Updated January 2020

Frequently Asked Questions

DARK SPOTS in salmon fillets

The farming industry is paying great attention to and seeking to understand the underlying causes to quality deviation related to dark discoloration of salmon fillets. The discoloration can appear as distinct dark spots or as diffuse grayish discoloration. Occasionally discolored muscle is seen under the skin.

Occurrence of dark spots in salmon fillets

- Most spots are up to 3 cm wide and a few mm thick, located in the front part of the fillet
- Dark discoloration is observed in wild caught salmon

What is melanin?

- Melanin is a group of natural pigments found in most living organisms
- Melanin pigments act as natural antioxidants

Causes of dark spots in salmon fillets

- Melanin is the main pigment causing dark discoloration
- Melanin pigments are deposited as a response to tissue damages or local inflammation that develops over time
- Melanin deposition is a natural part of the fish's immune system
- The causality is complex. According to the state of knowledge, handling during slaughter, genetic background/breed or vaccine adverse reactions are not believed to be major causes to the problem

Is melanized tissue safe to eat

- No harmful compounds are detected in melanized tissues of salmon fillets
- Dark spots are considered a quality deviation and are normally cut out and discarded

Research on dark spots

- The Norwegian Seafood Research Fund (FHF), on behalf of the fish farming industry, is supporting research on dark spots to reveal causes and define measures to mitigate the problem. The research was intensified in 2012, and involves several industrial stakeholders and research communities. Additionally, private companies have their own ongoing research projects
- Research projects initiated by FHF have identified mitigating factors that have been implemented by the industry. In particular, the prevalence of large, problematic spots has decreased.

Project partners:

FAQ described by partners in the FHF project EX-Spot, Dark spots in salmon fillets. Causes and preventive measures
Please contact turid.morkore@nofima.no or Kristian.prytz@fhf.no for further questions

ANALYTICAL METHODS *Organic pollutants &metals*: PCB 6 (UB), Dioxin-like PCB (UB), Dioxins (UB), Dioxsins, dl-PCB (UB), Sum PAH4, As, Cd, Hg, Pb, Fe, Cu (ref: Berntssen MHG, Julshamn K, Lundebye A-K (2010) Chemosph 78, 637-646. *Pesticides*: Organo-nitrogen pesticides (MS1 + MS2), organophosphorylated pesticides, pesticides; none detected (ref: ASU L 00.00-34:2010-09 - Eurofins Dr. Specht Laboratorien (Hamburg) DIN EN ISO/IEC 17025:2005 D-PL-14198-01-00). *Minerals*: Na, Mg, Al, P, S, K, Ca, V, Cr, Mn, Fe, Ni, Cu, Zn, As, Se, Sr, Mo, Ba (ref: Mørkøre T, Larsson T, Kvellestad AS et *al*. (2015) FHF 900824 /Nofima report 34/2015)