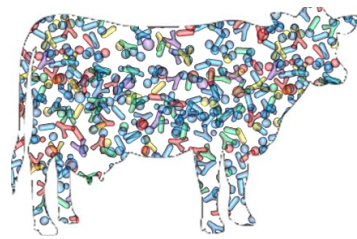


# Animal Health & the Microbiome

  
Science  
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Microbiome  
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Interfacing Food & Medicine



## The 'Microbiome'.

The microbiome is the term used to describe the vast collection of bacteria in a particular environment. Animals have their own individual microbiomes, which play a significant role in their overall health status, including resistance to infection, efficient conversion of nutrients in their diets, and even their response to stress.



## Missing microbes?

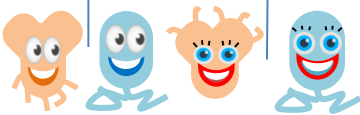
For millions of years wild animals acquired their microbiomes from their mothers, and from natural environments, but domesticated animals raised using modern farming techniques may lack some of these ancient microbial partners.

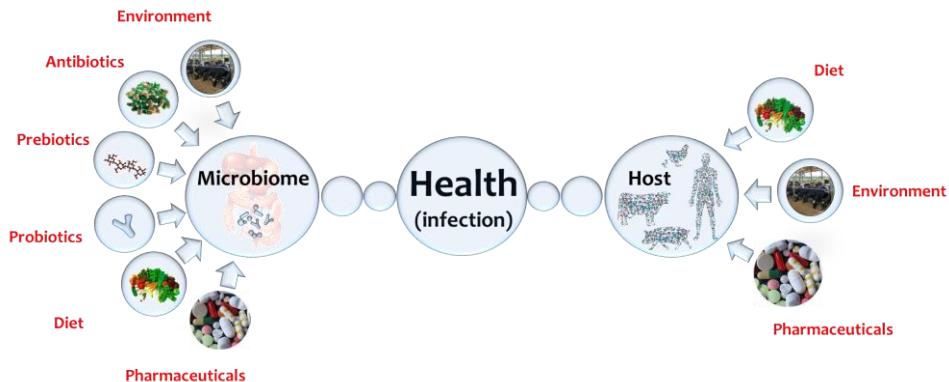


Save our  
microbiomes!

## Save our microbiomes!

A huge challenge for microbiologists, veterinarians and farmers is how we can restore and maintain a healthy and balanced microbiome in our domesticated animals, both on farms and in household pets. Solutions could include new diets, or probiotics and prebiotics.





## Manipulating the microbiome

The health of any animal involves two main biological entities – the host and the microbiome. Most health interventions are aimed at the host (diet, drugs, environment), but it may be that future interventions will be aimed at the microbiome. Fortunately, there are many ways in which we can imagine improving the health of domesticated animals by manipulating their microbiomes. These include changes in the diet ‘aimed’ at supporting bacterial populations (rather than addressing the direct nutritional needs of the host). We can of course use probiotics and prebiotics, limit the use of antibiotics in agriculture, and many more possibilities ....

## Research at APC Microbiome Ireland

Researchers at APC Microbiome Ireland are interested in the impact of diet on animal health, but also in using the microbiome to develop novel interventions which could be used in farming.

For example, APC researchers have developed a treatment for bovine mastitis – the most costly animal disease on earth – based on using a live microbe to treat infection! This novel treatment could significantly reduce the amount of antibiotic treatment of sick animals, and help to reduce the spread of antibiotic resistance.



APC researchers have also identified bacteria from the pig microbiome, which protects pigs from *Salmonella* infection. The probiotic is as effective as any currently available veterinary medicine, but is a much more natural solution to a devastating disease.