HEILSUFRØÐILIGA STARVSSTOVAN
Faroese Food and Veterinary Authority

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Levels of Heavy Metals and Selenium in Faroese wild caught fish

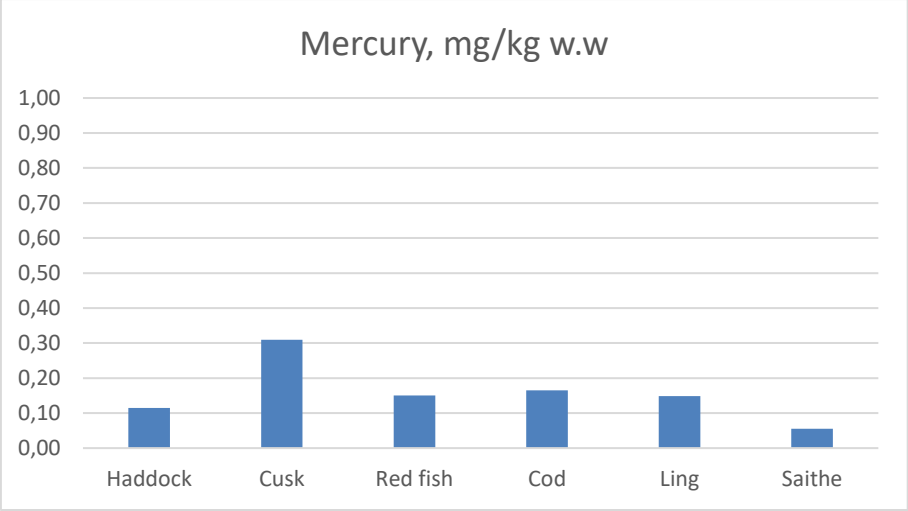
The Faroese Food and Veterinary Authority has analysed[1] different species of fish for the heavy metals lead, cadmium, arsenic, mercury and in addition, the essential trace mineral, selenium. Eighteen samples of different size and weight, from Haddock (*Melanogrammus aeglefinus*), Cusk (*Brosme brosme*), Red fish (*Sebastes marinus*), Cod (*Gadus morhu*), Ling (*Molva molva)* and Saithe (*Pollachius virens*), were obtained from the Faroese fishing area in, Vb in 2017. The results are summarised in table 1.

Summary: In general, the levels were in line with the regulatory limits. There were no concerns for human health. The levels of the essential trace mineral Selenium, ranged between 344-1020 µg/kg.

Heavy metals

Heavy metals may pose a potential health risk to consumers and therefor there are regulatory limits for some metals[2]. In this study the levels of cadmium < 0,002 mg/kg and lead < 0,02 mg/kg were under the detection limit. The levels of mercury were generally low (figure 1) apart from one sample, which was at the limit of the regulatory levels of 0,50 mg/kg, but still under 1,0 mg/kg[2], table 1. The levels of mercury increased with the increasing fish size.

Figure 1*. Mean Levels of Mercury (Hg) in different fish species: Haddock, Cusk, Red fish, Cod, Ling and Saithe, September 2017. Unit mg/kg w.w. The lower EU regulatory limit for Mercury is 0,50 mg/kg and for some species 1,0 mg/kg.*



[1] The analyses were performed by ICP-MS (ISO 17294-1,2 2005 mod) at FFVA, 100 Torshavn, Faroe Islands. DANAK reg.no.303.

[2] Faroese Departmental order no. 147/2009 setting maximum levels for certain contaminants in foodstuffs (implements regulation (EC) 1881/2006).

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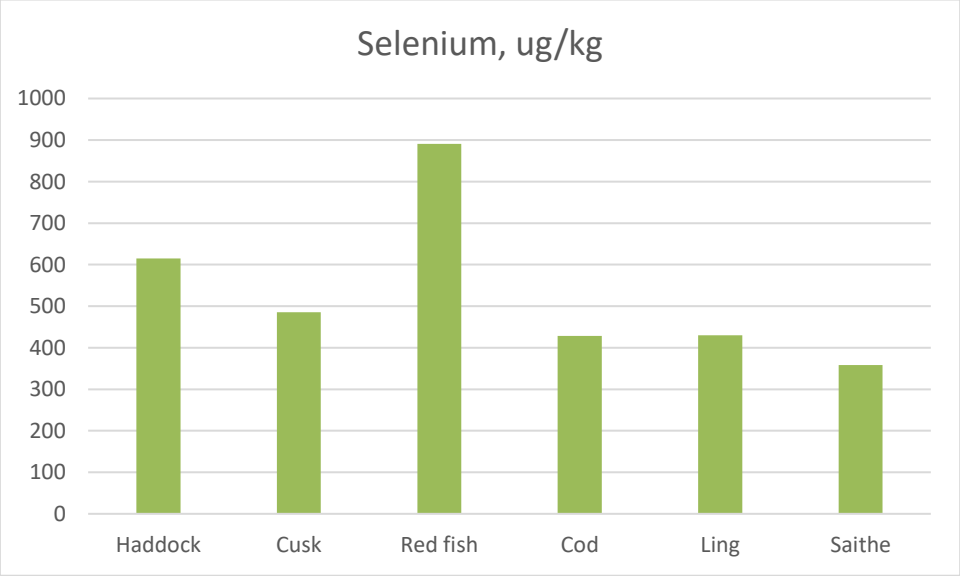
Selenium

Selenium is a trace mineral and an essential nutrient of vital importance to human health in trace amounts. It acts as an antioxidant in both humans and animals. The levels of selenium in this study ranged from 344 µg/kg in Saithe to 1020 µg/kg in Red fish (figure 2 and table 1). These results are in line with other findings[3]. In general, Selenium levels in meat, eggs, poultry and seafood are usually high (range 88-1500 µg/kg), whereas fruits and vegetables contain low levels of selenium (range 1-76 µg/kg)[3]. The Nordic Nutrition Recommendations (2012) intake for selenium (i.e. in adults) is 50 and 60 µg per day (females and males, respectively) and 60 µg per day (pregnant and lactating women)[4].

Figure 2*. The mean content of Selenium (Se) in different fish species, Haddock, Cusk, Red fish, Cod, Ling and Saithe, September 2017. Unit µg/kg fresh weight.*



[3] Habib Ullah et al. 2018. Developmental selenium exposure and health risk in daily foodstuffs: A systematic review and meta-analysis. Ecotoxicology and Environmental Safety Volume 149, March 2018, Pages 291-306. https://doi.org/10.1016/j.ecoenv.2017.11.056

[4] Nordic nutrition Recommendation 2012 (NNR 2012). Nordic Council of Ministers, Nordic Council of Ministers *Nordic Nutrition Recommendations 2012(2014),5(11):1*. http://dx.doi.org/10.6027/Nord2014-002

***Table 1**. Levels of heavy metals (Pb, Cd, Hg, As) and Selenium (Se) in different fish species caught from the Faroese fishing area. September 2017. In total 18 samples.*

Species	Scientific name	Length	Weight	Lead (Pb)	Cadmium (Cd)	Mercury (Hg)	Arsenic total	Selenium (Se)	Report ID*	Date
		cm	kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg		
Haddock	*Melanogrammus aeglefinus*	42	0,9	<0,02	<0,002	0,10	5,43	605	F217-01705-2	26.09.17
Haddock	*Melanogrammus aeglefinus*	56	1,9	<0,02	<0,002	0,11	15,3	548	F217-01705-1	26.09.17
Haddock	*Melanogrammus aeglefinus*	58	1,9	<0,02	<0,002	0,13	6,91	692	F217-01705-3	26.09.17
Cusk	*Brosme brosme*	55	1,9	<0,02	<0,002	0,12	3,08	423	F217-01706-3	26.09.17
Cusk	*Brosme brosme*	75	4,4	<0,02	<0,002	0,30	0,61	467	F217-01706-1	26.09.17
Cusk	*Brosme brosme*	83	5,2	<0,02	<0,002	0,51	0,93	566	F217-01706-2	26.09.17
Red fish	*Sebastes marinus*	39	0,5	<0,02	<0,002	0,15	1,86	751	F217-01707-1	26.09.17
Red fish	*Sebastes marinus*	43	1	<0,02	<0,002	0,09	1,63	901	F217-01707-2	26.09.17
Red fish	*Sebastes marinus*	47	2,1	<0,02	<0,002	0,22	3,08	1020	F217-01707-3	26.09.17
Cod	*Gadus morhu*	50	1,2	<0,02	<0,002	0,09	4,98	406	F217-01708-2	26.09.17
Cod	*Gadus morhu*	69	3,2	<0,02	<0,002	0,09	7,12	511	F217-01708-1	26.09.17
Cod	*Gadus morhu*	85	6,4	<0,02	<0,002	0,32	18,8	368	F217-01708-3	26.09.17
Ling	*Molva molva*	73	2,1	<0,02	<0,002	0,17	3,18	415	F217-01709-2	26.09.17
Ling	*Molva molva*	82,5	2,6	<0,02	<0,002	0,14	4,73	442	F217-01709-3	26.09.17
Ling	*Molva molva*	90	3,7	<0,02	<0,002	0,14	2,85	433	F217-01709-1	26.09.17
Saithe	*Pollachius virens*	49	1,4	<0,02	<0,002	0,05	1,2	344	F217-01710-2	26.09.17
Saithe	*Pollachius virens*	51,5	1,4	<0,02	<0,002	0,06	2,36	354	F217-01710-1	26.09.17
Saithe	*Pollachius virens*	56	1,4	<0,02	<0,002	0,05	1,74	376	F217-01710-3	26.09.17

**Laboratory reports are in FFVA file 17/00072*

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