

## **Role of *Melissa officinalis* in cholesterol oxidation: Antioxidant effect in model systems and application in beef patties**

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### **Abstract**

Cholesterol oxidation products (COPs) constitute a known health risk factor. The antioxidant effect of a lyophilized aqueous *Melissa officinalis* extract against cholesterol degradation and COPs formation during a heating treatment was evaluated in a model system (180 °C, 0–180 min) at a ratio of 2 mg extract/100 mg cholesterol. Furthermore, the plant extract was subsequently added to beef patties alone or incorporated within an oil-in-water olive oil emulsion to assess its effectiveness during cooking. Melisa extract protected cholesterol from thermal degradation in the model system, yielding higher remaining cholesterol and lower COPs values throughout the whole heating process. Maximum total COPs were achieved after 30 and 120 min of heating for control and melisa-containing samples, respectively. In cooked beef patties, even though the olive oil emulsion was used as flavor-masking approach, melisa extract off-flavor limited the maximum dose which could be added. At these doses (65 µg/g and 150 µg/g without and with the emulsion, respectively), no additional protective effect of melisa over the use of the emulsion was found. Addition of natural extracts into functional foods should definitively take into account sensory aspects.