PROBIOTIC CLEANING SPECIFICALLY DEVELOPED

4BILLIARD®

Introduction

We are increasingly aware of the fact that a many hygiene problems are due to the wrong microbiology, in which bacteria, viruses or fungi are persistently troubling us. We also know very well the problem of resistance among these microorganisms, as a result of the excessive and inappropriate use of antibiotics and biocides (antiseptics).

This brings us today innovative cleaning products based on efficient and sustainable technology. probiotics and prebiotics are used to create a good microflora that prevents undesirable effects.

What are microorganisms?

A **micro-organism or microbe** is an organism that is too small to see with the naked eye. Only if they are present in large numbers they can become visible. The most important examples of microorganisms are ***viruses***, bacteria, fungi, yeasts and algae.

Microorganisms can be found everywhere in nature. They are found in large numbers on the skin, in the digestive tract, in the soil, in water and in the air.

The majority of microorganisms are benign, useful or even necessary for humans, animals and the environment.

Unfortunately, there are also a number of microorganisms that are harmful to humans, animals or the environment; we call them pathogens. Although they are the minority, they give the microorganisms a very bad reputation.

Some examples where microorganisms are harmful:

- **Disease:** different microorganisms can cause diseases such as colds, pneumonia, ***flu***, wound inflammation, tetanus, etc. Plants can also be made sick by microorganisms, so that they no longer bear fruit or even die.
- **Food spoilage:** bacteria in particular can cause spoiled or contaminated food, resulting in intestinal infections and diarrhea after eating this food. Salmonella, E. coli, Listeria and Clostridium are the most important ones.

The microbial community

A more recent term is **microbiome**. This is the total of microorganisms that are located somewhere; whether they work together as a community or not. The best known microbiome is that of humans and includes, for example, the microorganisms present in our mouth, digestive system and on our skin. Even though these microorganisms do not all work together, they do together determine the “state (or health)” of the place where they are (humans, animals, indoor environment, soil, water, etc.). A stable, healthy microbiome is therefore of great importance for our health and that of the entire environment.

The microbial dynamics

The microbial community, microflora, biofilm or microbiome is a living entity; this means that it changes continuously according to the circumstances (moisture, food, temperature ...). Despite these changes, the goal of the microbial community is to stay alive as long as possible. The microorganisms do this by adapting to the circumstances.

Since the microorganisms have an average lifespan of a few days, there will therefore be a continuous dying and growing of microorganisms, the actual composition of the community being determined by the type of food and the environmental parameters.

Unfortunately, the composition of the microflora is not always beneficial for humans, for example when it contains too many members that cause odor nuisance, biofilm pollution or disease. In the last century the knowledge of microbiology was still very limited and people only looked at individual micro-organisms that caused problems. The importance of a stable, healthy microflora was not yet known.

The result was that methods were sought to kill germs or other unwanted microorganisms, without taking into account the good microorganisms. This was the birth of the **hygiene concept**, in which people wanted to live as "clean" as possible. This gave rise to the development of antibiotics and disinfectants, which had a very broad effect with a major impact on the useful microorganisms.

In recent decades, thanks to new techniques, science has gained insight into the importance of the microbial community, rather than the individual micro-organisms. It has become clear that the hygiene concept needs to be urgently reviewed, with the aim of achieving a healthy, balanced microbiome; instead of killing off all microbiology.

In the following chapter we show you the influence of chemical cleaning and disinfection on the microbial balance. Afterwards it is explained what the sustainable alternative of 4billiard entails.

Chemical cleaning and disinfection

Because the discovery of microorganisms was mainly linked to diseases, people had the idea that all microorganisms are dangerous. In addition to the search for means to combat diseases (antibiotics), more and more attention was paid to the hygiene of ourselves and our environment. To this end, products have been developed for cleaning and disinfecting.

Cleaning and disinfection

There is an important difference between cleansing and disinfection, both of surfaces and of our body.

- **Cleaning:** Removing dirt from a surface (a material or our skin). This is done with soaps (or detergents).
- **Decontamination:** Make a surface free of microorganisms by killing them. This is done with biocides (or disinfectants).

Both soaps and biocides are completely chemical in composition, the biocides containing an active substance that is killing micro-organisms. Nowadays, soaps and biocides are sometimes combined, whereby one product should do both cleaning and killing (eg Dettol).

The ultimate goal is therefore to ensure that microorganisms and their food source (= dirt) are no longer present in our environment through cleaning and disinfection.

The resistance issue

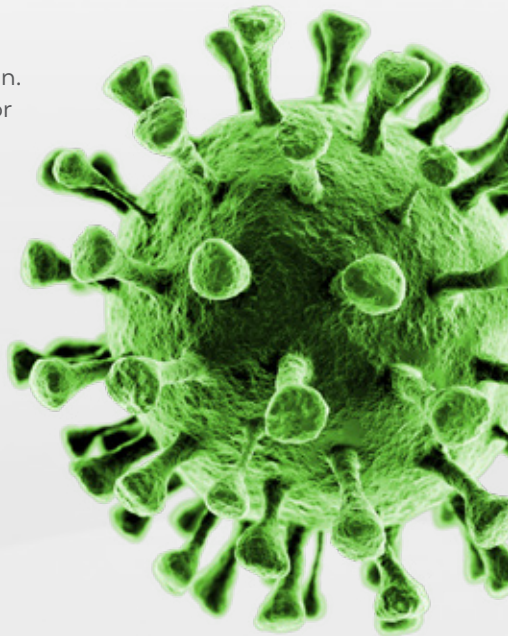
Very quickly (a few decades) after the introduction of disinfectants, the microorganisms found ways to circumvent this threat, which we now call resistance. This means that the microorganisms are increasingly able to survive an attack of disinfectants. The efficiency of disinfectants is therefore becoming less and less.

As a result, the cleaning agents (soaps, detergents) can no longer efficiently remove dirt from surfaces because it is increasingly stuck in biofilms that are almost impenetrable to soaps.

The decontamination paradox

However, there is a greater danger behind chemical cleaning and disinfection. The influence on microbial dynamics is such that the microbial community or microflora is increasingly directed towards a harmful microflora.

However, due to the resistance, a number of microorganisms will survive this disinfection. A disinfectant has no after-effect, so these survivors will start to regrow after a few minutes. After all, they suddenly have a lot of place (the vacant places of the killed microorganisms), food (the killed microorganisms themselves serve as a source of food) and moisture (brought along with the disinfectants).



Probiotic and synbiotic cleaning

4billiard's producer, on the impulse of academic research by Dr.R.Temmerman, has been aware of the problem of resistance for many years and after years of research has devised a solution for sustainable and efficient cleaning. This solution uses nature and is based on good bacteria **(probiotics)**, optionally supplemented with good sugars **(prebiotics)**. The combination of probiotics and prebiotics in one product is called **synbiotics**. The probiotic and / or synbiotic cleaners form a healthy microflora during and after cleaning for **optimum sustainable hygiene**.

How does it work?

As mentioned earlier, the hygiene concept is no longer the radical control of all microorganisms, but the maintenance of a **balanced and healthy microbiome**.

4billiard's probiotic and synbiotic technology ensures optimum hygiene by (1) keeping a surface clean via a cleaning effect and (2) supporting good microorganisms.

Probiotic and synbiotic cleaners ensure an efficient, long-term cleaning effect and stimulate good, stable microbiology.

What about the combination of pro / synbiotic cleaning and disinfection?

It may be that a disinfection is nevertheless required, for example due to legal provisions in the healthcare sector, food industry, or as pre-treatment of an air conditioner.

The combination of probiotic and synbiotic cleaning with disinfection is perfectly possible.

Clean first, then disinfect

Benefits of probiotic and synbiotic cleaning

Efficiency
The dual action of the surfactants and the probiotic enzyme production ensure maximum cleaning efficiency. Organic pollution that gives rise to discoloration or odor is completely removed. Stubborn, deep pollution can take a few weeks; but once gone, always gone.

Sustainable
4billiard's producer of pro/synbiotic products have already been awarded the EU Ecolabel for cleaning agents and are also Cradle2Cradle Gold compatible. This means that not only the products, but also the entire production process is as safe and sustainable as possible.

No resistance
It has already been emphasized that the conventional killing of microorganisms has very harmful consequences for the microbiome, with resistant harmful germs as a result. 4billiard's producer of pro/synbiotic technology therefore has no biocidal effect against other microorganisms, making resistance impossible.

Safety
Safety is an ever-increasing problem with cleaning agents and here too the pro/synbiotic technology scores best. The minimally used chemistry is of the most modern and sustainable nature. The probiotics and prebiotics are 100% natural ingredients. And in addition to the safety of the products themselves, they also result in a lower risk of infection as demonstrated in several hospital studies.

Security
Because probiotic and synbiotic cleansing is a new technology, 4billiard has devoted a great deal of attention from the start of the development to demonstrating the safety of the products and especially the probiotic strains used.

4billiard probiotics and synbiotics meet the following criteria:

- All probiotics used belong to ATCC safety class 1 (= highest safety)
- The pro / prebiotics are 100% natural, not genetically modified (non-GMO)
- The pro / prebiotics are listed on the list of safe ingredients of the European Fo (EFSA) for processing in food
- Food safe according to the American FDA (GRAS status)
- Passed the following official OECD safety tests:
  - OECD 403 Inhalation toxicity
  - OECD 404 Acute skin irritation / corrosion
  - OECD 405 Acute eye irritation / corrosion
  - OECD 406 Skin sensation
- The products meet the EU Ecolabel criteria
- The prebiotics and probiotics meet the criteria for use in cosmetics
- 10 years of safe use in hospitals and clinical studies

Applications

Surface cleaning

Virtually all buildings (private, public or professional) are constantly affected by pollution and odor. The microscopically deep cleaning of the probiotic and synbiotic cleaners ensures a significant reduction of these problems.

Where: Healthcare sector, agriculture, public sector, schools, offices, shops, ***sports infrastructure, hospitality, (food) industry,*** private homes ...

What makes these products unique?

In order to enjoy the maximum effect and benefits of probiotic and synbiotic cleaning, the products must meet a number of important criteria:

Composition of the product

The selection of the types of probiotics and prebiotics are crucial for the proper functioning of the product.

Product stability

The number of pre- and probiotics in the product is also of great importance. Often the organic pollution on a surface is very strong. A probiotic cleaning product with only a few probiotics will not work. The 4billiard products contain an absolute minimum of 50 million probiotics per ml. Certain products go up to half a billion per ml! Probiotics and prebiotics must also survive the entire life of the product. 4billiard's producer is by far the market leader in terms of stability and gives all of its products a shelf life of at least 3 years!

Product quality

To guarantee the proper functioning and safety of every product, a sound quality system is of great importance. 4billiard has the ISO9001 quality certificate since 1999. This guarantees the proper functioning of the entire company.

Product Operation

The operation of all 4billiard's products is always externally validated by specialized academic or private institutions. 4billiard's producer's regular research partners include UGent, Eurofins, SGS and BMA Labor...

Conclusion

With the probiotic and synbiotic cleaning products, **4billiard has found a true revolution and proven solution in terms of cleaning 4 billiards.** The optimal effect in combination with their safety, durability and environmental friendliness make these products the sustainable hygiene that we all need.

In the coming years, this technology will be used in more and more sectors. You can help to build a sustainable future!


A BETTER WORLD CAN
START WITH YOU.
CHOOSE RIGHT.
4BILLIARD®