Detection of animal fat contaminations in sunflower oil by differential scanning calorimetry.

ABSTRACT

In this study, the use of differential scanning calorimetric heating thermograms was investigated to detect the presence of lard, beef tallow, and chicken fat as contaminants in sunflower oil. Sunflower oil samples spiked separately with lard, beef tallow, and chicken fat in levels ranging from 1 to 20% (w/w) were analyzed using high performance liquid chromatography to get triacyl-glycerol profiles and differential scanning calorimetric to obtain their heating profiles. The results showed that below 20% (w/w) level of contamination, both lard and beef tallow in sunflower oil can be detected using characteristic contaminant peaks appearing in the higher temperature region (0-50°C) of differential scanning calorimetric curve. However, chicken fat contamination in sunflower oil did not show any characteristic peaks in this region, but caused changes only in the exiting thermal transitions in the low temperature region of the differential scanning calorimetric curve. Based on the characteristic differences in the peak size, shape, and position, it was also possible to make a distinction between lard and beef tallow contaminations in sunflower oil.