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# Serum Perfluoroalkyl Substances (PFAS) in Schoolchildren from Northern Norway: Dietary Impact

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## Extended Abstract

### Objectives

The aim of the study was to measure PFAS concentrations in serum of schoolchildren in northern Norway and to assess possible associations with dietary variables.

### Materials and methods

Altogether 1038 schoolchildren aged 15-19 years were invited to participate in the Fit Futures 1 study in 2010-11 in the Troms arctic district of northern Norway. 93% of those invited have participated in the study. All the participants completed the questionnaire including questions about dietary and life-style variables. Blood tests were sampled from 940 participants in special glass vials for pollutant analyses and were kept in a biobank at -40 °C before the analyses. Perfluorobutane sulfonate (PFBS), perfluoropentane sulfonate (PFPS), perfluorohexane sulfonate (PFHxS), perfluoroheptane sulfonate (PFHpS), perfluorooctane sulfonate (PFOS), perfluorononane sulfonate (PFNS), perfluorodecane sulfonate (PFDS), perfluorododecane sulfonate (PFDoDS), perfluorooctane sulfonamide (PFOSA), perfluorohexanoate (PFHxA), perfluoroheptanoate (PFHpA), perfluorooctanoate (PFOA), perfluorononanoate (PFNA), perfluorodecanoate (PFDA), perfluoroundecanoate (PFUnDA), perfluorododecanoate (PFDoDA), perfluorotridecanoate (PFTrDA) and perfluorotetradecanoate (PFTeDA) were measured by ultra high pressure liquid chromatography coupled to a triple quadrupol mass spectrometer (UHPLC-MS/MS).

### Results and conclusions

Several PFAS were found in serum of schoolchildren in the arctic Troms region of Norway. PFOS, PFOA, PFHxS, PFNA and PFDA were the most usual PFAS found in this population, they were detected in more than 99% of the samples. Even though PFOS has been phased out from most producers in 2000 and has been forbidden for use in Norway since 2007, it is still found in highest serum concentrations among all measured PFAS due to its continued presence in the environment and micro-environments of households. PFOA showed the highest concentration within the group of perfluorocarboxylic acids.PFUnDA and PFHpS were found in more than 95% of the samples, while PFHpA, PFHxA and PFNS were found in respectively 75%, 22% and 14% of all participants. PFDoDA and PFTrDA were found in <10% of the samples. PFTeDA, PFPS, PFDoDS, PFDS, PFOSA concentrations were under LOD in 100% of the study population. Associations of different PFAS with food variables were assessed by multiple regression analyses with adjustment for age, gender and BMI. The strongest positive associations were observed with intake of fat fish, fish liver, seagull eggs and reindeer meat.