



Is your horse eating a Biodiverse diet?

A DIET HIGH IN DIVERSITY FEEDS THE MICROBES IN THE HORSES GUT.

FEEDING THE MICROBIOME IS AS IMPORTANT TO OVERALL HORSE HEALTH AS BALANCING THE MINERAL AND VITAMIN INTAKE.

NEWSLETTER

August 2019

Loss of biodiversity is a current environmental crisis, with a direct impact on your own horse's health.

Providing diversity within the diet is important as the good gut bacteria thrive on a wide range of phyto-nutrients.

How to improve biodiversity in your horse's diet.

See the visible health improvements whilst doing your bit to save the planet!

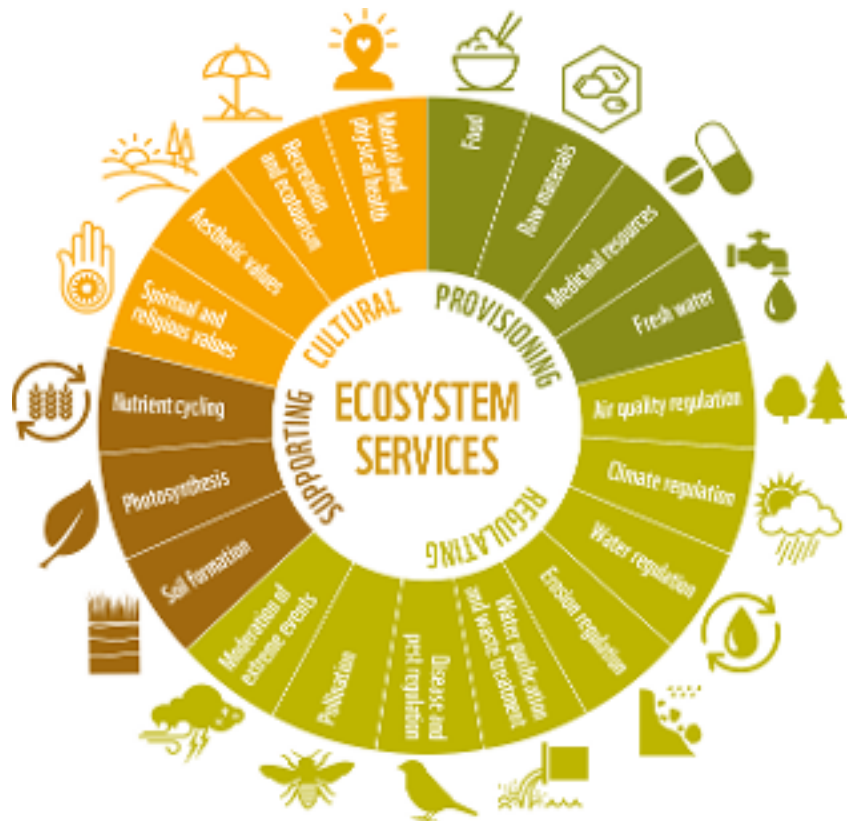
WHAT IS BIODIVERSITY

by Carol Hughes

Biodiversity is the variability of all things alive, mammals, insects, plants and bacteria. Biodiversity also includes the complex ecosystems that support life and variety within species.

Biodiversity contributes to the health and well being of every living thing (including your horse) on the planet.

In the last 50 years biodiversity has declined, as modern farming methods have reduced the number of species by spraying with herbicides and pesticides and by growing monoculture crops, such as rye grass, a common component of hay.



"Your horse's hind gut is home to an ecosystem of bacteria, fungi and archaea, high diversity (lots of different species) is key to good health."

BIODIVERSITY AND THE HIND GUT

The microbiome within the horse's hind gut, is complex and diverse, it's an internal ecosystem that co exists together, thriving on inter-relationships between the bacteria community and the host,

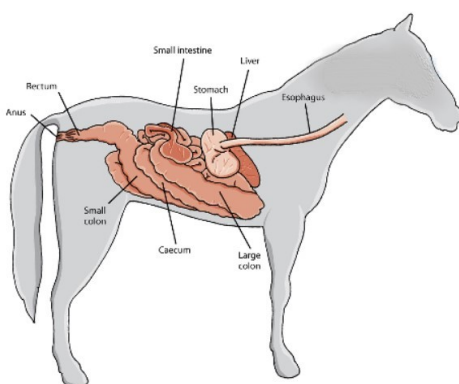
Diversity within the bacteria community is considered a good thing, diversity is measured by the number of different



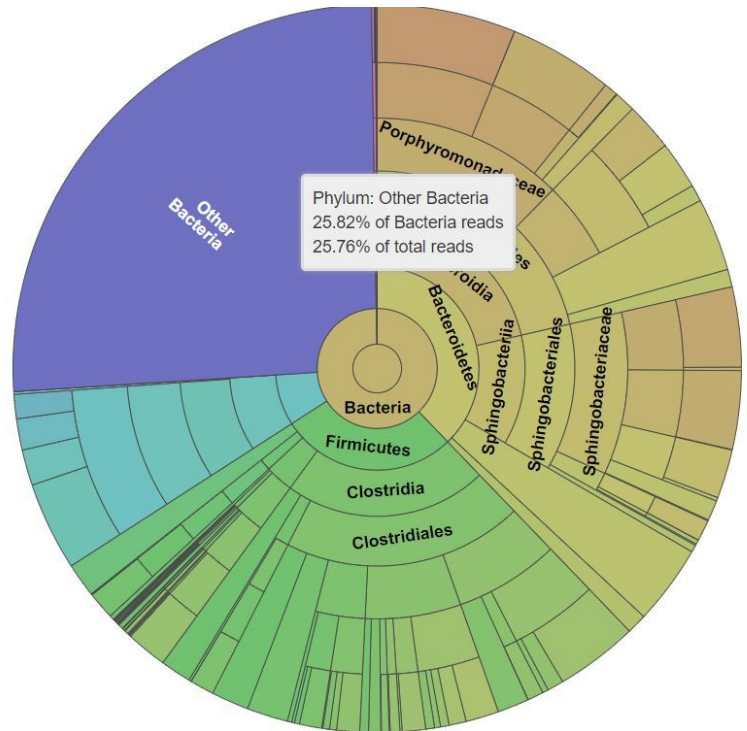
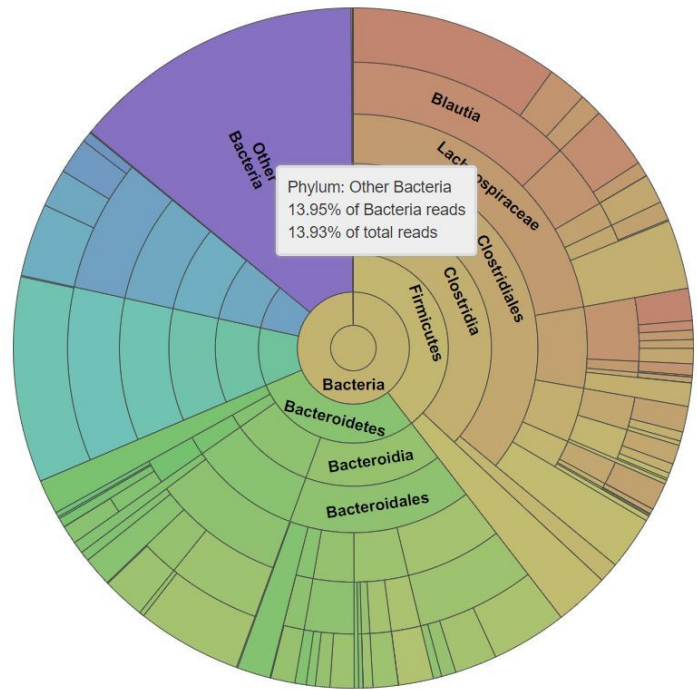
bacteria species in the biome, high diversity is calculated at between 800-1,000 different species, diversity indicates a good diet, a good immune response, good metabolism in short diversity represents good gastrointestinal health.

Common medications such as antibiotics, anti-inflammatories and even metformin can have a devastating effect on the biome, reducing bacteria diversity which may not recover.

Loss of diversity increases the opportunities for a take-over bid from stronger unwanted species to take over, leaving the biome full of unwanted additions such as bartonella (lyme).

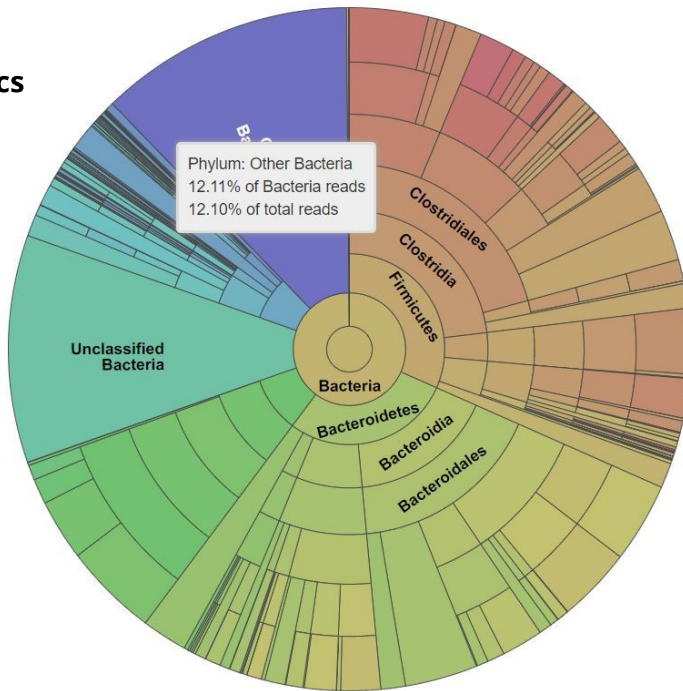


Using the latest technology it is now possible to calculate the diversity of bacteria within the hind gut of your horse.

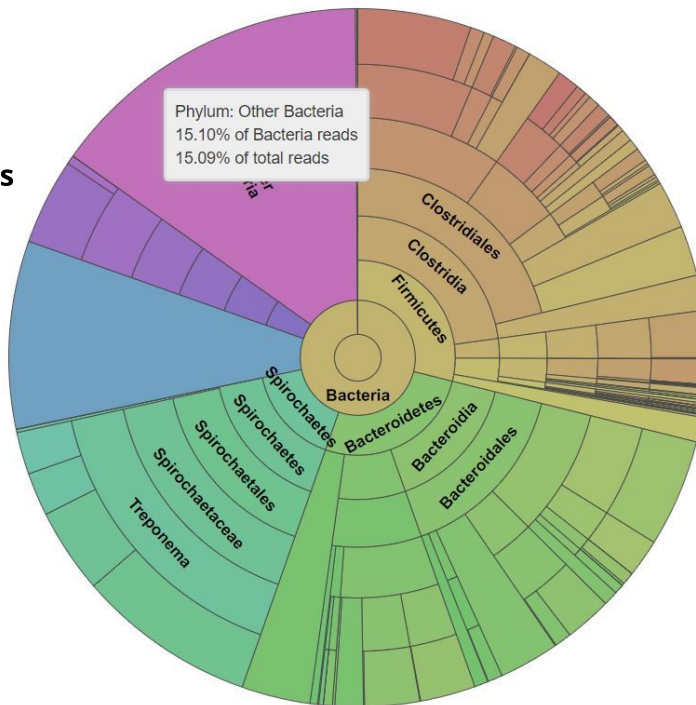


The EquiBiome uses **Metagenomic analysis** to detect and identify tens of thousands of different bacteria, as indicated in the sunburst diagrams above. This information is then organised into a report for the horse owner, calculating diversity and identifying the presence and percentages of good bacteria to bad bacteria. The Illumina MiSeq is a powerful and accurate analytical tool, providing the horse owner with information on whether the diet is providing enough vitamins and minerals. The report will also highlight whether the diet is providing enough of the right type of energy for the bacteria that support immune function and gut wall health.

Before Antibiotics



After Antibiotics



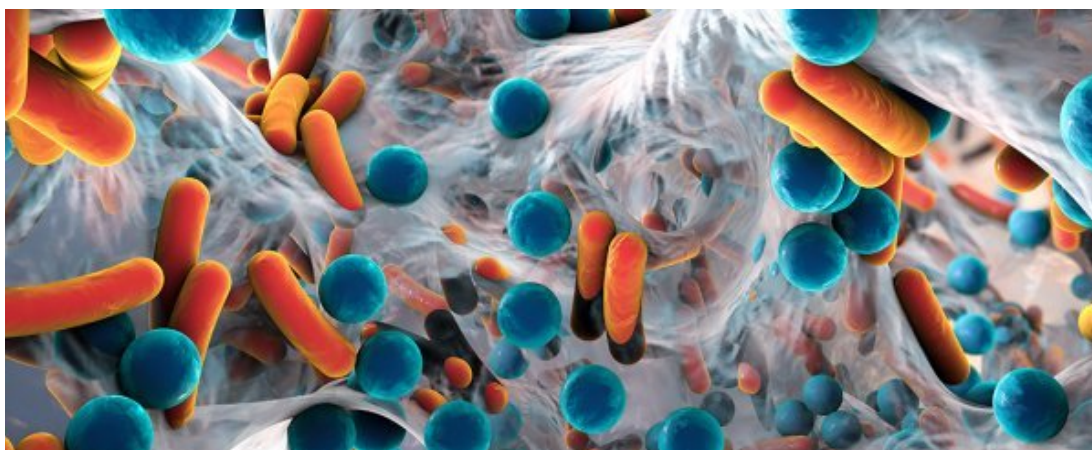
Common medications such as antibiotics, NSAID's (bute) and even metformin can have a devastating effect on the biome, reducing bacteria diversity which make take a long time to recover and in some horses may never recover.

ANTIBIOTICS

The two sunburst diagrams above clearly demonstrate the effect of antibiotics on the biome. The lower sunburst image 'After Antibiotics' shows a reduction in the amount of different species of bacteria. Especially those in the top left hand section, these are the proteobacteria, members of this phyla can be pathogenic but some members are beneficial bacteria, linked to the control of inflammation. These bacteria have been totally eradicated from the gut biome. Knowing how to restore the biome is only possible following the **EquiBiome** test as antibiotics affect the biome in different ways.

IMPROVING DIVERSITY

If a horse has low diversity of species in his microbiome, providing a wide variety of different types of phytonutrients can increase numbers and types.



The hind gut of the horse is home to trillions of bacteria, most are of benefit or harmless to the host. The gut bacteria make several important contributions to the health of the host-

- Extracting nutrients and energy
- Contribution to immune function
- Protection against invading pathogenic (bad) bacteria.

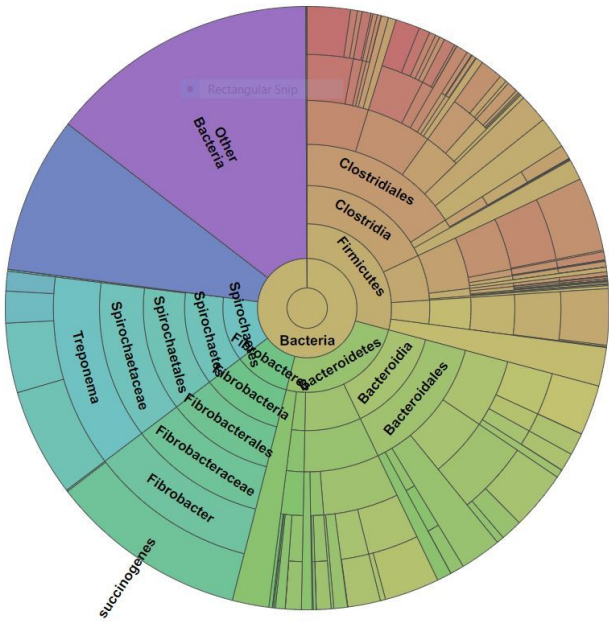
Disruptions to the balance and the diversity within the microbiome have been linked to laminitis, colitis, colic, malnutrition and inflammation and temperament changes.

Understanding balance in the biome requires that we look at the microbiome as an ecosystem, this means that we not only understand how individual bacteria relate directly, but also how the relationships between bacteria, fungi and archaea contribute to the health of the host. Improvements in sequencing methods and technologies such as proteomics and metabolomics, together with metabolic network modelling allow us to have insight into how the bacteria community change over a lifetime.

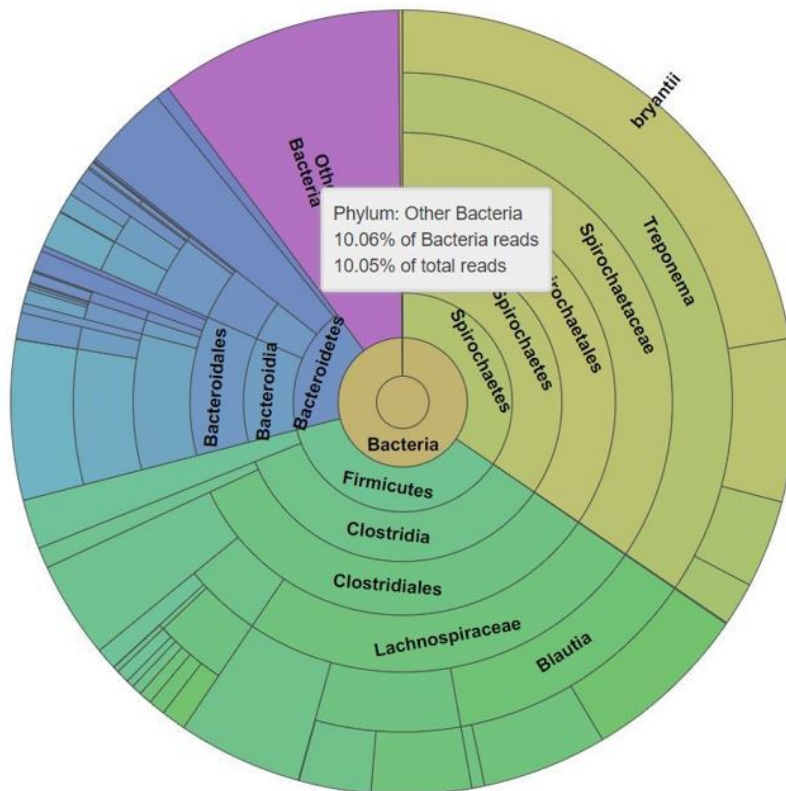
Diversity is important in weight management- obese horses have fewer different types of bacteria than those that are lean, obese horses also have fewer bacteria that are linked to metabolism.

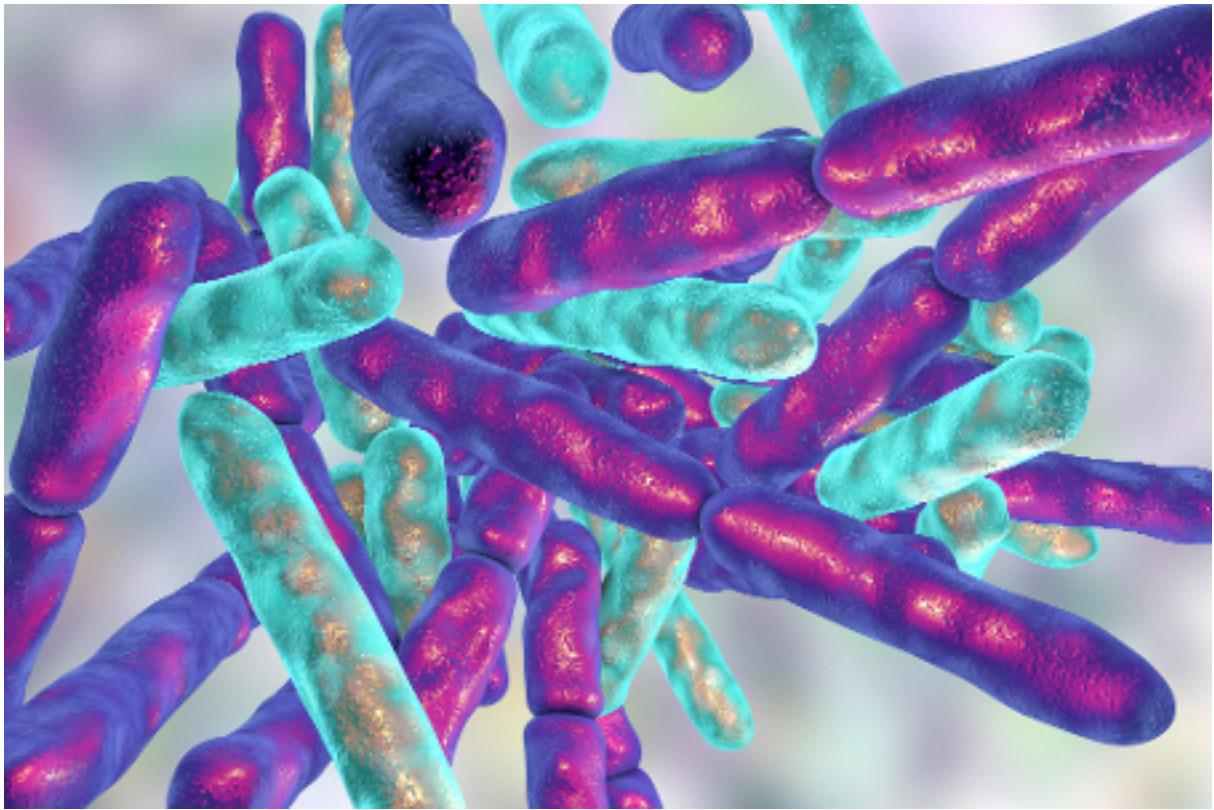
Inflammation relating to laminitis can reduce the diversity of the good gut bacteria but increase the numbers of bad bacteria, knowing the percentages of both and understanding how to feed and support the good bacteria can benefit both.

THE HIND GUT IN LAMINITIS



Acidosis





HOW TO INCREASE DIVERSITY

The only way to improve the biome is to feed the good gut bacteria, changing the gut environment reduces the opportunity for the bad bacteria to proliferate .

Good Gut Bacteria love...

- inulin,
- anti-oxidants.
- hormonally active phytonutrients
- active plant compounds such as tannins and saponins

All of these can be found in biodiverse forage and food containing a high variety of flowers, herbs, grasses and whole/bruised grains.

Horses need a complex varied diet, for more help please visit www.equibiome.org or contact sharon@equibiome.org