Ruminants - Polyphenols

The presence of olive polyphenols in the diet of ruminants is primarily related to the action of the antioxidant properties of the olive phenolic compounds contained in the mixture.

Phenolic compounds such as hydroxytyrosol and tyrosol are extremely useful in animal nutrition as energy metabolism is the critical issue of productive animals.

Of course, other compounds are especially useful because of their anti-inflammatory and hepatoprotective properties, such as terpenic acids.

At first, the action of polyphenols due to their antioxidant properties starts from rumen's microbial flora resulting in:

- The balanced production of acetic and propionic acid, while reducing the cytolytic mechanisms of lignin degradation and methane production.
- Increase of the flow of amino acids from the rumen to the small intestine, as they bind free amino acids, preventing their oxidation, thus reducing the production of ammonia and of course urea.
- Improving animal productivity due to better use of protein nitrogen and production tube and bio-synthesis of high nutritional value of fatty acids.

Of course, at the metabolic level, the action of phenolic compounds is the same for all aerobic organisms. The same intracellular mechanisms, as the case may be, contribute to the stability of cell membranes, the strengthening of the endothelium, the anti-inflammatory action and finally the response to environmental or biological pathogens.

Health

The positive effects of polyphenols on the health of dairy animals have been demonstrated by various studies and concern the:

- Reduction of clinical or subclinical mastitis cases
- Reduction of metabolic diseases cases
- Reducing inflammatory processes in the digestive system of animals.
- Reducing the need for antibiotic treatments.

Therefore, following the systematic administration of polyphenols in animal nutrition, in terms of their reproductive capacity and the ability of their derivatives to develop, the following shall be observed:

- Improvement of the fertility of male and female animals.
- Increase in the weight of newborns and their growth rate.
- Reduction of stillbirths and postpartum deaths.

In addition, as far as small ruminants are concerned, we shall observe:

- Increase in the total number of lactating periods per breeding animal.
- Satisfactory increase in the number of newborns per birth.

Milk

After 20 - 30 days from the start of the administration of polyphenol supplements in animal nutrition the following are observed in dairy milk:

- Reduction of milk odors and urea.
- Stabilization with increasing tendency of milk fat and proteins.
- Reduction of the Total Count of Microorganisms (TCM).
- Relative absence of Somatic Cells Count (SCC)

Regarding the quality characteristics of milk, it is known that the use of polyphenols in the diet of ruminants inhibits the bio hydrogenation of polyunsaturated fatty acids, reduces the basic biosynthesis of urea and the production of indoles, resulting in:

- Improvement of the quality of the lipid fraction of dairy products, with an increased concentration of high nutritional value fatty acids (e.g., PUFA, vaccenic, and rumenic acids).
- Improvement of the antioxidant properties of milk and its oxidative stability, which is enhanced by the presence of hydroxytyrosol and tyrosol sulfate metabolites in it.
- Improvement of the organoleptic characteristics of milk due to the reduction of odors and urea in it.

Conclusion

The expected results of the use of polyphenol supplementation in the diet of small ruminants and especially sheep concern:

- Improvement of food convertibility and digestibility of protein nitrogenous substances.
- Improvement of the quality characteristics of the produced products and reduction of the milk total microbial flora.
- Dramatic reduction of mastitis and metabolic diseases.

- Reduction of the need to use antibiotics and antiparasitic drugs.