Probiotics (support gut health)

Last update: 2 June 2023

- **Type of challenge**: Animal health.
- **Challenges**: Antimicrobial resistance.
- **Action**: Helps animals to cope with pathogens by supporting a healthy gut, reducing the need for antimicrobial treatment.
- **Animal category**: All animal species.
- **Technique**: Modulation of gut microbiota via delivery of micro-organisms authorized as feed additives (probiotics) to increase resistance to colonization by pathogenic bacteria and reinforce the immune response of the intestinal mucosa. (examples: *Lactobacillus*, yeasts, etc.).
- **Mode of action**: Competitive exclusion (competition of available nutrients and mucosal adhesion sites); inactivation of toxic compounds; reduction of oxygen concentrations promotion of intestinal barrier function; regulation of permeability of intestinal epithelium and its development; immune modulation.
- **Potential efficacy**: Several indicators used including faecal score or immunoglobulins level.
- **Nature of evidence of efficacy**: Peer-reviewed scientific publications (meta-analysis), EFSA opinions.
- **Factors impacting on efficacy**: Animal species; micro-organism species; dosage.
- **Mode of use**: Incorporated in compound feed or administered via water.
- **Requirements/limitations**: Authorisation as feed additive is required. Incorporation in feed on farm is restricted to farmers registered as feed business operator applying HACCP (R183/2005).
- **Economic consequences**: Use of probiotics results in improvement of daily growth and reduction of feed conversion ratios.
- **Other considerations**: Probiotics may also contribute to mitigate heat stress.
- **References**:

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  - Barreto *et al.* (2021). *Systematic review and meta-analysis of probiotic use on inflammatory biomarkers and disease prevention in cattle*. Preventive Veterinary Medicine, Volume 194. https://doi.org/10.1016/j.prevetmed.2021.105433.

- El-Saadony *et al.* (2021). *The functionality of probiotics in aquaculture: An overview*. 2021. Fish & Shellfish Immunology, Volume 117 Pages 36-52. https://doi.org/10.1016/j.fsi.2021.07.007.
- Abd El-Hack *et al.* (2020). *Probiotics in poultry feed: A comprehensive review*. Journal of Animal Physiology and Animal Nutrition, Volume 104, Issue 6. https://doi.org/10.1111/jpn.13454
- Smits, C.H.M., Li, D., Patience, J.F. and den Hartog, L.A. (2021). *Animal nutrition strategies and options to reduce the use of antimicrobials in animal production*. FAO Animal Production and Health Paper No. 184. Rome, FAO. https://doi.org/10.4060/cb5524en
- EMA and EFSA (2016). *Joint Scientific Opinion on measures to reduce the need to use antimicrobial agents in animal husbandry in the European Union, and the resulting impacts on food safety* (RONAFA).
- EIP-AGRI Focus Group (2014). Reducing antibiotic use in pig farming

▪ **Other techniques**: Enteral stimulation (dietary fibers); microbiota management (organic acids, Medium Chain Fatty Acids, copper compounds, bacteriophages); support mucosal barrier function (Short Chain Fatty Acids); immune modulation (plant extracts, essential oils, yeast products, prebiotics, synbiotics, chitosan); amylases, clay minerals; etc.

Charter Ambition: 4