Food Chemistry Analytical Unit
CISB
Agri-Food and Biosciences Institute (AFBI)
Stoney Road
Belfast BT4 3SD

# STUDY PLAN 10/2018

## Official Control Services for Shellfish Chemical Contaminants 2018

Results included overleaf.

Abnormalities or departures from standard conditions: None.

Remarks: None.

Sample condition: Acceptable.

| | | |
|---|---|---|
| Method used: | PAHs | SOP 147 |
| | Heavy Metals | SOP 33, 39, 41, 163 |

Date of issue of report 31st May 2018

Food Chemistry Analytical Unit
CISB
Agri-Food and Biosciences Institute (AFBI)
Stoney Road
Belfast BT4 3SD

Table 1: Sample information.

Three individual samples per site were collected and combined to make a composite sample for all analyses.

| Lab Number | Site name/Production Area | Site Identification Ref (SIR) | Species collected | Sample Date | Date sample received |
|---|---|---|---|---|---|
| 201800698 | Middlebank, Belfast Lough | B1 AFFNI 55 | Mussels | 22/01/2018 | 22/01/2018 |
| 201800733 | Shingle Bay, Larne Lough | L3 AFFNI 88 | Oysters | 23/01/2018 | 23/01/2018 |
| 201801107 | Fair Green, Carlingford Lough | C11 AFFNI 84 | Oysters | 29/01/2018 | 30/01/2018 |
| 201801112 | Ballyedmond, Carlingford Lough | C7 AFFNI 73 | Oysters | 29/01/2018 | 30/01/2018 |
| 201801113 | Narrow Water, Carlingford Lough | NW –Wild Fishery | Mussels | 29/01/2018 | 30/01/2018 |
| 201801662 | Paddy's Point, Strangford Lough | S7 AFFNI 76 | Oysters | 19/02/2018 | 19/02/2018 |
| 201801830 | Killough Harbour, Killough | K1 AFFNI 18 | Oysters | 21/02/2018 | 21/02/2018 |

Food Chemistry Analytical Unit
CISB
Agri-Food and Biosciences Institute (AFBI)
Stoney Road
Belfast BT4 3SD

**PART 1: PAHs**

Table 2: The following PAHs were actively sought (reporting limit 0.5 µg/kg).

| PAHs |
|---|
| Naphthalene |
| Phenanthrene |
| Anthracene |
| Fluoranthene |
| Pyrene |
| 7H-Benzo(c)Fluorene |
| Benzo(a)Anthracene |
| Cyclopenta(c,d)Pyrene |
| Chrysene |
| 5-Methylchrysene |
| Benzo(b)Fluroanthene |
| Benzo(k)Fluroanthene |
| Benzo(j)Fluroanthene |
| Benzo(a)Pyrene |
| Indeno(1,2,3-cd)Pyrene |
| Dibenzo(a,h)Anthracene |
| Benzo(g,h,i)Perylene |
| Dibenzo(a,l)Pyrene |
| Dibenzo(a,e)Pyrene |
| Dibenzo(a,i)Pyrene |
| Dibenzo(a,h)Pyrene |

Food Chemistry Analytical Unit
CISB
Agri-Food and Biosciences Institute (AFBI)
Stoney Road
Belfast BT4 3SD

Table 3: PAH results in µg/kg on a fresh (wet) weight basis

| lab number | EFSA 4 | Naphthalene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | 7H-Benzo (c) Fluorene | Benzo (a) Anthracene | Cyclopenta (c,d) Pyrene | Chrysene | 5 Methyl Chrysene | Benzo (b) Fluoranthene | Benzo (k) Fluoranthene | Benzo (j) Fluoranthene | Benzo (a) Pyrene | Indeno (123,cd) Pyrene | Dibenzo (a,h) Anthracene | Benzo (ghi) Perylene | Dibenzo (a,l) Pyrene | Dibenzo (a,e) Pyrene | Dibenzo (a,i) Pyrene | Dibenzo (a,h) Pyrene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 201800698 | 14.6 | <0.50 | 6.5 | 2.1 | 10.2 | 13.1 | <0.50 | 4.0 | <0.50 | 3.4 | <0.50 | 4.8 | 2.8 | 2.2 | 2.3 | 1.4 | <0.50 | 2.9 | <0.50 | <0.50 | <0.50 | <0.50 |
| 201800733 | 16.3 | 0.56 | 10.8 | 0.50 | 19.3 | 16.1 | <0.50 | 4.1 | <0.50 | 4.8 | <0.50 | 6.0 | 2.9 | 2.0 | 1.5 | 0.52 | <0.50 | 0.95 | <0.50 | <0.50 | <0.50 | <0.50 |
| 201801107 | 18.0 | <0.50 | 11.2 | 0.93 | 22.5 | 16.3 | <0.50 | 3.7 | <0.50 | 5.3 | <0.50 | 7.3 | 4.0 | 2.3 | 1.8 | 0.90 | <0.50 | 1.7 | <0.50 | <0.50 | <0.50 | <0.50 |
| 201801112 | 23.1 | 0.55 | 17.7 | 1.6 | 30.1 | 22.8 | <0.50 | 4.8 | <0.50 | 5.2 | <0.50 | 10.7 | 4.4 | 3.3 | 2.4 | 1.2 | <0.50 | 1.8 | <0.50 | <0.50 | <0.50 | <0.50 |
| 201801113 | 26.4 | <0.50 | 41.6 | 4.2 | 55.1 | 39.9 | <0.50 | 8.0 | <0.50 | 6.1 | <0.50 | 9.4 | 4.5 | 4.0 | 2.9 | 2.0 | <0.50 | 3.6 | <0.50 | <0.50 | <0.50 | <0.50 |

Food Chemistry Analytical Unit
CISB
Agri-Food and Biosciences Institute (AFBI)
Stoney Road
Belfast BT4 3SD

Table 3 continued: PAH results in µg/kg on a fresh (wet) weight basis

| lab number | EFSA 4 | Naphthalene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | 7H-Benzo (c) Fluorene | Benzo (a) Anthracene | Cyclopenta (c,d) Pyrene | Chrysene | 5 Methyl Chrysene | Benzo (b) Fluoranthene | Benzo (k) Fluoranthene | Benzo (j) Fluoranthene | Benzo (a) Pyrene | Indeno (123,cd) Pyrene | Dibenzo (a,h) Anthracene | Benzo (ghi) Perylene | Dibenzo (a,l) Pyrene | Dibenzo (a,e) Pyrene | Dibenzo (a,i) Pyrene | Dibenzo (a,h) Pyrene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 201801662 | 22.7 | <0.50 | 12.5 | 1.2 | 22.2 | 16.7 | <0.50 | 4.8 | <0.50 | 5.2 | <0.50 | 10.4 | 4.9 | 3.3 | 2.3 | 1.1 | <0.50 | 1.6 | <0.50 | <0.50 | <0.50 | <0.50 |
| 201801830 | 27.6 | 0.58 | 10.3 | 1.2 | 19.8 | 15.2 | <0.50 | 5.9 | <0.50 | 6.5 | <0.50 | 12.5 | 5.6 | 3.9 | 2.7 | 1.3 | <0.50 | 1.9 | <0.50 | <0.50 | <0.50 | <0.50 |
| LOD (µg/kg) | - | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| LOQ (µg/kg) | - | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| $HORRAT_r$ | - | 1.34 | 0.48 | 1.00 | 0.32 | 0.32 | 0.85 | 0.56 | 0.57 | 0.26 | 0.37 | 0.30 | 0.40 | 0.36 | 1.09 | 1.19 | 0.38 | 0.55 | 0.67 | 1.08 | 1.27 | 0.97 |
| Uncertainty* | - | 0.20 | 0.17 | 0.19 | 0.17 | 0.17 | 0.38 | 0.14 | 0.26 | 0.20 | 0.17 | 0.14 | 0.18 | 0.16 | 0.19 | 0.29 | 0.17 | 0.18 | 0.30 | 0.49 | 0.58 | 0.44 |

*Uncertainty is the expanded measurement uncertainty using a coverage factor of 2, which gives a confidence level of approximately 95%.

Food Chemistry Analytical Unit
CISB
Agri-Food and Biosciences Institute (AFBI)
Stoney Road
Belfast BT4 3SD

**PART 2: Metals**

Metals sought: Lead, Cadmium and Mercury.

Table 4: Metal results for Lead, Cadmium and Mercury, expressed as mg/kg on a fresh (wet) weight basis.

| Lab Number | Site name/Production Area | Species collected | Lead | Cadmium | Mercury |
|---|---|---|---|---|---|
| 201800698 | Middlebank, Belfast Lough | Mussels | 0.44 | <0.20 | <0.10 |
| 201800733 | Shingle Bay, Larne Lough | Oysters | <0.30 | 0.20 | <0.10 |
| 201801107 | Fair Green, Carlingford Lough | Oysters | <0.30 | 0.29 | <0.10 |
| 201801112 | Ballyedmond, Carlingford Lough | Oysters | <0.30 | 0.26 | <0.10 |
| 201801113 | Narrow Water, Carlingford Lough | Mussels | 0.52 | <0.20 | <0.10 |
| 201801662 | Paddy's Point, Strangford Lough | Oysters | <0.30 | 0.33 | <0.10 |
| 201801830 | Killough Harbour, Killough | Oysters | <0.30 | 0.27 | <0.10 |
| LOD (mg/kg) | | | 0.15 | 0.10 | 0.05 |
| LOQ (mg/kg) | | | 0.30 | 0.20 | 0.10 |
| $HORRAT_r$ | | | 0.27 | 0.16 | 0.17 |
| Uncertainty* | | | 0.09 | 0.07 | 0.09 |

*Uncertainty is the expanded measurement uncertainty using a coverage factor of 2, which gives a confidence level of approximately 95%.