

**P65: DIFFERENTIAL SCANNING CALORIMETRY AS AN EFFICIENT TOOL FOR
DETERMINATION OF FOOD AUTHENTICITY**

Arik Kibar E.A., Özer H.

TÜBİTAK MAM, Food Institute – Barış Mh. Dr. Zeki Acar Cd. No:1, PK:21, Gebze, Kocaeli (Turkey) –
aytunga.kibar@tubitak.gov.tr, hayrettin.ozer@tubitak.gov.tr

The development of new and effective techniques for the determination of food authenticity significantly increased for the last two decades. Differential scanning calorimetry (DSC) is the most common thermal analysis technique applied in food research; where the difference between the amount of heat required to increase the temperature of a sample and a reference material as a function of temperature. This differential heat flow enables to measure the thermal behavior of foods such as exothermic (freezing, crystallization, oxidation etc.) and endothermic (melting, denaturation, gelatinization, evaporation) events or heat capacity changes of foods.

Main authenticity testing applications with DSC are focused on oils and fat containing samples. The general approach is based on the identification of unique melting and crystallization characteristics of fatty acids together with minor constituents. When it comes into the oil authenticity most published work deals with olive oil. Discrimination of commercial categories, differentiation of various cultivars and geographical origin and detection of olive oil adulteration with cheaper oils are the main subjects investigated with DSC. Palm, coconut, canola, sesame and sunflower oils are the other vegetable oils that are subjected to DSC studies in order to detect adulteration and geographical origin. Nuts and honey are the other foods where DSC is applied for the determination of country origin and detection of glucose syrup respectively. As a conclusion, DSC is a reliable and suitable tool for screening purposes to reduce time and cost prior to verification with other highly sophisticated confirmatory methods.