

19 risk factors					
Age	Alcohol consumption	Anti-cholesterol medication use	Anti-hypertensive medication use	Random blood glucose	Body mass index
Diastolic blood pressure	Systolic blood pressure	Cholesterol	HDL cholesterol	Cardiovascular disease history	Duration of diabetes
Sex	Glycated hemoglobin %	Hypertension	Insulin use	LDL cholesterol	Pulse pressure
Current smoker					
220 metabolites					
AcAce	LA	L-VLDL-P	M-VLDL-L	S-LDL-TG%	XL-VLDL-C%
Ace	Lac	L-VLDL-PL	M-VLDL-P	SM	XL-VLDL-CE
Ala	LAFA	L-VLDL-PL%	M-VLDL-PL	S-VLDL-C	XL-VLDL-CE%
Alb	LDL-D	L-VLDL-TG	M-VLDL-PL%	S-VLDL-C%	XL-VLDL-FC
ApoA1	LDL-TG	L-VLDL-TG%	M-VLDL-TG	S-VLDL-CE	XL-VLDL-FC%
ApoB	Leu	M-HDL-C	M-VLDL-TG%	S-VLDL-CE%	XL-VLDL-L
ApoBApoA1	L-HDL-C	M-HDL-C%	PC	S-VLDL-FC	XL-VLDL-P
boHBut	L-HDL-C%	M-HDL-CE	Phe	S-VLDL-FC%	XL-VLDL-PL
Cit	L-HDL-CE	M-HDL-CE%	PUFA	S-VLDL-L	XL-VLDL-PL%
DHA	L-HDL-CE%	M-HDL-FC	PUFAFA	S-VLDL-P	XL-VLDL-TG
DHAFA	L-HDL-FC	M-HDL-FC%	RemnantC	S-VLDL-PL	XL-VLDL-TG%
EstC	L-HDL-FC%	M-HDL-L	SerumTG	S-VLDL-PL%	XS-VLDL-C
FAw3	L-HDL-L	M-HDL-P	SFA	S-VLDL-TG	XS-VLDL-C%
FAw3FA	L-HDL-P	M-HDL-PL	SFAFA	S-VLDL-TG%	XS-VLDL-CE
FAw6	L-HDL-PL	M-HDL-PL%	S-HDL-C	TGPG	XS-VLDL-CE%
FAw6FA	L-HDL-PL%	M-HDL-TG	S-HDL-C%	TotCho	XS-VLDL-FC
FreeC	L-HDL-TG	M-HDL-TG%	S-HDL-CE	TotFA	XS-VLDL-FC%
Gln	L-HDL-TG%	M-LDL-C	S-HDL-CE%	TotPG	XS-VLDL-L
Gp	L-LDL-C	M-LDL-C%	S-HDL-FC	Tyr	XS-VLDL-P
HDL-2C	L-LDL-C%	M-LDL-CE	S-HDL-FC%	UnSat	XS-VLDL-PL
HDL-3C	L-LDL-CE	M-LDL-CE%	S-HDL-L	Val	XS-VLDL-PL%
HDL-D	L-LDL-CE%	M-LDL-FC	S-HDL-P	VLDL-C	XS-VLDL-TG
HDL-TG	L-LDL-FC	M-LDL-FC%	S-HDL-PL	VLDL-D	XS-VLDL-TG%
His	L-LDL-FC%	M-LDL-L	S-HDL-PL%	VLDL-TG	XXL-VLDL-C
IDL-C	L-LDL-L	M-LDL-P	S-HDL-TG	XL-HDL-C	XXL-VLDL-C%
IDL-C%	L-LDL-P	M-LDL-PL	S-HDL-TG%	XL-HDL-C%	XXL-VLDL-CE
IDL-CE	L-LDL-PL	M-LDL-PL%	S-LDL-C	XL-HDL-CE	XXL-VLDL-CE%
IDL-CE%	L-LDL-PL%	M-LDL-TG	S-LDL-C%	XL-HDL-CE%	XXL-VLDL-FC
IDL-FC	L-LDL-TG	M-LDL-TG%	S-LDL-CE	XL-HDL-FC	XXL-VLDL-FC%
IDL-FC%	L-LDL-TG%	MUFA	S-LDL-CE%	XL-HDL-FC%	XXL-VLDL-L

IDL-L	LVLDL-C	MUFAFA	S-LDL-FC	XL-HDL-L	XXL-VLDL-P
IDL-P	L-VLDL-C%	M-VLDL-C	S-LDL-FC%	XL-HDL-P	XXL-VLDL-PL
IDL-PL	L-VLDL-CE	M-VLDL-C%	S-LDL-L	XL-HDL-PL	XXL-VLDL-PL%
IDL-PL%	L-VLDL-CE%	M-VLDL-CE	S-LDL-P	XL-HDL-PL%	XXL-VLDL-TG
IDL-TG	L-VLDL-FC	M-VLDL-CE%	S-LDL-PL	XL-HDL-TG	XXL-VLDL-TG%
IDL-TG%	L-VLDL-FC%	M-VLDL-FC	S-LDL-PL%	XL-HDL-TG%	
Ile	L-VLDL-L	M-VLDL-FC%	S-LDL-TG	XL-VLDL-C	

*Traditional risk factors: age, sex, systolic blood pressure, hba1c, duration of diabetes, and body mass index.

Ethnicity was not adjusted because SEED and UK Biobank had different ethnicities.

Abbreviations : DHA: Docosahexaenoic acid; LA: Linoleic acid; FA: fatty acids, MUFA: monounsaturated FA, SFA: saturated FA; XXL: extremely large, XL: very large, L: large, M: medium, S: small, XS: very small; HDL: high-density lipoprotein, IDL: intermediate-density lipoprotein, LDL: low-density lipoprotein, VLDL: very-low-density lipoprotein; C: cholesterol, CE: cholesterol esters, FC: free cholesterol, L: total lipids, PL: phospholipids, TG: triglycerides; %: metabolites to total lipids ratio;