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COMPARISON OF FATTY ACID PROFILE AND ANTIOXIDANT COMPOUNDS IN SOME MEDITERRANEAN FORAGES FOR DAIRY GOATS

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Forages have been shown to be a good source of healthy beneficial compounds that can be transferred to animal products. The aim of the study was to characterize the fatty acid profile, the polyphenol and α -tocopherol contents of 7 Mediterranean forages in order to estimate their potential contribution to produce milk with increased levels of beneficial fatty acids and antioxidant compounds.

Three grass (*Festuca arundinacea*, *Hordeum vulgare*, *Triticum-secale*) and four legume (*Pisum sativum*, *Trifolium alexandrinum*, *Vicia sativa*, *Vicia faba minor*) forages were investigated. Forages were harvested at the phenological stage commonly used in Southern Italy for animal grazing. Samples were collected during forage distribution to housed goats. The fatty acid profile, total (Ptot), tannic (TP) and non tannic (NTP) polyphenol contents, total antioxidant capacity (TAC) and α -tocopherol content were measured. Statistical analysis was carried out by ANOVA procedure and means were compared by Tukey-test. Pearson's correlation coefficients were calculated among variables.

Forage species affected polyphenol, α -tocopherol, polyunsaturated fatty acid (PUFA) contents and TAC ($P<0.01$). Within grass and legume forages, *F.arundinacea* and *T.alexandrinum* had the highest PUFA contents (72.74; 66.45 g/100g FA, $P<0.05$), while *Triticum secale* and *V.faba minor* had the highest Ptot (37.88; 39.94 $\mu\text{g/mL}$ gallic acid equivalent, GAE; $P<0.05$) and TP (26.24; 33.83 $\mu\text{g/mL}$ GAE; $P<0.05$) values. In grasses and legumes, *F.arundinacea* and *P.sativum* had the highest NTP (23.24; 18.77 $\mu\text{g/mL}$ GAE; $P<0.05$) and α -tocopherol (98.45; 81.87 $\mu\text{g/g}$ DM; $P<0.05$) contents, while *F.arundinacea* and *V.faba minor* displayed the highest TAC (131.92; 288.45 $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ μM ; $P<0.05$). Antioxidant activity of the investigated forages was related to their polyphenolic content ($r=0.62$; $P<0.01$). It could be explained by the role of phenolic compounds as antioxidants. Additionally, a relationship was found between PUFA and NTP contents ($r=0.62$; $P<0.01$). As PUFA and NTP are able to reach the mammary gland, knowledge of their content in forages could represent a new tool to assess the potential of animal feed for improve dairy product quality.

