



Sampling and Sample Preparation – PFAS in Food, Feed and Biota

Both sampling and sample preparation in the laboratory are of great importance for achieving a correct and representative result. Below our capacity for sample preparation for food, feed and biota is outlined. Some guidance on sampling with reference to published documents is given in addition to information on optimal and minimal sample weights. This also refers to sample containers.

Foodstuffs

Sampling

For foods with maximum levels for PFAS4 in Regulation (EU) 2023/915 the EU commission has published an implementing regulation (EU) 2022/1428 on sampling and analysis aimed for official control. Parts of this latter regulation plus a few national recommendations have been reproduced by the Swedish and Danish Food Agencies (SLV and DVFA)

The implementing regulation (EU) 2022/1428 covers sampling of foodstuffs with limit values such as meat, offal, poultry, egg, fish and crustaceans. The general rule is that the aggregate sample should weigh (at least) 1kg, but there are exceptions and different instructions given for number and size of incremental samples, number of animals/fish to be sampled, different cuts etc. The regulation also gives advice on sampling when the food consists of individual packages or units. The rules apply to sampling at the retailer stage too.

An additional recommendation published by SLV is that 18 eggs (>1 kg) should make up the aggregate sample. SLV also states that for crayfish and crabs the limit values only apply to the white muscle meat, not the crayfish butter or the brown crab meat that can contain high concentrations of PFAS.

The EU recommendation (EU) 2022/1431 on monitoring of PFAS in food also refers to implementing regulation (EU) 2022/1428. The recommendation covers fruits, vegetables, starchy roots and tubers, seaweed, cereals, nuts, oilseeds, food for infants and young children, food of animal origin, non-alcoholic drinks, wine and beer.

If these regulations are not to be followed, we typically manage with less than 1kg. An indicative weight is 300-500g, but in many cases we can manage with 100g or less. Consumer packs can also be submitted and the number depends on the overall weight (unless EU 2022/1428 is adhered to).

More information on sampling statistics etc can be found at SLV control wiki (see link below).



Sample preparation

In most cases the foodstuff must be mixed in a grinder to achieve a homogeneous sample to take a representative aliquot for testing. Normally the regulations refer to the eatable part of the product, and thus this is what we recommend and follow unless otherwise stated. In case of food with different segments e.g. whole chicken, fish or other animal produce, meat with a thick fat streak etc please give further advice what to include. For fruit and vegetables we apply the EU regulations for pesticide residues ((EC) No 178/2006; (EU) 2018/62) for selection of parts to include. Please inform us if these directives should not be used and give alternative instructions.

For whole fish we can prepare fillets (given adequate size, approx. 15cm) of muscle or alternatively for bigger fish (>1kg; SLV) we can cut a mid-body cutlet, in both cases followed by mixing. Also dissection of liver is possible for larger fish. Moreover, peeling of prawns, mussels and crayfish can be carried out. See codes to be ordered in the table below.



Feed

Sampling

To the best of our knowledge there is no specific EU directive or regulation for PFAS in feed. Some guidance may be provided by the regulation (EC) 152/2009 on sampling and analysis for the official control of feed. Principles stated in the implementing regulation EU 2022/1428 may also be of interest. In general, 300-500g sample weight is sufficient from a laboratory perspective.

Biota - Environmental analysis

Sampling

For sampling procedures in the field Eurofins has no specific recommendations other than reducing the risk of contamination (see below). Please refer to other documentation such as instructions from competent authorities. In case of Sweden please see references below to reports from the Swe-EPA (2021a, b), the County administrative boards (LST, 2021) and references within for further guidance. However, e.g. in the case of fish, samples amount and size may depend on the part that is going to be analysed and assessed such as muscle vs liver vs whole (small) fish. In relation to Water Framework Directive monitoring muscle is normally considered. Liver typically has much higher PFAS levels than muscle (5-15 times, but may vary). Optimal sample weight, from a laboratory perspective, is 100g but down to 10g can be handled although sample preparation can be compromised.

Precautions at sampling

Implementing regulation (EU) 2022/1428 states a number of things to consider to avoid contamination of the sample:

- Avoid clothing/gloves that contain fluoropolymer or are treated with PFAS to improve water and stain repellence
- Do not use PFAS containing cosmetics (moisturizers, cosmetics, hand cream, sunscreens etc)
- Material for sampling, sample storage and sample transmission must be PFAS free.
- Avoid contact with e.g. cutting boards, sampling containers and linings of caps made of fluoropolymers (Teflon, PVDF etc)
- Containers should be clean, inert and made of PP, PE or other PFAS-free material. Glass should not be used.

Codes for sample preparation

The table below shows the codes to be used when ordering and what kind of preparation that can be carried out. Unless the preparation is a straightforward case of mixing we would like to ask that instructions are given on the order form or in the electronic order. For fruit and vegetables, we follow the rules for pesticide residues (see above) unless stated.

There is also a possibility to submit already mixed and homogenized samples to possibly shorten delivery time, save cost and avoid the risk of delays due to any questions about the preparation.

Sample preparation

Preparation of feed depends on the characteristics and size. For grass and silage drying and milling is required and we have analytical "cellulose-rich" packages that include the preparation necessary. At least 50g, preferably more (100g+) is called for. For premix, concentrates, granules/pellets the sample preparation may vary.

Sample preparation

For whole fish muscle (>15 cm) can be prepared followed by mixing. Mixing of small whole fish can also be made. Dissection of liver is possible for larger fish. Peeling and mixing of prawns, mussels and crayfish can be performed. See codes to be ordered in the table below. Additional services such as length and weight for fish are feasible, also to submit own measurements to be on reported. If there is a need for age determination in a specific project, please contact us. Preparation of fruit, berries and vegetables is selected in accordance with EU directives for pesticide residues (see above).

For cellulose rich plant material e.g. grass, reed, leaves, bark, twigs we offer dedicated packs incl drying, milling and reporting of total moisture.



Codes for sample preparation	
Code	Description
LPP02	Simple preparation – mixing of food/biota as delivered. Total sample weight max 1 kg (incl incremental samples to be mixed)
LW0RZ	Preparation of muscle and/or liver (up to 3 fish), peeling of up to 1 kg shellfish, followed by mixing. Length and weight of fish. Advanced composite samples. Samples >1 kg
LWB02	Length, fish (cm)
LWLK4	Weight, fish (g)
LWLL4	Length, fish (cm) (reported by client)
LW340	Weighth, fish (g) (reported by client)

More information on PFAS and Eurofins analysis

Visit our PFAS homepage at Eurofins.se for information of PFAS regulation, limit values, analytical packs etc. Suitable packs for food, biota, “cellulose-rich” material, water, soil, sediment etc are also listed. For Environmental analysis (ie biota), details (compounds, LOQ, delivery time etc) can be found using the search engine for environmental analyses

References and links

DFVA: <https://foedevarestyrelsen.dk/kost-og-foedevareer/foedevaresikkerhed/kemiske-stoffer-og-toksiner/miljoeforurening-i-foedevareer/pfas>

(EC) No 178/2006: <https://eur-lex.europa.eu/eli/reg/2006/178/oj>

(EC) No 152/2009 <https://eur-lex.europa.eu/eli/reg/2009/152/2014-07-17>

(EU) 2018/62: <https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=CELEX%3A32018R0062>

(EU) 2022/1428: https://eur-lex.europa.eu/eli/reg_impl/2022/1428/oj

(EU) 2022/1431: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022H1431>

(EU) 2023/915: <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32023R0915>

Eurofins (PFAS): <https://www.eurofins.se/about-pfas/>

LST (2021): <https://naturvardsverket.diva-portal.org/smash/record.jsf?pid=diva2%3A1468888&dswid=8768>

SLV control wiki (PFAS): <https://kontrollwiki.livsmedelsverket.se/artikel/825/pfas-provtagning>

SLV control wiki (statistics): <https://kontrollwiki.livsmedelsverket.se/artikel/189/provtagningsstatistik>

Swe-EPA (2021a): <https://www.naturvardsverket.se/globalassets/vagledning/miljoovervakning/handledning/undersokningstyper/undersokningstyp-metaller-och-organiska-miljogifter-i-fisk-marint-2021-03-16.pdf>

Swe-EPA (2021b): <https://www.naturvardsverket.se/4ac535/globalassets/vagledning/miljoovervakning/handledning/undersokningstyper/undersokningstyp-metaller-organiska-miljogifter-fisk-sjoar-vattendrag.pdf>

