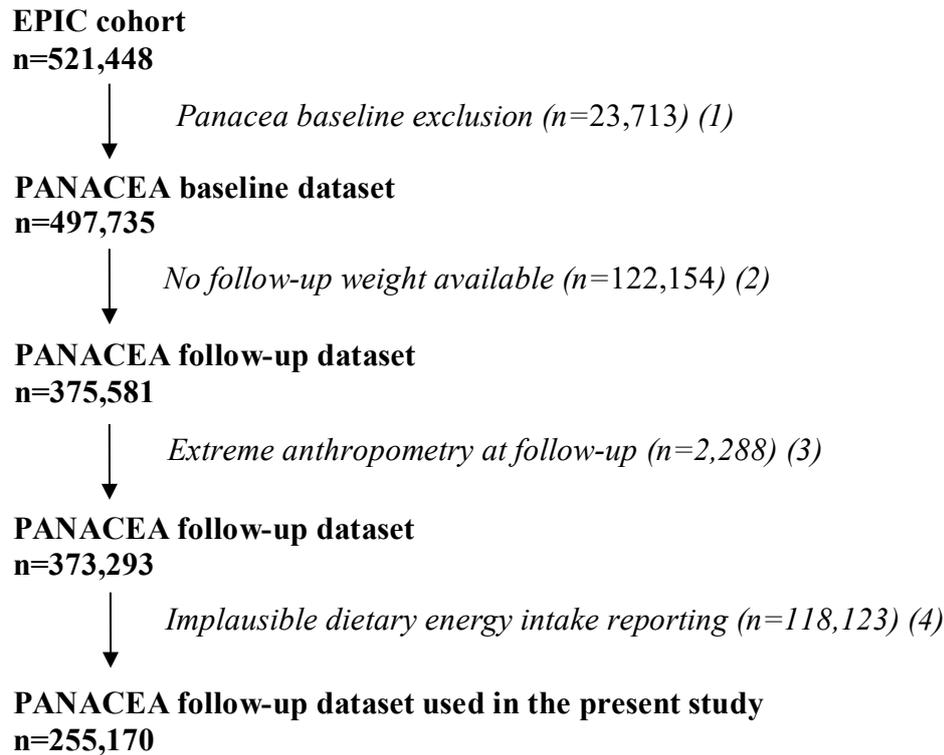


**Supplemental Figure 1:** Flow chart of sample exclusion criteria for the present study

## (1) PANACEA baseline exclusions:

1. Length of follow-up equals to 0 (n=1,517)
2. No dietary data available (n= 6,611)
3. Those in the lowest and highest 1% of the ratio of reported total energy intake / energy requirement (EI/ER) (n=10,209)
4. No lifestyle information (n=64)
5. Pregnant women (n=623)
6. Unreliable anthropometry [height <130 cm (n=16), BMI <16.0 kg.m<sup>-2</sup> (n=302), waist circumference <40 cm (n=0) or waist circumference >160 cm (n=16), waist circumference <60 cm if BMI >25 kg.m<sup>-2</sup> (n=42)]
7. Missing information on weight (n=4,079)
8. Missing information on height (n=234)

## (2) Reasons for missing data on follow-up assessment of body weight:

1. Death before the follow-up body weight assessment (n=8,226)
2. Not yet approached for follow-up body weight assessment (n=23,957)
3. (E)migrated (n=3,991)
4. Non-respondents to the invitation to participate in the second follow-up assessment of body weight (n=85,967)
5. Follow-up time missing (n=13)

## (3) Extreme anthropometry at follow-up:

1. Weight change < -5 kg/year or > 5 kg/year (n=1,926)
2. BMI at follow-up <16 kg/m<sup>2</sup> (n=140)
3. Missing BMI at follow-up (n=222)

## (4) Implausible reporting of total energy intake (Goldberg cut-offs):

1. Dietary energy under-reporting (n=93,792)
2. Dietary energy over-reporting (n=24,331)

**Supplemental Table 1** Difference in body weight gain (kg) over 5 years per 1 standard deviation (SD)/day increase in baseline dietary advanced glycation endproducts (AGEs) intake in men and women after different sensitivity tests

<b>CEL</b>	<b>N (%)</b>	<b>Beta</b>	<b>Lower 95%</b>	<b>Upper 95%</b>
Model 3	255,170 (100)	0.111	0.087	0.135
Model S1	255,170 (100)	0.101	0.076	0.125
Model S2	239,719 (94)	0.120	0.095	0.144
Model S3	255,170 (100)	0.111	0.087	0.135
Model S4	244,332 (96)	0.111	0.086	0.136
Model S5	99,766 (39)	0.096	0.062	0.129
<b>CML</b>	<b>N (%)</b>	<b>Beta</b>	<b>Lower 95%</b>	<b>Upper 95%</b>
Model 3	255,170 (100)	0.065	0.041	0.089
Model S1	255,170 (100)	0.041	0.017	0.065
Model S2	239,719 (94)	0.069	0.044	0.093
Model S3	255,170 (100)	0.066	0.042	0.090
Model S4	244,332 (96)	0.065	0.040	0.089
Model S5	99,766 (39)	0.063	0.031	0.095
<b>MG-H1</b>	<b>N (%)</b>	<b>Beta</b>	<b>Lower 95%</b>	<b>Upper 95%</b>
Model 3	255,170 (100)	0.034	0.012	0.057
Model S1	255,170 (100)	0.015	-0.008	0.037
Model S2	239,719 (94)	0.039	0.016	0.062
Model S3	373,293 (100)	0.034	0.012	0.057
Model S4	244,332 (96)	0.035	0.011	0.058
Model S5	99,766 (39)	0.025	-0.005	0.055

Multilevel linear mixed models with random effect on the intercept and slope according to center. Overall mean 5- year weight gain corresponded to 2.1 kg (SD 5.0) and positive beta values indicate more weight gain (kg) over the same period: **Model 3** main model using log-transformed and standardized AGEs (adjusted for age, sex and body mass index (BMI) at baseline; follow-up-time in years, total energy intake (kcal/day), educational level, levels of physical activity, smoking status at baseline, and plausibility of dietary energy reporting; modified relative Mediterranean diet score)

**Model S1** using smoking at follow-up instead of at baseline

**Model S2** excluding participants who started or quit smoking during follow-up

**Model S3** adjusting for chronic conditions at recruitment using an indicator for missing values

**Model S4** excluding subjects with missing values in any of the covariates

**Model S5** excluding centers with less than 5 years of weight follow-up

CEL:N<sup>ε</sup>-(1-carboxyethyl)-lysine, CML:N<sup>ε</sup>-(carboxymethyl)-lysine, MG-H1: N<sup>δ</sup>-(5-hydro-5-methyl-4-imidazolone-2-yl)-ornithine

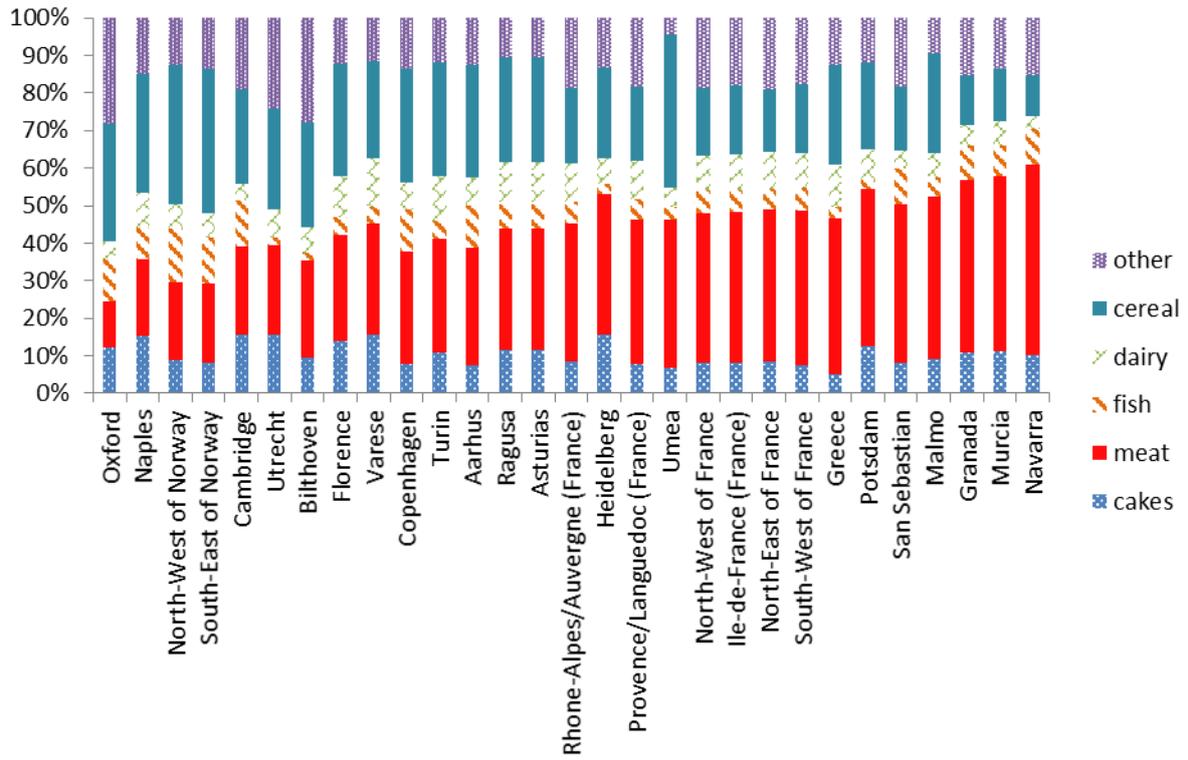
**Supplemental Table 2** Difference in body weight gain (kg) over 5 years according to baseline dietary advanced glycation endproducts (AGEs) intake in 255,170 men and women by 5 main food groups contributing to AGEs intake.

Food group	CEL	CML	MG-H1
<i>Beta (95%CI) per 1 SD /day</i>			
Meat	0.046 (0.020, 0.071)	0.044 (0.020, 0.068)	0.033 (0.010, 0.055)
Fish	0.103 (0.079, 0.128)	0.070 (0.046, 0.094)	0.028 (0.006, 0.050)
Cereals	0.119 (0.094, 0.143)	0.088 (0.063, 0.112)	0.057 (0.032, 0.082)
Cakes	0.127 (0.102, 0.151)	0.099 (0.074, 0.125)	0.039 (0.017, 0.062)
Dairy	0.113 (0.089, 0.137)	0.070 (0.046, 0.094)	0.028 (0.006, 0.051)

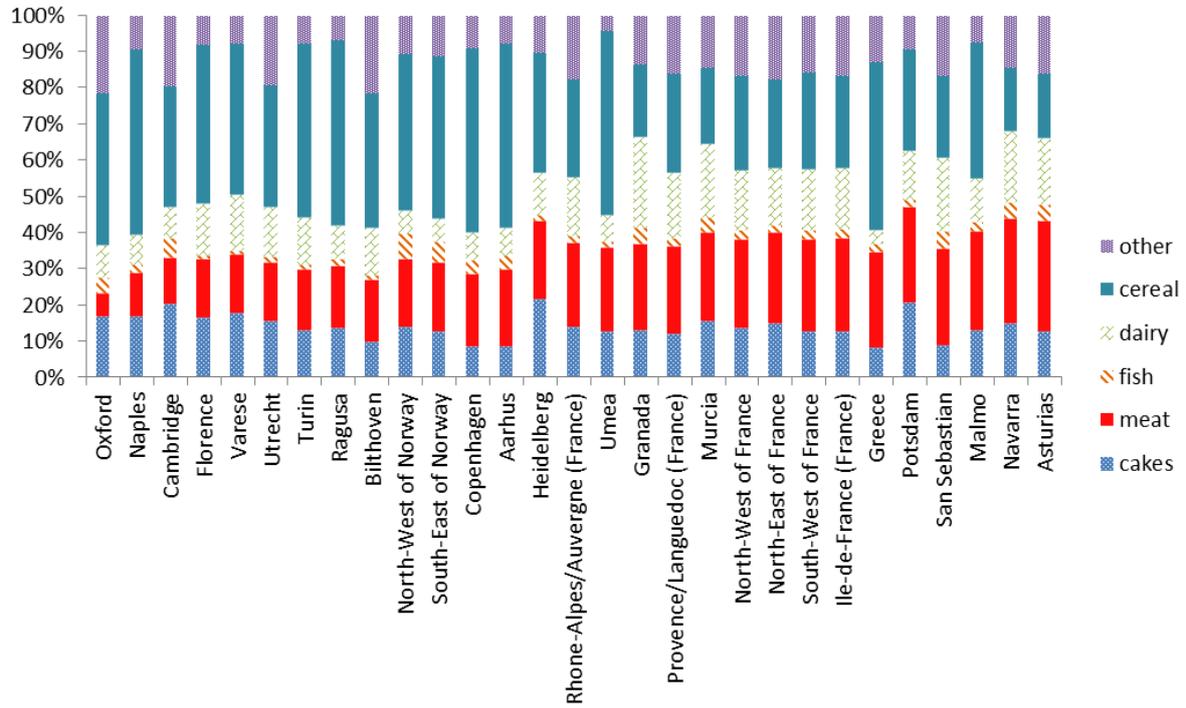
Multilevel linear mixed models with random effect on the intercept and slope according to center. Overall mean 5-year weight gain corresponded to 2.1 kg  $\pm$  standard deviation (SD) 5.0 and positive beta values indicate more weight gain (kg) over the same period. Model adjusted for age, body mass index (BMI) at baseline, follow-up-time in years, total energy intake, educational level, levels of physical activity, smoking status at baseline, and plausibility of dietary energy reporting and then further adjusted separately for each food group. Using log-transformed dietary AGEs.

CEL: N<sup>ε</sup>-(1-carboxyethyl)-lysine, CML: N<sup>ε</sup>-(carboxymethyl)-lysine, MG-H1: N<sup>δ</sup>-(5-hydro-5-methyl-4-imidazolone-2-yl)-ornithine.

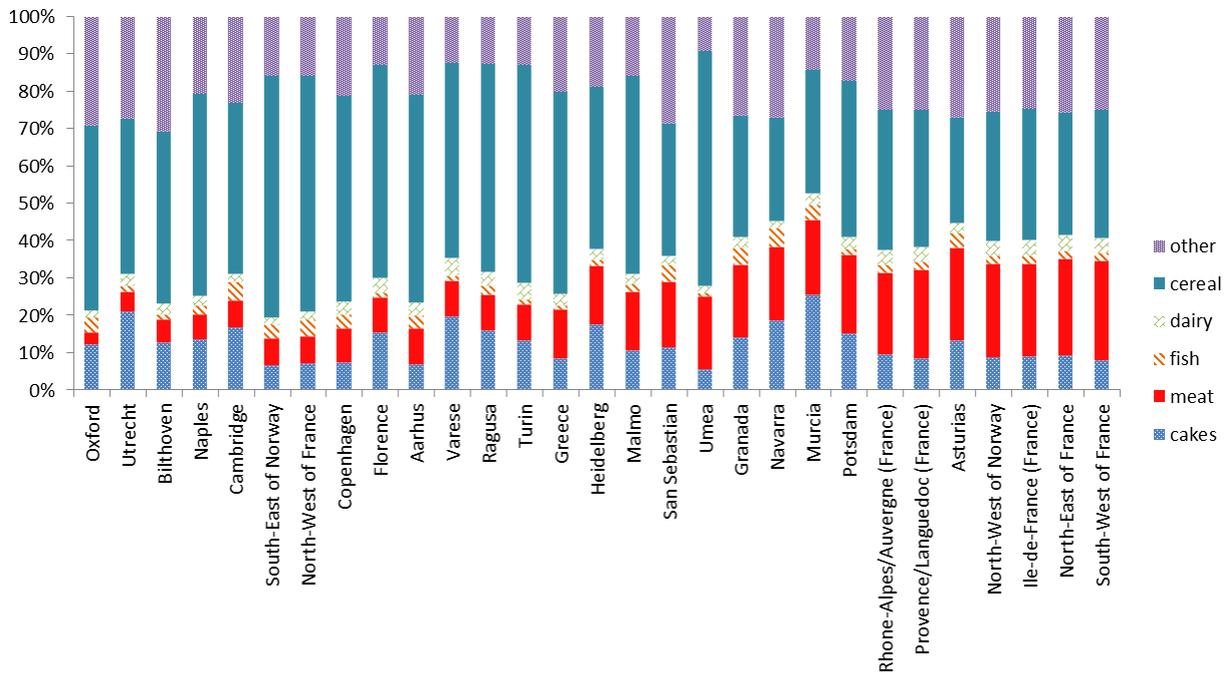
**Supplemental Figure 2** Percentage contribution of all food groups to N<sup>ε</sup>-(1-carboxyethyl)-lysine (CEL) intake by European Prospective Investigation into Cancer and Nutrition (EPIC) centers in both sexes



**Supplemental Figure 3** Percentage contribution of all food groups to N<sup>ε</sup>-(carboxymethyl)-lysine (CML) intake by European Prospective Investigation into Cancer and Nutrition (EPIC) centers in both sexes



**Supplemental Figure 4** Percentage contribution of all food groups to N<sup>δ</sup>-(5-hydro-5-methyl-4-imidazolone-2-yl)-ornithine(MG-H1) intake by European Prospective Investigation into Cancer and Nutrition (EPIC) centers in both sexes



**Supplemental Table 3** Difference in body weight gain (kg) over 5 years according to baseline dietary advanced glycation endproducts (AGEs) intake by sex for each dietary advanced glycation endproduct and principal components.

	<b>Women</b> (n= 184,600)	<b>Men</b> (n= 70,570)
CEL <i>Beta per 1 SD/day</i> <i>(95%CI)</i>	0.126 (0.098, 0.155)	0.027 (-0.021, 0.074)
CML <i>Beta per 1 SD/day</i> <i>(95%CI)</i>	0.086 (0.058, 0.115)	-0.003 (-0.049, 0.044)
MG-H1 <i>Beta per 1 SD/day</i> <i>(95%CI)</i>	0.052 (0.025, 0.078)	-0.033 (-0,076, 0.011)
PC1 <i>Beta per 1 SD/day</i> <i>(95%CI)</i>	0.079 (0.056, 0.102)	-0.004 (- 0.042, 0.035)
PC 2 <i>Beta per 1 SD/day</i> <i>(95%CI)</i>	-0.005 (- 0.031, 0.020)	0.005 (-0.039, 0.049)
PC 3 <i>Beta per 1 SD/day</i> <i>(95%CI)</i>	0.100 (0.075, 0.125)	0.072 (0.033, 0.112)

Eigenvalues of the covariance matrix for the three principle components (PCs) are as follows:

PC1: 2.385, PC2:0.386, PC3: 0.234

Multilevel linear mixed models with random effect on the intercept and slope according to center.

Overall mean 5-year weight gain corresponded to 2.1 kg  $\pm$  standard deviation (SD) 5.0 and positive beta values indicate more weight gain (kg) over the same period.

Model 3 adjusted for age, body mass index (BMI) at baseline, follow-up-time in years, total energy intake, educational level, levels of physical activity, smoking status at baseline, and plausibility of dietary energy reporting; relative Mediterranean diet score. Using log-transformed dietary AGEs.

CEL: N<sup>ε</sup>-(1-carboxyethyl)-lysine, CML: N<sup>ε</sup>-(carboxymethyl)-lysine, MG-H1: N<sup>δ</sup>-(5-hydro-5-methyl-4-imidazolone-2-yl)-ornithine.

**Supplemental Table 4** Eigenvalues (loadings) of the covariance Matrix and explained variances for the three Principal Components (PC) identified by PCA<sup>1</sup>

<b>dietary AGEs</b>	<b>PC 1</b>	<b>PC2</b>	<b>PC3</b>
Eigenvalues	2.385	0.386	0.234
loadings			
CEL	0.5842	-0.4704	0.6614
CML	0.5555	0.8258	0.09675
MG-H1	0.5917	-0.3109	-0.7438
Proportion of explained variance (%)	0.7935	0.1286	0.0779
Cumulative explained variance (%)	0.7935	0.9221	1

Estimates from European Prospective Investigation into Cancer and Nutrition (EPIC)-Wide <sup>1</sup>principal component analysis (PCA) done on the country specific validated dietary questionnaires (DQ) derived intake levels of three different dietary advanced glycation endproducts (AGEs) (log transformed and energy adjusted, using residuals method). CEL: N<sup>ε</sup>-(1-carboxyethyl)-lysine, CML: N<sup>ε</sup>-(carboxymethyl)-lysine, MG-H1: N<sup>δ</sup>-(5-hydro-5-methyl-4-imidazolone-2-yl)-ornithine.