Microbial dynamics in livestock and fish gastrointestinal tracts (impact of polyphenolic extracts)

Grape marc, a by-product of the winemaking process is rich in bioactive compounds such as plant polyphenols that have antioxidant and antimicrobial activities. Due to their chemical structures and high molecular weights, a substantial proportion of dietary polyphenols remain unabsorbed in the gastrointestinal tract and may reach the large intestine and thus interact with the intestinal bacteria, the so-called gut microbiota. In the large intestine polyphenols can be bio-transformed into bioactive, lower molecular weight metabolites by the gut microbiota. In vivo studies have previously shown that polyphenol supplementation can therefore also potentially modulate the gut microbiota in animals, such as in livestock and in farmed fish, including the possible increase of beneficial microbes and the decrease of harmful bacteria

Polyphenolic extracts could also reduce in other trials the populations of some additional potentially pathogenic bacteria, such as Salmonella, Shigella, and/or Proteus. In various vertebrate and invertebrate model organisms polyphenol supplementation was reported to increase the number of beneficial bacteria in the gut, such as numbers of Bifidobacterium or Lactobacillus.

These observations indicated that grape extract supplemented livestock and farmed fish diets might facilitate a (statistically significant or a trend-like) reduction in the intestinal populations of Escherichia coli and/or the family Enterobacteriaceae.

