Online Supplementary Material

" Association between Dietary Phytochemical Index, cardiometabolic risk factors and metabolic syndrome in Switzerland. The CoLaus Study."
Nutrition, Metabolism and Cardiovascular Diseases

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Data availability
The data of CoLaus|PsyCoLaus study used in this article cannot be fully shared as they contain potentially sensitive personal information on participants. According to the Ethics Committee for Research of the Canton of Vaud, sharing these data would be a violation of the Swiss legislation with respect to privacy protection. However, coded individual-level data that do not allow researchers to identify participants are available upon request to researchers who meet the criteria for data sharing of the CoLaus|PsyCoLaus Datacenter (CHUV, Lausanne, Switzerland). Any researcher affiliated to a public or private research institution who complies with the CoLaus|PsyCoLaus standards can submit a research application to research.colaus@chuv.ch or research.psycolaus@chuv.ch. Proposals requiring baseline data only, will be evaluated by the baseline (local) Scientific Committee (SC) of the CoLaus and PsyCoLaus studies. Proposals requiring follow-up data will be evaluated by the follow-up (multicentric) SC of the CoLaus|PsyCoLaus cohort study. Detailed instructions for gaining access to the CoLaus|PsyCoLaus data used in this study are available at www.colaus-psycolaus.ch/professionals/how-to-collaborate/.

Supplementary Table 1. Baseline characteristics of included and excluded participants. CoLaus study, Lausanne, Switzerland, 2009-2012.

	Excluded (n = 1185)	Included (n = 3879)	p Value
Dietary Phytochemical index % (range)	16.9 - 34.9	17.7 - 34.6	
Dietary Phytochemical index %	16.3 (16.9)	26.8 (12.2)	**<0.001**
Daily total energy intake (Kcal/day)	965 (1136)	1804 (609)	**<0.001**
Daily total energy intake (KJoule/day)	4038 (4753)	7548 (2548)	
Daily energy intake from phytochemical-rich foods (Kcal/day)	246 (314)	478 (264)	**<0.001**
Daily energy intake from phytochemical-rich foods (KJoule/day)	1029 (1314)	2000 (1105)	
Demographic and lifestyle factors			
Age	58.2 (10.7)	57.6 (10.4)	0.08
Sex, n (% women)	633 (53.4)	2074 (53.4)	0.97
Education attainment, n (%)			
University	210 (17.7)	869 (22.4)	**<0.001**
High school	272 (23.0)	1034 (26.6)	
Apprenticeship	420 (35.5)	1376 (35.4)	
Primary	280 (23.6)	598 (15.4)	
Physical activity (total minutes/day)	448.9 (189.9)	442 (170.3)	0.36
Smoking status, n (%)			
Current	303 (26.7)	786 (20.2)	**<0.001**
Former	396 (34.9)	1487 (38.3)	
Never	435 (38.3)	1600 (41.3)	
Alcohol intake (units/week)	6 (8.9)	6.4 (8.1)	0.14
Alcohol abstainers, n (%)	373 (31.4)	908 (23.4)	**<0.001**
History of Hypertension, n (% yes)	516 (43.9)	1580 (40.7)	0.05
History of CVD, n (% yes)	97 (8.3)	268 (6.9)	0.09
History of T2D, n (% yes)	175 (15.0)	364 (9.3)	**<0.001**
Family history of CVD, n (% yes)	404 (42.5)	1277 (38.4)	**0.022**
Treatments, n (% yes)			
Antihypertensive	371 (31.3)	1012 (26)	**<0.001**
Hypolipidemic	261 (22.0)	795 (20.4)	0.25
Antidiabetic	107 (9.0)	179 (4.6)	**<0.001**
Dietary supplements consumption, n (% yes)	35 (2.9)	196 (5.0)	**0.002**
Cardiovascular risk factors distribution			
BMI, kg/m^2	26.8 (5.1)	26 (4.4)	**<0.001**
BMI categories (%)			
Normal	417 (37.2)	1665 (42.9)	**<0.001**
Overweight	439 (39.2)	1538 (39.6)	
Obesity	247 (22.0)	622 (16.0)	
Waist circumference, cm	93.4 (13.4)	91.5 (12.8)	**<0.001**
Systolic blood pressure (mm Hg)	126.4 (17.6)	126 (18.0)	0.56
Diastolic blood pressure (mm Hg)	77.8 (10.7)	78.2 (10.9)	0.26
Fasting glucose (mmol/L)[1]	6.1 (1.6)	5.8 (1.0)	**<0.001**
Insulin (microIU/mL)[1]	9.8 (13.9)	8.4 (16.4)	**<0.001**
Leptin (ng/mL)[1]	5.5 (7.3)	4.8 (6.0)	**0.02**
Adiponectin (ng/mL)[1]	5.5 (5.2)	4.9 (4.0)	**0.01**
Total cholesterol (mmol/L)	5.6 (1.1)	5,7 (1.0)	0.08
HDL-cholesterol (mmol/L)	1.6 (0.6)	1,7 (0.5)	**<0.001**
LDL-cholesterol (mmol/L)	3.4 (0.9)	3.5 (0.9)	**0.01**
Triglycerides (mmol/L)[1]	1.5 (1.3)	1.3 (0.7)	**<0.001**
hs-CRP (mg/L)[1]	3.8 (5.5)	2.2 (2.7)	**<0.001**
TNFa (pg/mL)[1]	10.2 (26.3)	10.1 (65.2)	0.12
IL-6 (pg/mL), median (IQR)[1]	20.1 (77.0)	18.1 (99.3)	**0.03**
Il-1b (pg/mL), median (IQR)[1]	4.1 (14.2)	4.4 (19.7)	0.70
Distribution by metabolic syndrome and its components[2], n (%)			

Metabolic Syndrome	510 (43.0)	1434 (36.9)	**<0.001**
Central obesity	807 (68.1)	2492 (64.2)	**0.01**
Hypertension	655 (55.2)	2049 (52.8)	0.13
Hyperglycemia	746 (62.9)	2243 (57.8)	**0.002**
Low HDL-cholesterol	191 (16.1)	386 (9.95)	**<0.001**
Hypertriglyceridemia	337 (28.4)	898 (23.1)	**<0.001**

Kcal, kilocalorie. CVD, Cardiovascular disease. T2D, Type 2 diabetes. BMI, Body mass index. Kg, kilogram. m2, square meter. cm, centimeter. mm Hg, millimeters of mercury. mmol, millimole. L, liter. microIU, microInternational units. mL, mililiter. ng, nanogram. mg, milligram. pg, picogram. HDL, high-density lipoprotein. LDL, low-density lipoprotein. hs-CRP, High sensitivity C-reactive protein. TNF-alpha, tumor necrosis factor-alpha.

Values expressed as mean ± standard deviation or as number of participants (percentage). The between-group comparisons were made using chi-square for categorical variables and ANOVA or Kruskal-Wallis's test for continuous variables.

[1] Crude values. Transformation of values done in logarithmic scale before testing for statistical significance.

[2] Metabolic Syndrome components definition (according to IDF criteria): central obesity (waist circumference >94 cm in males, >80 cm in females), hypertension (Systolic: $\geq$ 130 mm Hg or Diastolic: $\geq$ 85 mm Hg), hyperglycemia (Fasting plasma glucose $\geq$ 5.6 mmol/l or previously diagnosed T2D), low HDL-cholesterol (< 1.03 mmol/l in males & < 1.29 mmol/l in females), hypertriglyceridemia ($\geq$ 1.7 mmol/l or specific treatment for this abnormality). Metabolic Syndrome definition (according to IDF criteria): central obesity plus any other two additional components.

The number of subjects does not add to the total for excluded and included due to missing data.

Supplementary Table 2. Cross-sectional multivariable associations of the dietary phytochemical index (DPI) across percentiles with cardiometabolic risk factors and metabolic syndrome (and its components) stratified by age. CoLaus study, Lausanne, Switzerland, 2009-2012.

	Dietary Phytochemical index				
	Quartile 1	*Quartile 2*	*Quartile 3*	*Quartile 4*	*p Trend[2]*
Cardiometabolic risk factors					
Anthropometric measurements					
Waist circumference (cm)					
40-60 years		-1.10 (-2.42, 0.22)	-0.70 (-2.09, 0.69)	-2.02* (-3.48,-0.57)	**0.017**
> 60 years	Reference	-0.28 (-2.34, 1.77)	-0.79 (-2.78, 1.20)	-3.36** (-5.28,-1.43)	**<0.001**
Body mass index (kg/m^2)					
40-60 years		-0.42 (-0.91, 0.07)	-0.39 (-0.91, 0.12)	-0.68* (-1.22,-0.14)	**0.018**
> 60 years	Reference	-0.15 (-0.90, 0.60)	-0.29 (-1.02, 0.43)	-1.12* (-1.83,-0.42)	**0.001**
Blood pressure					
Systolic blood pressure (mm Hg)					
40-60 years		1.47 (-0.25, 3.19)	1.63 (-0.19, 3.44)	0.81 (-1.08, 2.71)	0.330
> 60 years	Reference	-2.41 (-5.68, 0.86)	-2.48 (-5.64, 0.69)	-1.93 (-5.02, 1.15)	0.328
Diastolic blood pressure (mm Hg)					
40-60 years		0.29 (-0.96, 1.54)	0.22 (-1.10, 1.53)	-0.11 (-1.49, 1.26)	0.887
> 60 years	Reference	-0.52 (-2.47, 1.43)	-0.50 (-2.39, 1.39)	-0.97 (-2.81, 0.87)	0.325
Markers of insulin resistance and diabetes					
Fasting glucose (mmol/L)					
40-60 years		-0.01 (-0.02, 0.01)	0.001 (-0.01, 0.01)	-0.001 (-0.01, 0.01)	0.713
> 60 years	Reference	0.001 (-0.02, 0.03)	0.001 (-0.02, 0.02)	0.01 (-0.01, 0.03)	0.593
Insulin (microIU/mL)					
40-60 years		-0.06 (-0.12, 0.01)	-0.12* (-0.19,-0.05)	-0.18** (-0.25,-0.11)	**<0.001**
> 60 years	Reference	0.07 (-0.02, 0.16)	0.01 (-0.08, 0.10)	0.03 (-0.06, 0.12)	0.973
Leptin (ng/mL)					
40-60 years		-0.09 (-0.21, 0.04)	-0.15* (-0.27,-0.02)	-0.27** (-0.40,-0.13)	**<0.001**
> 60 years	Reference	-0.04 (-0.21, 0.12)	-0.13 (-0.28, 0.03)	-0.15 (-0.30, 0.01)	**0.036**
Adiponectin (ng/mL)					
40-60 years		-0.02 (-0.10, 0.06)	0.001 (-0.08, 0.08)	0.04 (-0.05, 0.13)	0.348
> 60 years	Reference	0.04 (-0.08, 0.16)	0.11 (-0.01, 0.23)	0.10 (-0.01, 0.22)	**0.048**
Dyslipidemia markers					
Total cholesterol (mmol/L)					
40-60 years		-0.10 (-0.22, 0.02)	-0.15* (-0.28,-0.02)	-0.05 (-0.19, 0.08)	0.265
> 60 years	Reference	0.001 (-0.17, 0.18)	0.001 (-0.17, 0.17)	-0.03 (-0.20, 0.13)	0.673

HDL-cholesterol (mmol/L)					
40-60 years		0.001 (-0.04, 0.05)	0.01 (-0.03, 0.06)	0.04 (-0.01, 0.09)	0.127
> 60 years	Reference	-0.01 (-0.08, 0.07)	0.02 (-0.05, 0.09)	0.01 (-0.06, 0.07)	0.692
LDL-cholesterol (mmol/L)					
40-60 years		-0.08 (-0.18, 0.03)	-0.16* (-0.28,-0.05)	-0.07 (-0.19, 0.05)	0.094
> 60 years	Reference	0.02 (-0.14, 0.18)	-0.01 (-0.16, 0.15)	-0.03 (-0.18, 0.12)	0.599
Triglycerides (mmol/L)					
40-60 years		-0.04 (-0.09, 0.02)	-0.01 (-0.07, 0.05)	-0.04 (-0.10, 0.02)	0.370
> 60 years	Reference	0.001 (-0.07, 0.08)	0.001 (-0.07, 0.07)	-0.001 (-0.08, 0.07)	0.852
Cardiovascular/Inflammatory markers					
hs-CRP (mg/L)					
40-60 years		-0.06 (-0.17, 0.05)	-0.15* (-0.26,-0.03)	-0.24** (-0.37,-0.12)	**<0.001**
> 60 years	Reference	0.02 (-0.14, 0.19)	-0.05 (-0.21, 0.11)	-0.09 (-0.25, 0.07)	0.132
TNF-alpha (pg/mL)					
40-60 years		-0.05 (-0.18, 0.09)	-0.02 (-0.16, 0.12)	-0.07 (-0.21, 0.08)	0.460
> 60 years	Reference	-0.11 (-0.29, 0.06)	-0.16 (-0.33, 0.01)	-0.16 (-0.33, 0.001)	0.059
Interleukin 6 (pg/mL)					
40-60 years		-0.10 (-0.32, 0.11)	0.21 (-0.02, 0.43)	-0.02 (-0.25, 0.22)	0.451
> 60 years	Reference	-0.06 (-0.35, 0.23)	-0.13 (-0.42, 0.15)	-0.09 (-0.37, 0.19)	0.483
Interleukin 1b (pg/mL)					
40-60 years		0.07 (-0.15, 0.28)	0.12 (-0.10, 0.35)	-0.08 (-0.31, 0.16)	0.721
> 60 years	Reference	-0.10 (-0.43, 0.23)	-0.13 (-0.44, 0.18)	-0.24 (-0.54, 0.06)	0.115
Metabolic syndrome and its components[1]					
Metabolic syndrome					
40-60 years		0.91 (0.68, 1.22)	1.12 (0.82, 1.52)	1.02 (0.73, 1.41)	0.610
> 60 years	Reference	1.00 (0.69, 1.46)	0.89 (0.62, 1.29)	0.74 (0.52, 1.06)	0.057
Central obesity					
40-60 years		1.05 (0.81, 1.35)	1.21 (0.92, 1.59)	1.02 (0.77, 1.35)	0.624
> 60 years	Reference	0.94 (0.60, 1.46)	0.78 (0.51, 1.19)	0.52* (0.34, 0.77)	**<0.001**
Hypertension					
40-60 years		1.03 (0.75, 1.41)	1.41* (1.01, 1.95)	1.26 (0.88, 1.79)	0.081
> 60 years	Reference	0.73 (0.42, 1.25)	0.73 (0.43, 1.23)	0.72 (0.44, 1.20)	0.436
Hyperglycemia					
40-60 years		1.06 (0.81, 1.40)	1.10 (0.83, 1.47)	1.02 (0.76, 1.38)	0.796
> 60 years	Reference	1.41 (0.91, 2.17)	1.46 (0.96, 2.22)	1.37 (0.92, 2.05)	0.238
Low HDL-cholesterol					
40-60 years		0.71 (0.47, 1.08)	0.61* (0.38, 0.98)	0.94 (0.59, 1.49)	0.440
> 60 years	Reference	1.37 (0.67, 2.77)	1.56 (0.79, 3.06)	1.43 (0.72, 2.82)	0.399
Hypertriglyceridemia					

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40-60 years		0.79 (0.58, 1.09)	0.99 (0.71, 1.37)	0.76 (0.53, 1.10)	0.407
> 60 years	Reference	1.11 (0.72, 1.72)	0.85 (0.56, 1.32)	0.99 (0.65, 1.50)	0.672

cm, centimeter. Kg, kilogram. m^2, square meter. mm Hg, millimeters of mercury. mmol, millimole. L, liter. microIU, microInternational units. mL, mililiter. ng, nanogram. mg, milligram. pg, picogram. HDL, high-density lipoprotein. LDL, low-density lipoprotein. hs-CRP, High sensitivity C-re40-60 years protein. TNF-alpha, tumor necrosis factor-alpha.

Log-transformed variables: fasting glucose, insulin, leptin, adiponectin, triglycerides, hs-CRP, TNF-alpha, Interleukin 6 and Interleukin 1b.

Age categories: 40-60 years n = 2277, > 60 years n = 1602

[1] Metabolic Syndrome components definition (according to IDF criteria): central obesity (waist circumference >94 cm in males, > 80cm in females), hypertension (Systolic: ≥ 130 mm Hg or Diastolic: ≥ 85 mm Hg), hyperglycemia (Fasting plasma glucose ≥ 5.6 mmol/l or previously diagnosed T2D), low HDL-cholesterol (< 1.03 mmol/l in males & < 1.29 mmol/l in females), hypertriglyceridemia (≥ 1.7 mmol/l or specific treatment for this abnormality). Metabolic Syndrome definition (according to IDF criteria): central obesity plus any other two additional components.

Values expressed as standardized regression coefficients β and (95% confidence interval) for cardiometabolic risk factors and as odds ratios and (95% confidence interval) for metabolic syndrome and its components.

Quartile 1 is considered the reference group.

P-value: * = < 0.05 **= <0.001.

[2] P-trend estimated for Model 3

Multivariable model: crude model adjusted by sex, educational level, smoking status, alcohol consumption, physical activity, use of lipid-lowering medication (statins) (only for serum lipids), use of antihypertensive medication (only for blood pressure), use of antidiabetic drug treatment (only for markers of insulin resistance and diabetes), use of cardiovascular medication (only for blood pressure and serum lipids), family history of cardiovascular disease, presence of diabetes, presence of cardiovascular disease and body mass index (except for waist circumference and body mass index as outcomes).

Supplementary Table 3. Cross-sectional multivariable associations of the dietary phytochemical index (DPI) across percentiles with cardiometabolic risk factors and metabolic syndrome (and its components) stratified by sex. CoLaus study, Lausanne, Switzerland, 2009-2012.

	Dietary Phytochemical index				
	Quartile 1	*Quartile 2*	*Quartile 3*	*Quartile 4*	*p Trend[2]*
Cardiometabolic risk factors					
Anthropometric measurements					
Waist circumference (cm)					
Woman		-1.89* (-3.63,-0.14)	-1.34 (-3.04, 0.36)	-3.95** (-5.61,-2.29)	**<0.001**
Man	Reference	0.03 (-1.40, 1.45)	-0.46 (-2.00, 1.08)	-1.57 (-3.19, 0.06)	0.062
Body mass index (kg/m^2)					
Woman		-0.75* (-1.42,-0.09)	-0.68* (-1.33,-0.04)	-1.43** (-2.06,-0.79)	**0.001**
Man	Reference	-0.02 (-0.53, 0.48)	-0.10 (-0.65, 0.44)	-0.38 (-0.95, 0.20)	0.215
Blood pressure					
Systolic blood pressure (mm Hg)					
Woman		0.72 (-1.72, 3.17)	0.82 (-1.57, 3.20)	0.07 (-2.28, 2.42)	0.964
Man	Reference	0.21 (-1.79, 2.21)	-1.08 (-3.24, 1.08)	-0.93 (-3.21, 1.36)	0.269
Diastolic blood pressure (mm Hg)					
Woman		1.14 (-0.46, 2.74)	0.99 (-0.57, 2.55)	0.21 (-1.32, 1.74)	0.948
Man	Reference	-0.69 (-2.11, 0.74)	-0.85 (-2.39, 0.68)	-0.40 (-2.02, 1.22)	0.513
Markers of insulin resistance and diabetes					
Fasting glucose (mmol/L)					
Woman		0.001 (-0.01, 0.02)	0.001 (-0.01, 0.02)	0.001 (-0.01, 0.02)	0.566
Man	Reference	-0.01 (-0.02, 0.01)	0.001 (-0.02, 0.02)	-0.001 (-0.02, 0.02)	0.915
Insulin (microIU/mL)					
Woman		-0.02 (-0.09, 0.06)	-0.07 (-0.14, 0.01)	-0.09* (-0.16,-0.01)	**0.007**
Man	Reference	-0.01 (-0.09, 0.06)	-0.09* (-0.17,-0.001)	-0.11* (-0.20,-0.02)	**0.004**
Leptin (ng/mL)					
Woman		-0.10 (-0.23, 0.04)	-0.17* (-0.31,-0.04)	-0.24** (-0.37,-0.11)	**<0.001**
Man	Reference	-0.07 (-0.21, 0.07)	-0.14 (-0.29, 0.02)	-0.22* (-0.38,-0.06)	**0.005**
Adiponectin (ng/mL)					
Woman		-0.06 (-0.16, 0.04)	0.06 (-0.03, 0.16)	0.07 (-0.03, 0.16)	**0.019**
Man	Reference	0.05 (-0.04, 0.14)	-0.02 (-0.12, 0.07)	0.01 (-0.09, 0.11)	0.798
Dyslipidemia markers					
Total cholesterol (mmol/L)					
Woman		-0.05 (-0.20, 0.09)	-0.07 (-0.22, 0.07)	-0.07 (-0.21, 0.07)	0.357
Man	Reference	-0.05 (-0.18, 0.09)	-0.12 (-0.26, 0.03)	-0.04 (-0.19, 0.12)	0.393

HDL-cholesterol (mmol/L)					
Woman		-0.03 (-0.09, 0.03)	0.02 (-0.04, 0.08)	0.04 (-0.02, 0.10)	0.061
Man	Reference	0.02 (-0.02, 0.07)	0.001 (-0.05, 0.05)	-0.001 (-0.06, 0.05)	0.724
LDL-cholesterol (mmol/L)					
Woman		-0.02 (-0.15, 0.12)	-0.08 (-0.21, 0.04)	-0.08 (-0.21, 0.04)	0.125
Man	Reference	-0.04 (-0.16, 0.08)	-0.13 (-0.26, 0.001)	-0.02 (-0.16, 0.12)	0.400
Triglycerides (mmol/L)					
Woman		-0.01 (-0.07, 0.06)	-0.03 (-0.09, 0.03)	-0.05 (-0.11, 0.01)	0.063
Man	Reference	-0.03 (-0.10, 0.03)	0.03 (-0.04, 0.10)	-0.001 (-0.08, 0.07)	0.652
Cardiovascular/Inflammatory markers					
hs-CRP (mg/L)					
Woman		-0.06 (-0.19, 0.08)	-0.20* (-0.34,-0.07)	-0.20* (-0.34,-0.07)	**<0.001**
Man	Reference	-0.001 (-0.13, 0.12)	-0.02 (-0.16, 0.11)	-0.16* (-0.31,-0.02)	**0.043**
TNF-alpha (pg/mL)					
Woman		-0.12 (-0.28, 0.04)	-0.15 (-0.31, 0.01)	-0.18* (-0.33,-0.03)	**0.027**
Man	Reference	-0.04 (-0.18, 0.10)	-0.001 (-0.16, 0.15)	-0.04 (-0.20, 0.13)	0.767
Interleukin 6 (pg/mL)					
Woman		-0.08 (-0.35, 0.18)	0.01 (-0.25, 0.27)	0.06 (-0.19, 0.32)	0.401
Man	Reference	-0.13 (-0.36, 0.10)	0.14 (-0.11, 0.38)	-0.20 (-0.46, 0.06)	0.499
Interleukin 1b (pg/mL)					
Woman		-0.01 (-0.27, 0.24)	0.08 (-0.17, 0.33)	-0.07 (-0.32, 0.18)	0.684
Man	Reference	0.04 (-0.21, 0.29)	-0.02 (-0.29, 0.24)	-0.17 (-0.45, 0.11)	0.243
Metabolic syndrome and its components[1]					
Metabolic syndrome					
Woman		0.86 (0.59, 1.23)	0.85 (0.60, 1.21)	0.71 (0.50, 1.00)	0.059
Man	Reference	1.02 (0.76, 1.38)	1.14 (0.83, 1.58)	0.94 (0.67, 1.32)	0.969
Central obesity					
Woman		1.08 (0.76, 1.52)	1.07 (0.76, 1.50)	0.74 (0.53, 1.02)	**0.039**
Man	Reference	0.99 (0.74, 1.32)	1.03 (0.75, 1.41)	0.84 (0.60, 1.17)	0.414
Hypertension					
Woman		0.84 (0.54, 1.30)	1.21 (0.80, 1.83)	0.97 (0.64, 1.46)	0.705
Man	Reference	1.06 (0.74, 1.51)	1.00 (0.68, 1.47)	1.10 (0.73, 1.66)	0.748
Hyperglycemia					
Woman		1.17 (0.83, 1.65)	1.17 (0.84, 1.64)	1.12 (0.81, 1.56)	0.602
Man	Reference	1.17 (0.85, 1.62)	1.24 (0.88, 1.77)	1.03 (0.72, 1.49)	0.654
Low HDL-cholesterol					
Woman		1.12 (0.65, 1.94)	0.73 (0.41, 1.30)	0.89 (0.52, 1.53)	0.408
Man	Reference	0.73 (0.45, 1.17)	1.00 (0.61, 1.65)	1.23 (0.73, 2.08)	0.423

Hypertriglyceridemia					
Woman		1.03 (0.67, 1.60)	0.82 (0.53, 1.27)	0.82 (0.54, 1.26)	0.238
Man	Reference	0.85 (0.62, 1.16)	1.05 (0.75, 1.46)	0.86 (0.60, 1.24)	0.706

cm, centimeter. Kg, kilogram. m2, square meter. mm Hg, millimeters of mercury. mmol, millimole. L, liter. microIU, microInternational units. mL, mililiter. ng, nanogram. mg, milligram. pg, picogram. HDL, high-density lipoprotein. LDL, low-density lipoprotein. hs-CRP, High sensitivity C-reactive protein. TNF-alpha, tumor necrosis factor-alpha.

Log-transformed variables: fasting glucose, insulin, leptin, adiponectin, triglycerides, hs-CRP, TNF-alpha, Interleukin 6 and Interleukin 1b.

Sex categories: Women n = 1.839, Men n = 1607

[1]Metabolic Syndrome components definition (according to IDF criteria): central obesity (waist circumference >94 cm in males, > 80cm in females), hypertension (Systolic: ≥ 130 mm Hg or Diastolic: ≥ 85 mm Hg), hyperglycemia (Fasting plasma glucose ≥ 5.6 mmol/l or previously diagnosed T2D), low HDL-cholesterol (< 1.03 mmol/l in males & < 1.29 mmol/l in females), hypertriglyceridemia (≥ 1.7 mmol/l or specific treatment for this abnormality). Metabolic Syndrome definition (according to IDF criteria): central obesity plus any other two additional components.

Values expressed as standardized regression coefficients β and (95% confidence interval) for cardiometabolic risk factors and as odds ratios and (95% confidence interval) for metabolic syndrome and its components.

Quartile 1 is considered the reference group.

P-value: * = < 0.05 **= <0.001

[2]P-trend estimated for Model 3

Multivariable model: crude model adjusted by age, educational level, smoking status, alcohol consumption, physical activity, use of lipid-lowering medication (statins) (only for serum lipids), use of antihypertensive medication (only for blood pressure), use of antidiabetic drug treatment (only for markers of insulin resistance and diabetes), use of cardiovascular medication (only for blood pressure and serum lipids), family history of cardiovascular disease, presence of diabetes, presence of cardiovascular disease and body mass index (except for waist circumference and body mass index as outcomes).

Supplementary Table 4. Cross-sectional multivariable associations of the dietary phytochemical index (DPI) across percentiles with cardiometabolic risk factors and metabolic syndrome (and its components) stratified by educational attainment. CoLaus study, Lausanne, Switzerland, 2009-2012.

	Dietary Phytochemical index				
	Quartile 1	*Quartile 2*	*Quartile 3*	*Quartile 4*	*p Trend[2]*
Cardiometabolic risk factors					
Anthropometric measurements					
Waist circumference (cm)					
University		-0.61 (-2.81, 1.59)	-1.18 (-3.46, 1.11)	-1.59 (-3.82, 0.65)	0.142
High school	Reference	-2.71* (-4.82,-0.60)	-0.94 (-3.13, 1.24)	-4.12** (-6.28,-1.95)	**0.003**
Apprenticeship		0.13 (-1.86, 2.11)	-0.81 (-2.82, 1.19)	-3.47* (-5.59,-1.35)	**0.001**
Primary		0.25 (-2.75, 3.24)	-0.17 (-3.18, 2.84)	-1.23 (-4.22, 1.77)	0.391
Body mass index (kg/m^2)					
University		-0.19 (-0.97, 0.59)	-0.46 (-1.27, 0.35)	-0.53 (-1.33, 0.26)	0.149
High school	Reference	-0.90* (-1.69,-0.10)	-0.29 (-1.11, 0.54)	-1.13* (-1.95,-0.31)	**0.036**
Apprenticeship		-0.24 (-0.97, 0.50)	-0.51 (-1.25, 0.23)	-1.36** (-2.14,-0.58)	**0.001**
Primary		0.17 (-0.97, 1.31)	-0.07 (-1.22, 1.08)	-0.23 (-1.37, 0.92)	0.615
Blood pressure					
Systolic blood pressure (mm Hg)					
University		3.39* (0.42, 6.36)	1.95 (-1.14, 5.03)	2.25 (-0.77, 5.27)	0.341
High school	Reference	-1.39 (-4.48, 1.71)	-2.28 (-5.48, 0.92)	-1.16 (-4.34, 2.03)	0.424
Apprenticeship		0.30 (-2.49, 3.08)	0.53 (-2.28, 3.34)	-0.39 (-3.39, 2.61)	0.874
Primary		-1.96 (-6.20, 2.29)	-1.64 (-5.91, 2.64)	-3.92 (-8.15, 0.32)	0.092
Diastolic blood pressure (mm Hg)					
University		1.76 (-0.36, 3.88)	1.56 (-0.64, 3.76)	1.46 (-0.69, 3.62)	0.274
High school	Reference	-0.49 (-2.58, 1.60)	-0.34 (-2.50, 1.82)	-0.52 (-2.67, 1.63)	0.689
Apprenticeship		-0.42 (-2.25, 1.41)	-0.11 (-1.95, 1.74)	-1.11 (-3.08, 0.86)	0.361
Primary		-0.28 (-3.04, 2.48)	-1.04 (-3.82, 1.74)	-1.08 (-3.83, 1.67)	0.369
Markers of insulin resistance and diabetes					
Fasting glucose (mmol/L)					
University		0.001 (-0.02, 0.02)	0.01 (-0.01, 0.03)	-0.01 (-0.03, 0.01)	0.636
High school	Reference	0.001 (-0.02, 0.02)	0.001 (-0.02, 0.02)	-0.001 (-0.02, 0.02)	0.941
Apprenticeship		-0.01 (-0.03, 0.01)	-0.01 (-0.03, 0.01)	0.001 (-0.02, 0.02)	0.953
Primary		0.01 (-0.02, 0.03)	0.01 (-0.02, 0.04)	0.02 (-0.01, 0.04)	0.236
Insulin (microIU/mL)					
University		0.08 (-0.03, 0.20)	-0.05 (-0.17, 0.06)	-0.07 (-0.18, 0.05)	**0.048**
High school	Reference	-0.09 (-0.19, 0.02)	-0.13* (-0.24,-0.03)	-0.20** (-0.31,-0.10)	**<0.001**

Apprenticeship		-0.05 (-0.14, 0.04)	-0.10* (-0.19,-0.01)	-0.10 (-0.20, 0.001)	**0.026**
Primary		0.04 (-0.11, 0.19)	0.04 (-0.12, 0.19)	0.05 (-0.11, 0.20)	0.588
Leptin (ng/mL)					
University		-0.001 (-0.21, 0.21)	-0.12 (-0.34, 0.10)	-0.20 (-0.41, 0.02)	**0.035**
High school	Reference	-0.13 (-0.32, 0.06)	-0.22* (-0.42,-0.02)	-0.30* (-0.50,-0.10)	**0.002**
Apprenticeship		-0.001 (-0.17, 0.16)	-0.04 (-0.21, 0.12)	-0.23* (-0.40,-0.05)	**0.016**
Primary		-0.20 (-0.44, 0.04)	-0.29* (-0.53,-0.05)	-0.08 (-0.32, 0.16)	0.426
Adiponectin (ng/mL)					
University		0.04 (-0.10, 0.18)	-0.02 (-0.17, 0.12)	-0.05 (-0.19, 0.09)	0.336
High school	Reference	-0.06 (-0.19, 0.07)	-0.02 (-0.15, 0.12)	0.02 (-0.11, 0.15)	0.577
Apprenticeship		-0.04 (-0.15, 0.07)	0.08 (-0.03, 0.19)	0.14* (0.02, 0.26)	**0.004**
Primary		0.12 (-0.06, 0.29)	0.07 (-0.11, 0.25)	0.05 (-0.12, 0.23)	0.693
Dyslipidemia markers					
Total cholesterol (mmol/L)					
University		-0.18 (-0.39, 0.03)	-0.21 (-0.43, 0.01)	-0.10 (-0.31, 0.12)	0.458
High school	Reference	-0.04 (-0.23, 0.15)	0.08 (-0.12, 0.28)	0.01 (-0.19, 0.21)	0.624
Apprenticeship		-0.06 (-0.22, 0.11)	-0.10 (-0.26, 0.07)	-0.05 (-0.23, 0.13)	0.459
Primary		0.001 (-0.28, 0.29)	-0.31* (-0.59,-0.02)	-0.12 (-0.41, 0.16)	0.152
HDL-cholesterol (mmol/L)					
University		0.01 (-0.07, 0.09)	0.04 (-0.05, 0.12)	0.05 (-0.03, 0.13)	0.197
High school	Reference	0.02 (-0.05, 0.10)	0.03 (-0.05, 0.11)	-0.01 (-0.09, 0.07)	0.824
Apprenticeship		-0.04 (-0.10, 0.03)	0.02 (-0.05, 0.08)	0.05 (-0.02, 0.12)	0.060
Primary		0.05 (-0.06, 0.16)	-0.04 (-0.15, 0.06)	-0.01 (-0.11, 0.10)	0.502
LDL-cholesterol (mmol/L)					
University		-0.12 (-0.31, 0.07)	-0.19 (-0.39, 0.01)	-0.09 (-0.28, 0.10)	0.328
High school	Reference	-0.03 (-0.20, 0.13)	0.04 (-0.13, 0.21)	0.05 (-0.12, 0.22)	0.404
Apprenticeship		-0.03 (-0.18, 0.12)	-0.12 (-0.28, 0.03)	-0.09 (-0.26, 0.07)	0.143
Primary		-0.01 (-0.27, 0.26)	-0.29* (-0.56,-0.02)	-0.16 (-0.42, 0.11)	0.089
Triglycerides (mmol/L)					
University		-0.08 (-0.18, 0.02)	-0.08 (-0.18, 0.02)	-0.06 (-0.16, 0.04)	0.314
High school	Reference	-0.04 (-0.13, 0.05)	0.02 (-0.08, 0.11)	-0.04 (-0.14, 0.05)	0.582
Apprenticeship		0.02 (-0.06, 0.09)	-0.001 (-0.07, 0.07)	-0.05 (-0.12, 0.03)	0.241
Primary		-0.04 (-0.18, 0.09)	0.03 (-0.10, 0.16)	0.10 (-0.04, 0.23)	0.086
Cardiovascular/Inflammatory markers					
hs-CRP (mg/L)					
University		0.09 (-0.10, 0.29)	-0.17 (-0.37, 0.03)	-0.16 (-0.36, 0.03)	**0.014**
High school	Reference	-0.03 (-0.21, 0.16)	-0.06 (-0.25, 0.13)	-0.20* (-0.39,-0.001)	**0.043**
Apprenticeship		-0.11 (-0.26, 0.05)	-0.17* (-0.33,-0.02)	-0.25* (-0.42,-0.08)	**0.002**

Primary		-0.03 (-0.29, 0.22)	0.03 (-0.23, 0.28)	-0.01 (-0.26, 0.24)	0.952
TNF-alpha (pg/mL)					
University		-0.04 (-0.27, 0.18)	0.03 (-0.20, 0.27)	-0.05 (-0.28, 0.18)	0.836
High school	Reference	0.05 (-0.16, 0.26)	0.03 (-0.19, 0.24)	0.02 (-0.19, 0.23)	0.911
Apprenticeship		-0.12 (-0.30, 0.05)	-0.10 (-0.28, 0.07)	-0.16 (-0.34, 0.03)	0.128
Primary		-0.10 (-0.39, 0.19)	-0.27 (-0.56, 0.02)	-0.20 (-0.49, 0.09)	0.096
Interleukin 6 (pg/mL)					
University		0.18 (-0.18, 0.55)	0.44* (0.06, 0.83)	0.08 (-0.30, 0.45)	0.539
High school	Reference	0.03 (-0.30, 0.36)	0.14 (-0.20, 0.48)	0.07 (-0.27, 0.41)	0.564
Apprenticeship		-0.25 (-0.53, 0.04)	-0.10 (-0.39, 0.19)	-0.02 (-0.33, 0.29)	0.920
Primary		-0.37 (-0.83, 0.08)	-0.08 (-0.54, 0.38)	-0.33 (-0.79, 0.12)	0.318
Interleukin 1b (pg/mL)					
University		0.18 (-0.19, 0.56)	0.44* (0.05, 0.83)	0.08 (-0.30, 0.46)	0.555
High school	Reference	0.08 (-0.25, 0.41)	0.21 (-0.13, 0.55)	0.09 (-0.25, 0.42)	0.501
Apprenticeship		-0.11 (-0.42, 0.20)	-0.24 (-0.54, 0.07)	-0.35* (-0.68,-0.02)	**0.009**
Primary		-0.001 (-0.49, 0.49)	-0.09 (-0.60, 0.42)	-0.20 (-0.68, 0.29)	0.382
Metabolic syndrome and its components[1]					
Metabolic syndrome					
University		0.90 (0.54, 1.51)	1.17 (0.70, 1.98)	0.84 (0.50, 1.43)	0.740
High school	Reference	0.76 (0.48, 1.21)	0.84 (0.52, 1.35)	0.64 (0.40, 1.03)	0.106
Apprenticeship		1.20 (0.82, 1.73)	1.02 (0.70, 1.49)	0.97 (0.65, 1.43)	0.697
Primary		0.73 (0.39, 1.38)	0.82 (0.43, 1.55)	0.82 (0.44, 1.54)	0.649
Central obesity					
University		0.85 (0.55, 1.33)	1.03 (0.65, 1.65)	0.80 (0.51, 1.26)	0.496
High school	Reference	0.83 (0.54, 1.27)	1.00 (0.64, 1.57)	0.63* (0.41, 0.98)	0.081
Apprenticeship		1.33 (0.91, 1.93)	0.97 (0.67, 1.41)	0.79 (0.53, 1.17)	0.135
Primary		1.01 (0.53, 1.91)	1.23 (0.63, 2.39)	0.82 (0.42, 1.56)	0.698
Hypertension					
University		1.15 (0.64, 2.07)	1.12 (0.62, 2.05)	1.46 (0.81, 2.63)	0.238
High school	Reference	0.85 (0.50, 1.45)	1.30 (0.76, 2.22)	0.79 (0.46, 1.37)	0.730
Apprenticeship		1.05 (0.67, 1.66)	1.25 (0.78, 1.99)	1.10 (0.67, 1.81)	0.538
Primary		0.63 (0.29, 1.37)	0.78 (0.36, 1.70)	0.64 (0.29, 1.41)	0.369
Hyperglycemia					
University		1.28 (0.80, 2.07)	1.47 (0.90, 2.42)	0.88 (0.54, 1.43)	0.601
High school	Reference	1.16 (0.74, 1.80)	1.00 (0.64, 1.58)	1.04 (0.66, 1.63)	0.957
Apprenticeship		1.07 (0.72, 1.60)	1.02 (0.68, 1.52)	1.27 (0.83, 1.94)	0.347
Primary		1.16 (0.57, 2.36)	1.62 (0.78, 3.34)	1.22 (0.60, 2.45)	0.436
Low HDL-cholesterol					
University		0.87 (0.37, 2.04)	0.78 (0.32, 1.90)	0.98 (0.42, 2.28)	0.919

High school	Reference	0.62 (0.31, 1.24)	0.49 (0.24, 1.02)	0.75 (0.37, 1.55)	0.248
Apprenticeship		1.15 (0.63, 2.08)	0.92 (0.48, 1.79)	1.36 (0.70, 2.65)	0.543
Primary		0.94 (0.38, 2.35)	1.50 (0.62, 3.62)	1.21 (0.49, 2.99)	0.484
Hypertriglyceridemia					
University		0.68 (0.40, 1.16)	0.61 (0.34, 1.08)	0.77 (0.45, 1.34)	0.348
High school	Reference	0.72 (0.44, 1.19)	0.83 (0.50, 1.38)	0.60 (0.35, 1.04)	0.117
Apprenticeship		1.16 (0.76, 1.76)	1.07 (0.70, 1.65)	0.89 (0.55, 1.44)	0.666
Primary		0.99 (0.48, 2.01)	1.28 (0.63, 2.59)	1.52 (0.76, 3.04)	0.174

cm, centimeter. Kg, kilogram. m2, square meter. mm Hg, millimeters of mercury. mmol, millimole. L, liter. microIU, microInternational units. mL, mililiter. ng, nanogram. mg, milligram. pg, picogram. HDL, high-density lipoprotein. LDL, low-density lipoprotein. hs-CRP, High sensitivity C-reactive protein. TNF-alpha, tumor necrosis factor-alpha.

Log-transformed variables: fasting glucose, insulin, leptin, adiponectin, triglycerides, hs-CRP, TNF-alpha, Interleukin 6 and Interleukin 1b.

Educational attainment categories: University n = 869, High School n = 1034, Apprenticeship n = 1376, Primary n = 598.

[1]Metabolic Syndrome components definition (according to IDF criteria): central obesity (waist circumference >94 cm in males, > 80cm in females), hypertension (Systolic: ≥ 130 mm Hg or Diastolic: ≥ 85 mm Hg), hyperglycemia (Fasting plasma glucose ≥ 5.6 mmol/l or previously diagnosed T2D), low HDL-cholesterol (< 1.03 mmol/l in males & < 1.29 mmol/l in females), hypertriglyceridemia (≥ 1.7 mmol/l or specific treatment for this abnormality). Metabolic Syndrome definition (according to IDF criteria): central obesity plus any other two additional components.

Values expressed as standardized regression coefficients β and (95% confidence interval) for cardiometabolic risk factors and as odds ratios and (95% confidence interval) for metabolic syndrome and its components.

Quartile 1 is considered the reference group.

P-value: * = < 0.05 **= <0.001.

[2]P-trend estimated for Model 3.

Multivariable model: adjusted by age, sex, smoking status, alcohol consumption, physical activity, use of lipid-lowering medication (statins) (only for serum lipids), use of antihypertensive medication (only for blood pressure), use of antidiabetic drug treatment (only for markers of insulin resistance and diabetes), use of cardiovascular medication (only for blood pressure and serum lipids), family history of cardiovascular disease, presence of diabetes, presence of cardiovascular disease and body mass index (except for waist circumference and body mass index as outcomes).

Supplementary Table 5. Cross-sectional multivariable associations of the dietary phytochemical index (DPI) across percentiles with cardiometabolic risk factors and metabolic syndrome (and its components) stratified by body mass index. CoLaus study, Lausanne, Switzerland, 2009-2012.

		Dietary Phytochemical index			
	Quartile 1	*Quartile 2*	*Quartile 3*	*Quartile 4*	*p Trend[2]*
Cardiometabolic risk factors					
Anthropometric measurements					
Waist circumference (cm)					
Undernourished		7.27 (-0.96,15.49)	6.14 (-1.70,13.98)	-0.08 (-9.68, 9.51)	0.798
Normal weight	Reference	0.12 (-0.95, 1.20)	-0.06 (-1.16, 1.04)	-0.92 (-1.99, 0.16)	0.069
Overweight		-0.40 (-1.42, 0.62)	-0.28 (-1.31, 0.75)	-0.91 (-1.98, 0.16)	0.137
Obesity		-1.09 (-3.38, 1.21)	-0.14 (-2.57, 2.30)	-1.73 (-4.26, 0.81)	0.307
Blood pressure					
Systolic blood pressure (mm Hg)					
Undernourished		8.16 (-12.11,28.43)	14.36 (-4.96,33.68)	10.32 (-14.34,34.97)	0.171
Normal weight	Reference	-1.18 (-3.59, 1.23)	-0.69 (-3.16, 1.79)	-1.92 (-4.34, 0.50)	0.176
Overweight		2.65* (0.22, 5.08)	0.26 (-2.18, 2.70)	1.03 (-1.52, 3.58)	0.871
Obesity		-1.61 (-5.74, 2.53)	-0.84 (-5.24, 3.55)	0.24 (-4.33, 4.80)	0.907
Diastolic blood pressure (mm Hg)					
Undernourished		1.59 (-9.46,12.64)	7.90 (-2.63,18.43)	7.81 (-5.62,21.25)	0.071
Normal weight	Reference	0.40 (-1.19, 1.99)	0.01 (-1.63, 1.64)	-0.30 (-1.89, 1.30)	0.574
Overweight		0.52 (-1.16, 2.20)	0.18 (-1.51, 1.87)	0.22 (-1.55, 1.98)	0.910
Obesity		-1.40 (-4.10, 1.31)	-0.26 (-3.13, 2.62)	-1.13 (-4.12, 1.85)	0.614
Markers of insulin resistance and diabetes					
Fasting glucose (mmol/L)					
Undernourished		0.04 (-0.11, 0.19)	0.04 (-0.11, 0.18)	0.01 (-0.16, 0.19)	0.789
Normal weight	Reference	0.001 (-0.01, 0.01)	0.01 (-0.01, 0.02)	0.001 (-0.01, 0.01)	0.732
Overweight		-0.001 (-0.02, 0.01)	-0.001 (-0.02, 0.01)	-0.01 (-0.02, 0.01)	0.544
Obesity		-0.01 (-0.04, 0.03)	-0.01 (-0.05, 0.03)	0.02 (-0.02, 0.06)	0.384
Insulin (microIU/mL)					
Undernourished		0.07 (-0.52, 0.67)	0.19 (-0.38, 0.76)	0.04 (-0.66, 0.74)	0.673
Normal weight	Reference	-0.06 (-0.14, 0.02)	-0.04 (-0.12, 0.04)	-0.10* (-0.18,-0.02)	**0.022**
Overweight		0.04 (-0.04, 0.13)	-0.09* (-0.18,-0.01)	-0.12* (-0.21,-0.03)	**0.001**
Obesity		-0.02 (-0.17, 0.13)	-0.15 (-0.31, 0.01)	-0.08 (-0.24, 0.09)	0.151
Leptin (ng/mL)					
Undernourished		-0.16 (-1.70, 1.38)	-0.04 (-1.51, 1.43)	-0.96 (-2.75, 0.84)	0.378
Normal weight	Reference	-0.05 (-0.22, 0.11)	-0.12 (-0.29, 0.05)	-0.26* (-0.43,-0.09)	**0.001**
Overweight		-0.07 (-0.22, 0.08)	-0.15* (-0.30,-0.001)	-0.19* (-0.34,-0.03)	**0.009**

Obesity		-0.17 (-0.35, 0.01)	-0.21* (-0.40,-0.02)	-0.15 (-0.35, 0.04)	0.081
Adiponectin (ng/mL)					
Undernourished		-0.13 (-0.91, 0.64)	0.35 (-0.39, 1.09)	-0.12 (-1.03, 0.79)	0.643
Normal weight	Reference	-0.05 (-0.15, 0.05)	0.01 (-0.09, 0.12)	0.03 (-0.07, 0.13)	0.329
Overweight		0.07 (-0.04, 0.17)	0.05 (-0.06, 0.15)	0.11 (-0.001, 0.22)	0.090
Obesity		-0.01 (-0.17, 0.14)	0.04 (-0.12, 0.21)	-0.04 (-0.21, 0.13)	0.877
Dyslipidemia markers					
Total cholesterol (mmol/L)					
Undernourished		0.22 (-1.27, 1.71)	-0.31 (-1.73, 1.11)	0.69 (-1.07, 2.45)	0.768
Normal weight	Reference	0.04 (-0.11, 0.19)	-0.08 (-0.24, 0.08)	-0.03 (-0.18, 0.12)	0.393
Overweight		-0.18* (-0.34,-0.02)	-0.16* (-0.32,-0.001)	-0.13 (-0.30, 0.03)	0.144
Obesity		-0.02 (-0.27, 0.24)	0.03 (-0.24, 0.31)	0.04 (-0.24, 0.33)	0.708
HDL-cholesterol (mmol/L)					
Undernourished		-0.16 (-0.86, 0.55)	0.08 (-0.59, 0.75)	0.07 (-0.76, 0.90)	0.633
Normal weight	Reference	-0.01 (-0.07, 0.06)	-0.01 (-0.07, 0.05)	0.01 (-0.05, 0.08)	0.655
Overweight		0.03 (-0.03, 0.08)	0.05 (-0.01, 0.10)	0.05 (-0.01, 0.11)	0.069
Obesity		-0.04 (-0.13, 0.04)	-0.01 (-0.10, 0.08)	-0.04 (-0.14, 0.05)	0.512
LDL-cholesterol (mmol/L)					
Undernourished		0.45 (-0.74, 1.63)	-0.40 (-1.53, 0.72)	0.58 (-0.82, 1.98)	0.993
Normal weight	Reference	0.02 (-0.12, 0.16)	-0.08 (-0.23, 0.06)	-0.05 (-0.19, 0.09)	0.257
Overweight		-0.15* (-0.29,-0.01)	-0.17* (-0.31,-0.03)	-0.15 (-0.29, 0.001)	**0.049**
Obesity		0.08 (-0.15, 0.31)	-0.001 (-0.25, 0.24)	0.09 (-0.16, 0.35)	0.639
Triglycerides (mmol/L)					
Undernourished		-0.18 (-0.62, 0.26)	-0.07 (-0.48, 0.35)	-0.01 (-0.53, 0.51)	0.936
Normal weight	Reference	0.05 (-0.02, 0.11)	0.03 (-0.04, 0.09)	-0.001 (-0.07, 0.06)	0.667
Overweight		-0.07 (-0.15, 0.001)	-0.06 (-0.13, 0.02)	-0.05 (-0.13, 0.03)	0.270
Obesity		-0.07 (-0.19, 0.05)	0.06 (-0.06, 0.19)	-0.001 (-0.13, 0.13)	0.567
Cardiovascular/Inflammatory markers					
hs-CRP (mg/L)					
Undernourished		-0.49 (-2.32, 1.34)	-0.13 (-1.81, 1.54)	-0.39 (-2.24, 1.47)	0.798
Normal weight	Reference	-0.02 (-0.16, 0.13)	-0.09 (-0.24, 0.06)	-0.24* (-0.39,-0.09)	**<0.001**
Overweight		0.03 (-0.11, 0.18)	-0.13 (-0.27, 0.02)	-0.05 (-0.21, 0.10)	0.189
Obesity		-0.12 (-0.35, 0.10)	-0.09 (-0.32, 0.15)	-0.21 (-0.45, 0.04)	0.134
TNF-alpha (pg/mL)					
Undernourished		0.15 (-1.23, 1.53)	0.84 (-0.43, 2.10)	-0.38 (-1.78, 1.02)	0.953
Normal weight	Reference	-0.05 (-0.22, 0.11)	0.03 (-0.14, 0.20)	-0.09 (-0.26, 0.07)	0.429
Overweight		-0.05 (-0.22, 0.11)	-0.13 (-0.30, 0.03)	-0.07 (-0.25, 0.11)	0.288
Obesity		-0.13 (-0.39, 0.14)	-0.21 (-0.49, 0.08)	-0.21 (-0.51, 0.08)	0.114

Interleukin 6 (pg/mL)					
Undernourished		-2.02 (-5.50, 1.46)	-1.39 (-4.75, 1.96)	-2.53 (-6.00, 0.93)	0.225
Normal weight	Reference	-0.36* (-0.64, -0.08)	0.10 (-0.19, 0.39)	-0.16 (-0.44, 0.12)	0.996
Overweight		0.10 (-0.16, 0.37)	0.05 (-0.22, 0.31)	0.08 (-0.19, 0.36)	0.659
Obesity		0.06 (-0.31, 0.43)	-0.02 (-0.42, 0.38)	0.02 (-0.39, 0.43)	0.995
Interleukin 1b (pg/mL)					
Undernourished		0.35 (-1.85, 2.55)	0.13 (-1.81, 2.07)	1.02 (-1.45, 3.48)	0.450
Normal weight	Reference	-0.14 (-0.41, 0.14)	0.13 (-0.15, 0.40)	-0.12 (-0.39, 0.15)	0.740
Overweight		0.07 (-0.22, 0.36)	-0.11 (-0.41, 0.18)	-0.12 (-0.42, 0.18)	0.264
Obesity		0.24 (-0.20, 0.68)	0.12 (-0.34, 0.58)	-0.07 (-0.56, 0.42)	0.772
Metabolic syndrome and its components[1]					
Metabolic syndrome					
Normal weight	Reference	1.12 (0.64, 1.97)	1.05 (0.60, 1.84)	1.02 (0.59, 1.75)	0.926
Overweight & obesity		0.94 (0.70, 1.26)	1.03 (0.76, 1.40)	0.94 (0.69, 1.28)	0.849
Central obesity					
Normal weight	Reference	1.16 (0.80, 1.69)	1.05 (0.72, 1.54)	0.83 (0.57, 1.20)	0.168
Overweight & obesity		1.02 (0.68, 1.54)	1.27 (0.80, 2.01)	1.03 (0.64, 1.67)	0.614
Hypertension					
Normal weight	Reference	0.83 (0.54, 1.28)	1.20 (0.78, 1.85)	0.99 (0.65, 1.52)	0.625
Overweight & obesity		1.08 (0.76, 1.54)	1.08 (0.75, 1.55)	1.05 (0.71, 1.54)	0.813
Hyperglycemia					
Normal weight	Reference	1.08 (0.76, 1.52)	1.06 (0.74, 1.50)	1.03 (0.73, 1.45)	0.954
Overweight & obesity		1.19 (0.87, 1.64)	1.23 (0.89, 1.70)	1.05 (0.75, 1.46)	0.693
Low HDL-cholesterol					
Normal weight	Reference	0.43 (0.18, 1.02)	0.53 (0.22, 1.24)	0.67 (0.30, 1.50)	0.352
Overweight & obesity		0.97 (0.66, 1.44)	0.87 (0.58, 1.33)	1.12 (0.73, 1.70)	0.799
Hypertriglyceridemia					
Normal weight	Reference	1.49 (0.90, 2.46)	1.26 (0.74, 2.15)	1.20 (0.71, 2.03)	0.730
Overweight & obesity		0.74* (0.55, 0.99)	0.81 (0.60, 1.09)	0.74 (0.54, 1.02)	0.095

cm, centimeter. Kg, kilogram. m2, square meter. mm Hg, millimeters of mercury. mmol, millimole. L, liter. microIU, microInternational units. mL, mililiter. ng, nanogram. mg, milligram. pg, picogram. HDL, high-density lipoprotein. LDL, low-density lipoprotein. hs-CRP, High sensitivity C-reactive protein. TNF-alpha, tumor necrosis factor-alpha.

Log-transformed variables: fasting glucose, insulin, leptin, adiponectin, triglycerides, hs-CRP, TNF-alpha, Interleukin 6 and Interleukin 1b.

BMI categories for cardiometabolic risk factors: Undernourished n = 54, Normal n = 1665, Overweight n = 1538, Obesity n = 622.

BMI categories for metabolic syndrome and its components: Undernourished n = 54, Normal n = 1665, Overweight & obesity n = 1538

[1]Metabolic Syndrome components definition (according to IDF criteria): central obesity (waist circumference >94 cm in males, > 80cm in females), hypertension (Systolic: ≥ 130 mm Hg or Diastolic: ≥ 85 mm Hg), hyperglycemia (Fasting plasma glucose ≥ 5.6 mmol/l or previously diagnosed T2D), low HDL-cholesterol (< 1.03 mmol/l in males &

< 1.29 mmol/l in females), hypertriglyceridemia (≥ 1.7 mmol/l or specific treatment for this abnormality). Metabolic Syndrome definition (according to IDF criteria): central obesity plus any other two additional components.

Values expressed as standardized regression coefficients β and (95% confidence interval) for cardiometabolic risk factors and as odds ratios and (95% confidence interval) for metabolic syndrome and its components.

Quartile 1 is considered the reference group.

P-value: * = < 0.05 **= <0.001.

[2]P-trend estimated for Model 3.

[2]Due to small sample size in sub-groups "undernourished" and "obesity", category "undernourished" is not shown in table, and categories "Overweight" and "obesity" were collapsed to allow statistical analyses.

Multivariable model: adjusted by age, sex, educational level, smoking status, alcohol consumption, physical activity, use of lipid-lowering medication (statins) (only for serum lipids), use of antihypertensive medication (only for blood pressure), use of antidiabetic drug treatment (only for markers of insulin resistance and diabetes), use of cardiovascular medication (only for blood pressure and serum lipids), family history of cardiovascular disease, presence of diabetes and presence of cardiovascular disease.

Supplementary Table 6a. Cross-sectional multivariable associations of the dietary phytochemical index (DPI) across percentiles with cardiometabolic risk factors and metabolic syndrome (and its components) stratified by alcohol intake. CoLaus study, Lausanne, Switzerland, 2009-2012.

	Dietary Phytochemical index				
	Quartile 1	*Quartile 2*	*Quartile 3*	*Quartile 4*	*p Trend[2]*
Cardiometabolic risk factors					
Anthropometric measurements					
Waist circumference (cm)					
Non-drinker		0.01 (-2.45, 2.48)	-0.38 (-2.96, 2.20)	-2.64* (-5.13,-0.16)	**0.042**
Low intake	Reference	-2.34* (-4.10,-0.58)	-2.09* (-3.88,-0.30)	-4.15** (-5.97,-2.33)	**< 0.001**
Moderate intake		0.58 (-1.72, 2.87)	0.55 (-1.86, 2.96)	-0.93 (-3.39, 1.53)	0.475
High intake		-0.45 (-3.43, 2.53)	-0.81 (-3.73, 2.12)	-2.19 (-5.20, 0.81)	0.122
Body mass index (kg/m^2)					
Non-drinker		-0.07 (-1.03, 0.89)	0.06 (-0.94, 1.07)	-0.88 (-1.84, 0.09)	0.113
Low intake	Reference	-0.75* (-1.40,-0.10)	-0.93* (-1.59,-0.27)	-1.44** (-2.11,-0.76)	**<0.001**
Moderate intake		0.01 (-0.81, 0.84)	0.26 (-0.61, 1.12)	-0.30 (-1.18, 0.59)	0.650
High intake		-0.21 (-1.24, 0.82)	-0.36 (-1.37, 0.65)	-0.46 (-1.49, 0.58)	0.360
Blood pressure					
Systolic blood pressure (mm Hg)					
Non-drinker		0.001 (-3.56, 3.56)	-1.55 (-5.27, 2.17)	-1.36 (-4.96, 2.24)	0.353
Low intake	Reference	-0.86 (-3.19, 1.46)	1.60 (-0.77, 3.97)	-0.15 (-2.57, 2.26)	0.623
Moderate intake		3.13 (-0.20, 6.46)	-1.53 (-5.02, 1.96)	-0.74 (-4.31, 2.83)	0.224
High intake		1.37 (-3.32, 6.05)	-1.72 (-6.32, 2.87)	0.75 (-3.96, 5.46)	0.851
Diastolic blood pressure (mm Hg)					
Non-drinker		0.42 (-1.89, 2.73)	-0.09 (-2.51, 2.33)	0.14 (-2.20, 2.48)	0.996
Low intake	Reference	0.29 (-1.31, 1.89)	1.68* (0.05, 3.32)	0.85 (-0.82, 2.51)	0.150
Moderate intake		0.86 (-1.41, 3.12)	-1.25 (-3.62, 1.13)	-1.23 (-3.66, 1.20)	0.135
High intake		-2.05 (-5.21, 1.10)	-3.44* (-6.53,-0.34)	-2.68 (-5.86, 0.49)	0.089
Markers of insulin resistance and diabetes					
Fasting glucose (mmol/L)					
Non-drinker		-0.01 (-0.04, 0.01)	0.001 (-0.02, 0.03)	0.01 (-0.01, 0.03)	0.249
Low intake	Reference	-0.001 (-0.02, 0.02)	-0.01 (-0.03, 0.01)	-0.01 (-0.02, 0.01)	0.343
Moderate intake		0.001 (-0.02, 0.02)	0.01 (-0.01, 0.04)	0.01 (-0.02, 0.03)	0.427
High intake		-0.001 (-0.03, 0.03)	0.01 (-0.02, 0.04)	0.001 (-0.03, 0.04)	0.586
Insulin (microIU/mL)					
Non-drinker		-0.06 (-0.18, 0.05)	-0.11 (-0.22, 0.01)	-0.05 (-0.17, 0.06)	0.282
Low intake	Reference	-0.02 (-0.10, 0.07)	-0.07 (-0.16, 0.01)	-0.12* (-0.21,-0.04)	**0.002**
Moderate intake		0.07 (-0.04, 0.18)	-0.05 (-0.16, 0.06)	-0.05 (-0.17, 0.06)	0.129

High intake		-0.13 (-0.30, 0.03)	-0.20* (-0.36,-0.03)	-0.25* (-0.42,-0.08)	**0.004**
Leptin (ng/mL)					
Non-drinker		-0.09 (-0.29, 0.11)	-0.16 (-0.37, 0.05)	-0.07 (-0.27, 0.14)	0.401
Low intake	Reference	-0.09 (-0.25, 0.07)	-0.17* (-0.33,-0.01)	-0.30** (-0.46,-0.13)	**<0.001**
Moderate intake		-0.09 (-0.29, 0.12)	-0.12 (-0.34, 0.09)	-0.22* (-0.44,-0.001)	**0.048**
High intake		-0.07 (-0.36, 0.21)	-0.13 (-0.41, 0.15)	-0.25 (-0.53, 0.04)	0.068
Adiponectin (ng/mL)					
Non-drinker		0.02 (-0.13, 0.16)	0.03 (-0.12, 0.18)	-0.02 (-0.17, 0.12)	0.829
Low intake	Reference	0.01 (-0.10, 0.11)	0.08 (-0.02, 0.19)	0.10 (-0.001, 0.21)	**0.027**
Moderate intake		-0.10 (-0.24, 0.05)	0.01 (-0.14, 0.16)	-0.03 (-0.18, 0.13)	0.884
High intake		0.14 (-0.04, 0.32)	0.01 (-0.17, 0.18)	0.11 (-0.07, 0.29)	0.607
Dyslipidemia markers					
Total cholesterol (mmol/L)					
Non-drinker		0.01 (-0.19, 0.22)	-0.16 (-0.38, 0.05)	-0.19 (-0.40, 0.02)	**0.033**
Low intake	Reference	-0.01 (-0.16, 0.14)	-0.12 (-0.27, 0.04)	0.02 (-0.14, 0.18)	0.874
Moderate intake		-0.15 (-0.37, 0.07)	-0.04 (-0.27, 0.19)	-0.10 (-0.33, 0.14)	0.651
High intake		-0.03 (-0.34, 0.27)	0.04 (-0.26, 0.34)	0.06 (-0.25, 0.37)	0.539
HDL-cholesterol (mmol/L)					
Non-drinker		-0.01 (-0.09, 0.07)	0.03 (-0.05, 0.11)	-0.01 (-0.08, 0.07)	0.924
Low intake	Reference	0.01 (-0.05, 0.07)	0.01 (-0.05, 0.07)	0.05 (-0.01, 0.12)	0.132
Moderate intake		-0.02 (-0.10, 0.05)	0.02 (-0.06, 0.10)	0.01 (-0.07, 0.09)	0.489
High intake		0.04 (-0.07, 0.16)	-0.01 (-0.12, 0.11)	-0.001 (-0.12, 0.11)	0.610
LDL-cholesterol (mmol/L)					
Non-drinker		0.04 (-0.14, 0.22)	-0.20* (-0.39,-0.01)	-0.20* (-0.38,-0.01)	**0.009**
Low intake	Reference	0.03 (-0.11, 0.16)	-0.10 (-0.24, 0.04)	0.02 (-0.12, 0.16)	0.769
Moderate intake		-0.15 (-0.35, 0.05)	-0.08 (-0.29, 0.13)	-0.10 (-0.31, 0.11)	0.508
High intake		-0.03 (-0.31, 0.25)	0.05 (-0.23, 0.32)	0.04 (-0.24, 0.33)	0.596
Triglycerides (mmol/L)					
Non-drinker		-0.04 (-0.13, 0.06)	-0.01 (-0.11, 0.08)	-0.02 (-0.11, 0.07)	0.769
Low intake	Reference	-0.04 (-0.11, 0.02)	-0.04 (-0.11, 0.03)	-0.07 (-0.14, 0.01)	0.103
Moderate intake		0.04 (-0.05, 0.14)	0.04 (-0.06, 0.14)	0.01 (-0.09, 0.12)	0.862
High intake		-0.08 (-0.23, 0.07)	-0.01 (-0.16, 0.13)	-0.001 (-0.15, 0.15)	0.637
Cardiovascular/Inflammatory markers					
hs-CRP (mg/L)					
Non-drinker		-0.12 (-0.32, 0.09)	-0.15 (-0.37, 0.06)	-0.20 (-0.40, 0.01)	0.054
Low intake	Reference	-0.05 (-0.19, 0.09)	-0.11 (-0.25, 0.04)	-0.20* (-0.35,-0.05)	**0.007**
Moderate intake		0.13 (-0.06, 0.33)	-0.06 (-0.26, 0.15)	-0.08 (-0.29, 0.13)	0.197
High intake		-0.07 (-0.35, 0.21)	-0.12 (-0.40, 0.16)	-0.21 (-0.49, 0.08)	0.123

TNF-alpha (pg/mL)					
Non-drinker		-0.08 (-0.29, 0.13)	-0.13 (-0.36, 0.09)	-0.13 (-0.35, 0.08)	0.191
Low intake	Reference	-0.03 (-0.20, 0.14)	-0.04 (-0.21, 0.14)	-0.04 (-0.22, 0.13)	0.638
Moderate intake		-0.08 (-0.31, 0.14)	-0.08 (-0.31, 0.16)	-0.11 (-0.35, 0.13)	0.404
High intake		-0.18 (-0.49, 0.14)	-0.14 (-0.45, 0.17)	-0.20 (-0.52, 0.12)	0.324
Interleukin 6 (pg/mL)					
Non-drinker		-0.24 (-0.59, 0.11)	-0.16 (-0.53, 0.21)	-0.04 (-0.40, 0.31)	0.865
Low intake	Reference	-0.02 (-0.29, 0.26)	0.17 (-0.11, 0.45)	0.10 (-0.19, 0.38)	0.307
Moderate intake		-0.04 (-0.40, 0.32)	0.11 (-0.27, 0.48)	-0.19 (-0.57, 0.19)	0.499
High intake		-0.34 (-0.85, 0.17)	-0.12 (-0.62, 0.38)	-0.30 (-0.81, 0.21)	0.513
Interleukin 1b (pg/mL)					
Non-drinker		0.01 (-0.36, 0.39)	-0.35 (-0.74, 0.04)	-0.21 (-0.59, 0.17)	0.119
Low intake	Reference	0.09 (-0.20, 0.37)	0.23 (-0.06, 0.52)	0.09 (-0.20, 0.38)	0.431
Moderate intake		-0.07 (-0.43, 0.29)	0.07 (-0.30, 0.43)	-0.18 (-0.56, 0.19)	0.490
High intake		-0.07 (-0.60, 0.45)	0.07 (-0.44, 0.58)	-0.17 (-0.71, 0.36)	0.645
Metabolic syndrome and its components[1]					
Metabolic syndrome					
Non-drinker		1.12 (0.69, 1.83)	1.03 (0.62, 1.71)	1.42 (0.88, 2.30)	0.204
Low intake	Reference	0.99 (0.68, 1.44)	0.83 (0.57, 1.21)	0.68 (0.46, 1.00)	**0.035**
Moderate intake		1.02 (0.63, 1.65)	1.36 (0.82, 2.26)	0.77 (0.45, 1.31)	0.567
High intake		0.66 (0.34, 1.25)	0.76 (0.40, 1.43)	0.68 (0.35, 1.32)	0.442
Central obesity					
Non-drinker		1.51 (0.94, 2.42)	1.35 (0.82, 2.21)	1.26 (0.78, 2.04)	0.379
Low intake	Reference	0.77 (0.54, 1.08)	0.87 (0.61, 1.24)	0.61* (0.43, 0.87)	**0.019**
Moderate intake		1.26 (0.79, 2.01)	1.24 (0.76, 2.02)	0.87 (0.53, 1.43)	0.599
High intake		0.87 (0.45, 1.68)	0.75 (0.39, 1.43)	0.56 (0.29, 1.08)	0.058
Hypertension					
Non-drinker		0.94 (0.53, 1.68)	1.27 (0.69, 2.34)	1.28 (0.71, 2.31)	0.306
Low intake	Reference	0.78 (0.50, 1.23)	1.43 (0.93, 2.21)	1.10 (0.70, 1.72)	0.251
Moderate intake		1.51 (0.85, 2.69)	1.02 (0.56, 1.87)	0.79 (0.42, 1.49)	0.255
High intake		0.68 (0.32, 1.46)	0.52 (0.24, 1.13)	0.95 (0.44, 2.07)	0.914
Hyperglycemia					
Non-drinker		0.85 (0.53, 1.38)	1.00 (0.61, 1.66)	1.12 (0.69, 1.82)	0.555
Low intake	Reference	1.33 (0.92, 1.91)	1.16 (0.81, 1.68)	1.07 (0.74, 1.56)	0.913
Moderate intake		1.64 (0.98, 2.73)	1.59 (0.94, 2.70)	1.49 (0.87, 2.55)	0.195
High intake		0.78 (0.38, 1.61)	1.05 (0.51, 2.16)	0.72 (0.34, 1.49)	0.575
Low HDL-cholesterol					
Non-drinker		1.63 (0.87, 3.05)	0.91 (0.45, 1.83)	1.73 (0.90, 3.33)	0.271
Low intake	Reference	0.48* (0.26, 0.87)	0.65 (0.36, 1.17)	0.76 (0.42, 1.37)	0.350

Moderate intake		0.83 (0.37, 1.83)	0.98 (0.42, 2.27)	0.96 (0.36, 2.51)	0.983
High intake		1.23 (0.20, 7.60)	2.84 (0.53,15.27)	1.50 (0.26, 8.83)	0.485
Hypertriglyceridemia					
Non-drinker		0.76 (0.43, 1.34)	0.95 (0.54, 1.68)	1.09 (0.62, 1.90)	0.682
Low intake	Reference	0.75 (0.50, 1.12)	0.74 (0.49, 1.13)	0.50* (0.32, 0.79)	**0.005**
Moderate intake		1.39 (0.83, 2.33)	1.18 (0.68, 2.06)	1.16 (0.65, 2.09)	0.730
High intake		0.89 (0.44, 1.82)	1.07 (0.53, 2.14)	1.14 (0.56, 2.33)	0.525

cm, centimeter. Kg, kilogram. m2, square meter. mm Hg, millimeters of mercury. mmol, millimole. L, liter. microIU, microInternational units. mL, mililiter. ng, nanogram. mg, milligram. pg, picogram. HDL, high-density lipoprotein. LDL, low-density lipoprotein. hs-CRP, High sensitivity C-reactive protein. TNF-alpha, tumor necrosis factor-alpha.

Log-transformed variables: fasting glucose, insulin, leptin, adiponectin, triglycerides, hs-CRP, TNF-alpha, Interleukin 6 and Interleukin 1b.

Alcohol intake categories: Non-drinker n = 908, Low n = 1573, Moderate n = 816, High = 582.

[1]Metabolic Syndrome components definition (according to IDF criteria): central obesity (waist circumference >94 cm in males, > 80cm in females), hypertension (Systolic: ≥ 130 mmHg or Diastolic: ≥ 85 mmHg), hyperglycemia (Fasting plasma glucose ≥ 5.6 mmol/l or previously diagnosed T2D), low HDL-cholesterol (< 1.03 mmol/l in males & < 1.29 mmol/l in females), hypertriglyceridemia (≥ 1.7 mmol/l or specific treatment for this abnormality). Metabolic Syndrome definition (according to IDF criteria): central obesity plus any other two additional components.

Values expressed as standardized regression coefficients β and (95% confidence interval) for cardiometabolic risk factors and as odds ratios and (95% confidence interval) for metabolic syndrome and its components.

Quartile 1 is considered the reference group.

P-value: * = < 0.05 **= <0.001.

[2]P-trend estimated for Model 3.

Multivariable model: adjusted by age, sex, educational level, smoking status, physical activity, use of lipid-lowering medication (statins) (only for serum lipids), use of antihypertensive medication (only for blood pressure), use of antidiabetic drug treatment (only for markers of insulin resistance and diabetes), use of cardiovascular medication (only for blood pressure and serum lipids), family history of cardiovascular disease, presence of diabetes, presence of cardiovascular disease and body mass index (except for waist circumference and body mass index as outcomes).

Supplementary Table 6b. Cross-sectional multivariable associations of the dietary phytochemical index (DPI) across percentiles with cardiometabolic risk factors and metabolic syndrome (and its components), excluding energy intake derived from alcoholic beverages (wine and beer). CoLaus study, Lausanne, Switzerland, 2009-2012.

	DPI Quartile 1	*DPI Quartile 2*	*DPI Quartile 3*	*DPI Quartile 4*	*p Trend[2]*
Cardiometabolic risk factors					
Anthropometric measurements					
Waist circumference (cm)					**< 0.001**
Model 1		-2.22** (-3.35,-1.09)	-3.78** (-4.91,-2.65)	-5.87** (-7.00,-4.74)	
Model 2	Reference	-0.88 (-1.90, 0.15)	-1.56* (-2.61,-0.52)	-3.25** (-4.32,-2.18)	
Model 3		-0.43 (-1.56, 0.69)	-0.98 (-2.13, 0.17)	-2.30** (-3.48,-1.11)	
Body mass index (kg/m^2)					**< 0.001**
Model 1		-0.33 (-0.73, 0.06)	-0.73** (-1.12,-0.33)	-1.19** (-1.59,-0.80)	
Model 2	Reference	-0.14 (-0.53, 0.24)	-0.43* (-0.83,-0.04)	-0.87** (-1.28,-0.47)	
Model 3		-0.20 (-0.62, 0.21)	-0.46* (-0.88,-0.03)	-0.75** (-1.19,-0.31)	
Blood pressure					
Systolic blood pressure (mm Hg)					0.491
Model 1		-2.43* (-4.03,-0.84)	-2.82** (-4.42,-1.22)	-2.09* (-3.69,-0.49)	
Model 2	Reference	-1.18 (-2.58, 0.22)	-1.31 (-2.74, 0.12)	-1.20 (-2.66, 0.27)	
Model 3		-1.20 (-2.77, 0.38)	-1.06 (-2.68, 0.56)	-0.69 (-2.36, 0.98)	
Diastolic blood pressure (mm Hg)					0.463
Model 1		-1.63** (-2.59,-0.66)	-1.77** (-2.73,-0.80)	-2.03** (-3.00,-1.07)	
Model 2	Reference	-1.08* (-2.04,-0.13)	-0.83 (-1.80, 0.14)	-0.86 (-1.85, 0.14)	
Model 3		-1.12* (-2.18,-0.06)	-0.71 (-1.79, 0.38)	-0.60 (-1.73, 0.52)	
Markers of insulin resistance and diabetes					
Fasting glucose (mmol/L)					0.623
Model 1		-0.02* (-0.03,-0.01)	-0.02** (-0.04,-0.01)	-0.03** (-0.04,-0.02)	
Model 2	Reference	-0.01 (-0.02, 0.001)	-0.01 (-0.02, 0.001)	-0.01* (-0.03,-0.001)	
Model 3		-0.01 (-0.02, 0.01)	-0.001 (-0.01, 0.01)	-0.001 (-0.02, 0.01)	
Insulin (microIU/mL)					**< 0.001**
Model 1		-0.03 (-0.09, 0.03)	-0.08* (-0.14,-0.02)	-0.15** (-0.21,-0.09)	
Model 2	Reference	-0.01 (-0.07, 0.05)	-0.06 (-0.11, 0.001)	-0.14** (-0.20,-0.08)	
Model 3		-0.03 (-0.08, 0.03)	-0.06* (-0.11,-0.001)	-0.10** (-0.16,-0.04)	
Leptin (ng/mL)					**< 0.001**
Model 1		0.09 (-0.03, 0.21)	0.17* (0.05, 0.29)	0.21** (0.09, 0.33)	
Model 2	Reference	-0.09 (-0.20, 0.01)	-0.21** (-0.32,-0.11)	-0.35** (-0.46,-0.24)	
Model 3		-0.05 (-0.15, 0.04)	-0.14* (-0.24,-0.04)	-0.21** (-0.31,-0.10)	
Adiponectin (ng/mL)					0.666
Model 1		0.04 (-0.03, 0.10)	0.17** (0.11, 0.23)	0.24** (0.18, 0.30)	

	DPI Quartile 1	DPI Quartile 2	DPI Quartile 3	DPI Quartile 4	p Trend[2]
Model 2	Reference	-0.04 (-0.10, 0.02)	0.001 (-0.05, 0.06)	-0.01 (-0.07, 0.05)	
Model 3		-0.05 (-0.12, 0.02)	-0.01 (-0.07, 0.06)	0.001 (-0.07, 0.07)	
Dyslipidemia markers					
Total cholesterol (mmol/L)					**0.027**
Model 1		-0.02 (-0.11, 0.08)	-0.06 (-0.15, 0.03)	0.01 (-0.08, 0.10)	
Model 2	Reference	-0.05 (-0.14, 0.04)	-0.14* (-0.23,-0.04)	-0.11* (-0.21,-0.02)	
Model 3		-0.06 (-0.16, 0.04)	-0.17* (-0.27,-0.07)	-0.09 (-0.20, 0.02)	
HDL-cholesterol (mmol/L)					0.999
Model 1		0.06* (0.02, 0.10)	0.11** (0.07, 0.15)	0.16** (0.12, 0.20)	
Model 2	Reference	0.01 (-0.03, 0.04)	-0.001 (-0.04, 0.04)	0.001 (-0.04, 0.04)	
Model 3		-0.001 (-0.04, 0.03)	-0.01 (-0.05, 0.03)	0.001 (-0.04, 0.04)	
LDL-cholesterol (mmol/L)					**0.020**
Model 1		-0.03 (-0.11, 0.06)	-0.09* (-0.18,-0.01)	-0.06 (-0.15, 0.02)	
Model 2	Reference	-0.03 (-0.11, 0.06)	-0.10* (-0.18,-0.01)	-0.07 (-0.16, 0.01)	
Model 3		-0.04 (-0.13, 0.05)	-0.15* (-0.25,-0.06)	-0.08 (-0.18, 0.01)	
Triglycerides (mmol/L)					0.546
Model 1		-0.08** (-0.12,-0.04)	-0.12** (-0.16,-0.08)	-0.14** (-0.18,-0.10)	
Model 2	Reference	-0.05* (-0.09,-0.001)	-0.06* (-0.11,-0.02)	-0.07* (-0.11,-0.03)	
Model 3		-0.02 (-0.07, 0.03)	-0.02 (-0.07, 0.02)	-0.01 (-0.06, 0.03)	
Cardiovascular/Inflammatory markers					
hs-CRP (mg/L)					**< 0.001**
Model 1		-0.04 (-0.13, 0.05)	-0.14* (-0.23,-0.05)	-0.22** (-0.31,-0.13)	
Model 2	Reference	-0.06 (-0.14, 0.03)	-0.19** (-0.28,-0.10)	-0.32** (-0.41,-0.23)	
Model 3		-0.001 (-0.10, 0.09)	-0.11* (-0.20,-0.01)	-0.21** (-0.30,-0.11)	
TNF-alpha (pg/mL)					0.464
Model 1		-0.12* (-0.21,-0.03)	-0.06 (-0.16, 0.03)	-0.10* (-0.20,-0.01)	
Model 2	Reference	-0.11* (-0.21,-0.02)	-0.06 (-0.15, 0.04)	-0.10* (-0.20,-0.01)	
Model 3		-0.11 (-0.21, 0.001)	-0.04 (-0.15, 0.07)	-0.07 (-0.18, 0.04)	
Interleukin 6 (pg/mL)					0.988
Model 1		-0.13 (-0.27, 0.02)	-0.03 (-0.17, 0.12)	-0.13 (-0.28, 0.01)	
Model 2	Reference	-0.12 (-0.26, 0.03)	-0.001 (-0.15, 0.15)	-0.09 (-0.25, 0.06)	
Model 3		-0.16 (-0.33, 0.01)	-0.001 (-0.18, 0.18)	-0.05 (-0.24, 0.13)	
Interleukin 1b (pg/mL)					0.433
Model 1		0.01 (-0.14, 0.16)	-0.10 (-0.25, 0.06)	-0.13 (-0.28, 0.03)	
Model 2	Reference	0.01 (-0.14, 0.17)	-0.07 (-0.22, 0.09)	-0.07 (-0.23, 0.09)	
Model 3		-0.01 (-0.19, 0.17)	-0.06 (-0.24, 0.12)	-0.06 (-0.25, 0.12)	
Metabolic syndrome and its components[1]					

	DPI Quartile 1	DPI Quartile 2	DPI Quartile 3	DPI Quartile 4	p Trend[2]
Metabolic syndrome					0.076
Model 1		0.80* (0.67, 0.96)	0.78* (0.65, 0.93)	0.62** (0.52, 0.74)	
Model 2	Reference	0.92 (0.76, 1.12)	0.98 (0.80, 1.19)	0.77* (0.63, 0.94)	
Model 3		0.86 (0.68, 1.08)	0.90 (0.71, 1.14)	0.78* (0.61, 0.99)	
Central obesity					**0.045**
Model 1		1.00 (0.83, 1.21)	1.14 (0.94, 1.37)	0.99 (0.82, 1.19)	
Model 2	Reference	0.93 (0.77, 1.12)	0.93 (0.77, 1.13)	0.69** (0.56, 0.84)	
Model 3		0.98 (0.78, 1.22)	1.02 (0.81, 1.28)	0.77* (0.61, 0.98)	
Hypertension					0.817
Model 1		0.74** (0.62, 0.88)	0.79* (0.66, 0.94)	0.86 (0.72, 1.03)	
Model 2	Reference	0.78* (0.64, 0.95)	0.84 (0.69, 1.03)	0.84 (0.68, 1.03)	
Model 3		0.82 (0.62, 1.07)	0.91 (0.69, 1.20)	0.99 (0.75, 1.33)	
Hyperglicemia					0.685
Model 1		0.80* (0.67, 0.96)	0.78* (0.65, 0.93)	0.62** (0.52, 0.74)	
Model 2	Reference	0.92 (0.76, 1.12)	0.98 (0.80, 1.19)	0.77* (0.63, 0.94)	
Model 3		1.03 (0.81, 1.30)	1.12 (0.88, 1.42)	0.93 (0.72, 1.19)	
Low HDL-cholesterol					0.955
Model 1		0.71* (0.53, 0.95)	0.72* (0.54, 0.97)	0.81 (0.61, 1.08)	
Model 2	Reference	0.76 (0.56, 1.02)	0.84 (0.62, 1.14)	1.03 (0.76, 1.39)	
Model 3		0.86 (0.60, 1.23)	0.82 (0.56, 1.19)	1.01 (0.69, 1.48)	
Hypertriglyceridemia					0.096
Model 1		0.67** (0.55, 0.82)	0.57** (0.46, 0.70)	0.52** (0.42, 0.64)	
Model 2	Reference	0.75* (0.61, 0.92)	0.71* (0.57, 0.88)	0.69* (0.55, 0.87)	
Model 3		0.79 (0.61, 1.01)	0.81 (0.62, 1.05)	0.79 (0.60, 1.03)	

cm, centimeter. Kg, kilogram. m2, square meter. mm Hg, millimeters of mercury. mmol, millimole. L, liter. microIU, microInternational units. mL, mililiter. ng, nanogram. mg, milligram. pg, picogram. HDL, high-density lipoprotein. LDL, low-density lipoprotein. hs-CRP, High sensitivity C-reactive protein. TNF-alpha, tumor necrosis factor-alpha.

Log-transformed variables: fasting glucose, insulin, leptin, adiponectin, triglycerides, hs-CRP, TNF-alpha, Interleukin 6 and Interleukin 1b.

Original DPI includes energy intake derivated from beer and wine.

[1]Metabolic Syndrome components definition (according to IDF criteria): central obesity (waist circumference >94 cm in males, > 80cm in females), hypertension (Systolic: ≥ 130 mmHg or Diastolic: ≥ 85 mmHg), hyperglycemia (Fasting plasma glucose ≥ 5.6 mmol/l or previously diagnosed T2D), low HDL-cholesterol (< 1.03 mmol/l in males & < 1.29 mmol/l in females), hypertriglyceridemia (≥ 1.7 mmol/l or specific treatment for this abnormality). Metabolic Syndrome definition (according to IDF criteria): central obesity plus any other two additional components.

Values expressed as standardized regression coefficients β and (95% confidence interval) for cardiometabolic risk factors and as odds ratios and (95% confidence interval) for metabolic syndrome and its components.
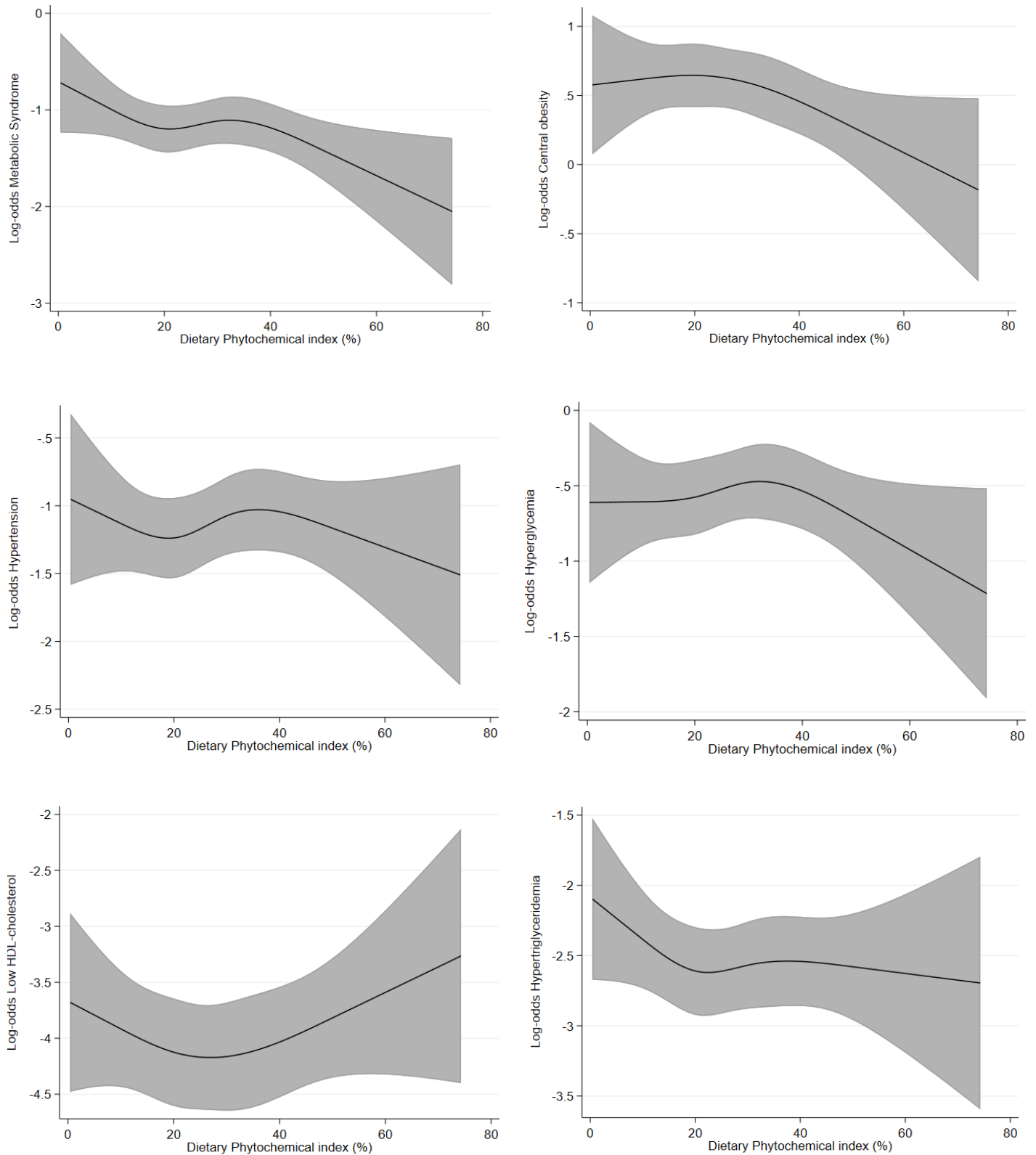
Quartile 1 is considered the reference group.

P-value: * = < 0.05 **= <0.001.
[2]P-trend estimated for Model 3.
Model 1: crude model. Model 2: adjusted by age and sex. Model 3 additionally adjusted by educational level, smoking status, alcohol consumption, physical activity, use of lipid-lowering medication (statins) (only for serum lipids), use of antihypertensive medication (only for blood pressure), use of antidiabetic drug treatment (only for markers of insulin resistance and diabetes), use of cardiovascular medication (only for blood pressure and serum lipids), family history of cardiovascular disease, presence of diabetes, presence of cardiovascular disease and body mass index (except for waist circumference and body mass index as an outcome).

Supplementary Figure 1. Spline curves for cross-sectional multivariable associations of the dietary phytochemical index with metabolic syndrome and its components. CoLaus study, Lausanne, Switzerland, 2009-2012.

Metabolic Syndrome components definition (according to IDF criteria): central obesity (waist circumference >94 cm in males, > 80cm in females), hypertension (Systolic: ≥ 130 mm Hg or Diastolic: ≥ 85 mm Hg), hyperglycemia (Fasting plasma glucose ≥ 5.6 mmol/l or previously diagnosed T2D), low HDL-cholesterol (< 1.03 mmol/l in males & < 1.29 mmol/l in females), hypertriglyceridemia (≥ 1.7 mmol/l or specific treatment for this abnormality). Metabolic Syndrome definition (according to IDF criteria): central obesity plus any other two additional components.
Values expressed as log odds and (95% confidence interval).

Multivariable model adjusted by age, sex, educational level, smoking status, alcohol consumption, physical activity, use of lipid-lowering medication (statins) (only for serum lipids), use of antihypertensive medication (only for blood pressure), use of antidiabetic drug treatment (only for markers of insulin resistance and diabetes), use of cardiovascular medication (only for blood pressure and serum lipids), family history of cardiovascular disease, presence of diabetes, presence of cardiovascular disease and body mass index (except for waist circumference and body mass index as an outcome).