

Analysis of PFAS in Blood

Sima Kumar, Ehab Abdelraheem, Mamy Rakotondravelo, and Wayne Jiang*
PFAS Analytical Laboratory, Center for PFAS Research, Michigan State University, Lansing,
MI 48910

Abstract

Due to the bioaccumulative nature of per- and polyfluorinated alkyl substances (PFAS), monitoring the PFAS levels in biofluids provides understanding of the impact of PFAS exposure levels and the PFAS pathways in cattle. Due to the stability of PFAS, they are not readily decomposed or metabolized or easily removed from animal and human bodies. The effects of PFAS on human health have attracted public attention. The MSU PFAS laboratory has developed a rugged and robust analytical method for the extraction of PFAS from blood serum followed by instrumental analysis by TSQ Altis Triple-Stage- Quadrupole Mass Spectrometer coupled with Thermo Scientific Vanquish UHPLC system with PFAS upgraded kit (Vanquish Flex Binary) – P/N 80100-62144. An Acclaim RSLC 120 C18 (2.1 × 100 mm, 2.2 μm) column provided crucial separations of PFAS from serum interferences. The method has been proven to be accurate and robust for the extraction and detection of PFAS from blood serum samples. Bovine serum was fortified at multiple levels of PFAS and their recoveries were found to be > 70% for major native PFAS analytes. In addition, the optimized extraction method was verified by spiking and extracting field blood serum samples (five sets of matrix spikes and matrix duplicates, MS/MSD) and the analytical results are consistent, accurate and reproducible.