



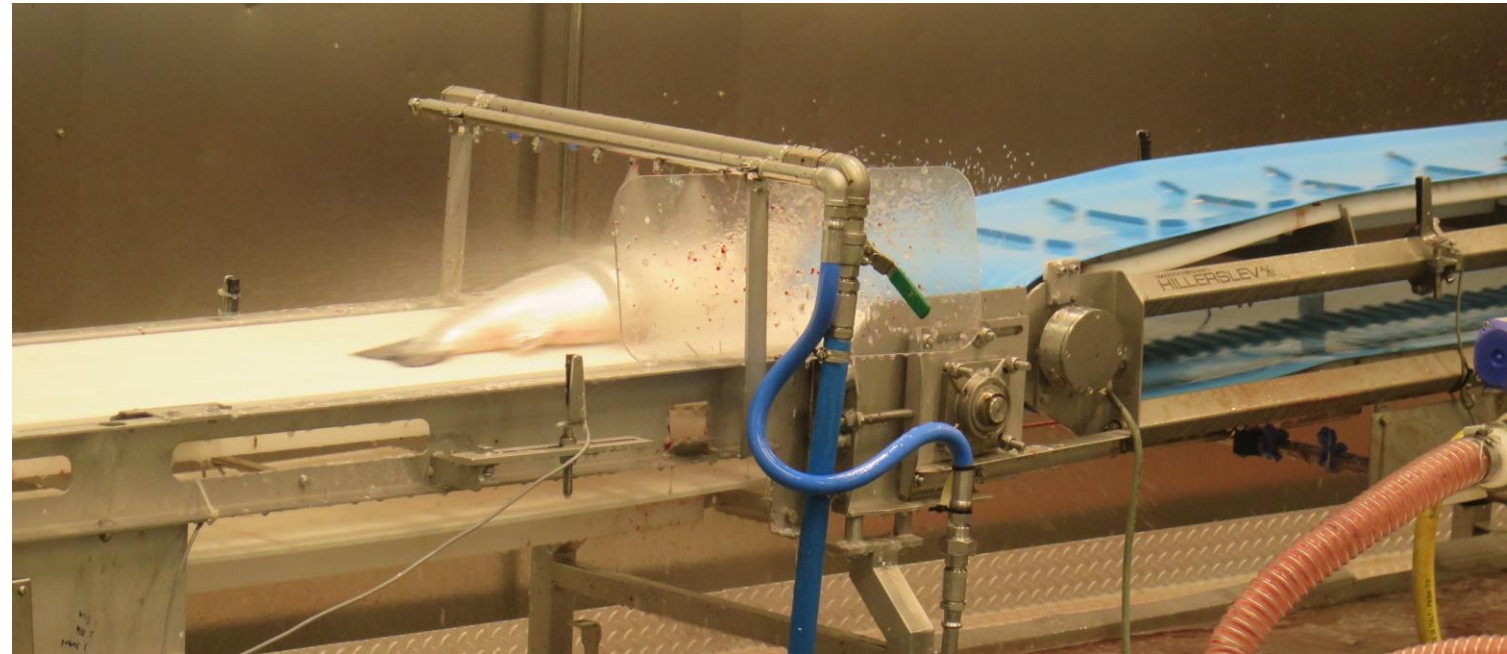
Hvordan håndterer vi fuktproblematikk? Bioaerosoler

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HMS i havbruk 19.03.2026

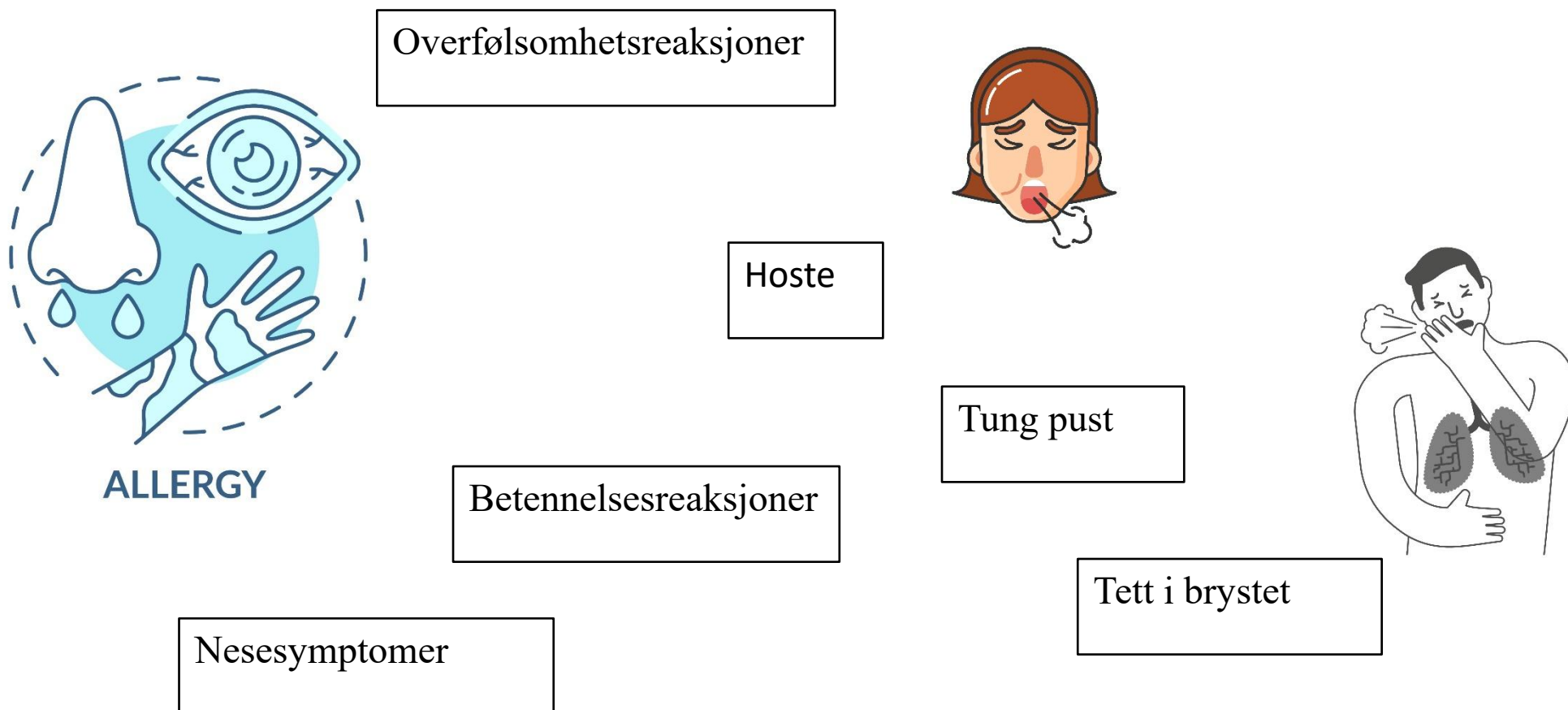
Arbeids- og miljømedisinsk avdeling
«Godt arbeid er god helse»

Hva er bioaerosoler?

- Finfordelte partikler med biologisk opprinnelse i luft
- Dannes ved mekanisk bearbeiding og sprut mot overflater med biologiske materialer
 - Proteiner
 - Allergener
 - Enzymer
 - Bakterier/endotoksiner
 - Mikroorganismer

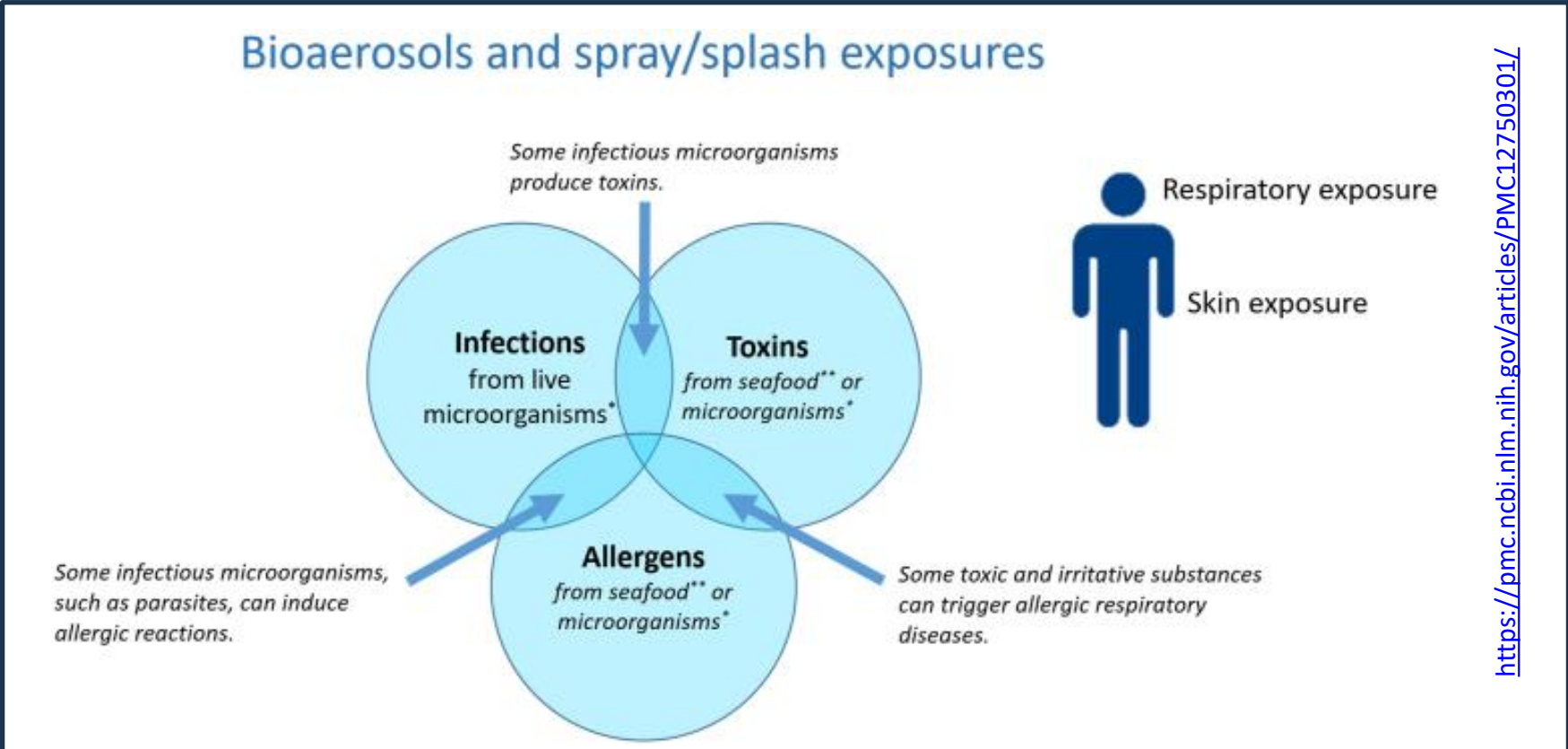


Helseproblemer som følge av bioaerosoler



Bilder: www.mostphotos.com

Forskning viser at bruk av vann er knyttet til eksponering for bioaerosoler



Data fra norsk lakseindustri
(bruk av vannslange):

Aldri/sjelden
Ofte

Proteiner		Allergener		Endotoksiner	
GM	Range	GM	Range	GM	Range
2.51	1.02–3.84	6.72	0.20–83.40	1.24	0.50–14.10
2.79*	1.45–12.62	10.79**	0.50–358.20	1.68*	0.60–29.0

<https://onlinelibrary.wiley.com/doi/epdf/10.1002/ajim.22281>



Forskning viser at det er mange forskjellige allergener i sjømaten



TABLE 3 IgE-binding to in-house and commercial protein extracts among sensitized workers using immunoblot protocols with in-house and commercial tissue extracts.

Immunoblot outcomes	Salmon processing workers, N = 71 n (%)
Immunoblot positive	71 (100)
<i>In-house extract^a</i>	
Raw muscle	56 (79)
Cooked muscle	14 (20)
Mucus	71 (100)
Skin	4 (6)
<i>Commercial extract^b</i>	
Cod	17 (24)
Salmon	0 (0)

^aIn-house salmon tissue extracts.

^bCommercially available SPT extracts.

<https://pmc.ncbi.nlm.nih.gov/articles/PMC12950587/pdf/falgy-07-1735903.pdf>

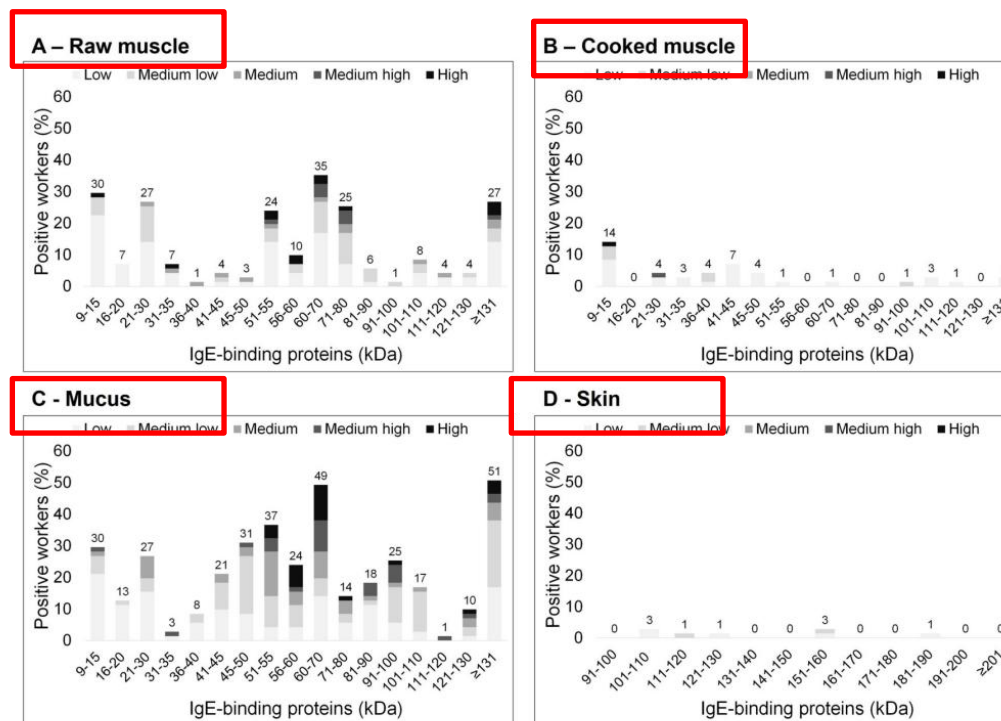
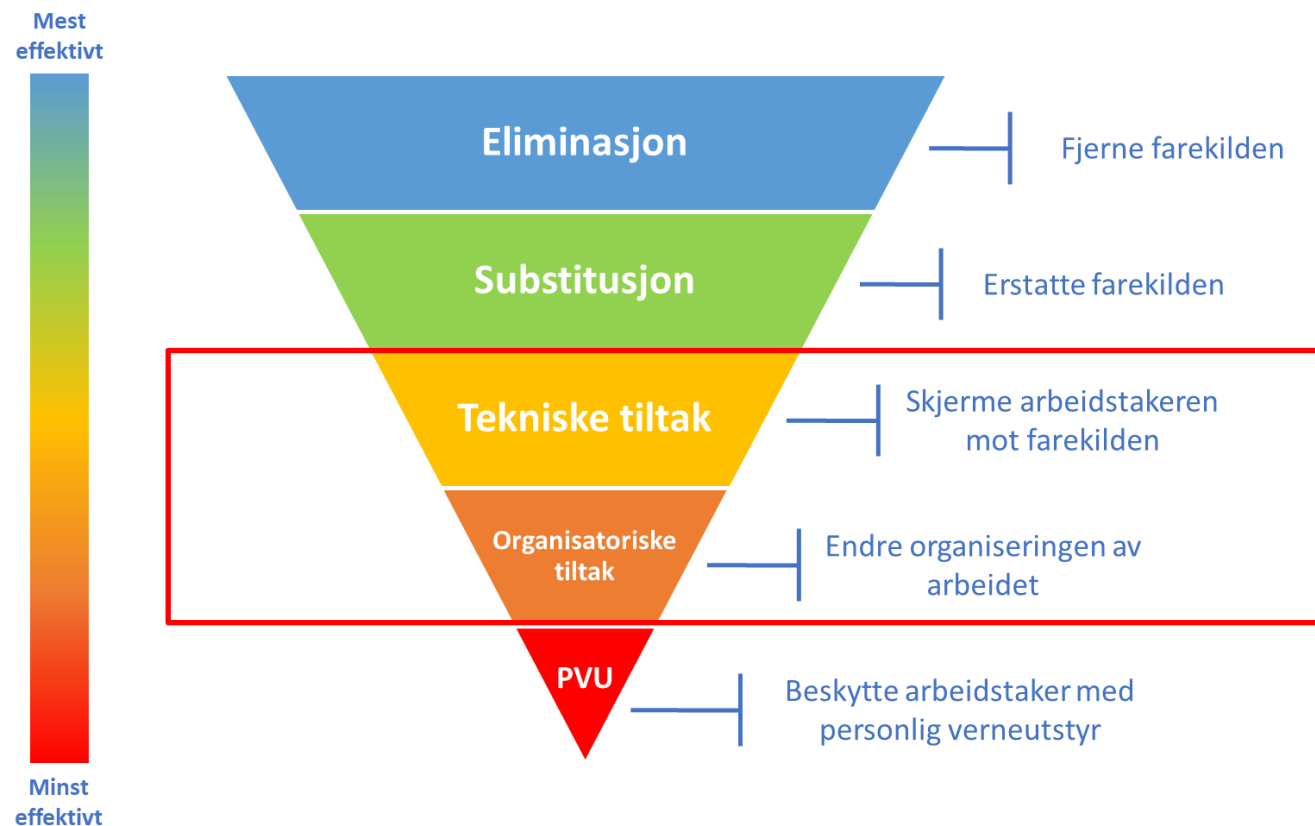


FIGURE 1 Stacked bar charts of serum IgE-binding proteins in sensitized Salmon processing workers (n = 71) using Salmon protein extracts from raw muscle (A), cooked muscle (B), mucus (C), and skin (D) the X-axis represents the different regions of molecular weight (kDa), and the Y-axis is the percentage of workers with IgE-binding to Salmon proteins. The different shades represent the relative binding intensity to the different proteins, based on immunoblots with serum from workers, meaning that "low" is relatively weak band-intensity, and "high" is relatively strong band-intensity. The numbers above each bar represent the total percentage of workers having IgE-binding to that molecular weight area.



Så hvordan håndtere fuktproblematikken for å unngå bioaerosolene



<https://yrkeshygiene.no/kb/tiltakshierarki/>

Tekniske tiltak - ventilasjon



Tekniske tiltak - lukkede prosesser eller punktavsug



Organisatoriske tiltak – plassering av arbeidsoppgaver



Tekniske og organisatoriske tiltak - høytrykkspyling

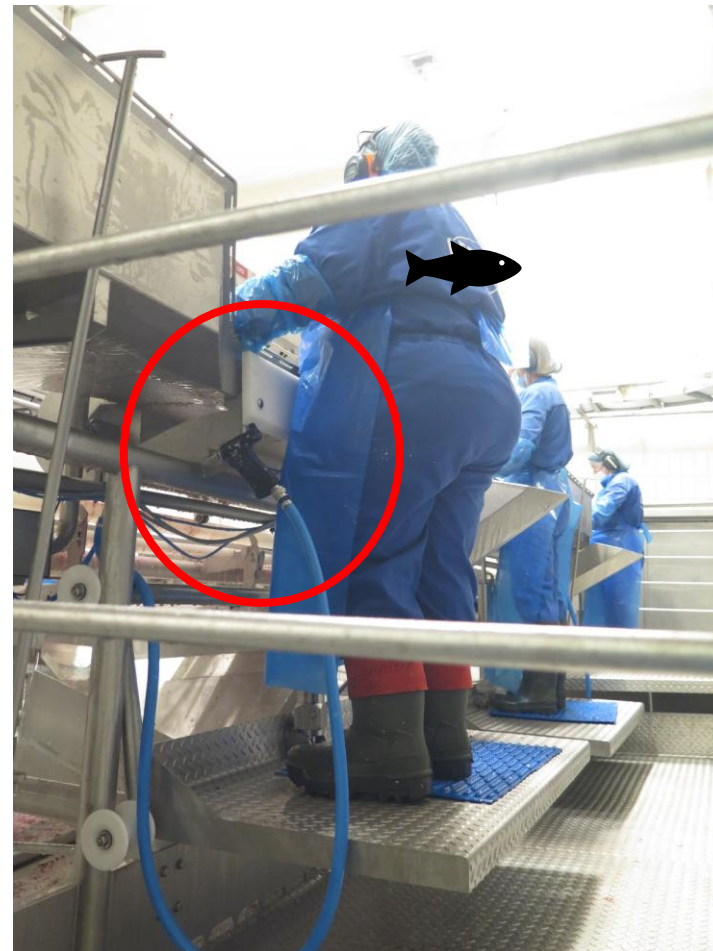


Data fra norsk lakseindustri (bruk av vannslange):

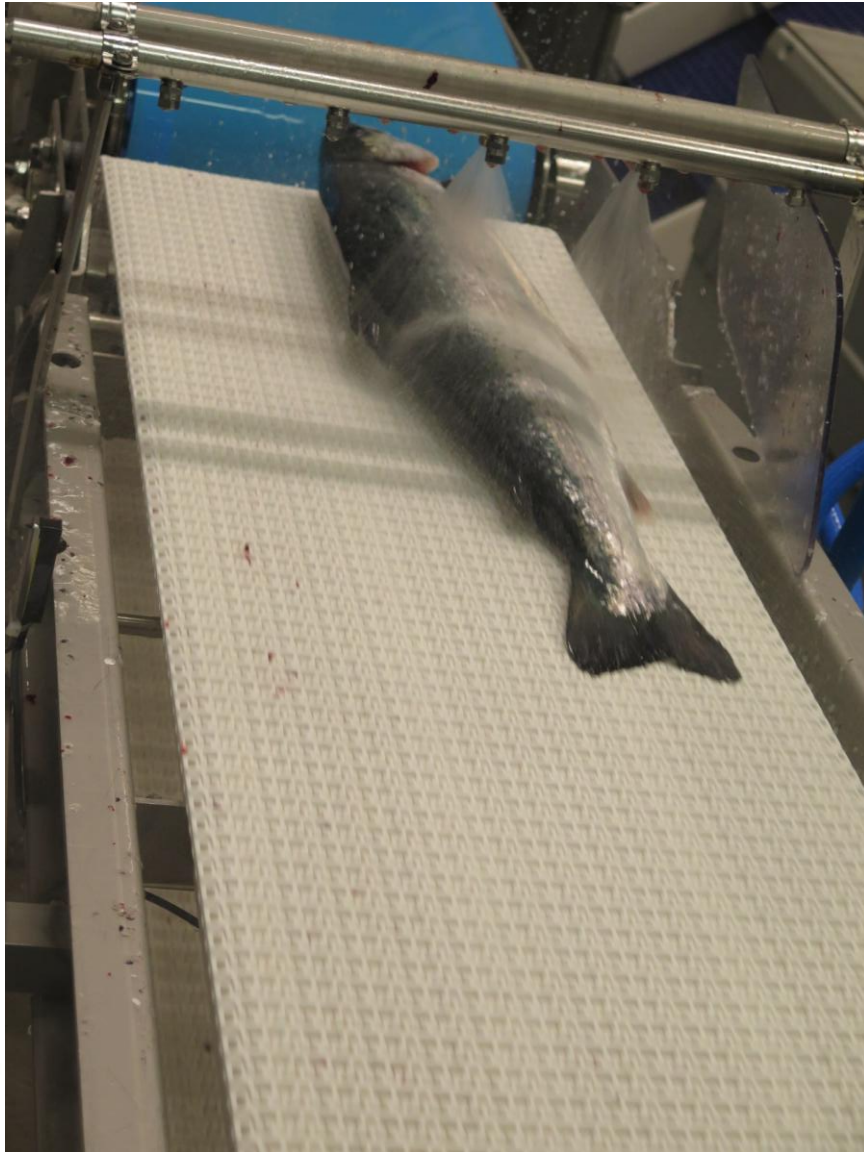
	TP ($\mu\text{g m}^{-3}$)		Parvalbumin (ng m^{-3})		Endotoxin (EU m^{-3})	
	GM	Range	GM	Range	GM	Range
Never, seldom	2.51	1.02–3.84	6.72	0.20–83.40	1.24	0.50–14.10
Often	2.79*	1.45–12.62	10.79**	0.50–358.20	1.68*	0.60–29.0



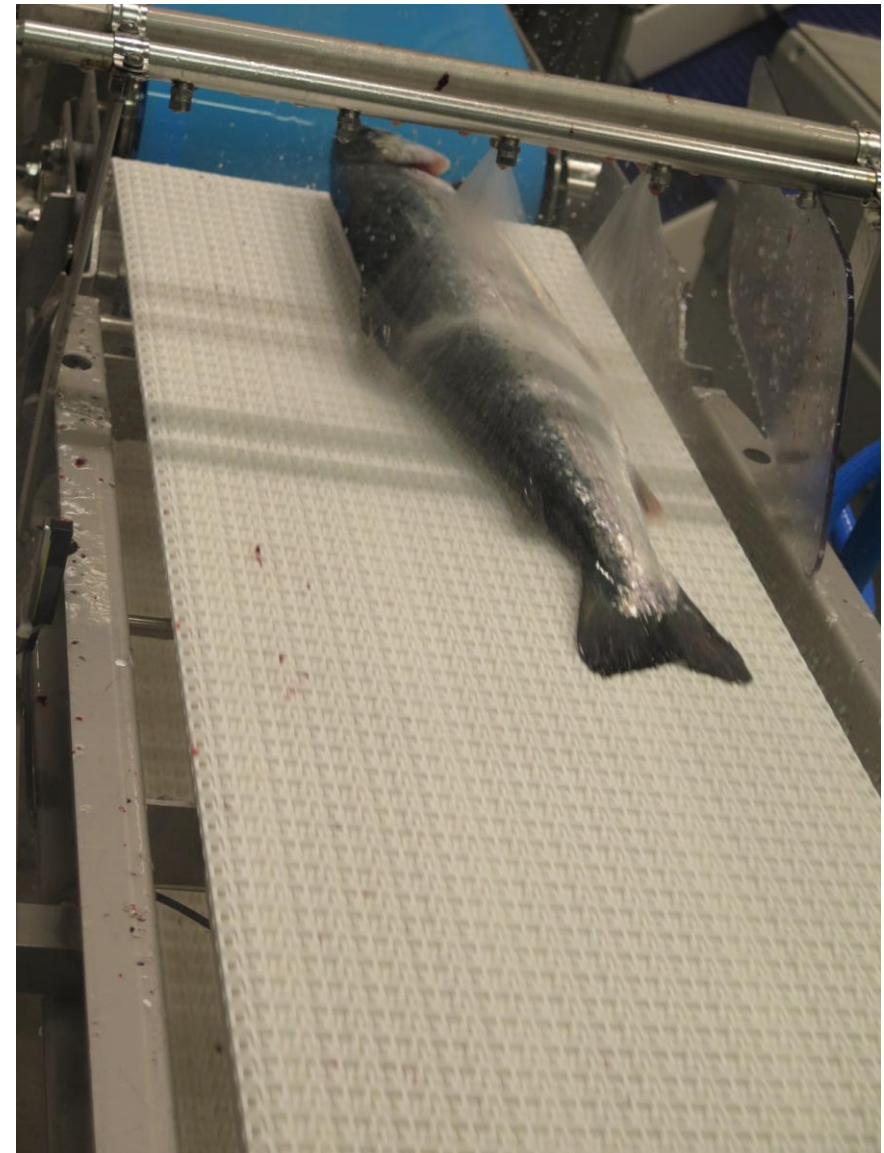
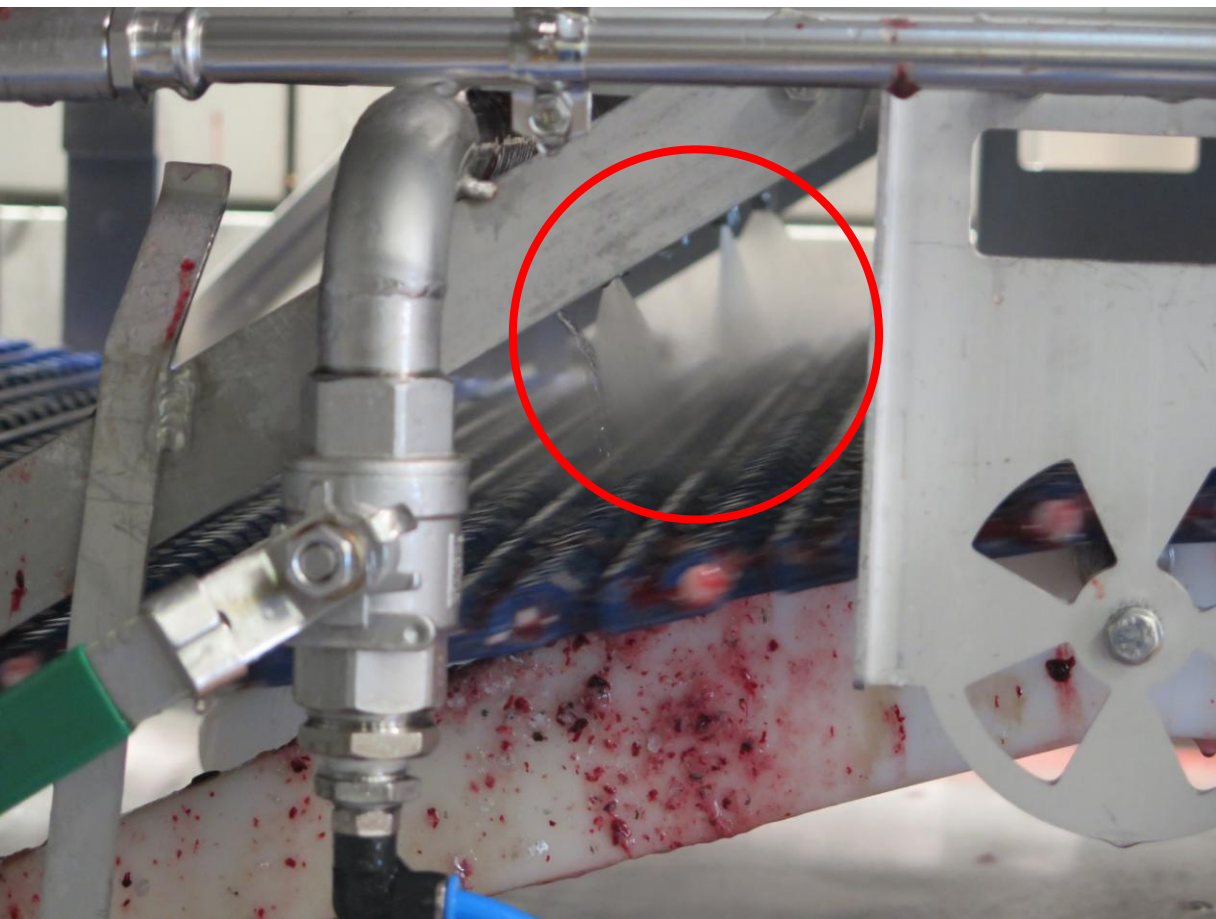
Tekniske og organisatoriske tiltak - spyling



Teknisk tiltak – redusere antall eller trykk på dysene



Tekniske tiltak – plassering av dyser



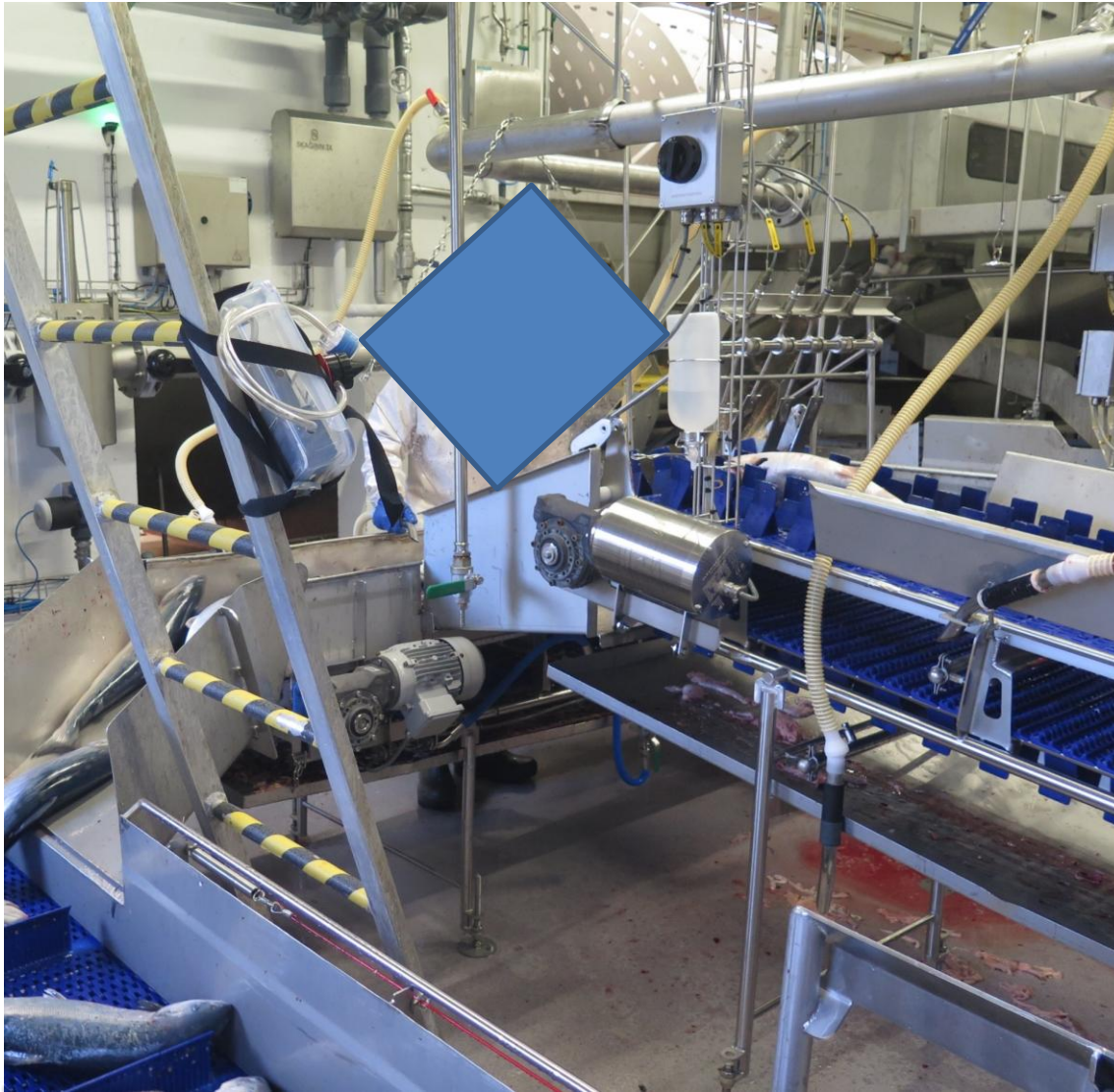
Tekniske tiltak - skjerming



Skjerminga hindrer spruten fra arbeidsoppgaven å spre seg ut i rommet og treffe de øvrige arbeidstakerne



Tekniske tiltak - skjerming



Skjerminga hindrer spruten fra maskinen/båndet å treffe arbeidstakeren som står og gjør sin arbeidsoppgave i enden av båndet

Variasjon mellom ukedager

TABLE III. Exposure Levels of TP, Parvalbumin, and Endotoxin, Stratified by Workday

	Monday		Tuesday		Wednesday		Thursday		Total	
	GM	Range	GM	Range	GM	Range	GM	Range	GM	Range
TP, $\mu\text{g m}^{-3}$	2.56	0.76–6.18	2.74	1.45–7.41	2.81	1.48–6.18	2.81	0.77–12.62	2.72	0.76–12.62
Parvalbumin, ng m^{-3}	6.19	0.30–51.20	6.35	0.20–83.40	6.58	0.20–358.2	7.16	0.30–82.10	6.57	0.20–358.2
Endotoxin, EU m^{-3}	1.39	0.40–6.80	1.52	0.40–29.0	1.53	0.50–6.18	1.65	0.30–10.8	1.52	0.30–29.0



Variasjon mellom bedrifter og avdelinger

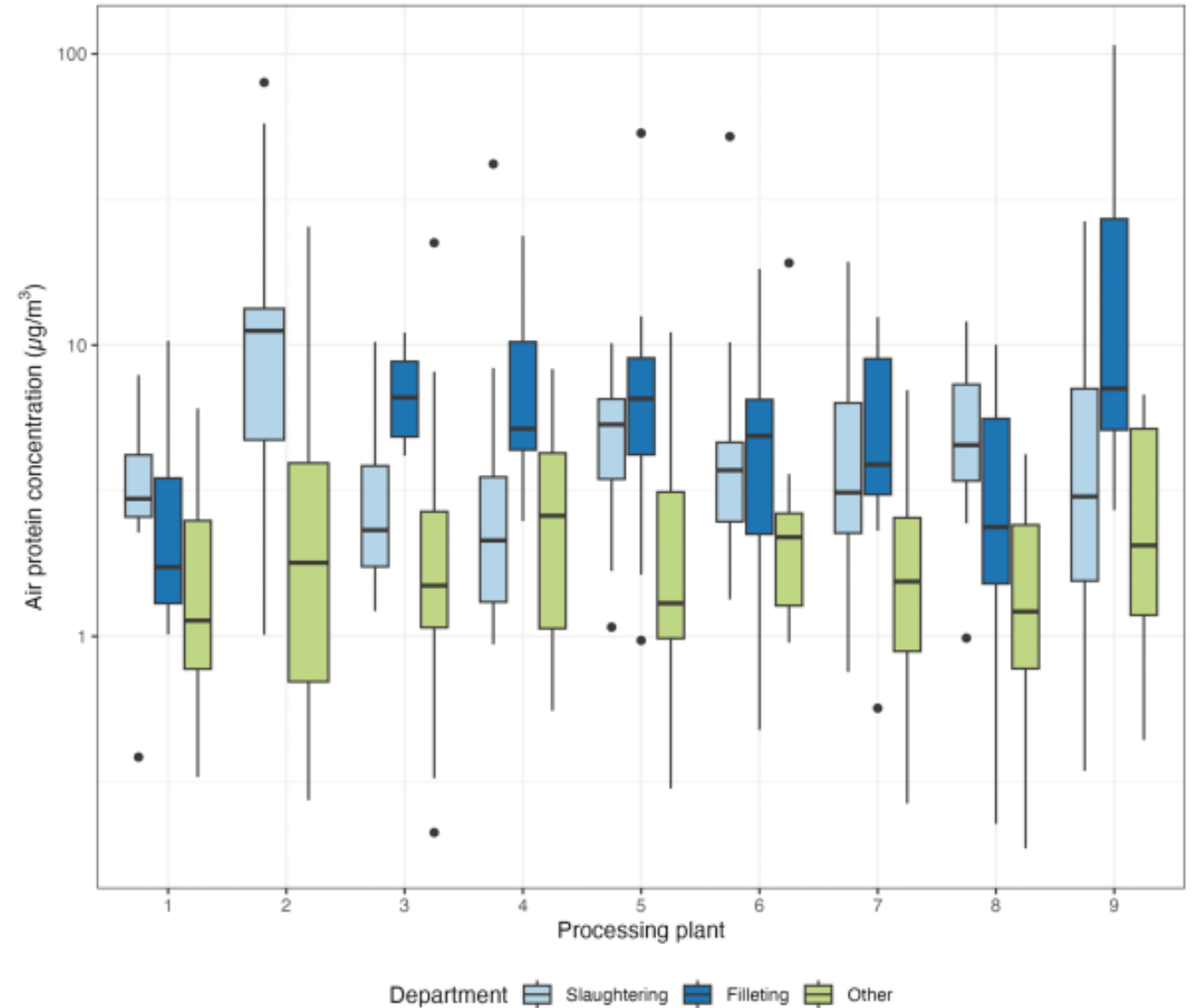


Fig. 2. Box plot of personal exposure to inhalable protein ($\mu\text{g}/\text{m}^3$, on a log scale) in 9 salmon processing plants at slaughtering, filleting, and other areas. Plant 2 did not have a filleting area. The box plot shows median values with its quartiles, 5 and 95 percentiles (lines), and outliers (dots).

<https://academic.oup.com/annweh/article/69/7/708/817821>



Occupational Health in the Seafood Industry

9th – 11th of June 2026
[Radisson Blu Bodø, Norway](#)

Register



About this course

This course addresses a wide range of occupational health issues relevant for the seafood industry. It covers both physical, biological, chemical and psychosocial factors relevant for workers involved in the seafood value chain.

With particular attention to the diversity of the workforce and industry-specific conditions, the course aims to provide a comprehensive understanding of both risks and health-promoting aspects of work in this sector.

Participants will explore key health concerns associated with seafood processing, such as exposure to cold, repetitive work, bioaerosols, and allergens, alongside organisational and psychosocial aspects. The course also focuses on the significant role of immigrant workers in the industry, and how their working conditions are shaped by temporary contracts and structural factors.

Course Summary

🕒 9th – 11th of June 2026

📖 [Onsite course](#)

📍 Radisson Blu Bodø, Norway

Deadline 4th of May 2026

€ EUR 730 – 900 (depending on the day package)

Register now

<https://niva.org/course/occupational-health-in-the-seafood-industry/>

- Med pasienten – for pasienten



<https://www.unn.no/ama/shine>

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