

The Potential of *Pleurotus*-treated Olive Mill Solid Waste as Cattle Feed

A. Shabtay, Y. Hadar, Z. Kerem, Rehovot/Israel

Abstract

Recycling the vast amounts of the biodegradation-resistant phenolic-rich olive mill solid waste (OMSW) has become a major ecological concern. Its utilization in animal nutrition is limited due to high content of crude fiber and anti-nutritive substances. The edible mushroom *Pleurotus ostreatus* is known to degrade lignin, cellulose and hemicellulose, and detoxify the phenolic wastes, in various types of agricultural wastes. It is, thus, a good candidate to improve OMSW for ruminant nutrition. Its capability to degrade cell wall components as well as soluble phenols of the OMSW of 3 different sources, which also contains considerable amounts of oil, was evaluated in the current study. We also followed the fate of tocopherols, squalene and β -sitosterol, all are lipid soluble compounds of great nutritional and health potential to ruminants. A significant decrease in oil and lipid soluble compounds with a concomitant shift in the fatty acid profile and degradation of soluble phenols took place already after 14d. Interestingly, the levels of β -sitosterol were recovered after 28d, and γ -tocopherol was less affected by the fungus in comparison to α -tocopherol. The utilization of lipids by the fungus as an available carbon and energy source, shifted the degradation of the structural carbohydrates to a later stage, as judged by the NDF, ADF and lignin values, and significantly reduced the metabolizable energy of the OMSW. Screening for edible fungi that lack the capability to degrade lipids would turn the OMSW into a valuable feed, preserving the energy and health promoting ingredients of the oil, and force the fungus to degrade structural carbohydrates thus improving its digestibility.

