

How do we nutritionally fight the enemies off to support gut health?

One of the main functions of the gastrointestinal tract (GIT) is to digest and absorb nutrients. Therefore, GIT must maintain a selective permeability, letting in the nutrients and maintaining out in the lumen, micro-organisms, and toxins. Selective permeability demands maintaining adequate integrity of mucosal tissue.

by The Technical Team,
ICC Brazil.
www.iccbrazil.com

In this context, the challenge in ruminants is more significant than in monogastrics, since in ruminants more gut compartments play important roles in absorption: upper gut, absorption of energetical compounds (for example, VFA in the rumen), and midgut, absorption of other nutrients (for example, amino acids in the small intestine).

To reach our goal of maintaining gut integrity, we must attack the three main enemies of gut health found in contemporaneous beef and milk production systems: subclinical ruminal acidosis, mycotoxins, and intestinal pathogens.

These enemies can initiate vicious circles that reduce gut health. Acidosis causes rumen wall lesions which reduces VFA absorption driving rumen pH down in a vicious circle.

Mycotoxins impair the adequate turnover of intestinal cells and the adequate function of tight junctions reducing intestinal integrity and favouring toxins absorption in another vicious circle.

Controlling pathogens

When pathogens colonise intestinal mucosa and start to replicate fast, mucosal integrity is reduced, and even not harmful micro-organisms can raise their replication opportunistically, enhancing infectious and pro-inflammatory processes.

Farmers, animal scientists, and veterinarians know that multifactorial techniques, for instance, animal management, feed management, and diet formulation, must be applied to fight these enemies of



gut health. However, it is interesting to note that yeast-based feed additives may be used to help combat these three enemies at once.

Concerning vicious circles, the clever way of avoiding these problems is to prevent them from initiating or starting.

Therefore, to avoid ruminal acidosis, mycotoxin toxicity, and pathogen-high multiplication in GIT, we must prevent the rise of lactate in the rumen, inactivate mycotoxin, and avoid pathogens adhering to GIT mucosa.

To avoid ruminal acidosis, controlling or reducing the lactate concentration is essential. Some yeast components can support and/or change the microbial population and positively impact the rumen pH control.

Regarding the mycotoxin toxicity and pathogen control in the GIT, it is crucial to consider the adequate ingestion of yeast cell wall fraction composed by functional bypass 1-3 and 1-6 β -glucans and mannanoligosaccharides (MOS). β -glucans can bind mycotoxins, and act as immunomodulators, enhancing the immune responses and helping to protect the gut integrity. The MOS can agglutinate pathogens and carry them out of the GIT until expelling them in faeces.

These three modes of action were accomplished by autolysed yeast grown on sugarcane molasses (RumenYeast): ruminal

lactate and pH control, mycotoxin risk mitigation, and pathogen control.

Yeast-based feed additives

Additionally, from the studies of Gonçalves et al., 2017 and Delazeri et al., 2023 we can highlight that this yeast-based feed additive is a tool not just for supporting animal performance and health but also to support food safety by reducing aflatoxin-contaminating milk and pathogens contaminating the meat, as demands the concept of one-health.

Regarding actual demands, autolysed yeast grown on sugarcane molasses has interesting characteristics; it is a coproduct of a renewable energy industry, the sugarcane ethanol industry, is easy to stock and manipulate, and plays a vital role in animal health programmes that seek to reduce or withdraw antibiotics from diets.

Accordingly with the technical data we presented, autolysed yeast grown on sugarcane molasses (RumenYeast) supports gut health by attacking these three enemies simultaneously; it may also be used as a one-health tool since it can mitigate food contamination. ■

References are available
from the authors on request