SUPPLEMENTARY FILE

Table S1. Number of missings in covariates

	All (n = 297)	Exclusion nonfasted (n = 216)
	Number of missings	*Number of missings*
General characteristics		
Age	0	0
Sex	1	1
Body mass index	0	0
Lipid lowering medication use	0	0
Knee osteoarthritis		
KL sum score	1	0
KOOS pain	1	1
KOOS ADL function	1	1
Hand osteoarthritis		
KL sum score	4	3
FIHOA score	3	3
NRS hand pain	17	14

ADL = activities daily living, BMI = body mass index, FIHOA = Functional Index Hand OsteoArthritis, KL = Kellgren Lawrence, KOOS = Knee Injury and Osteoarthritis Outcome Score, n = number

Table S2. Percentage explained by variables in the model (alpha=0.1)

	Knee			Hand		
	Radiographic OA	Pain	Function	Radiographic OA	Pain	Function
Only lipids	0.04	0	0	0.01	0.13	0.09
Lipids + clinical variables	0.25	0	0.16	0.28	0.36	0.15

Numbers represent the R^2 of the elastic net regularised regression analyses, using an alpha of 0.1. In the lipids only model, clinical variables and batch and centre were kept constant by including them in the offset. In the lipids + clinical variables model, both lipids and clinical variables were included as explanatory variables, while keeping batch and centre constant. Abbreviations: OA = osteoarthritis

Table S3. Lipids associated with radiographic knee and hand OA, using an alpha of 0.1

Radiographic knee OA				Radiographic hand OA			
Lipid	Coefficient*	↑/↓	R^2	Lipid	Coefficient*	↑/↓	R^2
TAG(54:8)-FA(20:4)	-0.0854264	↓	0.04	LPC(20:4)	0.7412834	↑	0.01
TAG(58:8)-FA(20:4)	-0.0672098	↓		LPC(16:0)	0.1562368	↑	
DAG(16:1/16:1)	-0.0583023	↓		TAG(56:1)-FA(16:0)	0.0963526	↑	
CE(20:1)	0.0569029	↓		LPC(20:3)	0.0379812	↑	
TAG(58:8)-FA(20:3)	-0.0538655	↓					
PC(18:1/20:3)	-0.0319941	↓					
HETE-11	-0.0218907	↓					
PC(18:0/20:3)	-0.0088361	↓					
PC(17:0/20:4)	-0.0072629	↓					

*Penalized regression coefficients. Lipids were log transformed and mean-scaled prior to the analyses. Only fasted samples were included. The variables age, sex, BMI, lipid lowering medication use, centre and batch were kept constant in the analyses. ↑/ ↓ higher/lower concentrations were associated with more severe radiographic OA. Abbreviations: CE = cholesterol ester, DAG = diacylglycerol, HETE = hydroxyeicosatetraenoic acid, OA = osteoarthritis, (L)PC = (lyso)phosphatidylcholine, TAG = triacylglycerol

Table S4. Lipids associated with knee pain and function, using an alpha of 0.1

Knee function				Knee pain			
Lipid	Coefficient	↑/↓	R^2	Lipid	Coefficient	↑/↓	R^2
-^	NA	NA	NA	-^	NA	NA	NA

^No lipids were associated with knee pain and function. Lipids were log transformed and mean-scaled prior to the analyses. Only fasted samples were included. The variables age, sex, BMI, lipid lowering medication use, centre and batch were kept constant in the analyses. ↑/ ↓ higher/lower concentrations were associated with less pain or more function. Abbreviations: NA = not applicable

Table S5. Lipids associated with hand pain and function, using an alpha of 0.1

Hand function				Hand pain			
Lipid	Coefficient*	↑/↓	R^2	Lipid	Coefficient*	↑/↓	R^2
FFA(20:4)	0.3980058	↑	0.09	PC(17:0/18:2)	-0.7089378	↓	0.13
PC(18:1/18:2)	-0.3462701	↓		FFA(17:0)	0.5328671	↑	
PC(18:0/18:2)	-0.2320979	↓		PC(18:1/18:2)	-0.5231301	↓	
FFA(22:5)	0.2202816	↑		PC(18:0/22:5)	0.3392263	↑	
DAG(16:1/16:1)	0.2184979	↑		CE(16:1)	0.3125859	↑	
TAG(50:5)-FA(16:1)	0.1604018	↑		TAG(38:0)-FA(12:0)	-0.2523214	↓	
FFA(20:3)	0.1589167	↑		TAG(42:2)-FA(12:0)	-0.1742208	↓	
TAG(50:4)-FA(16:1)	0.1537940	↑		TAG(58:6)-FA(16:0)	0.1628027	↑	
TAG(54:6)-FA(16:1)	0.1533064	↑		FFA(12:0)	-0.1313498	↓	
LPC(16:1)	0.1239552	↑		TAG(50:4)-FA(16:1)	0.1198322	↑	
PC(18:0/22:5)	0.1120789	↑		TAG(50:5)-FA(16:1)	0.1059935	↑	
TAG(38:0)-FA(12:0)	-0.1103878	↓		PC(16:0/22:6)	0.1040962	↑	
TAG(54:7)-FA(16:1)	0.0915470	↑		TAG(54:6)-FA(16:1)	0.0859366	↑	
DAG(16:1/18:2)	0.0799815	↑		PE(P-18:0/18:2)	0.0775400	↑	
TAG(58:6)-FA(16:0)	0.0606617	↑		SM(14:0)	-0.0765679	↓	
SM(14:0)	-0.0479799	↓		CE(22:5)	0.0677202	↑	
TAG(48:3)-FA(16:1)	0.0412418	↑		TAG(50:3)-FA(16:1)	0.0501251	↑	
Leukotriene D4	0.0397470	↑		TAG(52:3)-FA(22:1)	0.0500772	↑	
FFA(16:0)	0.0293081	↑		PC(18:0/22:6)	0.0476991	↑	
CE(16:1)	0.0218352	↑		TAG(48:3)-FA(16:1)	0.0429704	↑	
PC(18:0/22:6)	0.0061675	↑		DAG(16:1/16:1)	0.0402988	↑	
				CER(18:1)	0.0058991	↑	
				Leukotriene D4	0.0008714	↑	

*Penalized regression coefficients. Lipids were log transformed and mean-scaled prior to analyses. Only fasted samples were included. The variables age, sex, BMI, lipid lowering medication use, centre and batch were kept constant in the analyses. ↑/ ↓ higher/lower concentrations were associated with more functional impairment or pain. Abbreviations: CE = cholesterol ester, CER = hexosylceramide, DAG = diacylglycerol, FFA = free fatty acid, PC = phosphatidylcholine, PE = phosphatidyletholamine, TAG = triacylglycerol, SM = sphingomyelin.
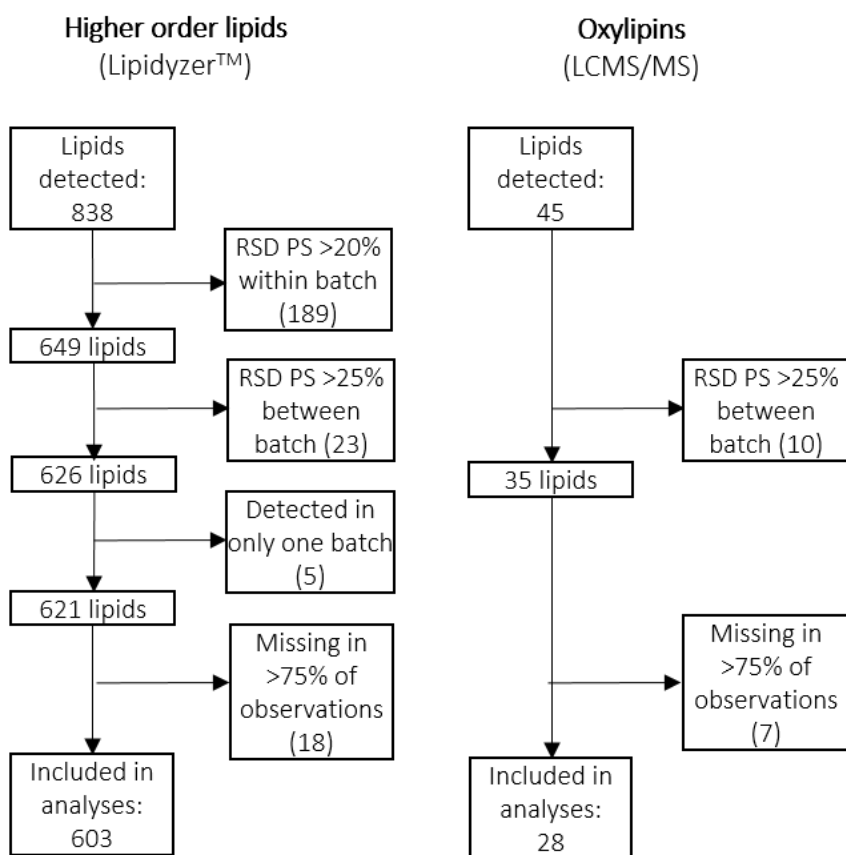
Figure S1. Data processing and exclusion numbers
Lipids were excluded from the analyses if the measurement variation (relative standard deviation (RSD)) of the pooled samples (PS) was above the predetermined value of 20% and 25% within a batch or between batches, respectively, or when detected in very low frequency.
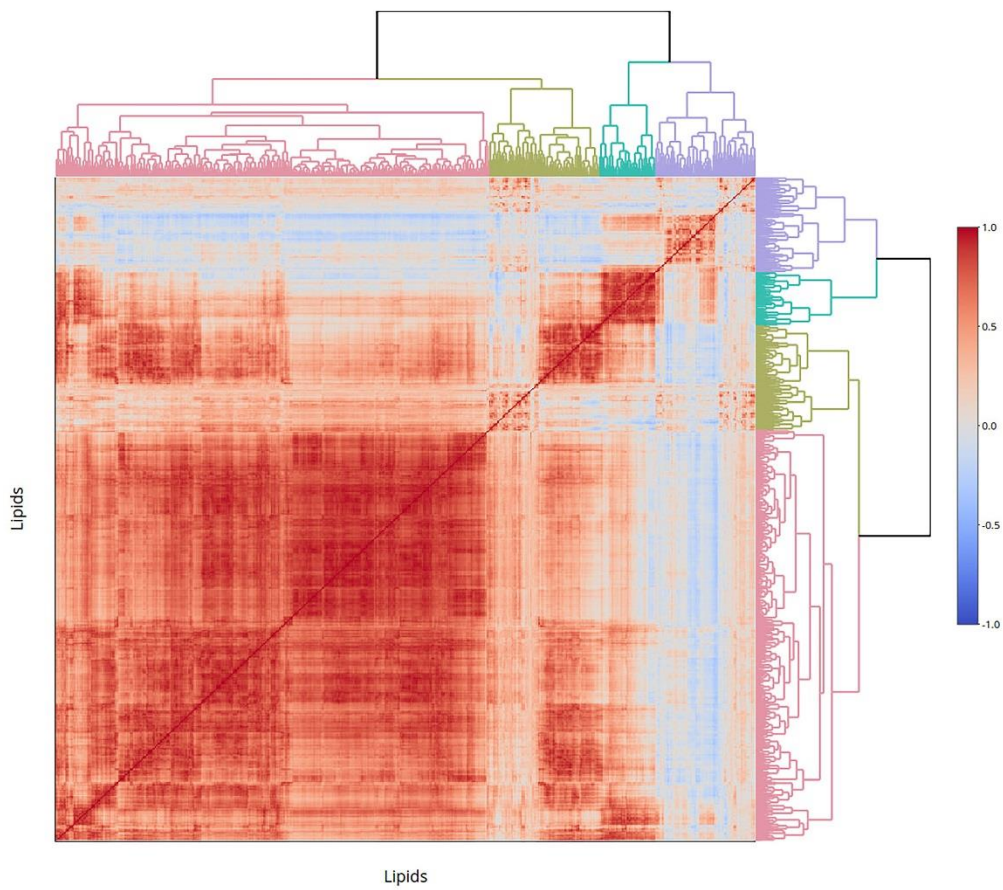
Figure S2. **Correlation matrix of lipids included in the analyses**
The figure shows a heatmap of the correlation between the lipids included in the analyses. Red color represents a positive correlation, blue color represents a negative correlation.