



Chrisal

Probiotic Hygiene

Animals

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Introduction

The care of animals, big or small, brings a series of challenges or problems with it; both for professional animal keepers (zoos, animal husbandry, horticulture, ...) as well as the individual who's pet resides in the home.

Some of the following problems may sound familiar to you:

- Odour issues
- Infections
- Allergies (both animal and human)
- Skin and coat problems

Many of these problems have to do with microorganisms, or microbes. For many decades we used human bactericidal products (disinfectants) assuming that they would solve the problem.

However, in recent years, it has become increasingly clear to us from media and scientific literature, that the frequent use of these aggressive products give rise to drug-resistant superbugs that are almost impossible to keep under control.

For 25 years Chrisal has been striving to produce hygiene products that are natural and sustainable. Probiotics are playing a crucial role in our product development. With probiotics we use nature to address the problem instead of trying to kill off nature.

Given the importance of good hygiene in animals, Chrisal has specially developed a probiotic product range for them. In this paper, we give you a general overview of what Chrisal can provide. For more detailed information on specific applications, please feel free to contact us.

We hope to be of good service to you and your animals!



Dr. Robin Temmerman
CEO



Brief introduction to the world of microbes

(More information can be found in our document 'Probiotic cleaning – the basics')

A **micro-organism or microbe** is an organism too small to see with the naked eye. Only when there are a large number of them can they become visible (such as the discoloration in a shower grout). The problematic types of microbes are viruses, bacteria, moulds, yeasts and algae. Bacteria are the most common microbes and are about 1 micrometer (μm) in size, that is 1 millimeter divided in 1000 pieces!

Micro-organisms are found everywhere in nature. They are present in large numbers on skin, in our digestive tract, in soil, water and the air. The majority of micro-organisms are beneficial, useful or even necessary for the survival of humans, animals and the environment.

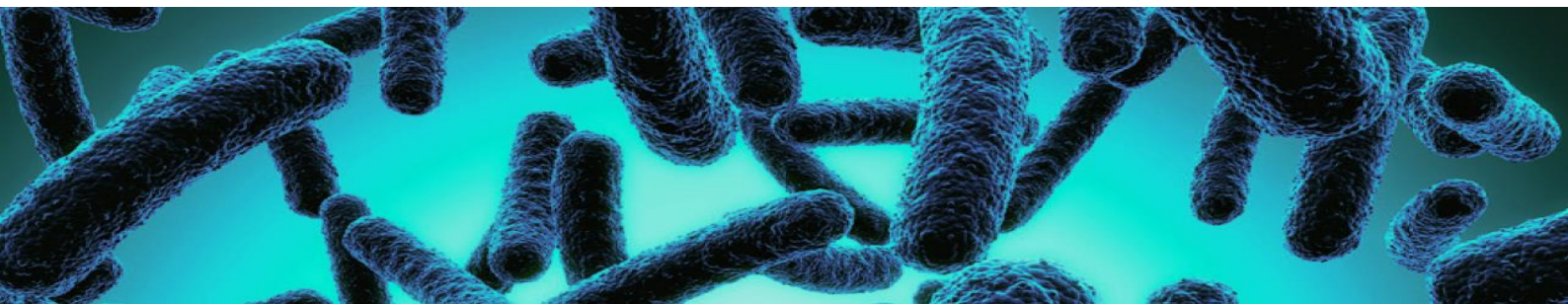
Unfortunately, a number of dangerous or 'unwanted' micro-organisms also exist. They might cause disease in plants, humans or animals; produce unpleasant smells or cause food spoilage and contamination. Despite the fact that these 'bad germs' are only a small portion of the total number of micro-organisms, they give microbes a bad reputation.

Wherever they reside (soil, air, water, humans, animal, plant), microbes have the tendency to organize themselves into communities: the **microbial community or microflora**. Such communities can be very diverse and complex. Each microbial member of the community plays a role and contributes to the sustainability of that community. Together, all microbes have only one purpose: survive as long as possible with as many as possible.

When a microbial community or microflora, attaches to a solid surface (material, skin, teeth, tubes, leaves...) it is called a **biofilm**. Very common examples of biofilm are brown stains or dark discolorations in grout lines, slime build-up in water pipes and pumps. Frequently, biofilm has negative consequences to humans and animals because it causes visual pollution, odours and harbours a high number of disease causing germs.

In order to survive, microbes also require food and water just like us. **Food** can easily be found among the abundant organic material present in water (such as plant material, slime or pulp in processed/cooling water). Microbes **drink** by means of absorbing moisture or water, which is of course abundant in water systems. The processing of food and moisture by microbes is called metabolism and very often this involves the excretion of smelly gasses that we then experience as bad odours. Worst case, some microbes might also produce substances that cause disease in animals, humans or plants, or that cause allergic reactions.

In order to obtain good hygiene and prevent the undesirable effects of microbes, it is important to create a healthy microflora in the water, that doesn't produce any dangerous or unpleasant substances. This can be achieved by means of the probiotic care and cleaning products of Chrisal.



Chemical cleaning and disinfection

For many years people believe that all micro-organisms are bad or dangerous and that they should be destroyed. For that purpose, chemical products called biocides, were developed to kill micro-organisms. These biocides contain microbe-killing agents and can be used as such, or be processed into other products (e.g. disinfecting soap). The eventual purpose of all biocide products is to prevent microbial growth so that none of the negative effects of microbes can exist. In water systems, a common biocide is chlorine.

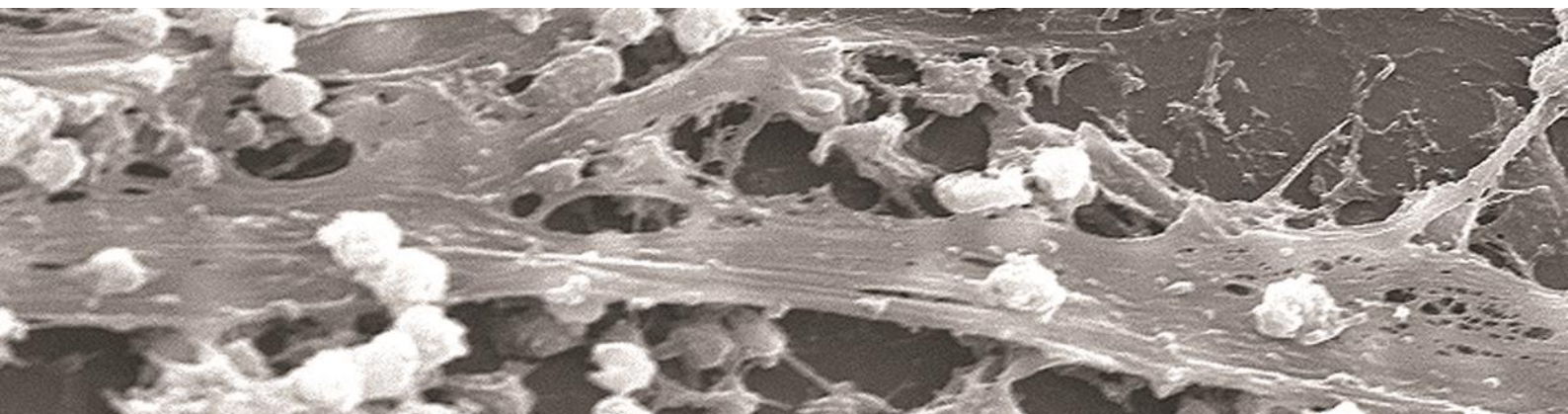
Initially, the use of biocides seemed very effective and water could be kept free of microbial growth and biofilm formation. However, very soon after the discovery of biocides the micro-organisms found ways to protect themselves against these chemicals, which is called **resistance**. This means that each year, microbes know much better how to survive the attack of a biocide. As a result, the efficacy of biocidal products is reduced meaning they need to be applied in higher concentrations and more frequently in order to keep the same effect. Today, the required concentrations of biocides are so high that it becomes very dangerous to work with these chemicals. Furthermore, it can result in huge costs, damage to technical equipment (corrosion) and harm to the environment.

On top of that, most water systems suffer from resistance microbes, which have developed strategies to survive. One of those strategies that defend them against the attack of chemicals is the formation of exceptionally **tenacious biofilms**. These biofilms have extremely complex structures and compositions and can be considered as bunkers and shelters for the microbes. Biofilms are mostly impenetrable to biocides and continue to grow over time. In most water systems, this causes huge problems such as clogging of pipes, pumps, filters and the formation of intensely bad odours. Also, the performance efficiency of a biofilm infested technical installation is hugely reduced.

The chemical substances used in these **dangerous chemical biocides** are detrimental to the health of humans, animals and plants. For instance, the Food and Drug Agency (FDA) in the USA has started an investigation towards the safety of disinfecting soaps*. Besides safety, the active ingredients of biocides are highly polluting to the environment because they are not biodegradable. They also persist for long time so they can stimulate resistance amongst the harmful micro-organisms in ponds and soil.

Over the last few years, a lot of dangerous disadvantages of biocides have been discovered. However, the discovery of using probiotic hygiene, based on natural ingredients, offers a sustainable solution to the emerging resistance and safety problems experienced with biocides.

*<http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm378393.htm>



Probiotic Cleaning and Hygiene

The probiotic products of Chrisal contain probiotic bacteria as the active ingredient. Probiotics are good, beneficial bacteria that provide a healthy environment for humans and animals.

Probiotic cleaning is done with soaps containing probiotics. These soaps contain a number of ingredients that provide basic cleaning, such as foaming and degreasing; but no more harmful chemicals. The probiotic bacteria provide many benefits (both during and after cleaning) which are demonstrated below.

Probiotic hygiene includes a number of probiotic products to be used in addition to the cleaning in order to resolve specific problems. This includes a 100% probiotic spray against odor, a probiotic shampoo for a clean and healthy coat / fur.

From our experience, we know that people immediately ask the following questions about our technology:

- **Are probiotics safe?**

Absolutely. The probiotics selected and used by Chrisal are internationally approved for use in nutrition. In addition, Chrisal performs a broad range of safety assessments of their own, in collaboration with accredited laboratories worldwide. Our production processes are fully ISO9001:2008 certified.

- **Can bad germs become resistant against the probiotics used?**

No, micro-organisms can never become resistant against other micro-organisms. Resistance is only possible against a molecule or chemical substance that threatens the microbes. The probiotic technology does not involve any biocidal activity or chemical substance that targets to kill microbes. This means that the probiotic technology can be used for many years, which is referred to as sustainable.

- **Why don't we stop with cleaning and disinfection to keep a natural microflora?**

There are places where people and animals live together that are simply dirty, creating an additional burden on microbial space. In these places, it must be cleaned in order to keep the situation livable. Therefore, we promote probiotic cleaning than chemical cleaning.

- **Is it a lot of work to apply probiotic cleaning?**

Not more than with regular cleaning. You use the probiotic products just like any other soap products. Used twice a week gives the optimal effect.

Of course many more questions exist because of interest in this probiotic technology, or the fear of change. Please do not hesitate to contact Chrisal (contact information at www.chrisal.com) to ask any of your questions, we are most happy to answer them and help you further understand the probiotic technology.

The benefits

If we start with the probiotic cleaning products, then the main advantage is, of course, the **cleaning effect**. The probiotics in the product remain present on the surface after the cleaning and provide microbial protection long after the cleaning action has been performed. Because they are so small, the probiotics can penetrate in the smallest crevices and indentations of any surface to remove the last traces of dirt and biofilm.

After a period of use, this results into a noticeably cleaner surfaces as shown in the examples below:

Concrete floor horse clinic De Morette / De Bosdreef (België)



Chemical Cleaning

Probiotic Cleaning

Tile floor in a restaurant:

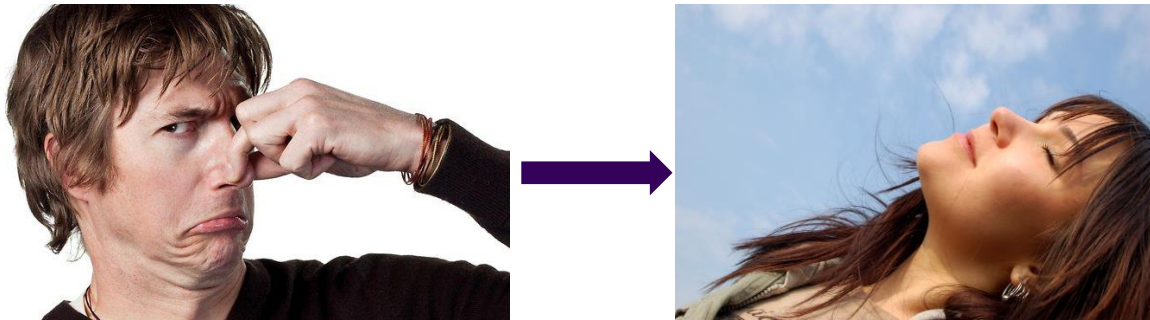


Chemical cleaning

Probiotic Cleaning

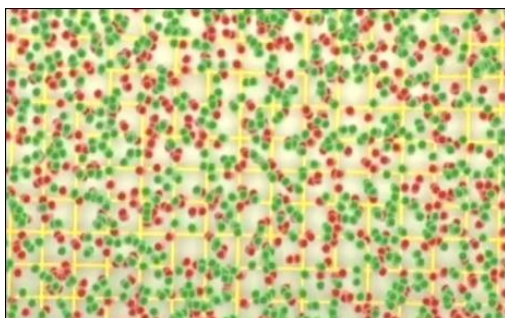
In addition to the superior cleaning, the probiotics also ensure good **odour control**. Smells are usually formed by certain micro-organisms that form gases as a result of their digestion. The probiotics which are present after cleaning, are in greater numbers on the surface than the odour causing organisms, and will remove the food sources from the microorganisms that cause the odours.

The odor-controlling effect is true for all of the probiotic cleaning products. However, there is a special probiotic product that can be used when soap and water cleaning is not possible, as in the case of the cat litter or dog basket, or the animal itself. This through a specific probiotic aerosol which was developed by Chrisal that contains only probiotic bacteria.

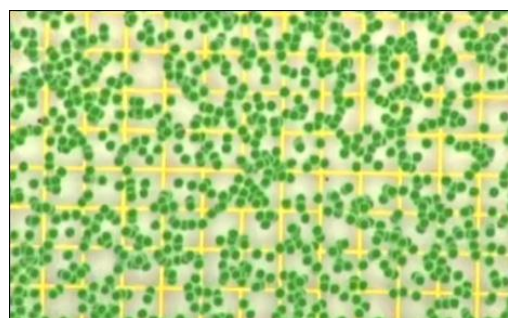


As mentioned previously probiotic cleaning provides for a healthy microflora on the surfaces and the animal itself. This is to say that the majority of the microorganisms present are harmless. The diagram below shows the basic principle in which the frequent administration of probiotics on a surface ensure that all food and space are occupied by the probiotics, so that other undesirable microorganisms die of old age and hunger. Once the surface is covered with probiotics they strongly decrease the risk of the presence of harmful microorganisms, as long as the probiotic products are routinely used.

A:



B:



A: Surface with a mixture of good (green) and bad/undesirable (red) microorganisms. This is the situation that we have when chemical cleaning and disinfection is used.

B: Surface completely occupied with good (probiotic) microorganisms. This is the situation that we have after applying the Chrisal probiotic products.

Many animals suffer from **skin problems or allergies**. After all, skin or fur is often a gathering of dirt, allergens and harmful microbes. Chrisal developed a number of products such as probiotic shampoo, which aim to keep the skin and fur dominated with beneficial probiotic microorganisms. This is not only beneficial for the animal itself, but also for people who, despite their love for animals, are sensitive (allergic) to certain substances (allergens) that may occur in the skin / fur



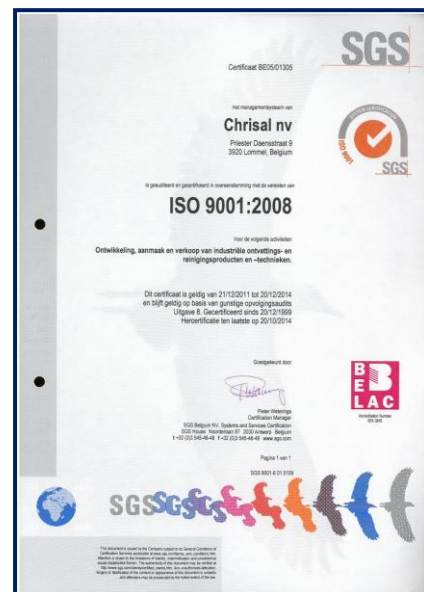
Because the probiotic products of Chrisal ensure a more hygienic skin or fur, your pet is healthier and you can also enjoy a more intimate relationship with your dear friend without the fear of becoming contaminated.

Safety and environment friendliness are major advantages of the probiotic products. The probiotics are 100% natural organisms and they actively contribute to the preservation of the environment. The probiotics used in the Chrisal products originate from soil and water and are not genetically modified.

Chrisal also has the European EU Ecolabel certificate proving that Chrisal is capable of developing products that meet the most demanding and recent specifications for environment friendly products. Because Chrisal is a company that invests a lot in innovation, our newest products are often ahead of legislation and are more “green” than the latest green legislation.

The **production process and quality control** are extremely important in order to have probiotic products that meet the highest quality standards to guarantee proper efficacy for the customer. Chrisal also has the ISO9001:2008 quality system in place which is subject to an annual external audit. The ISO system guarantees proper procedures of the entire Chrisal staff and infrastructure.

Whoever chooses the Chrisal Probiotic products is choosing a safe future for humans, animals and nature. They are also choosing top quality technology and service that is built on over 25 years of experience. The only thing you will need to be able to start with the probiotic technology from Chrisal is a little change of mind, and the benefits will soon become evident.



The right product

Are you convinced of the probiotic technology for cleaning? Perfect!

But, be careful, you have to pay attention to a number of important aspects when searching for a good supplier of probiotic products. Not all manufacturers of probiotic products demonstrate the same quality and professionalism as Chrisal.

Type of probiotics

Probiotics are mostly known from food supplementation where certain species of good bacteria are used to optimise the function of the gut microflora. Of course, surfaces and water systems are a totally different environment than intestines. The probiotic species used in probiotic food supplements cannot be used for cleaning applications in the environment or in water. Chrisal has screened many probiotic species and selected only the ones that demonstrate the highest and longest efficacy in environmental applications. This guarantees that the probiotics can be the most effective for the specific cleaning situation they are being used for.

Minimum count

Of course, each application requires a specific minimum number of probiotics in the product in order to achieve good results. When the probiotics used are too few in number, it may take a lot of time to achieve an effect, or worse, never achieve any effect at all. In over 10 years of research, Chrisal has demonstrated that most applications require at least 50 million probiotics per ml of product (50 billion probiotics per liter of product). For a number of water applications, this minimal count is much higher (up to 1 trillion per liter). Chrisal guarantees that even at the end of the product shelf-life, the minimum required number of probiotics are still alive in the product.



Stability

It is not only the type and number of probiotics in the product that are important, but also the stability that is crucial. Because of the unique and secret Chrisal product stabilization system, Chrisal is the only manufacturer of probiotic products in the world that can offer a minimum 2 year shelf-life for all its probiotic products. This means that the activity of all probiotic Chrisal products remains viable for 2 years.



Chrisal refers to the stabilized probiotics with the name 'SPF – Stabilized Probiotic Ferment' which can be recognized on the product label by means of the logo to the right.

The range

Currently the range of probiotic products includes a range of products that can be used for all species, along with some specific products for particular applications.

General Products

Animal Shampoo

As described earlier, a healthy coat of fur is very important for the overall health of the animal and its owners. Skin problems, allergies or bad odors may be due to a dirty or unkempt coat, or unhealthy imbalances in the microflora. The probiotic shampoo ensures that the hair coat is cleaned purely by the probiotics and potential allergens are removed. Unpleasant smells will also be minimized. The shampoo is completely safe for humans and animals. See specific product information for further info.

Packaging: 500 ml

Animal Skin Spray

Not all animals are as easily washed with a shampoo. In order to still be able to treat their fur probiotically and to keep it healthy, Chrisal has developed a small spray that gently mists the hair coat from a distance. The spray only contains probiotics and is completely harmless to the animal. The quantity applied will depend on the type of fur. See the specific product information for directions.

Packaging : 200 ml spray can with compressed air as a propellant

Animal House Cleaner

Animals such as dogs and horses often have their own residence (cage, kennel, stable). These areas are subjected to feces, food, litter, and sometimes weather conditions. This increases the risk of their animal shelter becoming dirty and smelly. Chrisal's probiotic foaming cleaner cleans deep into the surface of the animal housing area and deodorizes very efficiently.

Packaging: 1, 5 en 20 liter bottles

Animal House Stabilizer

Chrisal has developed a concentrated probiotic liquid that can be used in the animal housing to probiotically care for the house/stable during the period between cleaning with Animal House Cleaner. This product is diluted and put in a hand sprayer (back pack sprayer for larger areas) and misted sparingly over the bedding, equipment and even animals to maintain hygiene and reduce odors. Bird cages can also be misted to counteract the ammonia smell.

Packaging: 1, 5 and 20 liter

Specific for cats

Cat Box cleaner

When you do a thorough cleaning of the litter box, using the Cat Box cleaner will minimize the odours caused from urine and associated microorganisms that reside deep into the scratches and pores in the plastic. They make a lasting nasty urine smell (ammonia smell). Cleaning the litter with the cleaner ensures a thorough cleaning and probiotic odor control.

Cat Box Fresh

When you do not have the time to clean or change the litter box, Chrisal probiotic spray can very easily be misted over the litter box. This creates an odor reduction so your cat will want to use the litter box longer before having to change. You can also use the spray to keep the cat baskets or the cat's other favorite places without odour.

Specific for horses

Insect Spray

Horses often suffer from bugs on the coat, which may penetrate the skin and may provide infections or allergic reactions. A lot of these insects are attracted to the sweat on the skin. The Chrisal Probiotic Bug spray will ensure a rapid reduction in (sweat) moisture and prevent odors. This reduces the chance that insects are attracted to the coat of the horse.

Packaging: 200 ml aerosol spray with soft and silent mist in order not to frighten the horses

Specifically for aquariums

Chrisal has developed a product specifically for the maintenance of aquariums, that ensures a biological balance in the aquarium. The probiotics break down excess dirt, ensuring clean pumps and filters, and greatly reduce the risk of infections in fish. This product is 100% natural and is made up of several enzymes and probiotics.

Packaging: 500ml, 1 liter and 5 liters.

Professional users

For the professional animal owners (livestock, poultry farms, pig farms, aquaculture) Chrisal has marketed a PIP Animal Housing range. This requires professional guidance and application and it suggested that you can contact your local Chrisal agent for further advice.

References

You want the best for your animal. You also want to ensure that the products were tested by professionals who work with animals.

Chrisal is proud to present some of its most important users:

Artis Zoo (Amsterdam, Nederland)

The Artis in Amsterdam is a large and experienced zoo with an international reputation and leaves nothing to chance. After two years of extensive testing of different probiotic products from Chrisal, Artis decided in 2014 to clean all animal shelters, and use the water treatment products. The great diversity of small and large animal species shows that the probiotic Chrisal products are safe for all animals.



Veterinary Clinic De Bosdreef (Moerbeke, België)

This clinic has a great reputation for the treatment of all common pets like dogs, cats, rabbits and horses. The clinic is convinced that probiotic hygiene is the future and is cleaned with the Chrisal Probiotic products.



Horse Clinic De Morette (Asse, België)

The Horse Clinic De Morette has an international reputation as a highly respected horse clinic, where the most sensitive race horses are cared for and treated. Chrisal products are used for cleaning the stables and operating rooms.



Purebred dogs Amandus (Sint Amands, België)

This is a professional breeder of purebred dogs, who also operates a dog hotel, chose the Chrisal Products many years ago. They were convinced because of Chrisal's ability to control odors and to keep the concrete and infrastructure clean.



Conclusion

With probiotic cleaning Chrisal has introduced a true revolution, and found a proven solution to the growing problems associated with resistant microorganisms. The excellent performance of Chrisal products in terms of cleaning, coupled with their safety, durability and environmental friendliness, ensure these probiotic products provide sustainable sanitation which we all need.

Chrisal devotes itself to the development of new probiotic products for a broad range of applications in a continued effort to solve problems. After 10 years Chrisal has the number one position in the world as the premier manufacturer of probiotic products. We have a large number of excellent references and achievements.

The entire Chrisal team is always available to you in order to help you solve your problems in the best possible way. Please do not hesitate to contact us for any of your questions, we are most happy to help you:

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Together we build sustainability !

