

## **In vivo Micro-computed tomography imaging of adipose tissue of mice fed Sicilian pistachio**

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In obesity condition the adipose tissue undergoes molecular and cellular alterations affecting systemic metabolism via the release of different pro-inflammatory mediators. Nut-derived polyphenols and fatty acids have a documented role in the modulation of energy metabolism and antiobesity effect.

We investigate the effects of *Pistachia vera* nuts on body fat mass and its distribution in a mouse models of obesity by Micro-computed tomography (CT). For this purpose, three groups of C57BL/6J male mice were fed for 16 weeks with a standard chow, a high fat diet (HFD) or HFD supplemented with pistachio harvested in plantation of the valley of the Platani river (Sicily).

Fatty acids extraction from *Pistachia vera* nuts was carried out and analysed by a gas-chromatographic technique for contributing 20% of total diet energy. Total body fat mass was estimated and compared between groups by micro-CT (Quantum FX Micro CT scanner). Furthermore, the effects of pistachio consumption on total cholesterol, triglycerides, fat liver accumulation, adipose tissue inflammatory cytokines (TNF $\alpha$  and IL-1 $\beta$ ) expression and serum ROS levels were also evaluated.

The micro-CT slices and three-dimensional image stacks of control and obese mice showed a reduced body fat deposit and less visceral fat in mice fed HFD supplemented with pistachios. Furthermore, cholesterol and triglycerides levels, hepatic lipid accumulation, pro-inflammatory cytokines and serum ROS levels were significantly reduced in mice fed HFD supplemented with pistachio compared with the HFD mice.

Our results suggest that pistachio consumption could have counteracting effects on metabolic dysfunctions in obesity through acting on the fat mass. In particular, it lower the accumulation of visceral and subcutaneous fat that could be responsible of lower level of circulating and hepatic lipids and of the decreased inflammatory condition.

### Keywords

Micro-computed tomography, obesity, *Pistachia vera*, metabolic syndrome, adipose tissue