



Dog-Microbiome

DEMO REPORT

Health begins with us.



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Microbial Composition

Diversity of the Microbiome (Shannon Index)



Balance of the Microbiome (Dysbiosis Index)



Nutrition

Variety



Health

Non-haemorrhagic diarrhoea



Haemorrhagic diarrhoea



Intestinal Mucosa



Pathogenic Bacteria



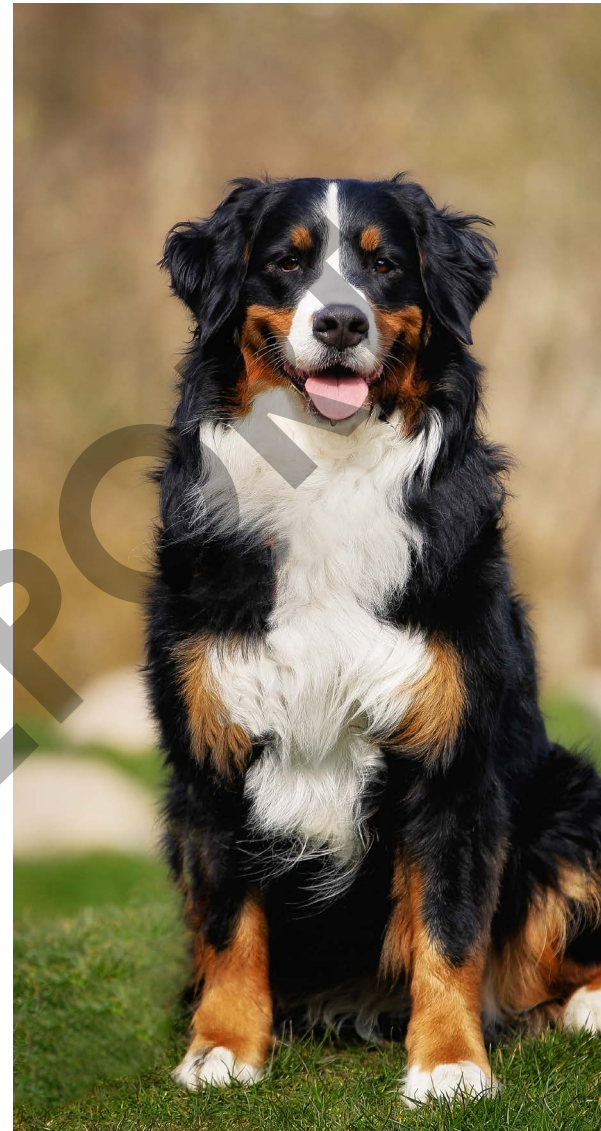
DEMO REPORT

What do bacteria do in my dog's gut?

The gut microbiome plays an important role in the health and well-being of dogs. Just like in humans, the gut microbiome of dogs consists of a variety of bacteria, viruses, fungi, and other microorganisms that inhabit the gut ^{[1][2]}. Although humans and animals are constantly surrounded by microorganisms, they are often only noticed when there are obvious symptoms. While some of these microbes in the gut have various beneficial functions in the dog's body, including supporting digestion, certain bacteria can have a negative impact on the dog's health ^[2].

A healthy gut microbiome in dogs is characterised by a high diversity, which means that many different types of microorganisms are present. A balanced diet promotes the diversity and balance of the gut microbiome. An imbalanced diet or the use of antibiotics can disrupt the balance of the gut microbiome. An imbalanced gut microbiome in dogs has been associated with various health issues such as digestive disorders, allergies, inflammatory bowel disease, and obesity ^[1].

Research on the gut microbiome in dogs is still in its early stages and is less explored compared to humans, but there is increasing knowledge about how a healthy microbiome influences the health and well-being of dogs. Individual differences in the gut microbiome can cause dogs to respond differently to specific diets or make them more susceptible to various diseases ^{[1][2][3]}. In the following, we will provide you with insights into the composition of your dog's microbiome and potential health issues that may arise from a disrupted microbiome. For that, over 1800 groups of bacteria are analysed in the microbiome.



MICROBIAL COMPOSITION

Diversity of the gut microbiome

The diversity of the microbiome is an important indicator, as a microbiome with higher diversity tends to be more stable than one with low bacterial diversity^[1]. Therefore, increased diversity is often associated with a healthy microbiome. This is because a greater variety of bacteria can help maintain the balance of the microbiome and limit the proliferation of harmful bacteria.

A stable microbiome is capable of recovering and restoring itself when disturbed. However, when the microbiome is disrupted, such as through changes in diet or the use of various medications like antibiotics, it can lose its stability and become more susceptible to diseases^[1].

The Shannon index is used to assess diversity and provides information about the bacterial diversity in your dog's gut. A low value indicates reduced microbiome diversity and potential space for pathogenic bacteria. High values indicate greater bacterial diversity and, consequently, a healthier balance of the microbiome.

The Result:



The Shannon index of your dog with 3.1 is within a range classified as slightly elevated, indicating a higher diversity of the microbiome. This means that the microbiome is stable and positively supports the immune system.

MICROBIAL COMPOSITION

Dysbiosis of the gut microbiome

The Dysbiosis Index is another way to assess the balance of the microbiome^{[1][2]}. Dysbiosis refers to an imbalanced composition of bacterial groups in the gut. Your microbiome is compared to the average composition of the microbiome in healthy dogs.

A low value in the Dysbiosis Index (green range) suggests a balanced microbiome, while high values (red range) are associated with dysbiosis.

The Result:



The dysbiosis index with 5.64 falls within a range that is classified as slightly increased, indicating a tendency towards an imbalance in the microbiome.

Is my dog's diet diverse?

A varied diet in dogs supports the diversity and balance of the gut microbiome. The diet should not predominantly consist of proteins or carbohydrates, but rather be fed equally at each meal. A protein-rich diet increases the abundance of Clostridiaceae in the microbiome and improves protein digestibility. Additionally, some bacteria in this group contribute to the production of butyrate and promote anti-inflammatory signals in the gut. When protein intake is too high, the positive effect is lost, and health problems like kidney dysfunction can arise due to an excessive protein content in the diet ^{[5][7][13]}. Below, we provide an overview of bacteria associated with protein metabolism.

The Result:

The bacteria in your dog's gut indicate, compared to healthy reference animals, an average protein intake. This means that the protein content in your dog's diet is likely sufficient.



What impact does the microbiome have on gastrointestinal issues in my dog?

Gastrointestinal issues are a common problem in dogs and can have various causes. An important component that plays a role in the health of the digestive system is the dog's microbiome. An imbalanced microbiome can contribute to gastrointestinal issues, such as diarrhoea ^[1].

Diarrhoea is a common symptom of gastrointestinal disorders in dogs and can have many causes, including food intolerances and parasitic infestations. In most cases, it is the imbalance in the microbiome that leads to the increased growth of harmful bacteria and food intolerances. The use of medications, especially antibiotics, disrupts the balance of the microbiome and can therefore cause long-term gastrointestinal issues. In dogs, acute non-haemorrhagic and acute haemorrhagic diarrhoea are distinguished.

Non-haemorrhagic diarrhoea

Non-haemorrhagic diarrhoea refers to inflammation of the intestines, which leads to increased bowel movements but without the presence of blood in the stool. This is mainly caused by changes in the gut microbiome, in addition to other factors such as food intolerances or stress. It is known that bacteria like Ruminococcaceae and Blautia are decreased in this type of diarrhoea ^[3].

The Result:



Compared to healthy reference dogs, your dog has slightly elevated levels of protective bacteria in the gut. Therefore, your dog's microbiome does not indicate this type of diarrhea condition (without blood in the stool).

What impact does the microbiome have on gastrointestinal issues in my dog?

Haemorrhagic diarrhoea

On the other hand, acute haemorrhagic diarrhoea is a more severe form of diarrhoea where blood is present in the stool. This condition usually indicates a serious infection or internal bleeding. Bacteria such as *Sutterella* and *Clostridium perfringens* are particularly associated with this type of diarrhoea.^{[3][4]}

The Result:



Compared to healthy reference dogs, your dog has average levels of bacteria in the gut that promote bloody diarrhea. Therefore, the microbiome tends not to indicate acute hemorrhagic diarrhea.



How does the microbiome contribute to the protection of the intestinal mucosa?

Butyrate is a short-chain fatty acid produced in the intestine through the fermentation of dietary fibre. This short-chain fatty acid plays an important role in protecting the intestinal mucosa as it serves as an energy source for the cells of the intestinal lining. Additionally, butyrate promotes the production of mucus, which acts as a protective barrier and shields the intestine from harmful bacteria and other harmful substances^{[5][6]}. Furthermore, butyrate has anti-inflammatory properties and can help reduce inflammation in the gut.

Diet plays a crucial role in butyrate production in the intestine. Fibre-rich foods such as vegetables, fruits, and whole grains promote the growth of bacteria in the gut that produce butyrate. Therefore, a balanced and diverse diet that is rich in fibre can help increase butyrate production and support gut health. Here is an overview of the amount of butyrate-producing bacteria, such as *Fusobacterium varium*.

The Result:



Compared to healthy reference dogs, the amount of butyrate-producing bacteria is average. This suggests that the intestinal mucosa is likely supported.

Are there any harmful bacteria in your dog's gut?

Infections in the gut are caused by pathogenic bacteria that can proliferate, particularly in an imbalanced microbiome. These bacteria can then cause health problems ranging from mild gastrointestinal discomfort to severe diseases^[8]. Certain bacteria, especially Escherichia coli (E. coli), are naturally present in the gut of mammals. However, certain strains can cause diarrhoea and other gastrointestinal issues. Dogs usually become infected through the consumption of raw, spoiled, or contaminated meat, eggs, or through contact with infected animals.

In some cases, these infections can also be transmitted to humans, so it is important to observe hygiene measures in cases of diarrhoea. Additionally, there are certain intestinal infections that usually have no symptoms in dogs but can cause gastrointestinal infections, especially in immunocompromised and elderly individuals. These infections include Campylobacter infections, among others^{[9][10][11]}.

Here is an overview of gut bacteria that could potentially cause diseases in your dog.

The Result:



RECOMMENDATIONS

Dietary recommendations

A healthy diet tailored to the individual needs of your dog, combined with appropriate exercise and stress reduction, can help promote a healthy and balanced gut microbiome your dog, thereby improving their health and quality of life. Adjustments to your dog's diet are particularly recommended if there is low diversity and/or dysbiosis in order to achieve a balanced microbiome. A stable microbiome also inhibits the proliferation of harmful bacteria.

It is important to provide high-quality dog food that contains all the necessary nutrients in appropriate amounts to prevent intestinal diseases and overweight. A balanced meal should consist of high-quality protein sources such as meat or fish, vegetables, fruits, and possibly grains. The diet should be varied with different types of meat, vegetables, and fruits to promote diversity in the gut microbiome and support healthy digestion. Avoid foods with artificial colours, flavours, and preservatives, and instead opt for natural and fresh ingredients. A diet rich in fibre is also recommended as it contributes to gut health. The addition of fermentable fibres, such as pumpkin or psyllium husk, can positively influence the diversity of the gut microbiome. Additionally, probiotic supplements for dogs can be a helpful measure to improve the composition of the microbiome.

Pay attention to adjusting the protein intake and portion size according to your dog's size, activity level, and individual needs to avoid excessive protein intake, overweight, and related health issues. Consult your veterinarian to ensure that your dog's diet meets their specific needs and to discuss any questions or concerns you may have.

What should I do if I suspect my dog has diarrhoea?

For cases of acute non-haemorrhagic diarrhoea and acute haemorrhagic diarrhoea in dogs, there are some recommendations that can help alleviate symptoms and promote recovery. In the case of non-haemorrhagic diarrhoea, it is important to provide the dog with a light, easily digestible diet consisting of cooked chicken or lean beef and cooked rice. It is advisable to avoid fatty or spicy foods. Additionally, the dog should drink sufficient water to prevent dehydration.

In the case of acute haemorrhagic diarrhoea, immediate veterinary treatment is necessary as it may indicate a serious illness. The veterinarian can make the appropriate diagnosis and initiate an appropriate treatment, possibly including antibiotic therapy. It is important to monitor the dog during recovery and administer the prescribed medications exactly as instructed by the veterinarian.



What should I do if I suspect pathogenic bacteria in my dog's gut?

If you suspect pathogenic bacteria in your dog's gut and/or if there are symptoms of gastrointestinal infection, it is advisable to consult a veterinarian. The veterinarian can make an appropriate diagnosis (this report does not replace a diagnosis!) and initiate appropriate treatment to combat the infection and restore the dog's health.

To prevent infections with pathogenic bacterial species, it is important to observe hygiene measures and ensure safe food preparation. Dog food should be properly cooked or treated to eliminate potentially harmful bacteria. Additionally, dogs should not have access to raw or contaminated meat.

These infections are not only dangerous for the dog but can also be transmitted to humans. As most infections are primarily transmitted through raw meat and often resistant to many antibiotics, hygiene should be particularly emphasised when feeding raw meat. Furthermore, if there is suspicion of symptoms or a diagnosis by a veterinarian, we recommend analysing the microbiome of those involved to rule out potential transmission of the infection.



Miscellaneous

Report created by:

Procomcure Biotech GmbH

Breitwies 1
5303 Thalgau
Austria

Measurement Method:

NGS

Next-Generation-Sequencing (16S rRNA Gene)

Primary sample or submitted material:

faecal sample

Disclaimer:

The analysis is based on the sequencing of the 16S rRNA gene, which allows for the classification of bacterial strains in the microbiome. The results of the microbiome test and their interpretation may be incomplete. The number of detected microorganisms is not exhaustive, and there may be other microorganisms present that are not captured by the sequencing. The current interpretation of the microbiome test may change in the future due to the publication of new scientific studies. Inaccurate or missing information can lead to misleading interpretation. This report is provided to you solely for informational and educational purposes and does not replace a visit to a veterinarian or the advice or services of a veterinarian.



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