Marine Mammals as a Food Source and Other Alternative Uses



A Canadian Perspective

November 4-5, 2026 - Reykjavik, Iceland

MATIS Workshop and Icelandic Seafood Conference

Heather Burke, Marine Institute, MUN, Canada

Quick Facts About Our Seal Fishery

Canada has a commercial and personal use fishery for Harp seals and Grey seals.

NL has the largest population of harp seals in the world estimated at 4.4 million in 2024 by DFO Science.

The grey seal population has increased to 400,000

Harp seals off the coast of NL are a species of “least concern” according to the International Union for the Conservation of Nature (IUCN) Red List.

The seal harvest is tightly managed by DFO. Sustainable harvest levels are currently estimated at 113,000 – 253,000 harp seals/year. However, average landings are much lower at ~31,000/year since 2021.

Canada’s seal harvest is a science-based, three-step process that ensures seals are harvested humanely



This Photo by Unknown Author is licensed under CC BY-SA

United Seal Industry Association of Newfoundland and Labrador - USIANL |

https://www.dfo-mpo.gc.ca/fisheries-peches/seals-phoques/index-eng.html

Canadian Sealers Association

Why Sealing is Important in Canada

- **Economic Importance** in Canada's remote coastal and northern communities contributing diversity of income sources
- **Social and Cultural Importance**
  - Indigenous peoples in Canada have a constitutionally-protected right to harvest marine mammals, including seals
- **Canadian Government Support**
  - Fisheries and Oceans Canada supports and regulates the seal harvest and ensures it is **sustainable** and conducted **safely** and **humanely**
  - The Canadian seal harvest is one of the world's most highly regulated and monitored harvests of wild animals.
  - It is an **important economic and cultural activity** in communities in Atlantic Canada, Quebec and the Arctic.



This Photo by Unknown Author is licensed under CC BY-SA

https://www.dfo-mpo.gc.ca/fisheries-peches/seals-phoques/harvest-importance-chasse-eng.html

Challenges for the Commercial Sealing Industry in Canada

- Global stigmatization of sealers, sealing and seal products
- Debate over seal predation and cod stock recovery
- Limited market access due to EU and US bans on seal imports
- Full utilization models for harvested animals
- Lack of processing facilities for high value products



Turning Point in the “Seal – Cod” Debate

- Feb 2022 – Fisheries Union launches campaign to educate people about environmental impacts of seals in NL
- April 2022 – Report of the Atlantic Seal Task Team Released
- May 2022 – Canada’s Fisheries Minister Joyce Murray acknowledges “**SEALS EAT FISH**”
- Nov 2022 – DFO hosts a Seal Summit in St. John’s NL



Seals Eat Fish

Key Findings from Recent Newfoundland & Labrador Ecosystem Studies

Harp Seals, Cod Recovery & Ecosystem Change

- The Northern cod collapse in 1990 transformed the Newfoundland and Labrador marine ecosystem.
- Shrimp, crab, and seal populations increased dramatically following the collapse.
- Cod recovery is complex and is affected by both predator-prey dynamics and declining forage fish stocks (capelin).
- Sustainable management requires an ecosystem-based approach that considers the interactions among cod, seals, capelin, and other species.

References: Atlantic Seal Task Team Report (2022); Rapid Ecosystem Change After the Cod Collapse in NL (2024); Increase in Harp Seal Ecosystem Role After the Cod Collapse (2025). DFO Science 2017, 2021, 2022, 2024.

Seal as a Food Source in Canada: And Other Alternative Uses



Source: Fisheries and Oceans Canada



Source: Government of Canada

MARINE INSTITUTE

GRENFELL CAMPUS | MEMORIAL UNIVERSITY

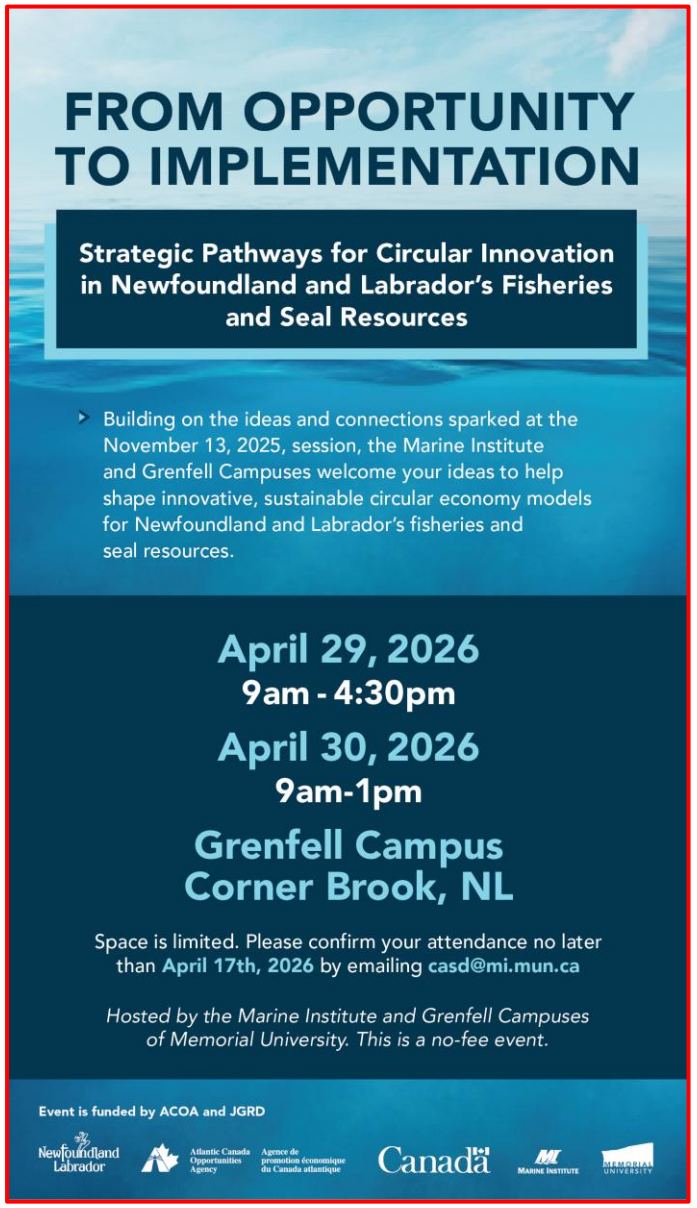
CE Models for the Sustainable Valorization of Fisheries and Seal Resources

Phase 1: April 2025 – Oct 2026

Heather Burke, PhD
Director
Centre for Aquaculture and Seafood Development
Fisheries and Marine Institute

Heather.Burke@mi.mun.ca
709-778-0345



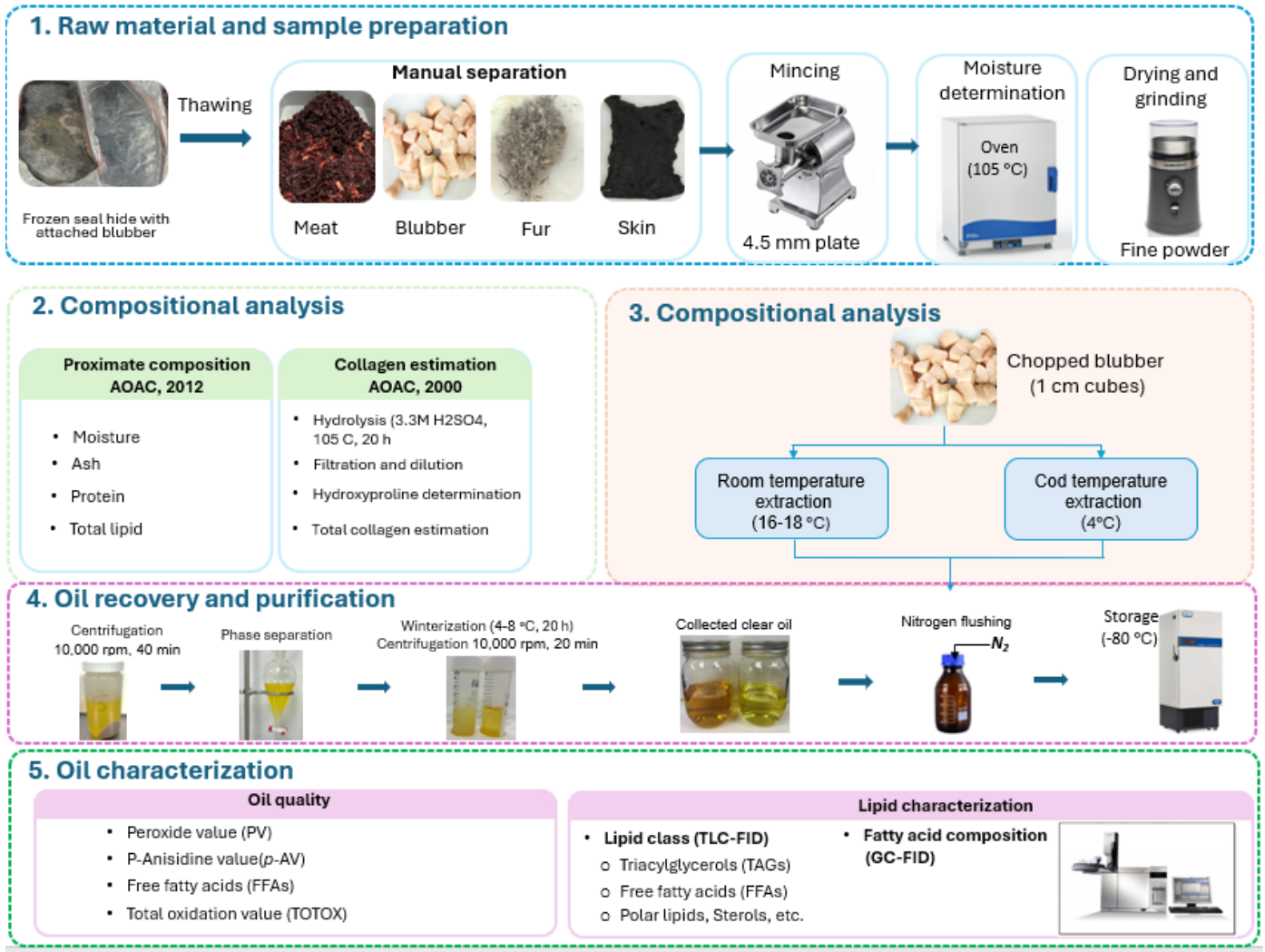


MARINE INSTITUTE





Seal Valorization Pilot Project



Full Utilization of Seal for High Value Products

Characterization study conducted by MI

MARINE INSTITUTE



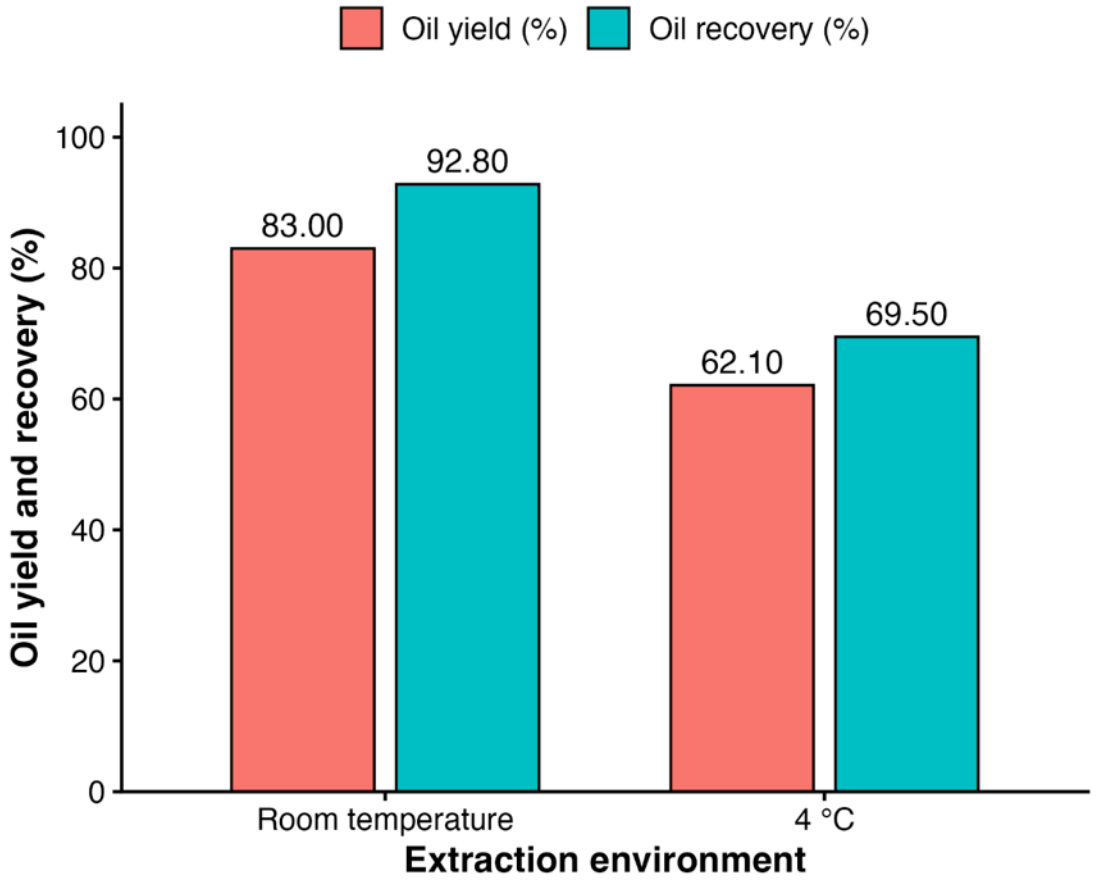
Table 1. Proximate composition of harp seal meat, skin, fur, and blubber

Sample	Moisture (%)	Protein (WWB, %)	Lipid (WWB, %)	Ash (WWB, %)
Meat	71.07 ± 1.12[a]	22.52 ± 0.88[c]	5.21 ± 0.24[b]	1.00 ± 0.01[a]
Skin	66.97 ± 0.20[b]	29.57 ± 0.28[b]	4.27 ± 0.08[c]	0.69 ± 0.03[b]
Fur	39.74 ± 0.83[c]	51.72 ± 1.16[a]	-	0.52 ± 0.04[c]
Blubber	6.93 ± 0.55[d]	-	89.39 ± 0.32[a]	0.04 ± 0.05[d]

Table 2. Quality characteristics of seal blubber oil obtained by solvent-free extraction at different temperatures.

Parameter	Room temperature	4 °C
Peroxide Value (POV) (meq O_2/kg oil)	1.15 ± 0.08[a]	0.38 ± 0.02[b]
p-anisidine (p-AV)	0.61 ± 0.06[a]	0.44 ± 0.03[b]
FFA (% as oleic acid)	17.47 ± 0.03[a]	0.75 ± 0.02[b]
TOTOX	2.91 ± 0.14[a]	1.19 ± 0.02[b]

Characterization of Seal By-products



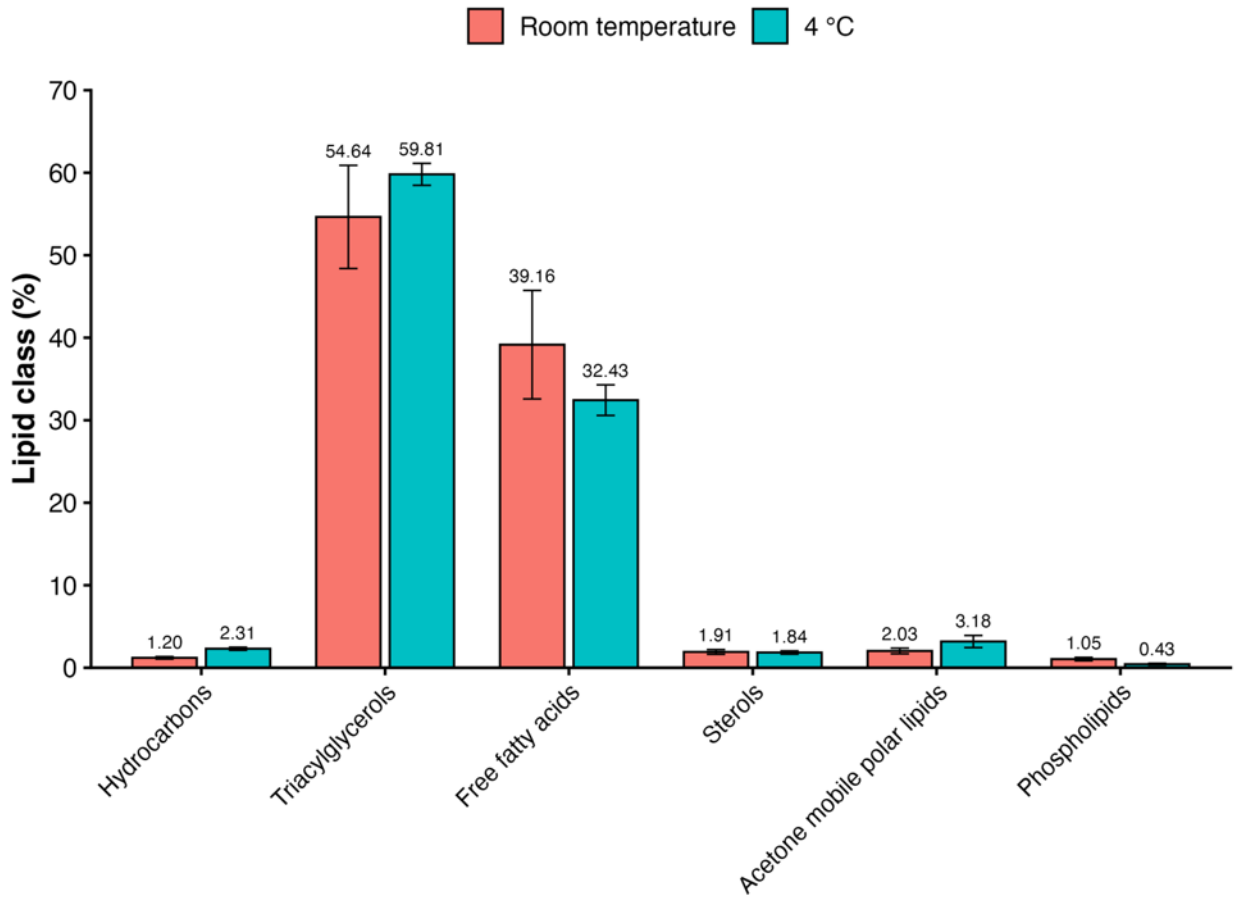


Table 4. Preliminary hydroxyproline and collagen content of harp seal skin (WWB)

Sample	Hydroxyproline (%)	Collagen (%)
Skin	2.33 ± 0.03	18.60 ± 0.22

Fatty Acids %	Room Temp	4°C
Total SFAs	6.94 ± 0.06	7.71 ± 0.02
Total MUFAs	65.63 ± 0.19	65.65 ± 0.02
Total PUFAs	27.75 ± 0.23	26.36 ± 0.24
Total Omega-3	22.75 ± 0.18	22.40 ± 0.18
Total Omega-6	3.22 ± 0.02	3.19 ± 0.05
Omega-6/Omega-3 ratio	0.14 (~1/7)	0.14 (~ 1/7)

Alternative Uses of Seal By-products

MARINE INSTITUTE

Marine Institute of Memorial University of Newfoundland and Labrador
Centre for Aquaculture & Seafood Development
155 Ridge Rd, St. John's, NL, A1B2J9

Provincial R&D Fish Processing License: 2020P20013D
Canadian Food Inspection License: 3GNBB7F6

Product:	**Seal Meat Powder**
Ingredients:	Seal meat
Production date:	July 10, 2026
Packaged on:	July 16, 2026
Allergens:	Produced in a facility that processes shellfish
Product for:	Carino

NOT IN FINAL RETAIL PACKAGING
RESEARCH SAMPLES - NOT FOR SALE IN CANADA

KEEP COOL AND DRY
Net weight: 250 g per bag



SEAL MEAT POWDER

** This product is under development for Carino*



PRODUCT DESCRIPTION
Made from 100% harp seal meat using a low-temperature process to preserve product quality.

STORAGE INSTRUCTIONS
Store in a sealed package in a cool, dry area.

MARINE INSTITUTE

Species	**Harp Seal**
Storage	**Cool dry area**

Composition

Moisture %	6.3 ± 0.21
Crude Protein %	73.9 ± 1.31
Crude Fat %	12.4 ± 0.13
Carbohydrate %	4.2 ± 1.77
Ash Content %	3.2 ± 0.24

Appearance

Color	Black/Red
Product form	Dry powder
Particle Size	≤ 0.5 mm

Contact Information
Marine Institute
Attn. Heather Burke

155 Ridge Road, St. John's NL
A1C 5R3, Canada

Tel. +1-709-778-0345
Heather.Burke@mi.mun.ca

**Updated July 21, 2026*

Proposed Seal Biorefinery Model for Newfoundland and Labrador



Key Takeaways

- **Seals in a Changing Ecosystem**
  Harp seals are key predators in Newfoundland and Labrador's marine ecosystem, where capelin remains critical to post-cod-collapse recovery.
- **Advancing Sustainable Management**
  Ecosystem-based management requires better seal-ecosystem data and stronger collaboration among industry, Indigenous, and academic partners.
- **Unlocking Seal Bioproduct Value**
  Tissue-specific processing can maximize production of high-value oils, proteins, peptides, and collagen from seal by-products leading to **job creation, revitalization of coastal communities,** and the **responsible use of seal resources** through circularity.

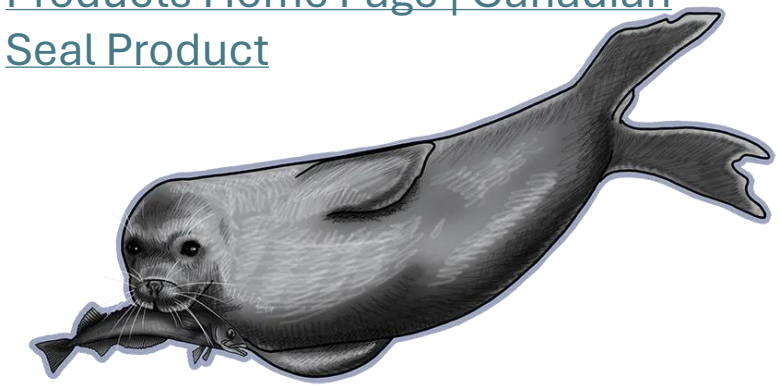
Useful Links:

United Seal Industry Association of Newfoundland and Labrador - USIANL |

https://www.dfo-mpo.gc.ca/fisheries-peches/seals-phoques/index-eng.html

Canadian Sealers Association

Welcome to Canadian Seal Products Home Page | Canadian Seal Product



Thank - You

MARINE INSTITUTE | MEMORIAL UNIVERSITY

MARINE INSTITUTE

Centre for Aquaculture and Seafood Development

Heather Burke, PhD Env. Sci., MBA
Director
Centre for Aquaculture and Seafood Development
Fisheries and Marine Institute MUN

Tel: 1-709-778-0345
Email: heather.burke@mi.mun.ca
www.mi.mun.ca/casd

AI Assistance Disclosure: Microsoft Copilot was used to support content, editing, visualization, and/or formatting. Final review and validation were completed by the author.