Supplementary data

Table S1: Cross-sectional association between circulating fatty acids and dairy fat intake

Total dairy Fat (g/d)	Fatty acids											
	C14:0		C15:0		C17:0		Trans-C16:1(n-7)		Trans-C18:1(n-7)		CLA	
	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value
Plasma TG												
Model 1	0.222	<0.001	0.257	<0.001	0.030	0.43	0.188	<0.001	0.261	<0.001	0.171	<0.001
Model 2	0.175	<0.001	0.250	<0.001	0.048	0.15	0.205	<0.001	0.248	<0.001	0.188	<0.001
Model 3	0.162	<0.001	0.231	<0.001	0.043	0.18	0.189	<0.001	0.229	<0.001	0.173	<0.001
Model 4	0.167	<0.001	0.230	<0.001	0.040	0.21	0.194	<0.001	0.230	<0.001	0.175	<0.001
Model 5	0.183	<0.001	0.240	<0.001	0.040	0.20	0.191	<0.001	0.218	<0.001	0.182	<0.001
Model 6	0.168	<0.001	0.230	<0.001	0.041	0.20	0.195	<0.001	0.229	<0.001	0.175	<0.001
Model 7	0.204	<0.001	0.231	<0.001	0.042	0.27	0.193	<0.001	0.236	<0.001	0.182	<0.001
Plasma PL												
Model 1	0.198	<0.001	0.192	<0.001	0.127	<0.001	0.085	0.02	0.232	<0.001	0.228	<0.001
Model 2	0.202	<0.001	0.189	<0.001	0.119	<0.001	0.118	<0.001	0.239	<0.001	0.242	<0.001
Model 3	0.170	<0.001	0.162	<0.001	0.092	0.003	0.105	0.001	0.219	<0.001	0.217	<0.001
Model 4	0.174	<0.001	0.164	<0.001	0.090	0.004	0.110	<0.001	0.214	<0.001	0.220	<0.001
Model 5	0.182	<0.001	0.165	<0.001	0.127	<0.001	0.101	0.001	0.197	<0.001	0.211	<0.001
Model 6	0.174	<0.001	0.164	<0.001	0.090	0.003	0.111	<0.001	0.214	<0.001	0.220	<0.001
Model 7	0.177	<0.001	0.166	<0.001	0.094	0.003	0.109	<0.001	0.214	<0.001	0.229	<0.001

Model 1: Crude model; **Model 2**: Adjusted for energy intake; **Model 3:** Adjusted for Model 2 + age, sex, education and smoking; **Model 4:** Adjusted for model 2 + age, sex and BMI; **Model 5**: Adjusted for model 4 + total carbohydrates and Fat; **Model 6:** Adjusted for Model 4 + fish fat intake; **Model 7:** Adjusted for model 4 + Total Triglycerides + Total Cholesterol

Dependent: Dairy fat intake, independent: Circulating fatty acids. Associations between fatty acid status and dairy fat intake are reported as standardized β's.
Abbreviations: C14:0, Myristic acid; C15:0, Pentadecanoic acid; C17:0, Heptadecanoic acid; Trans-C16:1(n-7), Trans-Palmitoleic acid; Trans-C18:1(n-7), Vaccenic acid; CLA, Conjugated Linoleic acid; TG, Triglycerides; PL, Phospholipids; BMI, Body Mass Index

Table S2: Cross-sectional association between circulating fatty acids and fish fat intake

Total fish Fat (g/d)	Fatty acids											
	C14:0		C15:0		C17:0		Trans-C16:1(n-7)		Trans-C18:1(n-7)		CLA	
	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value
Plasma TG												
Model 1	-0.094	0.01	-0.045	0.22	0.080	0.04	0.022	0.60	-0.018	0.61	-0.093	0.01
Model 2	-0.101	0.01	-0.045	0.21	0.082	0.03	0.024	0.57	-0.020	0.58	-0.091	0.01
Model 3	-0.118	0.001	-0.069	0.06	0.093	0.02	0.001	0.98	-0.045	0.23	-0.106	0.004
Model 4	-0.104	0.01	-0.062	0.09	0.075	0.05	0.017	0.69	-0.030	0.42	-0.097	0.01
Model 5	-0.095	0.01	-0.045	0.21	0.087	0.02	0.019	0.63	-0.032	0.38	-0.101	0.004
Model 6	-0.104	0.01	-0.062	0.10	0.076	0.05	0.022	0.61	-0.027	0.48	-0.098	0.01
Model 7	-0.068	0.09	-0.058	0.11	0.023	0.61	0.008	0.85	-0.019	0.61	-0.082	0.02
Plasma PL												
Model 1	-0.064	0.07	-0.008	0.83	0.067	0.07	0.034	0.35	-0.065	0.89	-0.070	0.05
Model 2	-0.064	0.08	-0.008	0.83	0.066	0.07	0.039	0.29	-0.004	0.91	-0.068	0.06
Model 3	-0.087	0.02	-0.016	0.65	0.063	0.09	0.026	0.49	-0.024	0.53	-0.089	0.02
Model 4	-0.076	0.04	-0.020	0.59	0.049	0.19	0.034	0.36	-0.020	0.60	-0.078	0.03
Model 5	-0.068	0.06	-0.007	0.84	0.098	0.01	0.041	0.26	-0.014	0.72	-0.097	0.01
Model 6	-0.076	0.04	-0.017	0.65	0.051	0.17	0.037	0.33	-0.016	0.67	-0.079	0.04
Model 7	-0.077	0.04	-0.036	0.33	0.037	0.34	0.020	0.59	-0.029	0.44	-0.070	0.06

Model 1: Crude model; **Model 2**: Adjusted for energy intake; **Model 3:** Adjusted for Model 2 + age, sex, education and smoking; **Model 4:** Adjusted for Model 2 + age, sex and BMI; **Model 5**: Adjusted for model 4 + total carbohydrates and Fat; **Model 6:** Adjusted for Model 4 + dairy fat intake; **Model 7:** Adjusted for model 4 + Total Triglycerides + Total Cholesterol

Dependent: fish fat intake, independent: fatty acids. Associations between fatty acid status and fish fat intake are reported as standardized β's. Abbreviations: C14:0, Myristic acid; C15:0, Pentadecanoic acid; C17:0, Heptadecanoic acid; Trans-C16:1(n-7), Trans-Palmitoleic acid; Trans-C18:1(n-7), Vaccenic acid; CLA, Conjugated Linoleic acid; TG, Triglycerides; PL, Phospholipids; BMI, Body Mass Index

Table S3: Association between the circulating fatty acids EPA and DHA and fish fat intake

Total fish Fat (g/d)	Omega-3 fatty acids			
	EPA		DHA	
	β	p-value	β	p-value
Plasma TG				
Model 1	0.277	<0.001	0.425	<0.001
Model 2	0.283	<0.001	0.440	<0.001
Model 3	0.272	<0.001	0.445	<0.001
Plasma PL				
Model 1	0.256	<0.001	0.457	<0.001
Model 2	0.258	<0.001	0.465	<0.001
Model 3	0.248	<0.001	0.464	<0.001

Model 1: Crude model; **Model 2:** Adjusted for model 1 + energy intake; **Model 3**: Adjusted for Model 2 + age and sex, education and smoking

Dependent: fish fat intake, independent: fatty acids. Associations between fatty acid status and fish fat intake are reported as standardized β's.
Abbreviations: DHA, docosahexaenoic acid; EPA: eicosapentaenoic acid; PL, Phospholipids; TG, Triglycerides

Table S4: Association between fatty acid markers from plasma triglycerides (TG) and cardiovascular risk factors

	C14:0		C15:0		C17:0		Trans-C16:1(n-7)		Trans-C18:1(n-7)		CLA	
	Model S1	**Model S2**	**Model S1**	**Model S2**	**Model S1**	**Model S2**	**Model S1**	**Model S2**	**Model S1**	**Model S2**	**Model S1**	**Model S2**
Dependent variable												
Weight (kg)	**0.074***	-0.025	**-0.079***	-0.079	**-0.116****	0.022	-0.032	-0.027	0.011	-0.026	0.000	-0.040
Waist circumference	**0.094****	-0.041	**-0.096****	**-0.107*****	**-0.144*****	0.039	-0.035	-0.040	0.023	-0.033	-0.007	**-0.064***
BMI (kg/m^2)	**0.081***	-0.066	**-0.121****	**-0.126*****	**-0.173*****	0.022	0.078	-0.052	-0.010	**-0.067***	-0.015	**-0.075***
SBP (mmHg)	0.032	-0.047	-0.059	**-0.066***	**-0.074***	0.039	-0.024	-0.036	-0.013	-0.050	-0.044	-0.080
DBP (mmHg)	**0.073***	0.001	**-0.064***	**-0.067***	**-0.088***	0.005	-0.008	-0.003	0.014	-0.013	0.015	-0.013
Total C (mmol/L)	**0.145*****	0.009	-0.025	-0.017	**-0.311*****	**-0.147*****	0.028	0.063	**0.104****	0.070*	0.057	0.015
HDL-c(mmol/L)	**-0.222*****	-0.057	**-0.072***	**-0.060***	**0.156*****	**-0.113****	-0.007	-0.010	-0.063	0.005	**-0.093****	-0.023
LDL-c (mmol/L)	**0.150*****	0.039	-0.001	0.005	**-0.273*****	**-0.133****	0.016	0.047	**0.093***	0.062	0.056	0.019
Total TG	**0.384*****	-	0.004	-	**-0.543*****	-	-0.042	-	**0.126*****	-	**0.141*****	-
TG/HDL-c ratio	**0.368*****	0.016	0.030	**0.022***	**-0.462*****	**0.049****	-0.027	0.006	**0.121*****	0.000	**0.140*****	0.007
Glucose (mmol/L)	**0.106****	0.014	-0.044	-0.049	**-0.100****	0.038	-0.027	-0.016	0.035	0.000	0.017	-0.025
HbA1c (%)	**0.093****	0.034	-0.020	-0.039	-0.023	0.080	-0.013	-0.021	0.011	-0.022	-0.023	-0.060
Hs-CRP (mg/L)[1]	0.053	-0.038	**-0.103***	**-0.110***	**-0.188*****	**-0.119***	-0.060	-0.070	-0.047	-0.085	-0.018	-0.065
Creatinine (umol/L)	0.015	-0.038	-0.039	-0.023	**-0.067***	0.022	0.018	0.028	0.001	-0.008	-0.001	-0.012
Uric acid (mmol/L)[1]	0.084	**-0.134***	**-0.150****	**-0.163*****	**-0.230*****	0.052	-0.090	-0.085	-0.091	**-0.140****	-0.027	-0.079
Ureum (mmol/L)[1]	0.016	0.001	**0.130****	**0.121***	0.087	**0.138***	0.109	0.097	**0.143****	**0.137***	0.082	0.079

Model S1: Adjusted for age, sex, education and smoking**; Model S2:** Adjusted for age, sex and triglycerides.

Dependent: cardiovascular risk factors, independent: fatty acid status. Associations between fatty acid status and cardiovascular risk factor are reported as standardized β's. P-value: * = ≤ 0.05, ** = < 0.01, *** = < 0.001. Abbreviations: BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; Total C; total cholesterol; HDL-c, high density lipoprotein cholesterol; LDL-c, Low density lipoprotein cholesterol; Total TG, total triglycerides; TG/HDL-c ratio, total triglycerides/HDL cholesterol; HbA1c, Hemoglobin A1C; Hs-CRP, High sensitive C-reactive protein. [1.] Hs-Crp data was available in n = 412, Uric acid and ureum data were available in n = 348

Table S5: Association between fatty acid markers from plasma phospholipids (PL) and cardiovascular risk factors.

	C14:0		C15:0		C17:0		Trans-C16:1(n-7)		Trans-C18:1(n-7)		CLA	
	Model S1	**Model S2**	**Model S1**	**Model S2**	**Model S1**	**Model S2**	**Model S1**	**Model S2**	**Model S1**	**Model S2**	**Model S1**	**Model S2**
Dependent variable												
Weight (kg)	-0.002	-0.015	-0.056	-0.019	**-0.150*** **	**-0.102** **	-0.011	0.012	-0.056	-0.047	0.012	-0.024
Waist circumference	0.001	-0.023	**-0.090** **	-0.047	**-0.176*** **	**-0.120*** **	-0.052	-0.027	**-0.070***	**-0.063***	-0.008	-0.058
BMI (kg/m^2)	-0.018	-0.040	-0.087	-0.017	**-0.186*** **	**-0.120** **	-0.049	-0.021	**-0.099***	**-0.087***	-0.025	**-0.079***
SBP (mmHg)	-0.026	-0.046	-0.043	-0.017	**-0.074***	-0.026	-0.049	-0.041	**-0.087***	**-0.083***	-0.048	**-0.088***
DBP (mmHg)	-0.005	-0.030	**-0.067***	-0.038	**-0.128*** **	**-0.078***	-0.039	-0.021	-0.063	-0.057	0.012	-0.023
Total C (mmol/L)	**0.117** **	-	**-0.087***	-	**-0.253*** **	-	-0.052	-	0.006	-	**0.136*** **	-
HDL-c(mmol/L)	-0.012	-0.022	0.030	-0.022	-0.063	**-0.109*** **	**-0.015**	**-0.057***	0.022	-0.015	0.018	0.043
LDL-c (mmol/L)	**0.120** **	0.010	**-0.073***	0.005	**-0.184*** **	**0.051*** **	-0.025	0.019	0.011	-0.001	**0.100** **	**-0.028***
Total TG	0.053	-	**-0.146*** **	-	**-0.232*** **	-	**-0.114** **	-	**-0.073***	-	**0.120** **	-
TG/HDL-c ratio	0.042	0.007	**-0.119*** **	0.010	**-0.147*** **	**0.043*** **	**-0.076***	**0.025***	-0.061	0.008	**0.080***	-0.018
Glucose (mmol/L)	0.029	0.026	-0.060	-0.031	**-0.107** **	**-0.085***	-0.023	0.005	**-0.084***	**-0.069***	-0.044	**-0.065***
HbA1c (%)	-0.019	-0.024	-0.030	-0.019	-0.029	-0.031	-0.018	-0.009	**-0.084***	**-0.081** **	-0.023	-0.037
Hs-CRP (mg/L)[1]	-0.037	-0.056	-0.081	-0.051	**-0.222*** **	**-0.200*** **	**-0.110***	**-0.102***	**-0.172*** **	**-0.168***	0.015	-0.028
Creatinine (umol/L)	-0.041	-0.044	-0.005	0.020	**-0.109*** **	**-0.060***	0.002	0.022	-0.055	-0.032	-0.006	-0.022
Uric acid (mmol/L)[1]	-0.087	**-0.106***	**-0.119***	-0.076	**-0.265*** **	**-0.197*** **	**-0.108***	-0.039	**-0.197*** **	**-0.128** **	-0.047	-0.073
Ureum (mmol/L)[1]	0.012	0.020	**0.188** **	**0.188*** **	0.091	0.088	0.096	0.104	0.093	0.105	0.028	0.037

Model S1: Adjusted for age, sex, education and smoking**; Model S2:** Adjusted for age, sex, triglycerides and cholesterol.

Dependent: cardiovascular risk factors, independent: fatty acid status. Associations between fatty acid status and cardiovascular risk factor are reported as standardized β's. P-value: * = ≤ 0.05, ** = < 0.01, *** = < 0.001. Abbreviations: BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; Total C; total cholesterol; HDL-c, high density lipoprotein cholesterol; LDL-c, Low density lipoprotein cholesterol; Total TG, total triglycerides; TG/HDL-c ratio, total triglycerides/HDL cholesterol; HbA1c, Hemoglobin A1C; Hs-CRP, High sensitive C-reactive protein. [1.] Hs-Crp data was available in n = 412, Uric acid and ureum data were available in n = 348

Table S6: Association between dairy fat intake and cardiovascular risk factors

	Dairy fat intake (g/d)					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Age (years)	**0.355*** **					
Sex	**0.083***					
Weight (kg)	-0.003	0.022	0.043	0.037	0.043	0.042
Waist circumference	**0.094***	0.007	0.023	0.014	0.023	0.025
BMI (kg/m^2)	0.048	-0.022				
SBP (mmHg)	**0.103***	-0.043	-0.048	-0.044	-0.048	-0.046
DBP (mmHg)	**0.108****	0.021	0.023	0.012	0.024	0.024
Total C (mmol/L)	**0.118****	-0.003	0.006	0.000	0.006	
HDL-c(mmol/L)	**0.112****	0.051	0.051	-0.004	0.053	0.036
LDL-c (mmol/L)	**0.086***	-0.015	-0.003	0.012	-0.003	-0.011
Total TG	0.009	-0.024	-0.026	-0.009	-0.028	
TG/HDL-c ratio	-0.037	-0.038	-0.039	-0.006	-0.041	-0.014
Glucose (mmol/L)	**0.085***	-0.036	-0.024	-0.055	-0.024	-0.018
HbA1c (%)	**0.215*****	0.020	0.027	0.030	0.027	0.031
Hs-CRP (mg/L)[1]	0.001	0.005	-0.008	0.004	-0.007	-0.012
Creatinine (umol/L)	-0.030	-0.020	-0.026	-0.030	-0.027	-0.023
Uric acid (mmol/L)[1]	**-0.172****	**-0.122***	**-0.107***	**-0.106***	-0.101	-0.058
Ureum (mmol/L)[1]	**0.188****	**0.183****	**0.186****	**0.184****	**0.186****	**0.184****

Model 1: Adjusted for energy intake; **Model 2**: Model 1 + age, sex, education and smoking; **Model 3**: Model 1 + age, sex and BMI; **Model 4**: Model 3 + total carbohydrates and total fat; **Model 5**: Model 3 + total fish fat intake; **Model 6**: Model 3 + total triglycerides and total cholesterol.

Dependent: cardiovascular risk factors, independent: dairy fat intake. Associations between dairy fat intake and cardiovascular risk factor are reported as standardized β's. P-value: * = ≤ 0.05, ** = < 0.01, *** = < 0.001. Abbreviations: BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; Total C; total cholesterol; HDL-c, high density lipoprotein cholesterol; LDL-c, Low density lipoprotein cholesterol; Total TG, total triglycerides; TG/HDL-c ratio, total triglycerides/HDL cholesterol; HbA1c, Hemoglobin A1C; Hs-CRP, High sensitive C-reactive protein. [1.] Hs-Crp data was available in n = 412, Uric acid and ureum data were available in n = 348

Table S7: Association between fish fat intake and cardiovascular risk factors

	Fish fat intake (g/d)					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Age (years)	**0.077***					
Sex	0.004					
Weight (kg)	-0.041	-0.036	0.007	0.003	0.007	0.003
Waist circumference	-0.022	-0.035	0.000	-0.001	0.001	0.007
BMI (kg/m^2)	-0.045	-0.048				
SBP (mmHg)	0.032	0.014	0.013	0.013	0.012	0.022
DBP (mmHg)	0.041	0.020	0.029	0.012	0.029	0.038
Total C (mmol/L)	0.019	-0.015	0.001	-0.011	0.002	
HDL-c(mmol/L)	**0.100****	**0.080***	**0.075***	0.042	**0.076***	0.018
LDL-c (mmol/L)	0.018	0.043	0.007	0.009	0.007	-0.001
Total TG	**-0.117****	**-0.120****	**-0.109****	**-0.110****	**-0.109****	
TG/HDL-c ratio	**-0.126*****	**-0.121*****	**-0.110*****	**-0.098****	**-0.111*****	-0.006
Glucose (mmol/L)	0.000	-0.030	-0.006	-0.014	-0.006	0.016
HbA1c (%)	0.016	-0.026	-0.013	-0.004	-0.012	0.001
Hs-CRP (mg/L)[1]	-0.085	-0.079	-0.047	-0.047	-0.047	-0.033
Creatinine (umol/L)	-0.013	-0.012	-0.015	-0.021	-0.016	-0.002
Uric acid (mmol/L)[1]	0.097	**0.102***	0.081	0.079	0.076	**0.102****
Ureum (mmol/L)[1]	-0.030	-0.019	-0.012	-0.015	-0.001	-0.011

Model 1: Adjusted for energy intake; **Model 2**: Model 1 + age, sex, education and smoking; **Model 3**: Model 1 + age, sex and BMI; **Model 4**: Model 3 + total carbohydrates and total fat; **Model 5**: Model 3 + total dairy fat intake; **Model 6**: Model 3 + total triglycerides and total cholesterol.

Dependent: cardiovascular risk factors, independent: fish fat intake. Associations between dairy fat intake and cardiovascular risk factor are reported as standardized β's. P-value: * = ≤ 0.05, ** = < 0.01, *** = < 0.001. Abbreviations: BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; Total C; total cholesterol; HDL-c, high density lipoprotein cholesterol; LDL-c, Low density lipoprotein cholesterol; Total TG, total triglycerides; TG/HDL-c ratio, total triglycerides/HDL cholesterol; HbA1c, Hemoglobin A1C; Hs-CRP, High sensitive C-reactive protein. [1.] Hs-Crp data was available in n = 412, Uric acid and ureum data were available in n = 348

Table S8A: Papers investigating the association between dairy fat biomarkers and cardiovascular risk factors (based on an illustrative search)

								Biomarkers[1,2]				
Fraction	**Plasma/Serum**	**Paper**	**Population**	**n**	**Outcome**		**+/-[3]**	**C14:0**	**C15:0**	**C15:0+ C17:0**	**C17:0**	**Trans-C16:1(n-7)**
CE+TG+PL+FFA	Plasma	-	-	-	-							
	Serum	Santaren et al. (2014)[1]	Hispanic, African American and Non-Hispanic white adults 40-60 yr	659	Insulin resistance by intravenous glucose-tolerance test (insulin sensitivity index)	r	+		0.14***			-0.12**
						β	+		0.84*			-0.42
					β-cell dysfunction by intravenous glucose-tolerance test (product of the insulin sensitivity index and acute insulin response)	r	+		0.11**			-
						β	+		2.21*			0.10
CE	Plasma	-	-	-	-	-		-	-	-	-	-
	Serum	Smedman et al. (1999)[2]	70-year old men	66	Weight	r	+		- 0.36**			
					BMI	r	+		- 0.39***			
					WC	r	+		- 0.28*			
					HC	r	+		- 0.32**			
					HDL triacylglycerol	r	+		- 0.23			
					Insulin sensitivity by clamp (insulin sensitivity index (glucose disposal/actual insulin concentration) *100)	r	+		0.21			
TG	Plasma/Serum	-	-	-	-	-		-	-	-	-	-
PL	Plasma	Mozaffarian et al. (2010)[3]	Cardio vascular Health study, adults from 4 US communities	3736	BMI	Δ%[a,c]	+					-1.8%*
					WC	Δ%	+					-1.8%**
					LDL	Δ%	0					+2.4%
					HDL	Δ%	+					+1.9%*
					Total Triglycerides	Δ%	+					-19.0%***
					Total:HDL ratio	Δ%	+					-4.7%***
					CRP	Δ%	+					-13.8%*
					Fasting glucose	Δ%	0					-0.96%
					Fasting insulin	Δ%	+					-13.3%***
					Insulin resistance by HOMA-IR	Δ%	+					-16.7%**
		Mozaffarian et al. (2013)[4]	US adults (45-84 yr) from the Multi-ethnic study of	2617	SBP	Δ%[a,c]	+					-2.4%*
					DBP	Δ%	+					-2.9%***
					LDL	Δ%	-					+6.4%***
					HDL	Δ%	0					-1.19
					Total Triglycerides	Δ%	+					-19.1%***

			athero-sclerosis		Total:HDL ratio	Δ%	0					+1.5%
					Fasting glucose	Δ%	0					-1.2%
					Fasting insulin	Δ%	+					-9.1%***
		Nestel et al. (2014)[5]	Overweight and obese subjects with metabolic syndrome	86	insulin sensitivity index by OGTT (Matsuda index)	β	+				0.30*	0.02
					Insulin resistance (Fasting Insulin) by OGTT	β	+				-2.41*	-0.76
					Insulin resistance (HOMA-IR) by OGTT	β	+				-0.70*	-0.17
		Oliveira et al. (2013)[6]	US adults (45-84 yr) from the Multi-ethnic study of athero-sclerosis	2837	SBP	Δ%[a,c]	+	+2.5%*	-4.0%***			-1.18%*
					DBP	Δ%	+	+1.4%*	-4.1%***			-2.1%**
					LDL	Δ%	0	+1.9%	-1.11%			+4.4*
					HDL	Δ%	0	-0.2%	+0.4%			-0.6%
					Total: HDL ratio	Δ%	0	+5.0%**	-3.4%			+1.0%
					Total Triglycerides	Δ%	+	+29.5%***	-15.0%***			-17.7%***
					CRP	Δ%	0	0%	0%			+2.8%
	Serum	Kratz et al. (2014)[7]	Population without fatty liver disease	32	Fasting glucose	β	+		-1.84*		-0.80*	-1.31*
					AUC glucose by OGTT	β	+		-34.27*		-23.94*	-36.02*
					Incremental AUC glucose by OGTT	β	+		-9.9		-13.26*	-18.68
					Liver fat (liver-spleen ratio)	β	+		2.39		2.13*	3.56*
					Hepatic insulin resistance (basal hepatic glucose * fasting plasma insulin)	β	+		-1.21		-2.68	-5.95*
					Systemic insulin resistance (LL)	β	0		-0.60		5.93	11.2*
					Systemic insulin resistance (HL)	β	0		-0.78		5.72	10.97*
					Pancreatic β-cell function (AIRg)	β	0		2.12		4.35	-1.67
					Pancreatic β-cell function (oral DI)	β	0		2.73		3.82	4.34
					Pancreatic β-cell function (IV DI)	β	0		1.68		6.24	1.24
		Rosell et al. (2004)[8]	Healthy men (63-year old)	299	Abdominal obesity	r	+	0.09	-0.22***		-0.30***	
		Smedman et al. (1999)[2]	Men (70-years old)	66	Weight	r	0		-0.21			
					HC	r	+		-0.25*			
					Apo-B	r	0		-0.27			
		Warensjö et al. (2010)[9]	Swedish general population	1000	SBP	r	+		-0.05	-0.10***	-0.11***	
					DBP	r	+		-0.06	-0.13**	-0.16**	
					BMI	r	+		-0.08*	-0.14**	-0.14**	
					Total cholesterol	r	+		-0.10***	-0.04	0.008	

					Total Triglycerides	r	+		-0.18**	-0.23**	-0.22*	
					Fasting glucose	r	+		-0.05	-0.13**	-0.16*	
FFA	Plasma/Serum	Kratz et al. (2014)[7]	Population without fatty liver disease	32	Fasting glucose	β	+		-1.09*		-0.54	-1.23
					AUC glucose by OGTT	β	+		-32.43*		-18.07*	-35.25
					Incremental AUC glucose by OGTT	β	+		-18.00*		-10.96*	-18.95
					Liver fat (liver-spleen ratio)	β	+		2.55*		1.80*	3.20
					Hepatic insulin resistance (basal hepatic glucose * fasting plasma insulin)	β	0		-2.21		-0.74	-4.79
					Systemic insulin resistance (LL)	β	0		7.24		1.15	7.95
					Systemic insulin resistance (HL)	β	0		6.89		1.10	8.14
					Pancreatic β-cell function (AIRg)	β	0		-2.32		2.29	-3.49
					Pancreatic β-cell function (oral DI)	β	0		3.75		1.30	-1.82
					Pancreatic β-cell function (IV DI)	β	0		2.15		4.05	4.82
Erythrocytes	-	-	-	-	-	-		-	-	-	-	-
AT	-	Castro-Webb et al. (2012)[10]	Costa-Rican adults	1744 (232 cases)	Type 2 diabetes	PR[b]	0			1.33 (0.88-2.11)		1.05 (0.66-1.66)
		Iggman et al. (2010)[11]	Elderly men	795	Insulin sensitivity by clamp (glucose infusion rate)	r	+	0.32***	0.07		0.21***	
						β	+	0.35**	0.04		3.5*	
					Insulin sensitivity (HOMA-IR)	r	+	-0.27***	-0.04		-0.21***	
						β	+	-0.10*	0.10		-1.4***	
		Rosell et al. (2004)[12]	Healthy men (63-year old)	297	Abdominal obesity	r	+	-0.30***	-0.20***		-0.31***	
		Smit et al. (2010)[13]	Costa-Rican Adults	1785	BMI	β	-					0.37***
					WC	β	-					0.95***
					SS	β	+					-2.27***
					TS	β	+					-1.38***
					SUS	β	+					-1.67***

Significance level: *= p <0.05, **= p <0.01, ***= p <0.001.

[a]. Relationships of the dairy fatty acid with cardiovascular risk factors were evaluated using linear regression; [b]. Highest versus lowest quintile; [c]. Δ% is calculated by the authors of this manuscript, using data from the study.

[1]. r= correlation coefficient, Δ%= difference between low and high fatty acid biomarker, β= beta-coefficient, PR = prevalence ratio

[2]. Adjustments: Santaren (2014)= demographics, lifestyle, dietary variables; Mozaffarian (2010)= age, sex, diabetes, smoking, coronary heart disease, physical activity, dietary intake (BMI, waist circumference); Mozaffarian (2013)= age, sex, race, education, smoking, alcohol intake, physical activity, prevalent diabetes, waist circumference; Nestel (2014)= age, systolic blood pressure,

waist:hip ratio; Oliveira (2013)= demographics, lifestyle, prevalent diabetes, medication; Kratz (2014)= age, sex, BMI; Castro-Webb (2012)= demographics, lifestyle, several fatty acids; Iggman (2010)= BMI, smoking, alcohol intake, physical activity; Smit (2010)= age, sex, residence, all trans-fatty acids, smoking, physical activity, income, diabetes, hypertension, energy intake and adipose tissue alpha-linolenic acid

[3.] + = An increase of the biomarker reduces the cardiovascular risk factor. - = An increase in the biomarker increases the cardiovascular risk factor. 0 = No significant effect

Abbreviations: AIRg, acute insulin response to glucose; AT, Adipose tissue; AUC, area under the curve for glucose; BMI, Body mass index; C14:0, Myristic acid; C15:0, Pentadecanoic acid; C17:0, Heptadecanoic acid; CE, Cholesterol esters; CRP, C-reactive protein; DBP, diastolic blood pressure; FFA, Free fatty acids; HC, Hip circumference; HDL, High density lipoprotein; HL, High level insulin infusion; HOMA-IR, homeostatic model assessment-estimated insulin resistance; IV DI, intravenous disposition index; LDL, Low density lipoprotein; LL, low-level insulin infusion; OGTT, oral glucose tolerance test; oral DI, oral disposition index; PL, Phospholipids; SBP, systolic blood pressure; SS, Subscapular Skinfold; SUS, Suprailiac skinfold; TG, Triglycerides; Trans-C16:1(n-7), Trans-Palmitoleic acid; TS, Triceps skinfold; WC, waist circumference.

Table S8B: Papers investigating the association of dairy fatty acid biomarkers with the development of cardiovascular diseases (based on an illustrative search)

								Biomarkers[1,2] (Risk (95%CI))			
Paper	**Population**	**n**	**Outcome**	**Blood Sample**	**Lipid Fraction**		**+/ -[3]**	**C14:0**	**C15:0**	**C17:0**	**Trans-C16:1(n-7)**
			Coronary Heart Disease								
Iggman et al. (2016)[14]	Uppsala Longitudinal Study of Adult Men (ULSAM)	535 (251 cases)	Cardiovascular diseases	Adipose Tissue		HR[a]	0	0.95 (0.79 – 1.15)	1.03 (0.86-1.23)	0.98 (0.82-1.16)	
Khaw et al. (2012)[15]	Men and women from the EPIC cohort study	2424 cases, 4930 controls	Incidence of coronary heart disease	Plasma	PL	OR[a]	0	0.97 (0.87-1.08)	0.98 (0.89-1.09)	0.91 (0.82-1.01)	
Matthan et al. (2014)[16]	Post-menopausal women	2448 (1224 cases, 1224 controls)	Coronary heart disease	Plasma	PL	OR[a]	0	1.05 (0.70-1.56)	1.02 (0.61-1.72)		
Oliveira et al. (2013)[6]	US adults (45-84yr) from the Multi-ethnic study of athero-sclerosis	2837 (189 cases)	Incidence of cardiovascular disease	Plasma	PL	HR[b]	0	1.06 (0.65-1.74)	0.55 (0.32-0.95)		0.99 (0.58-1.69)
						HR[a]	+	1.02 (0.87-1.20)	0.81* (0.68-0.98)		0.97 (0.82-1.13)
		2837 (146 cases)	Incidence of coronary heart disease	Plasma	PL	HR[b]	+	1.13 (0.63-2.03)	0.41* (0.22-0.78)		0.82 (0.45-1.49)
						HR[a]	+	1.01 (0.84-1.21)	0.74* (0.60-0.92)		0.91 (0.75-1.10)
Sun et al. (2007)[17]	Female nurses, 30-55 years old	166 cases, 327 controls	Ischemic heart disease	Plasma	Total	RR[c]	-		2.36 * (1.16-4.78)	1.25 (0.68-2.30)	0.79 (0.44-1.42)
				Erythrocytes		RR[c]	0		0.93 (0.42-2.05)	0.72 (0.38-1.38)	0.98 (0.53-1.83)
Warensjö et al. (2010)[9]	Swedish general population	444 cases (307 men), 556 controls (308 men)	First myocardial infarction	Plasma	PL	OR[a] (men)	0		0.92 (0.78-1.10)	0.92 (0.78-1.10)	
				Plasma	PL	OR[a] (wo-men)	+		0.78* (0.61-0.99)	0.74* (0.58-0.95)	
			Stroke								
Warensjö et al. (2009)[18]	Northern Swedish general population	108 stroke cases, 216 controls	First stroke	Plasma	PL	OR[a]	+		0.81* (0.60-1.10)	0.71* (0.52-0.79)	
Yaemsiri et al. (2013)[19]	Womens Health Initiative	964 cases, 964 controls	Incident ischemic stroke	Serum	PL	OR[b,d]	0	1.09 (0.86-1.37)	1.07 (0.87-1.13)	1.01 (0.85-1.21)	0.94 (0.76-1.16)

	Observational Study (WHI-OS)										
Yakoob et al. (2014)[20]	Women in the Nurses' Health study (NHS) and men in the Health professionals study (HPFS)	472 cases NHS, 122 cases HPFS, 594 controls	Incident stroke	Plasma	Total	HR[e]	0	1.05 (0.62-1.78)	0.85 (0.54-1.33)	0.99 (0.67-1.49)	0.89 (0.55-1.45)
				Erythrocytes		HR[e]	0	1.31 (0.73-2.36)	0.88 (0.53-1.45)	0.87 (0.42-1.76)	1.07 (0.61-1.88)
Yamagishi et al. (2013)[21]	Men and Women from the Minneapolis Field Center of the Athero-sclerosis Risk in Communities Study (ARIC)	3870 (168 cases)	Incident Ischemic stroke	Plasma	CE	HR[e]	0	1.43 (0.92-2.22)	0.83 (0.55-1.25)		
					PL	HR[e]	0	1.29 (0.83-2.01)	0.89 (0.60-1.33)		
			Heart Failure								
Matsumoto et al. (2013)[22]	Physicians Health Study (PHS)	788 cases, 788 controls	Incident heart failure	Plasma	PL	OR[e]	0	1.03 (0.65-1.64)	0.73 (0.44-1.12)		
						OR[a]	0	1.02 (0.86-1.20)	0.91 (0.76-1.07)		
Tokede et al. (2013)[23]	Physicians Health Study (PHS)	788 cases, 788 controls	Incident heart failure	Plasma	PL	OR[b]	0				0.74 (0.49-1.10)
						OR[a]	0				0.91 (0.80-1.04)
Yamagishi et al. (2008)[24]	Men and Women from the Minneapolis Field Center of the Athero-sclerosis Risk in Communities Study (ARIC)	3592 (197 cases)	Incident heart failure	Plasma	CE	HR[e]	0	1.70** (1.06-2.71)	0.80 (0.50-1.28)	0.81 (0.52-1.26)	
				Plasma	PL	HR[e]	+	1.29 (0.80-2.08)	0.62* (0.38-1.02)	0.55** (0.35-0.85)	

Significance level: *= p <0.05, **= p <0.01, ***= p <0.001. One asterisk was ascribed when the risk was significant, but the level unknown.

[a]. Evaluated as continuous variables (per 1 SD unit difference)[b] . Highest versus lowest quintile [c.] Highest versus lowest tertile [d]. CI is 99.9% instead of 95%, [e] Highest versus lowest quartile.

[1.] RR= Relative risk, HR= hazard ratio, OR= Odds ratio

[2.] Adjustments: Iggman (2016)= age,sex and cardiovascular risk factors; Kwah (2012)= age, sex, polyunsaturated fatty acids, BMI, smoking, alcohol intake, physical activity, social class, education, blood pressure; Matthan (2014)= demographics, BMI, systolic blood pressure, smoking, education, medication and hormone use, family history of cardiovascular disease/stroke/myocardial infarction/type 2 diabetes, physical activity, dietary intake; de Oliveira (2013)= demographics, lifestyle, dietary variables; Sun (2007)= age, smoking, fasting status, BMI, postmenoposal status and hormone use, physical activity, alcohol intake, aspirin intake, history of hypertension, hypercholesterolemia, diabetes, linoleic acid, total trans fatty acids; Warensjo (2009) = BMI, serum-cholesterol, tobacco use, systolic blood pressure, diastolic blood pressure; Yaemsiri (2013)= BMI, smoking, diabetes, aspirin use, systolic blood pressure, antihypertensive medication, total cholesterol, HDL cholesterol and triglycerides; Yakoob (2014)= age, race, month of blood collection, smoking status, physical activity, alcohol, family history of diabetes, myocardial infarction, menoposal status, postmenoposal hormone use, food intake, energy intake, plasma/erythrocytes trans 18:1, trans 18:1, 16:0, 18:0; Yamagishi (2008 & 2013)= Age and sex; Matsumoto (2013) and Tokede (2013)= age, race, year of birth, blood sample collection, BMI, smoking, exercise, alcohol intake, history of diabetes and atrial fibrillation and saturated fatty acids.

[3.] + = An increase of the biomarker decreases the risk of diabetes type 2 and/or cardiovascular diseases. - = An increase in the biomarker increases the risk of diabetes type 2 and/or cardiovascular diseases. 0 = No significant effect

Abbreviations: AT, Adipose tissue; C14:0, Myristic acid; C15:0, Pentadecanoic acid; C17:0, Heptadecanoic acid; CE, Cholesterol esters; FFA, Free fatty acids; PL, Phospholipids; TG, Triglycerides; Trans-C16:1(n-7), Trans-Palmitoleic acid.

Table S8C: Papers investigating the association of dairy fatty acid biomarkers with the development of diabetes type 2 (based on an illustrative search)

							Biomarkers[1,2] (Risk (95%CI))			
Paper	**Population**	**n**	**Blood Sample**	**Lipid Fraction**		**+/-[3]**	**C14:0**	**C15:0**	**C17:0**	**Trans-C16:1(n-7)**
Forouhi et al. (2014)[25]	Adults in the EPIC cohort study	27296 (12132 cases, 15164 controls)	Plasma	PL	HR[a]	+	1.15* (1.09-1.22)	0.79* (0.73-0.85)	0.67* (0.63-0.71)	
Hodge et al. (2007)[26]	Adults in the Melbourne collaborative cohort study	364 cases, 3391 controls	Plasma	PL	OR[b]	+		0.26*** (0.17-0.40)		
Krachler et al. (2008)[27]	Adults in the VIP study	159 cases, 291 controls	Erythrocytes		OR[a]	+	1.25* (1.01-1.53)	0.65** (0.50-0.85)	0.47*** (0.35-0.65)	
Mozaffarian et al. (2010)[3]	Cardio-vascular Health study, adults	2985 (304 cases)	Plasma	PL	HR[b]	+				0.38*** (0.24-0.62)
					HR[c]	0		0.99 (0.89-0.10)	0.98 (0.85-1.13)	
Mozaffarian et al. (2013)[4]	US adults (45-84yr) from the Multi-ethnic study of athero-sclerosis	2281 (205 cases)	Plasma	PL	HR[b]	+	0.98 (0.63-1.53)	0.70 (0.42-1.15)		0.52* (0.32-0.85)
Santaren et al. (2014)[1]	Hispanic, African American and Non-Hispanic white adults 40-60 yr	659	Serum	Total	OR[a]	+		0.73* (0.56-0.95)		
Yakoob et al. (2016)[28]	Women in the Nurses' Health study (NHS) and men in the Health professionals study (HPFS)	3333 (184 cases NHS study, 93 cases HPFS study)	Plasma	Total	HR[d]	+	1.03 (0.65-1.64)	0.56* (0.37-0.86)	0.57* (0.39-0.83)	0.48*** (0.33-0.70)
		3289 (179 cases NHS study, 97 cases in HPFS study	Erythrocytes		HR[d]	+	1.56 (0.98-2.49)	0.83 (0.55-1.25)	0.54*** (0.40-0.73)	0.78* (0.51-1.18)

Significance level: *= p <0.05, **= p <0.01, ***= p <0.001. One asterisk was ascribed when the risk was significant, but the level unknown.

[a]. Evaluated as continuous variables (per 1 SD unit difference), [b.] Highest versus lowest quintile, [c]. HR's evaluated per 0.05% points of total fatty acids [d]. Highest versus lowest quartile

[1.] RR= Relative risk, HR= hazard ratio, OR= Odds ratio

[2.] Adjustments: Forouhi (2014), Santaren (2014),Mozaffarian (2010, 2013)= demographics, lifestyle, dietary variables; Hodge (2007)= demographic, diabetes history, physical activity, alcohol intake; Krachler (2008)= alcohol intake; Yakoob (2016)= age, race, month of blood collection, smoking status, physical activity, alcohol, family history of diabetes, myocardial infarction, menoposal status, postmenoposal hormone use, food intake, energy intake, plasma/erythrocytes trans 18:1, trans 18:1, 16:0, 18:0;
[3.] + = An increase of the biomarker decreases the risk of diabetes type 2 and/or cardiovascular diseases. - = An increase in the biomarker increases the risk of diabetes type 2 and/or cardiovascular diseases. 0 = No significant effect

Abbreviations: AT, Adipose tissue; C14:0, Myristic acid; C15:0, Pentadecanoic acid; C17:0, Heptadecanoic acid; CE, Cholesterol esters; FFA, Free fatty acids; PL, Phospholipids; TG, Triglycerides; Trans-C16:1(n-7), Trans-Palmitoleic acid.

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