Livestock Polyphenols

In recent decades there have been rapid changes in the production standards of animal husbandry as well as in the genotype and phenotypic profile of productive animals.

The productive capacities of the animals multiplied, whether they relate to the growth rates of animals and their muscle mass or to their milk producing, egg laying and reproductive capacity.

At the same time, vast grasslands are now being used as farms or have been deserted, forcing livestock to be confined to smaller and smaller areas, confined to limited stables and to apply "super intensive livestock" models.

This new reality requires the administration of increasingly "concentrated" diets to meet the increased productive needs of animals, which are forced to consume disproportionately high amounts of nutrients in relation to their metabolic weight.

The intensification of animal husbandry, in combination with the environmental burdens, pushes the oxidative reducing balance of the animal organism to the limits of the oxidative metabolic stress, as a result of which it balances o n a background of chronic oxidative damages.

Chronic oxidative damage causes enormous economic damage to productive livestock every year, due to their high participation in the pathogenesis of almost all pathogens and productive mechanisms, which relate to:

- Metabolic kidney and liver diseases.
- Suppression of the immune system and vulnerability of their productive organs.
- Deregulation of their reproductive cycle.
- Reduction of diversity indicators and growth rates.
- Deterioration of the quality of the produced livestock products.
- Reduction of food convertibility and increase of the environmental impact.

The debate on the need to strengthen aerobic organisms with antioxidants, such as polyphenols, to treat oxidative stress has been going on for years with the promotion of foods rich in antioxidants which are called superfoods, since the center of attention is man It refers to the increased oxidative pressure, which is felt by aerobic organisms due to climate change, ultraviolet radiation and environmental and biological factors and hazards.

This discussion is certainly useful for animal husbandry, as the above reasons make clear the need to use powerful antioxidants in the daily diet of animals. Of course, the Mediterranean flora is an inexhaustible source of polyphenolic antioxidants, of which olive polyphenols are the main representative.

The use of polyphenols in animal nutrition in addition to increasing animal health, productivity and feed digestibility and convertibility, will help reduce greenhouse gas emissions from ruminants. In addition, their recovery from the by-products of the olive-mills will reduce the environmental footprint of the agro-industrial sector, specifically the oil mills.

Finally, the addition of the necessary amount of olive phenolic compounds to the feed can be accurately determined in order to achieve the desired antioxidant enhancement of the animal organism, taking into account:

- At the metabolic level the action of phenolic compounds is the same for all aerobic or-ganisms and concerns the same intracellular mechanisms, which on one hand prevent the formation of oxidative stress and on the other hand contribute to the restoration of oxidative damage.
- Current knowledge of the digestibility of the individual phenolic compounds contained in the mixture of olive polyphenols and the mean concentration of hydroxytyrosol and its derivatives in this mixture.
- The provisions of the EU-recognized health claim for olive oil rich in polyphenols, in ac-cordance with European Regulation 432/2012 (L 136 / 25.05.2012), which stipulates that the daily intake of 5 mg of hydroxytyrosol and its derivatives has a positive impact on human health.
- The human daily energy needs to calculate the energy equivalent for feed.