisms, in which our own cells account for merely one tenth of all the cells in this symbiotic group, like some sort of 'shell' protecting a myriad of microbes. If we perform our role of protector well, the community of microbes that reigns over our intestines rewards us with good health and well-being. And if we can make it shine in its youthful power with the aid of probiotics, it appears that it repays us with additional vital power.

In Harmony with the Queen of Life

I still take the opportunity sometimes to lie on the grass high up in the mountains. Just like in my youth, I admire the queen of the flora around me. But now I know that such a queen lives inside me, too – it is a mighty community of microorganisms, the intestinal biota. I take care of it with a probiotic drink when I leave home in the morning, and also in the evening, when we both need a restorative after a long day.

Erik Nielsen's Organic EM Probiotics and Their Use

Since the beginning of the 21st century, Erik Nielsen's organic EM probiotic has been developed further. Today, several types of this probiotic are produced, which are different from the organic EM probiotics of a decade ago. I would like to describe the common characteristics of those contemporary versions that are certified organic, and the forms of their use.

What Are Erik Nielsen's Organic EM Probiotics?

Erik Nielsen's organic EM probiotics (in short: organic EM probiotics) are fermented beverages prepared in Denmark and a few other countries using eight strains of good bacteria from the lactobacilli and bifido groups. These strains, all of which are also contained in the beverage, are: *B. lactis*, *B. longum*, *L. acidophilus*, *L. casei*, *L. rhamnosus*, *L. salivarius*, *Lc. lactis* and *S. thermophilus*.

Organic EM probiotics are registered as foods (not as dietary supplements or drugs). This means they

The Need for Probiotic Quality Control

In 2010, the results of a scientific study on the quality of 20 probiotic dietary supplements and two probiotic medicines on the Slovene market were published (Bogovič Matijašič et al. 2010). They confirmed that the two medicines contained the declared number and the declared types of microorganisms, and revealed that a whopping 75% of the probiotic dietary supplements did not contain the declared number of bacteria, and an additional 15% did not contain all the declared types of microbes. Only 10% of the probiotics examined were therefore in complete compliance with the declaration on the label.

Consumers should demand from the distributor of an individual type of probiotic the results of quality control for an individual series. The manufacturer of the organic EM probiotic provides them.

are not intended to treat illnesses. There are also no clinical trials on the physiological effects of their consumption.

Of their special qualities let me list the following:

a) They contain a large number of good bacteria

According to the declaration of the manufacturer, organic EM probiotics contain at least 20 million live microorganisms (we call them strains) per millilitre. This share is valid also on their expiration date, which is one year after the date of manufacture. The company distributing organic EM probiotics from Slovenia has additional requirements with regard to their quality: it only purchases the organic EM probiotics of those series which at the time of bottling have at least 100 million strains per millilitre. This puts the organic EM probiotics distributed from Slovenia in the group of concentrated probiotics.

b) They are based on the principles of EM technology

As previously mentioned, organic EM probiotics were developed based on the principles of Japanese EM technology. It is not just about the large number of good bacteria in them, but also about a special combination of various strains of bacteria which increases their efficiency.

c) They contain no chemical preservatives

The organic EM probiotics' very low pH (3.5) makes the product self-preservative. Tests conducted at the University of Ljubljana have confirmed the pH value.

d) Certified Organic Production

Organic EM probiotics are certified with the Danish Ministry of Food, Agriculture and Fisheries on the organic production of all the substances used in their manufacture.

e) They Contain Extracts of 19 Medicinal Herbs

Organic EM probiotics contain extracts of no less than 19 organically grown plants well-known in herbal medicine. These are: anise, basil, fenugreek, dill, juniper, fennel, elder, ginger, angelica, chervil, liquorice root, oregano, peppermint, parsley, chamomile, rosemary, sage, nettle, and thyme.

The particular quality of organic EM probiotics is achieved by mixing the herbs into the product at the time of the fermentation. The herbs and the sugarcane molasses as the energy source provide the good bacteria with excellent food for efficient and quick growth. In addition, during the fermentation, the herbs are processed into a more easily digestible and active form. In fact, the substances extracted from the medicinal herbs, which are contained in the beverage, are pre-digested; instead of the good bacteria processing the herbs in the intestines, they metabolise them effectively during the process of preparation of organic EM probiotics. I assume that the utilisation rate for the substances extracted from the herbs is in this way greater than if they were taken in unprocessed form.

Thus, organic EM probiotics are not only probiotics, but also a nutrient-packed functional food. They contain 40 kinds of minerals and a multitude of active enzymes, produced by the bacteria during the fermentation of the beverage.

f) Very effectively normalise the smell of stool

By taking the organic EM probiotic it is possible to eliminate the foul smell of stool within days. This is an important subjective criterion for determining the efficacy of a probiotic.

How Much Organic EM Probiotic Should We Take?

According to the recommendations of the manufacturer we can take the organic EM probiotic several times a day in dosages between 20 ml and 50 ml. The total daily dose can thus even exceed 150 ml. Since the organic EM probiotic, like yoghurt, is not a dietary supplement but food, there are no explicit restriction on its intake.

The decision about the quantity thus depends on the individual's purposes and needs:

a) Restoring a **good** *intestinal biota* (minimum target)

If our goal is only to **eliminate the imbalance** of the intestinal biota, we take the amount of probiotic sufficient to neutralise the offensive smell of stool. For people on an ordinary mixed diet to achieve that, it will normally take a few days and a total daily dose of around 50 ml. Those on a vegetarian diet need a smaller amount of beverage for the same result, while a severe dysbiosis will require as much as over 100 ml of the organic EM probiotic per day.

Once the gut biota is balanced again, keeping it in that condition will require smaller amounts of the probiotic. The more fresh fruit and raw vegetables, and the less meat and eggs contained in our diet, the smaller the daily dosage will be needed to preserve the balance. According to our observations, individuals following a healthy and balanced mixed diet will daily require 30 ml of the organic EM probiotic, while for those on a vegetarian diet with lots of fresh fruit and raw vegetables 15 ml to 20 ml of the beverage may already suffice. A tablespoon or the cup of the plastic bottle containing the organic EM probiotic can be used as a measuring vessel for 10 ml of the product.

b) For **a splendid** *intestinal biota* and as a dietary supplement **in times of illness**

If we want to reach more than just the necessary minimum of quality of our gut biota, it is considered necessary to take larger quantities of the organic EM probiotic than stated above. How much more has not been scientifically established yet. I assume it is roughly the amount recommended by experts for therapeutic effects, which is 10 billion microorganisms a day.

According to current regulations, the only authority in counselling sick people on nutrition are physicians. This applies as well to drinking probiotics. In such cases, therefore, consult your physician.

For information purposes only, the recommendations stated herein are mostly those made by Dr. Carsten Vagn-Hansen (2005). In determinate diseases, he achieved good nutritional support with the organic EM probiotic (its initial form) already at daily doses of 20 ml to 40 ml of this beverage, and in serious conditions like cancer with total daily doses of **75 ml to 100 ml**. Such a dosage provides us with some 10 billion good microbes a day.

The organic EM probiotic is not contraindicated in any disease. Being lactose-, gluten- and sugar-free, it is also suitable for patients who have to avoid these substances.

Like any other foodstuff, the organic EM probiotic can be taken as everyday food.

Is it necessary to drink the organic EM probiotic every single day? The lactic acid bacteria colonise our mucous membrane, but not permanently. Studies have shown that good bacteria

remain in the gut up to 14 days after the discontinuation of their intake. So, if we sometimes omit to take the probiotics there is no serious harm done, but it is better if we take them every day.

When to Take Organic EM Probiotics and How to Combine Them with Other Food?

Organic EM probiotics are best taken on an empty stomach or immediately preceding a meal. This way the beneficial microbes can travel through the stomach quickly. If we take them during meals, part of them can be destroyed by their long retention in the stomach (Vagn-Hansen 2005). However, for people with sensitive stomachs it is still all right to drink probiotics with meals. Such is also the general recommendation by the manufacturer. Some people even prefer drinking the organic EM probiotic after meals, especially when they have eaten too much. Organic EM probiotics in fact contain lots of active enzymes that are important for good digestion. When taken prior to the meal they prepare the gastrointestinal tract to receive food, taken after a (heavy) meal they also help the digestion. To this latter effect, as experience has shown, it is best to drink a sip or two of pure (undiluted) organic EM probiotic immediately after the meal.

Many seem to prefer diluting the organic EM probiotic with water, as it tastes quite sour. It is a very good idea to eat a piece of fruit or drink a thick juice with it. Since fibre is an ideal food for good bacteria, they perfectly supplement the organic EM probiotic, which does not contain fibre. Mixing the beverage into a thick raw juice mitigates the probiotic's sourness, while the thick raw juice acquires a fresh flavour, as if a lemon had been squeezed into it. This is especially important for users who would be thrown off by the sour flavour - children, for instance. While preparing the fresh raw juice, the organic EM probiotic should not be put in a blender, but added to the ready made juice.

Children, Pregnant Women and Nursing Mothers

Pregnant women and nursing mothers in particular require quality food and probiotic-assisted boosts. Organic EM probiotics are a completely safe food and thus suitable for these categories of users. But this is only a general statement; advice on the nutrition of pregnant women and nursing mothers is solely the province of physicians.

Organic EM probiotics can also be taken by children. The modern world does not spare them the impacts of stress, pollution and malnutrition. A daily dose for children should be reduced in comparison to adult doses in proportion to their body weight.

How to Start Taking Organic EM Probiotics

The consumption of the organic EM probiotic is safe, but some users may experience difficulties of a transient nature (headaches, increased fatigue, gases, other digestive disorders...) given that this functional food is a powerful antioxidant and as such detoxifies the body. According to the observations conducted by the HISA Institute, such detoxification crises occur in 5% of users in the first 2 to 10 days after the commencement of a probiotic regime.

Detoxification crises are the result of the organs of the excretory system not being able to remove toxins released in larger quantities fast enough during detoxification regimes like the organic EM probiotic diet. We can avoid them by starting with smaller amounts of the probiotic (only 10 ml to 20 ml the first day) and increasing them daily up to the desired level. The right amount is the one that does not worsen the general well-being. We can also facilitate the removal of toxins from the organism by drinking enough water (at least 1.5 litres a day). To avoid a detoxification crises it is also helpful to take MAP-type ideal proteins in a daily dose of 5g for two to three weeks to bolster the

excretory organs, and only then start taking strong detoxifying foodstuffs. This is especially recommended for very weak and elderly individuals.

Fasting with Organic EM Probiotics

It is recommended to take organic EM probiotics during fasting, which puts especially the good part of the intestinal biota under stress. In circumstance of shortage of suitable food, the number of acid lactic bacteria drops rapidly, which gives more power to bad bacteria. This is why the odour of the stool cleansed from the bowels (via enema) during fasting is markedly pungent. If we mitigate the fast by drinking a glass of fresh pureed juice (fibre) a day together with 20 ml to 30 ml of the organic EM probiotic, we are able to maintain and invigorate a healthy gut biota. Detoxification intensifies, yet the contents of the bowels do not smell badly. The organic EM probiotic can also be added to the enema water (10 ml per 200 ml of water), which improves its cleansing and invigorating effect manifold.

Storing Organic EM Probiotics

Organic EM probiotics are sold in 500 ml and 1000 ml plastic bottles. Unopened, they last for a year. After opening they have to be stored in the refrigerator and should be used within one, maximum two, months. If the contents of an opened bottle remain unused within this period, the remains can be diluted with water in a 1:10 ratio and used for watering flowers or garden vegetables.

For a more intensive use it is better to purchase a 3-litre bag-in-box packaging (a carton containing a vacuum plastic bag with a valve). Once the bag is in use, the EM organic probiotic does not need to be kept in the fridge, as it remains in the vacuum. For the same reason it can be used long after the bag has been opened.

Whatever the packaging, the plastic bottle or the carton should be shaken gently a few times before use to mix the contents, as during storage the bacteria will naturally sediment to the bottom.

Other Modes of Use for Organic EM Probiotics

Since the time of Louis Pasteur, microbes have been considered our enemies. Disinfection of the environment is therefore the rule. But if for that we use ordinary disinfectants, which are strong oxidants, we are just clearing the land for an invasion of new pathogenic bacteria. In truth, a healthy environment is not sterile, but rich with good bacteria, which produce antioxidants – protectors of life. A healthy soil, the surfaces of healthy plants, a healthy environment – they are all full of good bacteria. There is a multitude of good bacteria on healthy skin as well. The EM probiotic can therefore be:

- applied to the skin (with cotton wool)
- added to the water for a whole body bath or for a foot bath (add 20 ml of the organic EM probiotic into the water warmed to 38° C; after 20 minutes of soaking, do not shower or rinse, just dab the skin with a towel)
- applied to wounds in the form of dressing (sprinkle 10 ml of organic EM probiotic on a gauze or clean towel, lay it over the wound, bruise or sore spot and fix with a dry towel)
- sprinkled over the surfaces of ovens or other kitchen appliances with cakes of old grease for the microorganisms to clean them
- swished around like mouth-wash to disinfect the mouth (highly recommended). After swishing, you can swallow the liquid, as it still contains all the bacteria and these will continue their work in other parts of the digestive system. Swishing pure organic EM probiotic is also an

efficient way to eliminate bad breath. The most persistent is morning breath. Our experience has shown that if you swish the organic EM probiotic around the mouth before bed-time, you will wake up without that nasty morning breath.

The world is changing. From killing our enemies we should graduate to boosting our vital power and cooperating with beneficial beings. Isn't invigorating our smallest and oldest allies – the good bacteria – an ideal way to start improving ourselves and the world around us?

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