Supporting Information

Risk Tradeoffs Associated with Traditional Food Advisories for Labrador Inuit

Ryan S.D. Calder [a,b*], Sabri Bromage [c], Elsie M. Sunderland [a,b]

[a] Department of Environmental Health, Harvard T.H. Chan School of Public Health, Boston MA, 02215, USA
[b] Harvard John A. Paulson School of Engineering and Applied Sciences, Cambridge MA, 02138, USA
[c] Department of Nutrition, Harvard T.H. Chan School of Public Health, Boston MA, 02115, USA

[*] Corresponding author current contact information: Department of Civil and Environmental Engineering, Duke Pratt School of Engineering. 1116 Hudson Hall, Box 90287, Duke University, Durham NC, 27708, USA. T: (919) 355-6876; F: (919) 660-5219; ryan.calder@duke.edu

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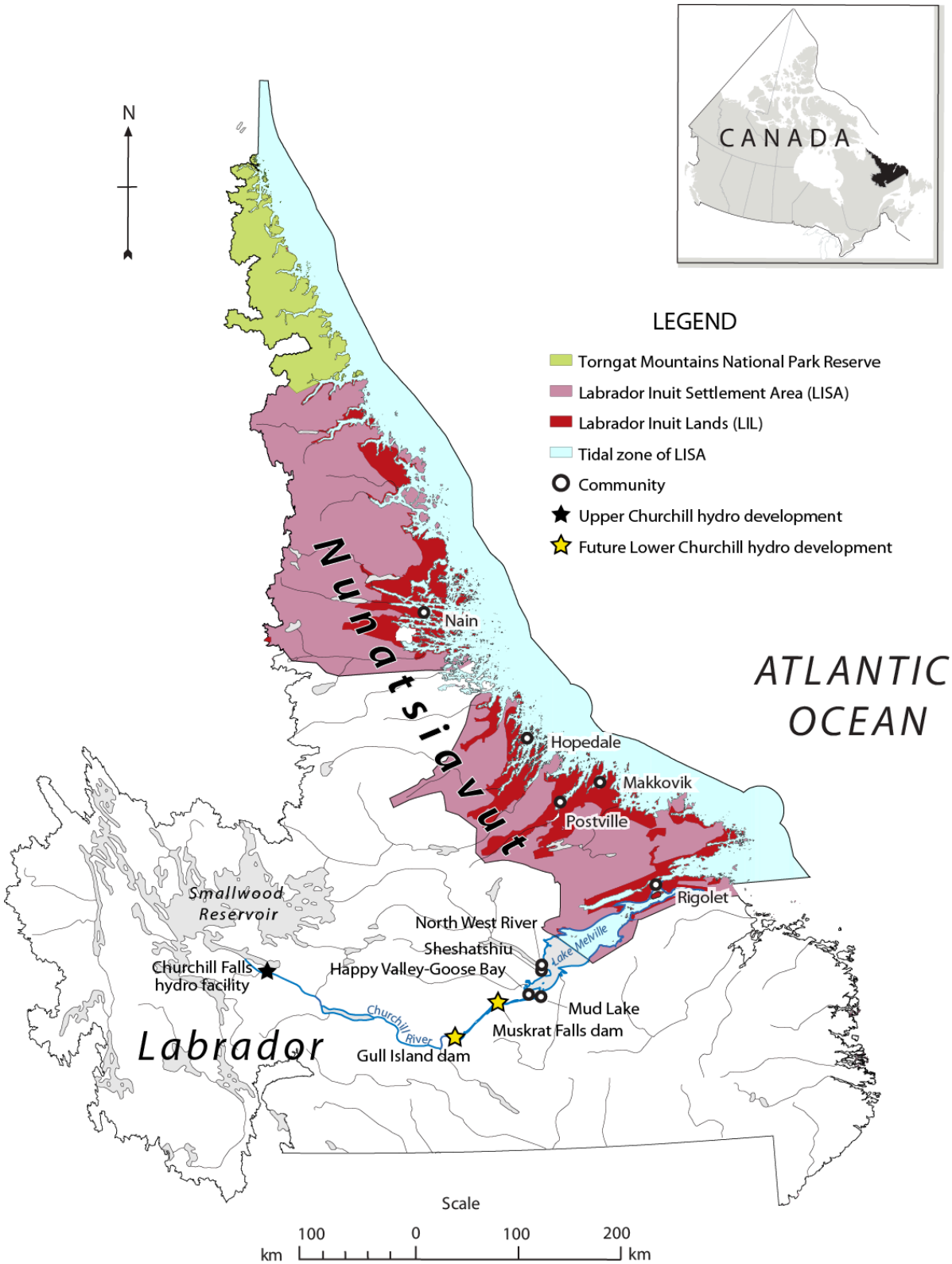

Figure S1: Map of the Labrador Inuit Settlement Area, existing and future hydroelectric developments on the Churchill River, and locations of indigenous communities. Source: Durkalec et al. (2016). Reprinted with permission from Nunatsiavut Government.

Table S1: Food frequency questionnaire data collected in March/April (winter), June/July (spring) and August/September (summer) 2014, adapted from Calder et al. (2016).

Demographic Group	Winter (*n*)	Spring (*n*)	Summer (*n*)	Total (*n*)	Unique individuals (fraction of Inuit population)[a]
All individuals	231	294	1054[b]	1579[b]	1,145[b]
Non-Inuit household[c] members	34	49	167	250	188
Inuit individuals	197	245	882	1324	952 (38%)
Communities					
Happy Valley-Goose Bay[d]	170	217	667	1054	745 (31%)
North West River	30	34	158	222	167 (43%)
Rigolet	31	43	229	303	233 (87%)
Demographic Group[e]					
Women of childbearing age (16-49)[f]	59	77	278	414	306
Children ≤12 years	55	59	166	280	179
Women of childbearing age (16-49) & children ≤ 12 in Rigolet	15	19	100	134	101
All male >12 years	74	108	387	569	406
All female > 49 years	28	37	191	256	200

[a] Data from some individuals are for multiple survey periods. Total Inuit population is based on the 2011 Census and National Household Survey (Statistics Canada 2012; Statistics Canada 2013).
[b] Total includes three individuals who did not report Inuit status.
[c] Non-Inuit individuals who share a household with a registered Inuit beneficiary identified by the Nunatsiavut Government were included in the survey.
[d] Includes the nearby community of Mud Lake (*n* = 22).
[e] Combined data for all three communities.
[f] As defined by the U.S. National Health and Nutrition Examination Survey (McDowell et al. 2004).

Table S2: Demographic breakdown of study participants in summer survey round vs. general population.

	Happy Valley-Goose Bay		North West River		Rigolet	
Male	Sample[a]	Population[b]	Sample[a]	Population[b]	Sample[a]	Population[b]
0–17	64	830	5	60	29	35
18–44	105	1,405	13	85	41	65
45–64	75	1,100	28	95	31	40
≥65	31	320	29	35	10	20
Female						
0–17	80	218	7	50	34	35
18–44	171	407	16	85	45	55
45–64	94	278	31	95	30	40
≥65	41	87	27	35	8	5

[a] Summer (August-September) survey round only. Excludes nine participants whose age was not recorded.

[b] Age bracket counts available for total (Inuit and non-Inuit) population only rounded to multiples of 5 (Statistics Canada 2013). Sample as a fraction of total Inuit population reported in Table S1.

Table S3: MeHg concentrations, dietary database information and per-capita caloric significance for locally caught traditional seafood

Food name (nutritional category)[a]	Name in nutritional database	Database code[b]	Baseline calories (%)[c]	MeHg Mean ± SD (ng g^{-1} ww)[d]
Arctic char liver (FL)	n/a		4.7	75.5
Arctic char muscle (FM)	Fish, arctic char, native, meat, raw	3230	4.9	62.4 ± 41.8
Arctic char roe (FR)	Fish, roe, mixed species, raw	3045	0.1	7.49
Atlantic cod muscle (FM)	Fish, cod (scrod), Atlantic, baked or broiled	3195	5.1	186 ± 57.4
Atlantic salmon liver (FL)	Fish, salmon, native, king or chinook, liver	5899	0.7	88.6
Atlantic salmon muscle (FM)	Fish, salmon, Atlantic, wild, baked or broiled	3156	46.9	73.2 ± 20.1
Atlantic salmon roe (FR)	Fish, salmon, native, eggs, raw	5928	1.9	8.78
Brook trout liver (FL)	n/a		0.8	95.2 ± 34.4
Brook trout muscle (FM)	Fish, trout, brook, raw	7234	11.7	105 ± 34.4
Brook trout roe (FR)	Fish, roe, mixed species, raw	3045	0.6	52.7 ± 22.4
Capelin muscle (FM)	Fish, smelt, rainbow (American, capelin), baked or broiled	3065	0.9	17 ± 2.24
Capelin roe (FR)	Fish, roe, mixed species, raw	3045	0.04	2.04
Clams (SF)	Mollusks, clam, mixed species, boiled or steamed	3111	0.2	10 ± 2
Flatfish (FM)	Fish, flatfish (flounder or sole or plaice), baked or broiled	3007	0.03	68 ± 41
Itiks (SF)	n/a		0.03	40
Lake trout (FM)	Fish, trout, brook, raw	7234	0.9	99 ± 46
Mussels (SF)	Mollusks, mussel, blue, boiled or steamed	3116	1.5	3.46 ± 0.5
Ouananiche (FM)	Fish, salmon, Atlantic, wild, baked or broiled	3156	0.02	150 ± 110
Porpoise blubber (MM)	n/a		0.02	~0
Porpoise liver (MM)	n/a		0	1,220 ± 870
Porpoise meat (MM)	n/a		0.02	600 ± 450
Rock cod liver (FL)	Fish, lingcod, native, liver	5888	1.0	225
Rock cod muscle (FM)	Fish, cod (scrod), Atlantic, baked or broiled	3195	1.5	186 ± 57.4
Scallops (SF)	Mollusks, scallop (bay and sea), cooked, steamed	5634	0.9	22
Sculpin liver (FL)	n/a		0	87.5 ± 86.4
Sculpin muscle (FM)	Fish, sculpin, native, raw	5919	0.1	231 ± 91.8
Seal blubber (MM)	Game meat, native, ringed seal, blubber, boiled	5781	4.1	~0
Seal liver (MM)	Game meat, native, ringed seal, liver, raw	5788	2.0	175 ± 119
Seal kidney (MM)	n/a		1.6	261 ± 74.5

[a] FL = fish liver; FM = fish muscle; FR = fish roe; MM = marine mammal; SF = shellfish.
[b] From Canada Nutrient File.
[c] Fraction of total per-capita calories from all locally caught traditional seafood (summer 2014).
[d] From Calder et al. (2016).
n/a: Data not available and values are calculated as average of other foods in same nutritional category.

Table S3 (cont'd): MeHg concentrations, dietary database information and per-capita caloric significance for locally caught traditional seafood

Food name (nutritional category)[a]	Name in nutritional database	Database code[b]	Baseline calories (%)[c]	MeHg Mean ± SD (ng g^{-1} ww)[d]
Seal muscle (MM)	Game meat, native, ringed seal, meat, boiled	5783	5.1	172 ± 110
Smelt (FM)	Fish, smelt, rainbow (American, capelin), baked or broiled	3065	2.7	114 ± 49.2
Whale blubber (MM)	Whale, bowhead, skin and subcutaneous fat (muktuk)	35086*	0.06	~0
Whale muscle (MM)	Game meat, whale, raw	3648	0	75 ± 21
Wrinkles (SF)	Pacific surf, cooked periwinkle meat	45002474*	0.1	40

[a] FM = fish muscle; MM = marine mammal; SF = shellfish.
[b] Codes with * are from USDA Nutrient Database; other foods are from the Canada Nutrient File.
[c] Fraction of total per-capita calories from all locally caught traditional seafood (summer 2014).
[d] From Calder et al. (2016).

Table S4: MeHg concentrations, dietary database information and per-capita caloric significance for other locally caught traditional foods

Food name (nutritional category) [a]	Name in nutritional database	Database code[b]	Baseline calories (%)[c]	MeHg Mean ± SD (ng g^{-1} ww)[d]
Bakeapples (FR)	Cloudberry (bakeapple), native	5939	9.42	~0
Black bear (TM)	Game meat, native, bear, simmered	3566	0.9	~0
Caribou (TM)	Game meat, native, caribou (reindeer), meat, cooked	3578	7.7	~0
Duck eggs (EG)	Egg, duck, whole, fresh, raw	1138*	1.7	30 ± 3
Duck muscle (FP)	Duck, wild, native, cooked	5931	5.4	117 ± 75.7
Eider muscle (FP)	n/a		2.3	113 ± 33
Goose muscle (FP)	Goose, domesticated, meat only, roasted	672	12.5	~0
Guillemot eggs (EG)	n/a		0	210 ± 9.59
Guillemot muscle (FP)	n/a		0.17	270 ± 70
Gull eggs (EG)	n/a		3.6	59.5 ± 7.84
Gull muscle (FP)	n/a		0.01	230 ± 27.1
Labrador tea (FR)	n/a		0.06	~0
Loon eggs (EG)	n/a		0.03	900 ± 1,880
Loon muscle (FP)	n/a		0	846 ± 237
Moose (TM)	Game meat, native, moose, roasted	3588	9.2	~0
Okalik/Hare (TM)	Game meat, native, rabbit, wild, cooked	3596	0.4	~0
Owl muscle (FP)			0.01	~0
Partridge muscle (FP)	Spruce grouse, native, meat, cooked		10.5	~0
Polar bear meat (TM)	Game meat, native, polar bear, meat, boiled	5834	0.03	70 ± 50
Rabbit (TM)	Game meat, native, rabbit, wild, cooked	3596	2.3	~0
Red berries (FR)	n/a		12	~0
Sandpiper (FP)	n/a		0.4	70 ± 7
Snowbird (FP)	n/a		0	~0
Tern eggs (EG)	n/a		1.2	424 ± 107
Tern muscle (FP)	n/a		0.23	233 ± 246
Wild blackberries (FR)	Blackberry, raw		1.1	~0
Wild blueberries (FR)	Blueberry, raw		10.2	~0
Wild raspberries (FR)	Raspberry, wild, raw		5.6	~0
Other picked berries (FR)	n/a		2.2	~0
Other wild plants (FR)	n/a		0.6	~0

[a] EG = egg; FR = fruit; FP = fowl/poultry; TM = terrestrial mammal; FR = fruit.
[b] Codes with * are from USDA Nutrient Database; other foods are from the Canada Nutrient File.
[c] Fraction of total per-capita calories from all other locally caught food (summer 2014).
[d] From Calder et al. (2016).
n/a: Data not available and values are calculated as average of other foods in same nutritional category.

Table S5: MeHg concentrations, dietary database information and per-capita caloric significance for store-bought seafood

Food name (nutritional category)[a]	Name in nutritional database	Database code[b]	Baseline calories (%)[c]	MeHg Mean ± SD (ng g^{-1} ww)[d]
Battered cod (FM)	Sea Cuisine, breaded cod tender flaky fillets	4511–9629*	11.5	110.0 ± 64.7
Battered haddock (FM)	Gorton's, haddock breaded fish sticks	4504–5406*	0.9	59.1 ± 26.9
Brook trout (FM)	Fish, trout, brook, raw	7234	0.6	87.9 ± 41.0
Canned oysters (SF)	Mollusks, oyster, eastern (blue point), wild, canned, solids and liquid	3121	0.7	2.6 ± 2.9
Canned salmon (FM)	Fish, salmon, chum (keta), canned, drained, solids with bone, salted	3218	3.7	40.0 ± 19.5
Canned tuna (FM)	Fish, tuna, light, canned in water, drained, unsalted	3131	13.1	162.4 ± 136.8
Catfish (FM)	Fish, catfish (wolffish), Atlantic, baked or broiled	3170	0	40.1 ± 19.0
Clams (SF)	Mollusks, clam, mixed species, boiled or steamed	3111	1.5	10.0 ± 2.0
Crab (SF)	Crustaceans, crab, red, steamed	3238	3.1	60.1 ± 27.0
Fish sticks (pollock) (FM)	Fish, fish sticks, frozen, prepared	3006	3.7	18.7 ± 10.9
Fresh cod (FM)	Fish, cod (scrod), Atlantic, baked or broiled	3195	18.3	110.9 ± 66.0
Fresh pollock (FM)	Fish, pollock, Atlantic (Boston blue), baked or broiled	3152	1.5	19.0 ± 10.6
Fresh tuna (FM)	Fish, tuna, skipjack (aku), baked or broiled	3166	1.2	440.1 ± 246.1
Herring (FM)	Fish, herring, Atlantic, baked or broiled	3015	3.0	18.0 ± 10.2
Lobster (SF)	Crustaceans, lobster, American (northern), boiled or steamed	3210	3.4	36.0 ± 16.9
Mussels (SF)	Mollusks, mussel, blue, boiled or steamed	3116	8.7	24.0 ± 12.5
Rainbow trout (FM)	Fish, trout, rainbow, farmed, baked or broiled	3187	0.9	34.0 ± 17.5
Salmon (FM)	Fish, salmon, Atlantic, wild, baked or broiled	3156	8.7	42.0 ± 19.8
Sardines (FM)	Fish, sardine, Atlantic, canned in oil, drained solids with bone	3203	5.0	34.9 ± 17.5
Scallops (SF)	Mollusks, scallop (bay and sea), cooked, steamed	5634	4.7	22.1 ± 12.1
Shrimp (SF)	Crustaceans, shrimp, mixed species, boiled or steamed	3212	5.9	30.9 ± 15.7
Skate (FM)	n/a		0	118 ± 50.7
Sole (FM)	Fish, flatfish (flounder or sole or plaice), baked or broiled	3007	0.05	101.3 ± 39.8
Tilapia (FM)	Fish, tilapia, baked or broiled	5697	0.1	20.1 ± 10.8

[a] FM = fish muscle; SF = shellfish.
[b] Codes with * are from USDA Nutrient Database. Other foods are from the Canada Nutrient File.
[c] Fraction of total per-capita calories from all store-bought seafood (summer 2014).
[d] From Calder et al. (2016).
n/a: Data not available and values are calculated as average of other foods in same nutritional category.

Supplemental methods for dietary survey

Food frequency questionnaire design

We designed the food frequency questionnaire (FFQ) in collaboration with a committee of Inuit elders convened by the Nunatsiavut Government (NG). Through this collaborative process, we developed an exhaustive list of traditional foods eaten by Labrador Inuit. We also explored the feasibility of different ways of measuring food intake (recall, journals, etc.). It was decided that a self-reported recall instrument administered by trained interviewers was likely to maximize enrollment and consistency of results.

We designed standardized clay models for participants to use to describe their average serving size of each food they reported eating. These models corresponded to serving sizes ranging between approximately 115 and 290 g.

Participant recruitment

The NG enrolled participants in the study through bilingual (English/Inuktitut) informational posters dispersed through the communities, informational sessions organized by staff from the NG Environmental Division and informational phone calls to community members registered as NG 'beneficiaries' (Inuit with a demonstrated connection to the Labrador Inuit Land Claims Area). Participants were entered into two raffles for three prizes each ranging from 250 to 1,000 CAD to incentivize 1) participation in all three survey periods (n = 147) and 2) participating in the larger-scale summer period (n = 1,054).

Hair Hg analysis

Trained research assistants collected hair samples from all willing participants in the Spring and Summer survey periods. Hair was collected from the occipital region of the scalp and we analyzed the 2 cm proximal ends of each sample for total Hg as an indicator of MeHg exposure over the past two to three months. The analytical procedure for total mercury used thermal decomposition, amalgamation, and atomic absorption spectrophotometry following US EPA method 7473 on a Nippon MA-3000 or Milestone DMA-80 at Harvard University. One method blank and one sample containing certified hair reference material were tested every 10 samples and all recoveries were within certified ranges. The mean relative standard deviation of replicate samples was 8.6%.

Table S6: Dietary database information and per-capita caloric significance for store-bought nutritious foods

Food name (nutritional category)[a]	Name in nutritional database	Database code[b]	Baseline calories (%)[c]	Retail and consumer waste (%)[d]
All fresh fruits (FR)	Apple, Gala, raw, with skin	7216	6.1	40
All frozen fruits (FR)	Blueberry, frozen, unsweetened	1706	0.04	0
All fresh vegetables, except whole pumpkins (VE)	Brussels sprouts, boiled, drained	2379	4.8	40
All frozen vegetables (excluding French fries, etc.) (VE)	Broccoli, frozen, chopped, boiled, drained	2377	0.08	0
All-purpose flour, whole-wheat flour, rye flour and other semi-perishable flours (except cake flour and pastry flour) (GR)	Grains, wheat flour, white, all purpose, bleached	4501	0	29
Bacon (PM)	Pork, cured, back bacon, pan-fried	7219	4.8	15
Bread (except garlic bread) (GR)	Bread, white, commercial	4066	8.3	29
Bread products without filling or coating (GR)	English muffin, wheat	3906	2.9	29
Butter (DA)	Butter, regular	118	1.4	15.5
Cheese (including block cheese, shredded cheese and cottage cheese) (DA)	Cheese, cheddar	119	1.2	15.5
Chocolate milk (DA)	Milk, fluid, chocolate, whole	69	1.7	15.5
Combination foods (e.g., lasagna)	Lasagna with meat and sauce, frozen	5870	0.5	0
Cook-type cereals (e.g., oatmeal and porridge) (GR)	Cereal, hot, oats, porridge	1432	0.03	29
Cooking oils (e.g., canola, peanut, olive and linseed)	Vegetable oil, canola	451	1.0	0
Crackers, crisp bread, hard bread, Pilot biscuits, Melba toast, arrow-root biscuits and Social Tea biscuits (GR)	Snacks, rice cakes, crackers (include mini rice cakes)	5493	1.1	29

[a] Food name/category from the Nutrition North program; FM = FR = fruit; VE = vegetables; GR = grains; PM = processed meat; DA = dairy.
[b] From the Canada Nutrient File.
[c] Fraction of total per-capita calories from all store-bought nutritious foods (summer 2014).
[d] From Gustavsson et al. (2011).

Table S6 (cont'd): MeHg concentrations, dietary database information and per-capita caloric significance for store-bought nutritious foods

Food name (nutritional category)[a]	Name in nutritional database	Database code[b]	Baseline calories (%)[c]	Retail and consumer waste (%)[d]
Cream, sour cream, cream cheese (DA)	Cream, sour, cultured, 18% M.F.	152	1.2	15.5
Dried fruits (e.g., grapes, dates, cranberries and apricots) (FR)	Apple, dried, sulphured, uncooked	1490	0.2	67.2
Eggs and egg substitutes (EG)	Egg, chicken, whole, fresh or frozen, raw	125	4.4	15
Enriched soy milk	Plant-based beverage, soy, enriched, all flavours	6720	0.2	15.5
Fresh and frozen meat other than side bacon and products that are breaded, battered or in pastry (RM)	Beef, ground, lean, raw	2683	21.7	15
Fresh and frozen pasta (except combined foods containing pasta) (GR)	Pasta, fresh-refrigerated, plain, as purchased	4502	0	29
Fresh and frozen pizzas	Fast foods, pizza, cheese, meat and vegetable, regular crust, frozen, cooked	5862	4.9	0
Fresh and frozen poultry e.g., chicken, turkey, goose) other than products that are breaded, battered or in pastry (FP)	Chicken, broiler, breast, skinless, boneless, meat, grilled	7322	5.8	15
Fresh and frozen seafood, other than products that are breaded, battered or in a pie crust (FM)	Fish, tuna, white, canned with water, drained, salted	3084	Counted in Table S4	n/a
Fresh milk (DA)	Milk, fluid, partly skimmed, 2% M.F.	61	2.6[e]	15.5
Frozen French fries, home fries and similar potato-based products	Potato, french-fried, frozen, shoestring, heated in oven	6517	5.3	0
Ice cream, iced milk, iced yogourt and sorbet (DA)	Dessert, frozen, ice cream, chocolate	4288	2.6[g]	15.5
Individually wrapped unsweetened juice (all sizes)	Apple juice, canned or bottled, unsweetened, calcium and Vitamin C and D added	7419	0.8	0
Lard and shortening	Shortening, household, unspecified vegetable and animal oils	539	1.5	0

[a] Food name/category from the Nutrition North program; FM = FR = fruit; VE = vegetables; GR = grains; PM = processed meat; DA = dairy.
[b] From the Canada Nutrient File.
[c] Fraction of total per-capita calories from all store-bought nutritious foods (summer 2014).
[d] From Gustavsson et al. (2011).

Table S6 (cont'd): MeHg concentrations, dietary database information and per-capita caloric significance for store-bought nutritious foods

Food name (nutritional category)[a]	Name in nutritional database	Database code[b]	Baseline calories (%)[c]	Retail and consumer waste (%)[d]
Margarine	Margarine, tub, hydrogenated, canola oil	7575	1.5	0
Melted cheese spreads (e.g., Cheez Whiz)	Kraft Cheez Whiz Pasteurized Process Cheese Sauce	1188*	0.04	0
Peanut butter and other nut butters	Peanut butter, natural	6289	0.7	81.4
Perishable dips	Dip, cream cheese base	6786	0.5 [f]	0
Powdered and evaporated milk	Milk, evaporated, whole, canned, undiluted, 7.8% M.F.	140	0.02	0
Processed cheese (e.g., Velveeta)	Kraft Velveeta Pasteurized Process Cheese Spread	1191*	1.8	0
Ready-to-eat breakfast cereals (GR)	Cereal, ready to eat, Life, Quaker	1258	0.8	29
Salad dressing and mayonnaise	Salad dressing, mayonnaise type, commercial, regular	527	1.3	0
Tofu and other vegetable-based meat substitutes (e.g., vegetable patties and nut burgers)	Tofu, silken, firm	4911	0	0
UHT milk (DA)	Milk, fluid, whole, pasteurized, homogenized, 3.25% M.F.	113	1.0 [h]	15.5
Unsweetened nuts and grains (GR)	Nuts, mixed nuts, dry roasted with peanuts	2577	0.6	0
Yogurt and yogurt drinks (DA)	Yogourt, plain (2-3.9% M.F.)	6961	1.3 [f]	15.5

[a] Food name/category from the Nutrition North program; GR = grains; DA = dairy.
[b] From the Canada Nutrient File.
[c] Fraction of total per-capita calories from all store-bought nutritious foods (summer 2014).
[d] From Gustavsson et al. (2011).

Table S7: Probability distribution of peak MeHg concentrations in locally caught traditional foods following upstream hydroelectric development, first reported by Calder et al. (2016)

Species	Expected mean	75th percentile	90th percentile	95th percentile
Arctic char				
Muscle	0.41	0.51	0.78	1.0
Liver	0.49	0.58	0.70	0.80
Roe	0.05	0.06	0.07	0.08
Atlantic cod	0.41	0.50	0.65	0.76
Atlantic salmon				
Muscle	0.16	0.20	0.25	0.29
Liver	0.20	0.23	0.28	0.31
Roe	0.020	0.023	0.027	0.031
Black duck				
Muscle	0.44	0.55	0.83	1.1
Eggs	0.11	0.13	0.16	0.18
Brook trout				
Muscle	0.68	0.84	1.1	1.3
Liver	0.62	0.76	1.0	1.2
Roe	0.34	0.42	0.58	0.70
Capelin				
Muscle	0.04	0.05	0.06	0.07
Roe	0.01	0.01	0.01	0.01
Clams	0.03	0.03	0.04	0.04
Eider				
Muscle	0.20	0.24	0.30	0.34
Flatfish	0.17	0.22	0.32	0.40
Green sea urchin	0.10	0.12	0.14	0.16
Guillemot				
Muscle	0.68	0.82	1.0	1.2
Eggs	0.53	0.61	0.74	0.84
Gull				
Muscle	0.41	0.46	0.54	0.59
Eggs	0.15	0.18	0.21	0.24
Lake trout	1.0	1.3	1.8	2.2
Loon				
Eggs	5.6	5.7	13.3	20.9
Minke whale	0.07	0.09	0.10	0.11
Mussels	0.01	0.01	0.01	0.01
Ouananiche	1.5	1.9	3.0	3.9
Periwinkles	0.10	0.12	0.14	0.16
Porpoise				
Muscle	1.4	1.8	2.7	3.5
Liver	2.8	3.6	5.2	6.8
Rock cod				
Muscle	0.42	0.50	0.65	0.77
Liver	0.50	0.58	0.70	0.79

Table S8 (cont'd): Probability distribution of peak MeHg concentrations in locally caught traditional foods following upstream hydroelectric development, first reported by Calder et al. (2016)

Species	Expected mean	75th percentile	90th percentile	95th percentile
Scallops	0.06	0.07	0.08	0.09
Sculpin				
Muscle	0.54	0.66	0.88	1.0
Liver	0.20	0.24	0.42	0.58
Seal				
Muscle	0.66	0.82	1.3	1.6
Liver	0.67	0.84	1.3	1.7
Kidney	1.0	1.2	1.6	1.9
Smelt	0.29	0.36	0.48	0.58
Tern	0.41	0.50	0.86	1.2

Derivation of dose-response functions for cardiovascular and cancer risks

Overall relative risks for cardiovascular and cancer death for each scenario are calculated as the product of individual relative risk equations developed based on dose-response information from the literature. This is presented in Equation S1where *RR* is the relative risk for cancer or cardiovascular death (*i*) for all individual nutrients, foods and contaminants (*j*) considered and presented in Tables 2 and 3 in the main text.

$$RR_i = \prod_{j=1}^{n} RR_{ij} \quad [S1]$$

Cause-specific relative risks of cancer or cardiovascular death (*i*) are calculated as a function of the change in dose (Δ) in nutrient, food or contaminant (*j*) in model dietary scenarios based on the relative risk calculated using the dose-response information the literature, scaling according to the magnitude of the dose of the substitution in the dietary model vs. the dose considered in the literature (Equation S2).

$$RR_{ij} = \exp\left(\log\left(RR_{ij}^{lit}\right) \times \frac{\Delta_{\mathrm{j}}^{model}}{\Delta_{\mathrm{j}}^{lit}}\right) \quad [S2]$$

Dose-response information in the literature is often presented for specific causes of mortality (e.g., relative risk of death from ischemic stroke or from pancreatic cancer) (*k*). To express this in terms of relative risk of overall mortality (e.g., relative risk of cardiovascular death or cancer death) (*i*), we consider the fraction at baseline of more general mortality associated with the more specific causes of death (*f*) for which dose-response information is available, according to Equation S3.

$$RR_{ij}^{lit} = 1 + \left(f_{ik}\left(RR_{kj}^{lit} - 1\right)\right) \quad [S3]$$

Tables 2 and 3 in the main text present values for RR_{jk}^{lit}, f_{ik} and $\Delta_{\mathrm{j}}^{lit}$ for cardiovascular and cancer dose-response functions, respectively.

Table S8: Summary statistics for modeled population-wide MeHg exposures

Demographic Group	MeHg exposure percentiles (µg kg^{-1} day^{-1})				Fraction of population exceeding threshold	
	50th (median)	90th	95th	99th	US EPA RfD (0.1 µg kg^{-1} day^{-1})	Health Canada pTDI[a]
Winter 2014						
All individuals	0.03	0.11	0.14	0.22	10.45%	1.24%
Spring 2014						
All individuals	0.01	0.05	0.09	0.16	4.29%	0.02%
Summer 2014						
All individuals	0.02	0.08	0.12	0.26	6.85%	0.89%
Communities						
Happy Valley-Goose Bay	0.02	0.07	0.09	0.21	4.88%	0.71%
North West River	0.02	0.07	0.09	0.19	3.90%	0%
Rigolet	0.05	0.2	0.27	0.5	24.38%	3.14%
Males						
All males	0.02	0.1	0.16	0.36	10.35%	1.35%
M 0–17	0.01	0.07	0.21	0.31	7.93%	3.68%
M 18–44	0.02	0.07	0.11	0.21	5.82%	0.15%
M 45–64	0.03	0.12	0.18	0.62	13.40%	1.42%
M ≥65	0.04	0.2	0.23	0.37	23.28%	0.36%
Females						
All females	0.02	0.06	0.08	0.14	3.42%	0.44%
F 0–17	0.01	0.06	0.09	0.17	4.70%	0.58%
F 18–44	0.01	0.04	0.06	0.16	2.28%	0.55%
F 45–64	0.02	0.06	0.07	0.13	2.87%	0.31%
F ≥65	0.03	0.09	0.1	0.16	6.93%	0%

[a] Tolerable daily intake = 0.2 µg kg^{-1} day^{-1} for women of childbearing age and children 12 and under; 0.47 µg kg^{-1} day^{-1} for others (Health Canada 2004; Health Canada 2007). Differences in the regulatory thresholds used by these two agencies mainly reflects variability in the uncertainty factor used to account for exposures of sensitive groups.[26] During the establishment of the RfD for MeHg by the U.S. EPA in 2000, it was acknowledged that, "It is also important to note that no evidence of a threshold arose for methylmercury-related neurotoxicity within the range of exposures in the Faroe Islands study."[16] A variety of epidemiological studies have since noted effects associated with exposures below the U.S. EPA's RfD.[90, 91]

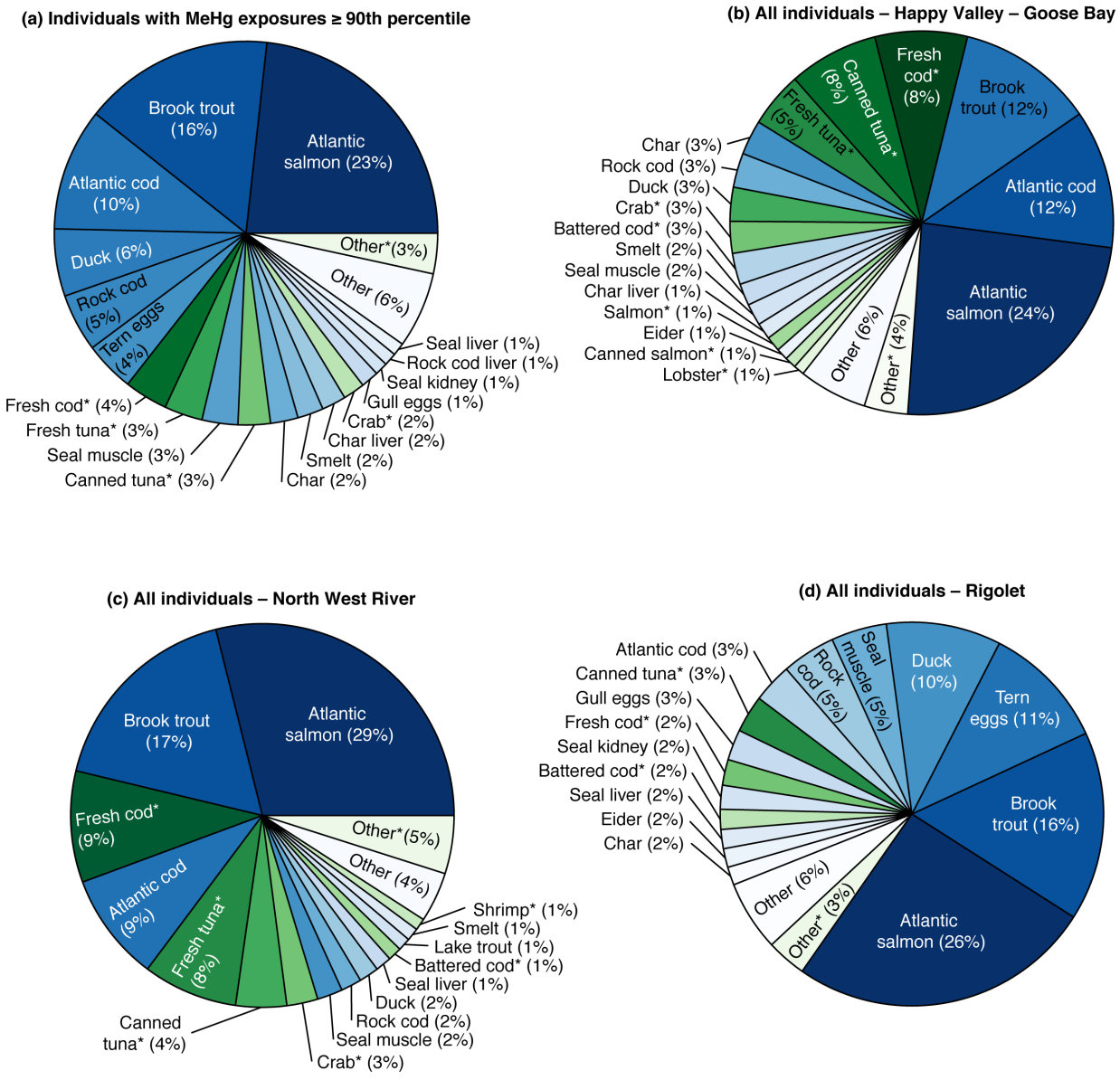

Figure S2: Sources of per-capita MeHg intakes among Lake Melville Inuit for individuals in all three communities with MeHg exposures ≥ 90th percentile (a) and for all individuals in each community (b, c, d), Summer 2014. Foods in blue are locally caught. Foods in green with * are store-bought. Rock cod is the local name for *Gadus ogac* (Greenland cod).

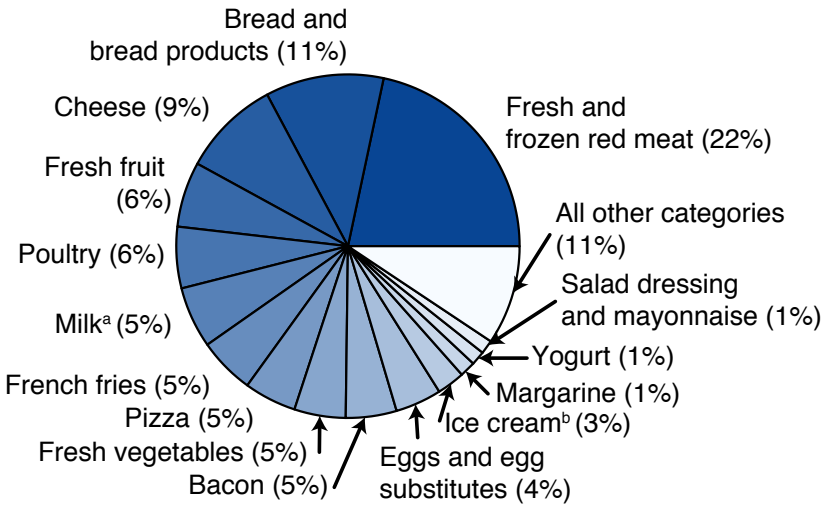

Figure S3: Main categories of store-bought nutritious foods as a fraction of total store-bought nutritious food intake at present day (by calories). [a] Includes soy, evaporated, powdered and chocolate milk. [b] Includes iced yogurt, iced milk and sorbet.

Table S9: Traditional food intake by season and demographic group

Demographic Group	Traditional food intake percentiles (g day^{-1})					
	25th	50th	75th	90th	95th	99th
Winter 2014						
All individuals	8.5	21.14	47.68	115.49	160.55	209.96
Spring 2014						
All individuals	5.14	11.62	29.79	77.83	125.95	229.23
Summer 2014						
All individuals	6.86	17.24	41.07	93.22	139.45	276.3
Communities						
Happy Valley-Goose Bay	6.38	14.11	33.5	85.8	121.8	237.25
North West River	10.38	21.96	41.06	87.79	127.48	183.57
Rigolet	16.8	41.32	91.96	180.04	226.56	421.92
Males						
All males	8.63	19.49	50.54	109.5	163.76	410.13
M 0–17	2.24	6.61	19.38	70.39	85.8	309.93
M 18–44	8.63	16.18	36.98	86.53	109.5	194.3
M 45–64	19.1	36.21	80.87	156.55	237.25	434.33
M ≥65	27.48	49.99	107.67	209.35	216.81	306.92
Females						
All females	6.61	14.06	30.28	82.14	110.5	173.09
F 0–17	4.39	6.84	14.19	42.53	82.14	117.07
F 18–44	6.37	11.56	25.42	56.77	99.21	146.18
F 45–64	10.94	20.45	45.02	90.94	130.84	189.08
F ≥65	16.77	32.73	74.48	136.98	196.34	230.9

Table S10: Modeled neurodevelopmental impacts (change in IQ, prenatal exposures, based on Summer 2014)[a]

Demographic Group	Baseline diet, increased MeHg	Replacement of traditional foods				
		Nutritious[b]	Empty-calorie	Processed meat	Vegetables	Atl. salmon
All individuals	-0.06 (0.04)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	0.08 (0.02)
Communities						
Happy Valley-Goose Bay	-0.05 (0.03)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.08 (0.01)
North West River	-0.05 (0.03)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.1 (0.02)
Rigolet	-0.29 (0.18)	-0.04 (0.05)	-0.04 (0.05)	-0.04 (0.05)	-0.04 (0.05)	0.31 (0.06)

[a] Values presented are the modeled expected mean (SD) of medians for the whole population and for each community among women of childbearing age (16–49).

[b] Representative basket of nutritious store-bought foods (SI Figure S2).

Table S11: Modeled cardiovascular impacts (relative risk of cardiovascular mortality)[a]

Demographic Group	Baseline diet, increased MeHg	Replacement of traditional foods with store-bought alternatives				
		Nutritious foods[b]	Empty-calorie	Processed meat	Vegetables	Atl. salmon
All individuals	1.02 (0.01)	1.12 (0.05)	1.12 (0.05)	1.19 (0.06)	1.08 (0.05)	0.88 (0.04)
Communities						
Happy Valley-Goose Bay	1.02 (0.01)	1.1 (0.04)	1.1 (0.04)	1.14 (0.05)	1.07 (0.04)	0.9 (0.04)
North West River	1.03 (0.02)	1.15 (0.07)	1.16 (0.07)	1.25 (0.09)	1.12 (0.07)	0.85 (0.05)
Rigolet	1.12 (0.07)	1.28 (0.14)	1.3 (0.14)	1.54 (0.21)	1.2 (0.14)	0.68 (0.09)
Males						
All males	1.03 (0.02)	1.17 (0.07)	1.17 (0.08)	1.28 (0.1)	1.13 (0.08)	0.82 (0.06)
M 25–44	1.02 (0.01)	1.09 (0.04)	1.1 (0.04)	1.13 (0.04)	1.05 (0.04)	0.88 (0.04)
M 45–64	1.05 (0.02)	1.23 (0.1)	1.23 (0.1)	1.35 (0.12)	1.16 (0.1)	0.81 (0.06)
M ≥65	1.07 (0.05)	1.27 (0.13)	1.29 (0.14)	1.53 (0.21)	1.22 (0.13)	0.74 (0.08)
Females						
All females	1.02 (0.01)	1.08 (0.03)	1.09 (0.04)	1.14 (0.05)	1.06 (0.04)	0.91 (0.03)
F 25–44	1.01 (0)	1.04 (0.01)	1.04 (0.02)	1.06 (0.02)	1.02 (0.01)	0.93 (0.02)
F 45–64	1.02 (0.01)	1.12 (0.05)	1.12 (0.05)	1.18 (0.06)	1.09 (0.05)	0.9 (0.04)
F ≥65	1.05 (0.03)	1.16 (0.07)	1.17 (0.07)	1.29 (0.11)	1.11 (0.07)	0.84 (0.06)

[a] Values presented are the modeled expected mean (SD) of medians for the whole population and for each demographic group among individuals at least 25 years of age.
[b] Representative basket of nutritious store-bought foods (SI Figure S2).

Table S12: Modeled cancer impacts (relative risk of cancer mortality)[a]

Demographic Group	Replacement of traditional foods with store-bought alternatives				
	Nutritious foods[b]	Nutrient-sparse	Processed meat	Vegetables	Atl. salmon
All individuals	1.006 (0.002)	1.007 (0.002)	1.009 (0.003)	1.003 (0.002)	0.995 (0.002)
Communities					
Happy Valley-Goose Bay	1.005 (0.002)	1.006 (0.002)	1.007 (0.002)	1.002 (0.002)	0.996 (0.001)
North West River	1.007 (0.003)	1.009 (0.003)	1.012 (0.003)	1.004 (0.003)	0.995 (0.002)
Rigolet	1.017 (0.007)	1.019 (0.007)	1.024 (0.007)	1.011 (0.007)	0.986 (0.005)
Males					
All males	1.009 (0.003)	1.01 (0.003)	1.013 (0.003)	1.005 (0.004)	0.994 (0.002)
M 25–44	1.004 (0.001)	1.004 (0.002)	1.006 (0.002)	1.001 (0.002)	0.995 (0.002)
M 45–64	1.011 (0.004)	1.013 (0.004)	1.016 (0.005)	1.006 (0.004)	0.992 (0.003)
M ≥65	1.016 (0.006)	1.018 (0.006)	1.023 (0.007)	1.011 (0.006)	0.991 (0.003)
Females					
All females	1.005 (0.002)	1.005 (0.002)	1.007 (0.002)	1.002 (0.002)	0.996 (0.001)
F 25–44	1.002 (0.001)	1.003 (0.001)	1.004 (0.001)	1 (0.001)	0.997 (0.001)
F 45–64	1.006 (0.002)	1.007 (0.002)	1.009 (0.003)	1.003 (0.002)	0.996 (0.002)
F ≥65	1.009 (0.004)	1.011 (0.004)	1.016 (0.004)	1.004 (0.004)	0.995 (0.002)

[a] Values presented are the modeled expected mean (SD) of medians for the whole population and for each demographic group among individuals at least 25 years of age. Increased MeHg content in local foods is assumed to have no impact on cancer risks.

[b] Representative basket of nutritious store-bought foods (SI Figure S2

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