Cooperative harvesting of aquatic resources triggered the beginning of pottery production in north-eastern North America

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What benefits were derived from the invention of pottery? And why did ceramics remain marginal for so long? Increasing use of pottery has been seen as a response to large-scale harvesting in a model that favours economic advantage through increased efficiency. This paper challenges that view; combining carbon and nitrogen isotope and lipid analysis the authors argue that pottery was used selectively for storing or processing valued exchange commodities such as fish oil. Its use can be seen as part of broader developments in hunter-gatherer society, featuring seasonal gatherings, collective feasting and a new articulation of social relations.

Keywords: North America, hunter-gatherers, pottery production, aquatic resources, carbon isotopes, nitrogen isotopes, lipid analysis, Vinette 1 pottery, social gatherings

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Table S1. Charred deposits and ceramic samples selected for bulk isotope analysis, lipid analysis by GCMS and GC-c-IRMS. FA (Cx:y)=fatty acids with carbon length *x* and number of unsaturations *y*, br=branched chain acids, DCx=α,ω-dicarboxylic acids with carbon length *x*, ALx=alkanes with carbon length *x*, pri=pristanic acid, phy=phytanic acid, TMTD=4,8,12-trimethyltridecanoic acid, APFA (Cn)=ω-(o-alkylphenyl) alkanoic acids with carbon length *n*, ODA= dehydroabietic acid, cholest=cholesterol and cholesterol by-products, lano=lanosterol, stig=stigmasterol, ergo=ergosterol, ket=long chain ketones. F=interior foodcrust sample, S=exterior carbonised deposit, I=interior ceramic sample, E=exterior ceramic sample. tr=trace, NA=not applicable. Lipid concentrations are expressed in ug mg^{-1} for carbonised deposits, and in ug g^{-1} for interior and exterior ceramic samples. In the column P/A of aquatic biomarkers, two ticks indicate complete sets of biomarkers and one tick indicates partial sets of biomarkers. Each line groups potsherds from the same vessel.

		Lipid analysis				Bulk isotope analysis			GC-C-IRMS	
Sites	Sample ID	Lipid conc.	Compound detected	Aquatic Biomarkers (P/A)	C16/C18	$\delta^{15}N$	$\delta^{13}C$	C:N	$C_{16:0}$ $\delta^{13}C$ (‰)	$C_{18:0}$ $\delta^{13}C$ (‰)
Bruce Boyd	AdHc4-1-F	NA	NA		NA	8.62	-24.94	14.75	NA	NA
	AdHc4-1-I	69.99	FA($C_{9:0-28:0}$ $C_{16:1-18:1}$ $C_{15-17br}$), AL($C_{16-18,26}$), DC(C_{5-12}), APFA ($C_{18(tr)}$), phy	P(√)	1.68					
	BB01-I	191.48	FA($C_{5:0-22:0}$ $C_{18:1}$ C_{17br}), AL(C_{14-28}) DC(C_{9-13}), APFA (C_{18}), phy, ket	P(√)	0.45				-27.45	-27.93
	BB05-I	10.37	FA($C_{9:0-28:0(tr)}$ $C_{15-17br}$), AL(C_{16-25}), DC(C_{9})	A	3.13					
	BB07-I	19.32	FA($C_{12:0-26:0}$ $C_{14(tr),15br}$), AL(C_{16-27}), DC($C_{9(tr)}$)	A	1.84					
	BB08-I	5.18	FA($C_{12-26(tr)}$ $C_{18:1}$ $C_{15,17(br)}$), AL(C_{17-28}), TMTD(tr)	P(√)	1.28					
	BB09-I	27.14	FA($C_{12:0-26:0}$ $C_{14(tr),15br}$), AL(C_{16-29}), DC($C_{9(tr)}$)	A	2.99					
	BB09-E	53.15	FA($C_{12:0-28:0}$ $C_{16:1-18:1}$ $C_{14,15,17br}$), AL(C_{16-31}), DC(C_{9-11}), APFA(C_{16}), TMTD	P(√)	1.90					

	BB10-I	13.82	FA($C_{12:0-26:0}$ $C_{18:1}$$C_{14(tr),15-17br}$), AL($C_{16-27,29}$), DC($C_{9(tr)}$)	A	2.67					
Peace Bridge	AfGr9-1-F	<0.5				6.72	-28.25	8.91		
	AfGr9-1-I	122.53	FA($C_{10:0-26:0}$ $C_{16:1-20:1}$ $C_{16,17br}$), AL($C_{16,17}$), DC($C_{8,9,12,16}$), APFA ($C_{16-22(tr)}$), pri, phy, ket ($C_{16-16,16-18,18-18}$)	P(√√)	0.73				-27.85	-29.22
	PB01-I	206.26	FA($C_{8:0-26:0}$ $C_{16:1,18:1,20:1}$ $C_{15-17,19br}$), AL(C_{22-30}), APFA($C_{18,20}$), phy, cholest	P(√√)	1.56					
	PB02-I	<5								
	PB03-I	127.79	FA($C_{10:0-26:0}$ $C_{18:1}$ C_{17br}), APFA ($C_{18-22(tr)}$), pri, phy, ket	P(√√)	0.42				-29.31	-30.88
	PB04-I	<5								
	PB06-I	<5								
	PB08-I	<5								
	PB09-I	6.25	FA($C_{12:0(tr)-28:0(tr)}$ $C_{16:1,18:1}$ $C_{15-17br}$), AL(C_{16-20})	A	1.45					
Scaccia	Cda17.3-1-F	<0.5				5.59	-25.80	11.63		
	Cda17.3-1-I	50.70	FA($C_{10:0-28:0}$), AL(C_{15-28})	A	1.02					
	Cda17.3-2-F	<0.5				6.39	-25.91	8.29		
	Cda17.3-2-I	34.90	FA($C_{9:0-28:0}$ C_{15br}), AL(C_{15-28}), DC(C_{6-9})	A	0.57					
	Cda17.3-3-I	6.09	FA($C_{12:0-26:0}$ $C_{18:1,22:1}$ $C_{14-17br}$), AL (C_{16-27})	A	1.55					
	Cda17.3-4-I	23.82	FA($C_{9:0-28:0}$ $C_{15,17br}$), AL(C_{16-27}), DC(C_{6-9})	A	2.70					
	Cda17.3-5-I	<5								
	Cda17.3-6-I	42.62	FA($C_{9:0-28:0}$ $C_{18:1,22:1}$ $C_{17,18,22,24,25br}$), AL(C_{15-24}), DC(C_{9})	A	1.24					
	Cda17.3-6-E	17.16	FA($C_{9:0-10:0,12:0,14:0-18:0,20:0,22:0,24:0,26:0(tr)}$ $C_{18:1,22:1}$ C_{15br}), AL(C_{17-29}), DC(C_{6})	A	1.04					
	Cda17.3-7-I	14.01	FA($_{12:0-30:0}$ $C_{18:1}$ $C_{15,17,22,24br}$), AL(C_{16-27}), DC($C_{6,9}$)	A	1.52					
	Cda17.3-8-I	<5								

	Cda17.3-9-I	45.63	FA($_{10:0-26:0}$), AL(C_{14-25})	A	2.05					
	Cda17.3-10-I	440.74	FA($C_{9:0-30:0}$ $C_{18:1}$ $C_{15-17,26,27br}$), AL(C_{14-28}), DC(C_{5-14}), pri, phy	P(√)	0.69				-31.11	-31.86
Vine Valley	VineValley1-F	<0.5				6.53	-27.95	11.51		
	VineValley1-I	305.56	FA($C_{8:0-28:0}$ $C_{16:1-18:1}$ $C_{16,17br}$), AL(C_{14-27}), DC($C_{6,8-11}$), TMTD(tr), pri(tr), phy, ODA(tr)	P(√)	0.44				-27.34	-28.29
	VineValley2-F	<0.5				6.51	-27.53	10.29		
	VineValley3-F	<0.5				7.19	-25.96	7.01		
	VineValley3-I	201.28	FA($C_{8:0-28:0}$ $C_{18:1}$ $C_{15,17br}$), AL(C_{15-26}), DC($C_{6,8}$), APFA (C_{18}), phy, ODA(tr)	P(√)	0.69					
	VineValley4-F	<0.5				6.73	-26.02	6.62		
Dawson Creek	BaGn16-1-I	36.11	FA($C_{9:0-10:0,12:0-18:0,20:0,22:0-28:0}$ $C_{18:1}$ C_{15br}), AL(C_{16-25}), DC(C_9)	A	4.70					
	BaGn16-2-I	21.60	FA($C_{9:0-10:0,12:0-18:0,20:0,22:0-28:0}$ $C_{18:1}$ C_{15br}), AL(C_{16-25}), DC(C_9)	A	2.20					
	BaGn16-3-I	27.10	FA($C_{9:0-10:0,12:0-18:0,20:0,22:0-28:0}$ $C_{18:1}$), AL(C_{16-25}), DC(C_9)	A	2.36					
	BaGn16-3-E	32.63	FA($C_{9:0-26:0(tr)}$ $C_{16:1-18:1}$ $C_{14-17br}$), AL(C_{16-27}), DC($C_{6-11,13}$), TMTD	P(√)	1.37					
	BaGn16-4-I	13.32	FA($C_{9:0-10:0,12:0-18:0,20:0,22:0-28:0}$ $C_{18:1}$), AL(C_{16-25}), DC(C_9)	A	2.53					
	BaGn16-5-I	<5								
	BaGn16-6-I	<5								
Pointe-du-Buisson	BhFl1-1-F	0.8	FA($C_{9:0-26:0}$ $C_{16:1-22:1}$ $C_{15-17br}$), AL(C_{22-31}), APFA(C_{16-22}), pri, phy	P(√√)	0.95	6.92	-27.47	16.96		
	BhFl1-1-I	227.70	FA($C_{10:0-26:0}$ $C_{18:1,22:1}$ $C_{15-17br}$), AL(C_{15-19}), DC(C_{7-12}), APFA($C_{16-22(tr)}$), phy, stig(tr)	P(√√)	1.01				-27.09	-28.13
	BhFl1-24-F	<0.5				8.78	-25.93	12.80		
	BhFl1-2-F	0.72	FA($C_{9:0-26:0}$ $C_{16:1-22:1}$ $C_{15-19br}$), DC(C_{6-14}), APFA(C_{16-20}), TMTD, pri, phy	P(√√)	0.62	9.54	-26.78	15.93	-26.32	-27.65
	BhFl1-2-I	776.14	FA($C_{9:0-26:0}$ $C_{16:1-20:1}$ $C_{13-19br}$), AL(C_{14-18}), DC(C_{7-18}), APFA(C_{16-22}), TMTD, pri, phy	P(√√)	0.70				-27.05	-28.08
	BhFl1-3-F	1.25	FA($C_{12:0-24:0}$ $C_{16:1-22:1}$ $C_{15-19br}$), AL(C_{24-28}), DC(C_{9-11}), APFA(C_{16-20}), TMTD, pri, phy, cholest	P(√√)	1.15	10.26	-24.99	10.70	-26.03	-26.33

BhFl1-3-I	217.28	FA($C_{9:0-26:0}$ $C_{16:1-20:1}$ $C_{15-19br}$), AL(C_{15-19}), DC(C_{6-18}), APFA(C_{16-22}), TMTD, phy, cholest	P(√√)	1.34				-25.65	-26.37
BhFl1-19-I	121.98	FA($C_{9:0-30:0}$ $C_{18:1-20:1}$ $C_{15-19br}$), AL(C_{17-18}), DC($C_{6-12,14,16}$), APFA($C_{16-22(tr)}$), phy	P(√√)	1.52				-24.95	-25.20
BhFl1-4-F	Ind	Not completely derivatized			7.94	-26.61	14.30		
BhFl1-4-I	792.34	FA($C_{9:0-28:0(tr)}$ $C_{16:1-22:1}$ $C_{13,15-19br}$), AL(C_{15-18}), DC(C_{6-16}), APFA(C_{14-24}), TMTD, pri, phy, cholest, ergo(tr)	P(√√)	2.05				-26.82	-26.63
so	1.63	FA($C_{14:0-26:0}$ $C_{16:1-22:1}$ $C_{15-19br}$), AL(C_{24-28}), DC(C_{6-11}), APFA(C_{16-20}), TMTD, pri(tr), phy	P(√√)	1.12	10.86	-26.63	41.00		
BhFl1-23-F	<0.5				8.45	-25.31	8.80		
BhFl1-23-I	298.85	FA($C_{9:0-26:0}$ $C_{16:1-20:1}$ $C_{13-19br}$), AL(C_{15-18}), DC(C_{6-16}), APFA(C_{16-22}), TMTD, pri(tr), phy	P(√√)	1.68				-25.19	-25.41
BhFl1-6-F1	1.3	FA($C_{12:0-26:0(tr)}$ $C_{16:1-22:1}$ $C_{15-19br}$), DC(C_{7-13}), APFA(C_{16-22}), TMTD, pri, phy	P(√√)	2.10	10.45	-24.12	9.90	-26.60	-26.15
BhFl1-6-F2	NA	NA			11.37	-24.50	9.40		
BhFl1-6-S	<0.5				10.59	-24.94	26.50		
BhFl1-6-I	57.72	FA($C_{9:0-26:0}$ $C_{18:1}$ $C_{15-19br}$), AL(C_{16-19}), DC(C_{7-12}), APFA(C_{16-22}), TMTD, phy	P(√√)	1.80				-24.63	-25.69
BHFl1-6-E	17.03	FA($C_{10:0-28:0}$ $C_{16:1-18:1}$ $C_{14-19br}$), AL($C_{17,18,22-29}$)DC(C_{8-13}), TMTD	P(√)	2.07					
BhFl1-7-F	0.54	FA($C_{12:0-28:0}$ $C_{16:1-22:1}$ $C_{15-19br}$), AL(C_{24-30}), DC(C_{7-11}), APFA($C_{16(tr)-22}$), TMTD, pri, phy	P(√√)	0.88	7.79	-26.19	10.20		
BhFl1-8-F	<0.5				8.47	-27.41	12.10		
BhFl1-21-F	<0.5				8.92	-25.02	9.10		
BhFl1-11-F	<0.5				7.89	-28.20	9.00		
BhFl1-11-I	64.92	FA($C_{9:0-26:0}$ $C_{18:1}$ $C_{15-18br}$), AL(C_{16-19}), DC(C_{6-12}), APFA($C_{16-20(tr)}$), phy	P(√√)	1.01				-26.55	-27.14
BhFl1-12-I	24.22	FA($C_{9:0-20:0,24:0,26:0}$ $C_{18:1}$ $C_{15,17,19br}$), AL(C_{16-19}), DC(C_{8-9})		1.10					
BhFl1-13-I	624.75	FA($C_{9:0-30:0}$ $C_{16:1-20:1}$ $C_{15-17,19,25br}$), AL(C_{14-18}), DC(C_{5-18}), APFA($C_{16(tr),18,20(tr)}$), TMTD, phy	P(√√)	0.71				-29.61	-31.93
BhFl1-14-F	1.68	FA($C_{14:0-28:0}$ $C_{18:1}$ $C_{15-19br}$), AL(C_{23-30}), APFA($C_{18,20}$), pri, phy, cholest	P(√√)	0.35	6.80	-27.37	13.10	-28.01	-30.24
BhFl1-14-I	53.87	FA($C_{9:0-28:0(tr)}$ $C_{18:1}$ $C_{15,17br}$), AL(C_{15-24}), DC(C_{6-10}), ODA(tr), APFA($C_{18,20}$), phy	P(√√)	0.73				-27.27	-28.53

	BhFl1-15-I	145.84	FA($C_{9:0-30:0}$ $C_{16:1-22:1}$ $C_{15-18br,21br}$), AL(C_{16-18}), DC(C_{5-14}), APFA($C_{18,20(tr)}$), TMTD, pri(tr), phy, cholest(tr)	P(√√)	0.94				-25.17	-25.54
	BhFl1-17-I	1056.4	FA($C_{8:0-26:0}$ $C_{16:1-20:1}$ $C_{12-17br,19br}$), AL(C_{14-18}), DC($C_{6-13,16}$), APFA($C_{16-22(tr)}$), TMTD, phy	P(√√)	0.82				-27.78	-29.36
	BhFl1-18-I	187.37	FA($C_{9:0-26:0}$ $C_{18:1-20:1}$ $C_{13-18br}$), AL($C_{15-18,20}$), DC(C_{6-14}), APFA($C_{16-22(tr)}$), TMTD, phy	P(√√)	1.78				-23.98	-24.51
	BhFl1-20-I	82.28	FA($C_{9:0-28:0}$ $C_{16:1-20:1}$ $C_{15-17br,18-27br}$), AL(C_{16-19}), DC(C_{8-16}), APFA(C_{18}), TMTD, phy	P(√)	0.23				-24.95	-25.20
	BhFl1-22-F	<0.5				10.01	-24.09	9.30		
	BhFl1-25-F	<0.5				8.63	-26.57	9.70		
	BhFl1-26-I	139.23	FA($C_{9:0-30:0}$ $C_{18:1}$ $C_{15-19br}$), AL(C_{15-27}), DC(C_{6-12}), APFA(C_{16-22}), TMTD, pri(tr), phy	P(√√)	0.99				-24.40	-24.91
Batiscan	CcFb1-1-F	<0.5				6.96	-26.86	11.70		
	CcFb1-1-I	402.84	FA($C_{9:0-26:0(tr)}$ $C_{18:1}$ $C_{15,17,19br}$), AL($C_{15-18,20}$) APFA($C_{18-22(tr)}$), TMTD, phy, cholest	P(√√)	1.70				-27.71	-27.92
	CcFb1-2-I	65.48	FA($C_{14:0-28:0}$ $C_{16:1-18:1}$ $C_{15-17br}$), AL(C_{17-23}), DC($C_{9,11,14}$)	A	1.18				-28.56	-29.97
	CcFb1-3-I	215.76	FA($C_{10:0-26:0}$ $C_{16:1-18:1}$ $C_{15-17,25,26br}$), AL(C_{17-29}), DC(C_{9-13}), stig, cholest	A	1.87				-26.90	-28.84
	CcFb1-3-E	167.04	FA($C_{9:0-28:0}$ $C_{16:1-18:1}$ $C_{13-17,25br}$), AL($C_{15-18,20,22-27}$), DC(C_{7-14}), TMTD, pri, phy	P(√)	1.81					
	CcFb1-4-I	229.94	FA($C_{12:0-28:0(tr)}$ $C_{18:1}$ $C_{15-18br}$), AL(C_{17-23}), DC($C_{11,16}$), APFA(C_{18-22}), phy, cholest	P(√√)	1.35				-27.09	-30.52
	CcFb1-5-I	141.56	FA($C_{14:0-26:0}$ $C_{18:1}$ $C_{15-17br}$), AL(C_{16-24}), APFA(C_{18}), phy	P(√)	1.26				-29.69	-30.54
	CcFb1-6-I	471.38	FA($C_{12:0-26:0}$ $C_{18:1}$ $C_{15-19br}$), AL($C_{16-20,24-27}$), DC(C_{9-14}), APFA($C_{16(tr),18-22(tr)}$), phy, cholest	P(√√)	0.81				-28.67	-29.93
	CcFb1-7-I	57.00	FA($C_{14:0-26:0(tr)}$), AL(C_{16-25})	A	1.61				-29.12	-29.92
Parc des Pins	CcFb4-1-F	<0.5				9.50	-24.58	8.40		
	CcFb4-1-I	302.70	FA($C_{14:0-26:0}$ $C_{18:1,20:1}$ $C_{15-19br}$), DC($C_{8-11,16,18}$), APFA($C_{18,20}$), phy, cholest	P(√√)	1.35				-26.98	-27.24
	CcFb4-2-F	<0.5				10.39	-24.36	8.40		
	CcFb4-2-I	84.77	FA($C_{14:0-24:0}$ $C_{16:1,18:1}$ $C_{15-19br}$), DC(C_{9}), APFA($C_{18,20(tr)}$), phy, cholest	P(√√)	1.78				-29.67	-30.07
	CcFb4-3-F	<0.5				9.12	-25.71	8.10		

	CcFb4-3-I	12.77	FA($C_{16:0-26:0(tr)}$ $C_{18:1}$ C_{17br})	A	0.71					
	CcFb4-4-I	87.47	FA($C_{14:0-24:0}$ $C_{18:1-20:1}$ $C_{15-17br}$), DC(C_{9-16}), cholest	A	1.55				-28.82	-29.75
	CcFb4-5-I	23.85	FA($C_{9:0-26:0}$ $C_{16:1-20:1}$ $C_{15-19br}$), DC($C_{8-11,18,22}$)	A	1.01					
	CcFb4-6-I	9.88	FA($C_{14:0-24:0}$ $C_{18:1}$ $C_{15-17br}$)	A	0.86					
	CcFb4-7-I	27.36	FA($C_{15:0-28:0}$ $C_{16:1,18:1,18:2}$ $C_{15-17,19br}$), DC($C_{16,18,20,22}$)	A	0.92					
	CcFb4-8-I	31.45	FA($C_{12:0-26:0}$ $C_{16:1,18:1,18:2}$ $C_{15-18br}$)	A	1.25					
	CcFb4-9-I	15.46	FA($C_{15:0-26:0(tr)}$ $C_{16:1,18:1}$ $C_{16,17br}$)	A	1.11				-28.98	-29.40
Lambert	CeEu12-1-F	<0.5				7.82	-26.37	15.40		
	CeEu12-1-I	111.27	FA($C_{9:0-26:0}$ $C_{16:1(tr)-20:1}$ $C_{15-19br}$), AL(C_{15-20}), DC(C_{6-11}), APFA(C_{16-20}), TMTD, pri, phy	P(√√)	2.26					
	CeEu12-2-F	<0.5				7.22	-26.45	16.04		
	CeEu12-3-F	0.59	FA ($C_{16:0,18:0}$)	A	1.34	6.58	-26.06	10.38		
	CeEu12-3-S	1.46	FA ($C_{16:0,18:0}$)	A	1.47	12.47	-24.31	27.41		
	CeEu12-4-F	<0.5				9.04	-25.21	11.44		
	CeEu12-4-S	<0.5								
	CeEu12-4-I	133.12	FA($C_{9:0-28:0}$ $C_{16:1-22:1}$ $C_{13,15-19br}$), AL(C_{16-18}), DC($C_{8,9,11,12}$), APFA(C_{16-22}), TMTD, pri, phy	P(√√)	1.88				-24.74	-26.25
	CeEu12-4-E	39.41	FA($C_{12:0-28:0}$ $C_{16:1-22:1}$ $C_{14-19br}$), AL($C_{16-18,20}$), DC(C_{6-14}), APFA($C_{18,20}$), TMTD, pri, phy	P(√√)	1.39					
	CeEu12-5-F	N/A	N/A			9.87	-23.89	10.50		
	CeEu12-5-I	35.54	FA($C_{9:0-28:0(tr)}$ $C_{18:1}$ $C_{13,17,19br}$), AL(C_{16-26}) APFA($C_{18(tr),20(tr)}$)	P(√√)	0.46				-25.82	-26.41
	CeEu12-6-I	196.68	FA($C_{9:0-30:0}$ $C_{16:1-20:1}$ $C_{15-19br}$), AL(C_{15-18}), DC(C_{7-12}), APFA(C_{16-22}), TMTD, phy	P(√√)	0.87				-26.84	-27.12
Gasser	BgFg2-1-I	25.54	FA($C_{9:0-18:0,24:0}$ $C_{16:1,18:1,22:1}$ C_{15br}), AL(C_{17-20}), DC(C_{9}), APFA($C_{18,20}$), ODA	P(√)	1.62					
Carson	VT1-F	<0.5								

Farm	VT1-I	93.32	FA($C_{9:0-30:0}$ $C_{16:1-20:1}$ $C_{13-17,19-23,25-27br}$), AL(C_{15-29}), DC($C_{6-9,11-13}$), APFA($C_{16(tr),18-22(tr)}$), pri, phy	P(√√)	0.67					
	VT2-F	<0.5								
	VT2-I	62.52	FA($C_{9:0-28:0(tr)}$ $C_{18:1}$ $C_{15,17br}$), AL(C_{14-29}), DC(C_{6-9})	A	2.03					
Fort Hunter	36Da159-1-I	<5								
Mc-Cormick Is.	36Da11-1-F	<0.5				10.28	-23.72	10.85		
	36Da11-2-F	<0.5				11.06	-22.03	9.38		
	36Da11-2-I	20.03	FA($C_{9:0-26:0}$ $C_{C18:1-24:1}$ $C_{15-18br}$), AL(C_{16-18}), DC(C_{7-12}), APFA (C_{18-22}), TMTD, pri, phy	P(√√)	1.62				-23.47	-25.18
	36Da11-2-E	6.78	FA($C_{12:0-18:0,20:0,24:0}$ $C_{18:1,22:1}$ $C_{14-17br}$), AL($C_{17-20,22,23}$), DC(C_9), APFA (C_{16}), TMTD	P(√)	1.42					
Sheldon	Sheldon-1-I	48.50	FA($C_{12:0-28:0}$ $C_{16:1-22:1(tr)}$ $C_{15-19br}$), AL(C_{16-19}), phy	P(√)	0.36				-28.89	-29.40
Wilson	36Br58-1-I	<5								
	36Br58-2-I	53.78	FA($C_{10:0-28:0}$ $C_{18:1}$), AL(C_{15-28}), DC(C_{7-9}), ODA(tr)	A	0.39					
	36Br58-3-I	44.34	FA($C_{9:0-26:0}$ $C_{18:1}$), AL(C_{15-29}), DC(C_{4-9}), APFA(C_{18}), phy, ODA(tr)	P(√)	0.78					
Barton complex	18AG3-1-I	28.47	FA($C_{10:0-28:0}$ $C_{16:1-18:1,22:1}$ $C_{15,17,23,25br}$), AL($C_{15-17,20}$), cholest., ODA(tr)	A	1.84					
	18AG3-1-E	34.20	FA($C_{12:0-30:0}$ $C_{16:1-18:1,22:1}$ $C_{14-17,19-23,25br}$), AL($C_{15-18,20,22-27}$), DC(C_9), cholest.	A	2.02					
	18AG8-1-I	28.94	FA($C_{12:0-28:0}$ $C_{18:1,22:1}$ $C_{15,25br}$), AL($C_{15-20,22-25}$)	A	2.31					
	18AG8-2-I	142.04	FA($C_{10:0-30:0}$ $C_{16:1-22:1}$ $C_{15,17br}$), AL($C_{15-18,22,24-28}$), DC(C_{7-10}), APFA(C_{18}), phy	P(√)	0.65				-27.77	-29.25
Zimmer-man	36Pi14-1-F	<0.5				5.68	-24.31	14.31		
	36Pi14-2-F	<0.5				4.95	-26.03	10.72		
	36Pi14-2-I	<5								
	36Pi14-3-F	<0.5				7.77	-25.45	12.56		
	36Pi14-3-I	107.51	FA($C_{8:0-26:0}$ $C_{16:1-22:1}$ $C_{16-18br}$), AL(C_{17-18}), DC(C_{8-14}), APFA (C_{16-22}), TMTD, pri, phy, stig(tr)	P(√√)	1.54				-25.35	-25.66

	36Pi14-3-E	20.25	FA($C_{12:0-26:0}$ $C_{16:1-18:1,22:1}$ $C_{15,17br}$), AL($C_{17-18,22-24}$), DC(C_{9-11}), APFA (C_{16-18}), TMTD, pri, phy	P(√)	1.63					
	36Pi14-4-F	<0.5				5.26	-24.92	11.22		
	36Pi14-4-I	<5								
	36Pi14-5-F	<0.5				10.18	-24.69	12.10		
	36Pi14-5-I	24.04	FA($C_{12:0-26:0}$ $C_{16:1-18:1}$ $C_{15-17br}$), AL(C_{20-25}), DC(C_{8-12}), APFA ($C_{16(tr),18,20(tr)}$), pri, phy	P(√√)	1.34					
Minisink Island	28Sx28-1-I	229.61	FA($C_{9:0-30:0}$ $C_{16:1:22:1}$ $C_{15-17br,19br,21br,23br}$), AL($C_{14-19}$), DC($C_{8-18}$), APFA ($C_{16-22}$), TMTD, pri, phy, stig	P(√√)	0.53				-26.67	-29.16
	28SX28-2-I	22.54	FA($C_{11:0-28:0}$ $C_{18:1}$ C_{17br}), AL(C_{15-29}), DC(C_{8-9})	A	5.41					
	28SX28-3-I	16.29	FA($C_{11:0-28:0}$ $C_{18:1}$ $C_{16-17br,19br}$), AL(C_{16-27}), DC(C_{6-9}), APFA(C_{18-22}), phy	P(√√)	0.81				-25.89	-26.51
	28SX28-4-I	69.21	FA($C_{11:0-30:0}$ $C_{18:1-22:1}$ $C_{17-19br,23br,25br}$), AL(C_{15-19}), DC($C_{8-10,14}$), phy	P(√)	0.17				-27.03	-28.37
Drake	27BK16-1-I	44.02	FA($C_{10:0-28:0}$ $C_{16:1-24:1}$ $C_{15,17br}$), AL(C_{14-24}), DC(C_{6-14}), APFA(C_{16-22}), pri, phy	P(√√)	1.68					
	27BK16-2-I	106.81	FA($C_{10:0-28:0(tr)}$ $C_{16:1-22:1}$ $C_{15,17br}$), AL(C_{15-18}), DC($C_{8,11,13,14,16,18}$), APFA(C_{16-22}), pri(tr), phy, stig	P(√√)	0.96					
Hormell	27CA15-1	32.94	FA($C_{12:0-28:0}$ $C_{18:1}$ $C_{15-17br}$), AL($C_{15-20,25,26,28}$), DC(C_{6-11}), stig, cholest	A	1.88					
Roberts	36La51-1-I	169.20	FA($C_{9:0-30:0}$ $CC_{18:1-24:1}$ $C_{15-17br,23br}$), AL(C_{14-27}), DC(C_{5-11}), APFA (C_{18-22}), TMTD, pri, phy(tr)	P(√√)	2.13					
	36La51-2-I	8.96	FA($C_{10:0-18:0,24:0,26:0}$), AL(C_{14-28}), DC(C_9)	A	2.73					
	36La51-3-I	91.97	FA($C_{9:0-30:0(tr)}$ $C_{18:1-24:1}$ $C_{15-18br}$), AL(C_{15}), DC(C_{5-18}), APFA (C_{16-22}), TMTD, pri, phy	P(√√)	2.27					
Kirby Brooks	6LF2-1-I	38.30	FA($C_{12:0-30:0(tr)}$ $C_{15,16,24-26br}$), AL(C_{16-25}), TMTD	P(√)	2.75					
	6LF2-2-I	183.59	FA($C_{10:0-30:0}$ $C_{18:1}$ $C_{17,25,26br}$), AL(C_{15-23}), DC(C_{8-9})	A	0.49					
Lovers Leap	6LF70-1-I	167.78	FA($C_{10:0-30:0}$ $C_{18:1-22:1}$ C_{18br}), AL(C_{14-22}), DC(C_{7-12}), APFA (C_{18-22}), TMTD, pri, phy, ergo	P(√√)	0.98					
	6LF70-2-I	<5								
	6LF70-3-I	101.87	FA($C_{12:0-30:0}$ $C_{18:1-20:1}$ $C_{16,17,22-26br}$), AL(C_{15-31}), DC($C_{8,9,18}$), APFA($C_{18-22(tr)}$), phy	P(√√)	0.46					
	6LF70-4-I	10.83	FA($C_{12:0-16:0,18:0,20:0,23:0-26:0}$ $C_{16:1-18:1}$) AL(C_{16-27}), ODA(tr)	A	0.91					

	6LF70-5-I	23.06	FA($C_{11:0-14:0,16:0,18:0,23:0-26:0}$) AL($C_{15-27}$), DC($C_{9}$)	A	0.97					
	6LF70-6-I	138.92	FA($C_{10:0-30:0}$ $C_{16:1-26:1,18:3}$ $C_{17,18br}$), AL(C_{16-24}), DC(C_{4-14}), APFA (C_{16-22}), TMTD, pri, phy	P(√√)	3.26					
	6LF70-7-I	72.14	FA($C_{9:0-30:0}$ $C_{18:1-22:1}$), AL(C_{14-27}), DC(C_{5-11}), APFA($C_{18-22(tr)}$), pri, phy	P(√√)	1.41					
	6LF70-8-I	264.90	FA($C_{9:0-30:0}$ $C_{18:1-22:1}$ $C_{15-17br}$), AL(C_{14-20}), DC($C_{6-12,14,16}$), APFA (C_{18-22}), TMTD, pri, phy, stig, ergo, lano	P(√√)	1.87					
Hopkins	6LF1-1-I	14.03	FA($C_{12:0-30:0}$ $C_{16:1-18:1,18:2}$ $C_{15,17br}$), AL(C_{16-26}), DC(C_{6-11}), APFA ($C_{18-22(tr)}$), phy	P(√√)	2.16					
	NH38.6-1-F	<0.5				5.16	-25.00	20.46		
	NH38.6-1-I	212.73	FA($C_{8:0-26:0}$ $C_{14:1-18:1,18:2}$ $C_{15-17br}$), AL($C_{22,24-27}$), DC(C_{5-13}), TMTD, pri(tr), phy	P(√)	3.61				-24.96	-24.22
	NH38.6-2-I	<5								
	NH38.6-3-I	76.75	FA($C_{8:0-30:0}$ $C_{16:1-24:1}$ $C_{15-18br}$), AL(C_{16-20}), DC(C_{4-16}), APFA(C_{16-22}), TMTD, pri, phy	P(√√)	1.80				-23.94	-23.53
Eddy	NH38.6-3-E	32.52	FA($C_{11:0-30:0}$ $C_{16:1-24:1}$ $C_{15-18br}$), AL(C_{16-20}), DC(C_{7-16}), APFA($C_{16(tr),18(tr),20(tr),22(tr)}$), TMTD(tr), pri, phy	P(√√)	2.08					
	NH38.6-4-I	7.86	FA($C_{12:0-28:0}$ $C_{16:1-18:1}$ $C_{15br,17br}$), AL($C_{16-19,22-26}$)	A	1.41					
	NH38.6-5-I	101.22	FA($C_{12:0-30:0}$ $C_{18:1-24:1}$ $C_{15-18br}$), AL(C_{16-27}), DC(C_{5-14}), APFA(C_{18-22}), TMTD, pri, phy	P(√√)	2.62				-25.67	-26.07
	NH38.6-6-I	75.05	FA($C_{9:0-30:0(tr)}$ $C_{18:1-24:1}$ $C_{17br,18br}$), AL(C_{15-26}), DC(C_{5-10}), APFA($C_{16(tr),18,20(tr),22}$), pri, phy, ODA, stig	P(√√)	1.13					
	NH38.6-7-I	88.78	FA($C_{11:0-30:0(tr)}$ $C_{16:1-24:1}$ C_{17br}), AL(C_{15-22}), DC(C_{8-14}), APFA($C_{16(tr),18(tr),20,22}$), pri, phy, ODA, stig, cholest	P(√√)	1.68					
Hoffman	M12.43-1-I	65.30	FA($C_{9:0-28:0}$ $C_{15-17br}$), AL(C_{15-29}), DC(C_{9}), APFA($C_{18,20(tr)}$), TMTD	P(√√)	2.51					
	Mpt-1-I	21.31	FA($C_{14:0-28:0}$ $C_{16:1-18:1}$ $C_{15-18br}$), AL(C_{22-24}), DC(C_{8-11})	A	2.16					
Morrill Point	Mpt-2-I	204.42	FA($C_{11:0-30:0}$ $C_{16:1-20:1}$ $C_{15-17br}$), AL($C_{17,28}$), DC(C_{7-16}), APFA(C_{16-24}), TMTD, pri, phy	P(√√)	1.40					
	Mpt-3-I	7.61	FA($C_{14:0-28:0}$ $C_{16:1-18:1}$ $C_{14-16br}$), AL($C_{17,18}$), DC(C_{8})	A	2.51					
	M49.2-1-F	<0.5				11.51	-21.22	13.30		
Horn-blower	M49.2-2-F	<0.5				10.57	-22.49	10.60		
	M49.2-3-F	<0.5				8.97	-23.47	9.20		

	M49.2-4-F	<0.5				8.73	-23.23	9.90		
	M49.2-5-F	<0.5				8.07	-22.99	7.70		
	M49.2-5-I	99.66	FA($C_{9:0-28:0}$ $C_{16:1-20:1}$), AL(C_{14-26}), DC(C_{6-10}), APFA($C_{16(tr),18,20}$), TMTD, phy	P(√√)	1.15					
	M49.2-5-E	64.92	FA($C_{9:0-24:0}$ $C_{16:1}$ $C_{15,17br}$), AL(C_{17-27}), DC(C_{6-9}), ODA	A	1.11					
	M49.2-6-F	<0.5				9.04	-23.16	9.30		
	M49.2-6-I	79.81	FA($C_{8:0-28:0}$ $C_{16:1-20:1}$ $C_{13,15-17br}$), AL(C_{15-22}), DC(C_{8-10}), APFA($C_{16(tr),18}$), TMTD(tr), phy	P(√)	0.87					
	M49.2-10-F	<0.5				9.75	-22.75	10.50		
	M49.2-10-I	45.08	FA($C_{8:0-28:0}$ $C_{16:1-18:1}$ C_{15br}), AL(C_{15-28}), DC(C_{5-10})	A	1.36					
	M49.2-11-F	<0.5				8.93	-22.74	8.70		
	M49.2-12-F	<0.5				11.17	-22.42	9.30		
	M49.2-12-I	318.62	FA($C_{9:0-30:0}$ $C_{18:1-20:1}$ $C_{15-18br}$), AL($C_{14-20,22-25}$), APFA(C_{18}), phy	P(√)	0.60					
	M49.2-13-F	<0.5				14.31	-21.89	9.70		
	M49.2-14-F	<0.5				14.27	-21.83	8.80		
	M49.2-14-I	160.76	FA($C_{8:0-30:0}$ $C_{18:1-22:1}$ $C_{15,17br}$), AL(C_{14-27}), DC(C_{6-12}), APFA(C_{16-24}), TMTD, pri, phy, cholest	P(√√)	0.83				-25.66	-25.78
Small swamp	M38.7-1/2-F	0.54	FA($C_{12:0-18:0,20:0,22:0,24:0}$ $C_{16:1-18:1}$ $C_{15,17br}$), AL(C_{16-22}), DC(C_{8-11}), TMTD(tr), phy(tr)	P(√)	2.03	14.29	-21.73	7.90		
	M38.7-2-I	25.72	FA($C_{8:0-26:0}$ $C_{18:1}$ $C_{15-17br}$), AL(C_{16-26}), DC(C_{8-11}), TMTD(tr), ODA	P(√)	1.72					
	M38.7-3-F	<0.5				13.29	-22.40	12.90		
	M38.7-4-F	<0.5				11.52	-21.43	11.60		
	M38.7-4-I	20.38	FA($C_{8:0-30:0}$ $C_{18:1-24:1}$ $C_{15-18br}$), AL(C_{15-24}), DC(C_{8-12}), APFA(C_{16-24}), TMTD, pri, phy, ODA	P(√√)	1.04				-23.74	-23.62
Rose	M38.11-1-F	<0.5				12.89	-21.26	7.50		
	M38.11-1-I	20.89	FA($C_{10:0-26:0}$ $C_{16:1-18:1}$ $C_{15,17br}$), AL(C_{16-22}), DC(C_{8-12}), TMTD	P(√)	1.76					

RI 1428	RI1428-1-F	<0.5				13.82	-20.67	8.88		
	RI1428-4-F	<0.5				12.73	-22.72	13.61		
	RI1428-4-I	54.11	FA($C_{7:0-26}$ $C_{16:1-24:1}$ $C_{13-19br}$), AL(C_{15-18}), DC(C_{8-12}), APFA(C_{16-24}), TMTD, pri, phy, cholest, wax esters	P(√√)	3.80				-25.96	-24.18
	RI1428-2-F	<0.5				12.53	-18.60	7.14		
	RI1428-2-I	19.87	FA($C_{9:0-28:0}$ $C_{16:1-22:1}$ $C_{15-19br}$), AL(C_{15-22}), APFA(C_{16-24}), pri, phy	P(√√)	1.46				-22.50	-21.99
	RI1428-2-E	<5								
	RI1428-3-F	<0.5				13.84	-19.30	10.12		
	RI1428-5-I	20.28	FA($C_{9:0-24:0}$ $C_{16:1-18:1}$ $C_{14-18br}$), AL(C_{16-30}), DC(C_{6-12}), ODA(tr)	A	3.27					
	RI1428-6-I	<5								
	RI1428-7-I	38.97	FA($C_{12:0-26:0}$ $C_{16:1-20:1}$ $C_{15-17br}$), AL($C_{17,18}$), DC(C_{6-14}), APFA (C_{16}), TMTD, pri, phy	P(√)	2.54				-21.69	-22.85
Knox	Knox-1-I	100.90	FA($C_{14:0-28:0}$ $C_{16:1-18:1}$ $C_{15-17br}$), AL(C_{16-23}), DC(C_{16}), cholest	A	1.16					
	Knox-2-I	22.45	FA($C_{12:0-30:0(tr)}$ $C_{18:1}$ $C_{15,17br}$), AL(C_{16-25}), DC($C_{8,9}$)	A	2.15					
Great Diamond Island	GDA-1-F	N/A	N/A			10.53	-25.33	10.28		
	GDA-1-I	22.80	FA($C_{9:0-24:0}$ $C_{18:1}$ $C_{15,17br}$), AL(C_{16-25}), DC($C_{6,8,9}$), APFA($C_{16(tr),18}$), phy	P(√)	1.66					
	GDA-2-F	<0.5				11.32	-25.47	13.58		
	GDA-2-I	96.74	FA($C_{11:0-28:0}$ $C_{16:1-22:1}$ $C_{15-17br}$), AL(C_{16-18}), DC(C_{7-16}), APFA(C_{16-22}), TMTD, pri(tr), phy	P(√√)	0.92				-26.42	-28.87
	GDA-3-F	<0.5				11.53	-24.42	13.59		
	GDA-4-F	<0.5				11.72	-24.58	11.51		
	GDA-4-I	14.36	FA($C_{9:0-24:0}$ C_{15br}), AL(C_{16-25})	A	1.37					
	GDA-5-F	<0.5				13.41	-23.01	9.56		
	GDA-5-I	14.43	FA($C_{9:0-24:0}$ $C_{18:1}$ $C_{15-17br}$), AL(C_{17-20}), DC($C_{6,8,9}$), APFA(C_{18}), phy	P(√)	1.10					

GDA-6-F	<0.5				13.93	-19.03	7.90		
GDA-6a-I	184.54	FA($C_{10:0-30:0}$ $C_{16:1-22:1}$ $C_{14-17br}$), AL(C_{15-28}), DC(C_{7-14}), APFA(C_{16-22}), TMTD, pri, phy, cholest	P(√√)	2.86				-24.15	-24.01
GDA-7-I	130.13	FA($C_{9:0-30:0}$ $C_{16:1-22:1}$ $C_{15-17br}$), AL(C_{16-27}), DC(C_{5-14}), APFA(C_{16-22}), TMTD, pri, phy	P(√√)	3.07				-23.81	-23.81
GDA-8-I	101.02	FA($C_{10:0-30:0}$ $C_{18:1}$ $C_{15-17br}$), AL(C_{16-26}), DC($C_{8,9}$), ODA	A	1.55					
GDA-9-I	72.99	FA($C_{11:0-30:0}$ $C_{18:1}$ C_{15br}), AL(C_{15-28}), DC(C_{8-10}), ODA	A	1.54				-26.57	-26.40
GDA-9-E	43.86	FA($C_{12:0-28:0}$ $C_{18:1}$ $C_{18:1}$ $C_{15,17br}$), AL(C_{16-29}), DC(C_{8-9}), ODA	A	2.04					
GDA-10-I	237.75	FA($C_{10:0-30:0}$ $C_{16:1-24:1}$ $C_{15-17br}$), AL(C_{15-22}), DC(C_{6-14}), APFA(C_{16-24}), TMTD, pri, phy	P(√√)	1.39				-25.23	-27.93
GDA-11-I	46.11	FA($C_{11:0-28:0}$ $C_{14-17,25br}$), AL(C_{15-29}), DC($C_{8,9}$), ODA(tr)	A	3.46					
GDA-12-I	79.42	FA($C_{11:0-26:0}$ $C_{16:1}$ $C_{13-15br}$), AL(C_{16-26}), DC(C_{9}), ODA	A	2.64					
GDA-13-I	144.21	FA($C_{10:0-28:0}$ $C_{18:1}$ $C_{14,15,17br}$), AL(C_{15-26}), DC(C_{7-11}), APFA(C_{18}), phy	P(√)	2.70				-26.69	-26.31
GDA-14-I	47.49	FA($C_{10:0-26:0}$ $C_{16:1-18:1}$ $C_{13-17,25br}$), AL(C_{16-27}), DC(C_{8-12}), ODA	A	2.35				-23.97	-24.35

Table S2. Stable carbon isotopic measurements of *n*-hexadecanoic ($C_{16:0}$) and *n*-octadecanoic ($C_{18:0}$) acids of reference fats from modern authentic animal products. To facilitate comparison with archaeological data, all modern samples, including marine samples, were adjusted for the addition of the effects of post-industrial carbon (Friedli *et al.* 1986).

Category	Species	Sample type	Provenience	Mean $\delta^{13}C$ values (‰) $C_{16:0}$	Mean $\delta^{13}C$ values (‰) $C_{18:0}$	Reference
Wild non-ruminant	*Ursus americanus* (Black bear)	bone	Canada	-26.73	-27.00	This study
	Castor canadensis (Beaver)	soft tissue	Canada	-31.04	-31.20	This study
	Lepus americanus (Hare)	soft tissue	Canada	-32.15	-32.54	This study
	Procyon lotor (Racoon)	soft tissue	Canada	-29.15	-28.65	This study
	Ondatra zibethicus (Muskrat)	soft tissue	Canada	-33.58	-33.02	This study
	Lontra Canadensis (Otter)	soft tissue	Canada	-31.76	-33.34	This study
Wild ruminant	*Cervus elaphus* (Red deer)	bone	Poland	-28.13	-31.89	Craig *et al*. 2012
	Cervus elaphus (Red deer)	bone	Poland	-27.77	-31.54	Craig *et al*. 2012
	Cervus elaphus (Red deer)	bone	Poland	-28.78	-32.98	Craig *et al*. 2012
	Cervus elaphus (Red deer)	bone	Poland	-30.41	-34.06	Craig *et al*. 2012
	Cervus elaphus (Red deer)	bone	Poland	-29.49	-33.08	Craig *et al*. 2012
	Cervus elaphus (Red deer)	bone	Poland	-29.16	-33.43	Craig *et al.* 2012
	Cervus elaphus (Red deer)	bone	Poland	-30.75	-33.44	Craig *et al*. 2012
	Cervus elaphus (Red deer)	bone	Poland	-29.88	-33.47	Craig *et al*. 2012
	Cervus elaphus (Red deer)	bone	Poland	-29.31	-32.69	Craig *et al*. 2012
	Cervus elaphus (Red deer)	bone	Poland	-29.82	-33.41	Craig *et al*. 2012
	Alces alces (Moose)	bone	Canada	-29.12	-32.62	This study
	Alces alces (Moose)	bone	Canada	-30.27	-32.80	This study
	Alces alces (Moose)	soft tissue	Canada	-29.30	-32.21	This study
	Alces alces (Moose)	soft tissue	Canada	-29.43	-31.37	This study
	Odocoileus virginianus (White-tailed deer)	bone	Canada	-29.32	-31.01	This study
	Odocoileus virginianus (White-tailed deer)	soft tissue	Canada	-29.65	-31.51	This study
	Odocoileus virginianus (White-tailed deer)	soft tissue	Canada	-29.83	-30.28	This study
	Rangifer tarandus (Caribou)	bone	Canada	-25.40	-28.32	This study
	Rangifer tarandus (Caribou)	soft tissue	Canada	-24.87	-26.14	This study
Freshwater	*Salmonidae* sp. (Salmon)	charred deposit	Japan	-28.01	-28.72	Craig *et al.* 2013
	Salmonidae sp. (Salmon)	charred deposit	Japan	-25.22	-26.79	Craig *et al.* 2013
	Salmonidae sp. (Salmon)	charred deposit	Japan	-26.01	-27.33	Craig *et al.* 2013
	Salmonidae sp. (Trout)	charred deposit	Japan	-26.74	-26.72	Craig *et al*. 2013
	Salmonidae sp. (Trout)	charred deposit	Japan	-27.64	-27.88	Craig *et al*. 2013
	Salmonidae sp. (Trout)	charred deposit	Japan	-25.83	-26.24	Craig *et al*. 2013
	Rhynchocypris lagowskii (Amur minnow)	charred deposit	Japan	-27.43	-28.13	Craig *et al*. 2013
	Pseudorasbora parva (Topmouth gudgeon)	charred deposit	Japan	-26.95	-26.64	Craig *et al*. 2013
	Anguilla anguilla (Eel)	soft tissue	Denmark	-28.96	-29.22	Craig *et al*. 2011
	Esox lucius (Pike)	soft tissue	Denmark	-35.59	-35.84	Craig *et al*. 2011
	Tinca tinca (Tench)	soft tissue	Denmark	-28.53	-29.60	Craig *et al*. 2011
	Tinca tinca (Tench)	soft tissue	Denmark	-25.04	-27.14	Craig *et al.* 2011
	Tinca tinca (Tench)	soft tissue	Denmark	-37.95	-37.27	Craig *et al*. 2011
	Ictalurus punctatus (Channel catfish)	soft tissue	Canada	-27.41	-27.43	This study
	Ictalurus punctatus (Channel catfish)	soft tissue	Canada	-26.07	-25.39	This study
	Ictalurus punctatus (Channel catfish)	soft tissue	Canada	-26.71	-27.16	This study
	Ictalurus punctatus (Channel catfish)	soft tissue	Canada	-26.15	-26.21	This study
	Ictalurus punctatus (Channel catfish)	soft tissue	Canada	-24.75	-24.81	This study
	Ictalurus punctatus (Channel catfish)	soft tissue	Canada	-26.04	-26.38	This study
	Microgadus tomcod (Tomcod)	soft tissue	Canada	-34.38	-34.63	This study

	Microgadus tomcod (Tomcod)	soft tissue	Canada	-34.19	-33.95	This study
	Microgadus tomcod (Tomcod)	soft tissue	Canada	-33.86	-33.41	This study
	Microgadus tomcod (Tomcod)	soft tissue	Canada	-33.35	-33.28	This study
	Microgadus tomcod (Tomcod)	soft tissue	Canada	-32.58	-33.10	This study
Marine organisms	*Gymnocranius euanus* (Sea bream)	flesh	Japan	-22.10	-21.77	Craig *et al.* 2013
	Gymnocranius euanus (Sea bream)	flesh	Japan	-22.36	-22.19	Craig *et al.* 2013
	Sebastes sp. (Roackfish)	flesh	Japan	-23.38	-22.76	Craig *et al*. 2013
	Mugil cephalus (Flathead mullet)	flesh	Japan	-21.60	-20.97	Craig *et al*. 2013
	Genyonemus lineatus (Croaker)	flesh	Japan	-21.45	-21.09	Craig *et al*. 2013
	Myoxocephalus scorpius (Bull trout)	flesh	Denmark	-16.89	-17.89	Craig *et al*. 2011
	Gadus morhua (Atlantic cod)	flesh	Denmark	-22.73	-22.19	Craig *et al*. 2011
	Gadus morhua (Atlantic cod)	flesh	Denmark	-22.74	-24.12	Craig *et al*. 2011
	Gadus morhua (Atlantic cod)	flesh	Denmark	-22.04	-24.45	Craig *et al*. 2011
	Zoarces viviparus (Eelpout)	flesh	Denmark	-19.43	-21.01	Craig *et al*. 2011
	Zoarces viviparus (Eelpout)	flesh	Denmark	-21.15	-21.34	Craig *et al*. 2011
	Platichthys flesus (European flounder)	flesh	Denmark	-18.51	-19.82	Craig *et al*. 2011
	Pleuronectes platessa (Plaice)	flesh	Denmark	-19.81	-21.54	Craig *et al*. 2011
	Pleuronectes platessa (Plaice)	flesh	Denmark	-18.85	-20.07	Craig *et al*. 2011
	Phoca largha (Spotted seal)	blubber	Denmark	-20.00	-19.95	Craig *et al*. 2011
	Phoca largha (Spotted seal)	blubber	Denmark	-12.80	-14.26	Craig *et al.* 2011
	Phoca vitulina (Harbour seal)	blubber	Germany	-18.56	-20.21	Craig *et al*. 2011
	Gadus morhua (Atlantic cod)	soft tissue	Germany	-21.3	-21.70	Craig *et al*. 2011?
	Clupea harengus (Atlantic herring)	soft tissue	Germany	-23.2	-20.80	Craig *et al*. 2011?
	Pinnipedia sp. (Seal)	bone	Canada	-22.98	-24.15	This study
	Pinnipedia sp. (Seal)	bone	Canada	-22.16	-23.78	This study
	Pinnipedia sp. (Seal)	bone	Canada	-24.59	-24.28	This study

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