SUPPLEMENTARY DATA

Full title: Gene-environment interactions of circadian-related genes for cardiometabolic traits.

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CONTENT

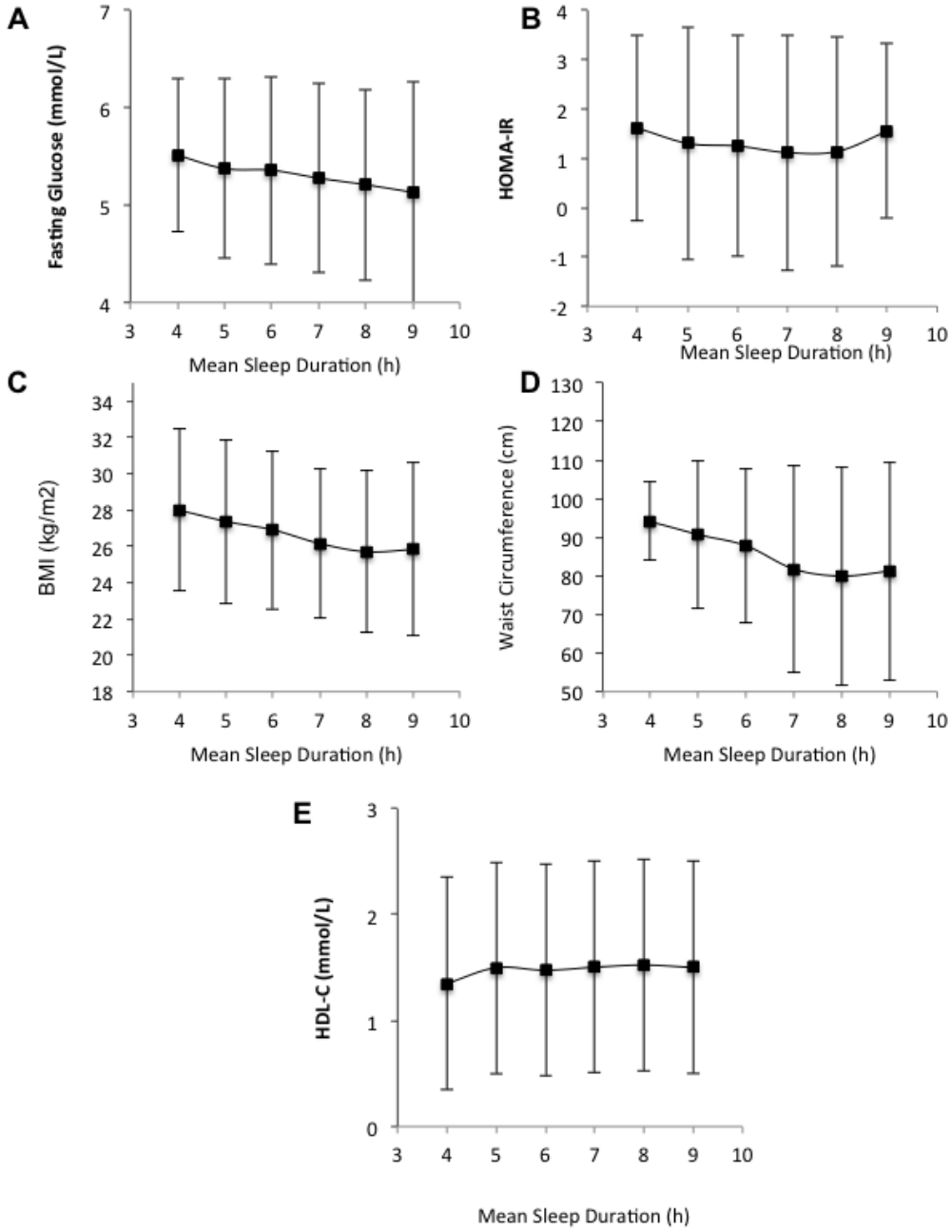
Abbreviations for Supplementary Tables and Figures

Cohort study name (study acronym) (country): Coronary Artery Risk Development in Young Adults (CARDIA) (USA); Corogene Controls (Finland); Cardiovascular Health Study (CHS) (USA); Dietary, Life Style, and Genetic Determinants of Obesity and Metabolic Syndrome (DILGOM) (Finland); Family Heart Study (FamHS) (USA); Framingham Offspring Study (FOS) (USA); Genetics of Lipid Lowering Drugs and Diet Network (GOLDN) (USA); GOYA MALE (Denmark); Helsinki Birth Cohort Study (HBCS) (Finland); Invecchiare in Chianti (Aging in the Chianti Areas; InCHIANTI) (Italy); Inter99 (Denmark); Multi-Ethnic Study of Atherosclerosis (MESA) (USA); Rotterdam Study (The Netherlands); The Hellenic Study of Interactions between SNPs and Eating in Atherosclerosis Susceptibility (THISEAS) (Greece); Cardiovascular Risk in Young Finns Study (YFS) (Finland).

Abbreviations: BMI, body mass index; CHO, carbohydrates; *h*, hours; HDL-C, High-Density Lipoprotein Cholesterol; HOMA-IR, homeostasis model assessment- estimated insulin resistance; MUFA, monounsaturated fatty acid; n, total sample size; NA, not available; PCA, principal component analysis; PUFA, polyunsaturated fatty acid; SD, standard deviation; SFA, saturated fatty acid; SNP, single nucleotide polymorphism.

SUPPLEMENTARY DATA

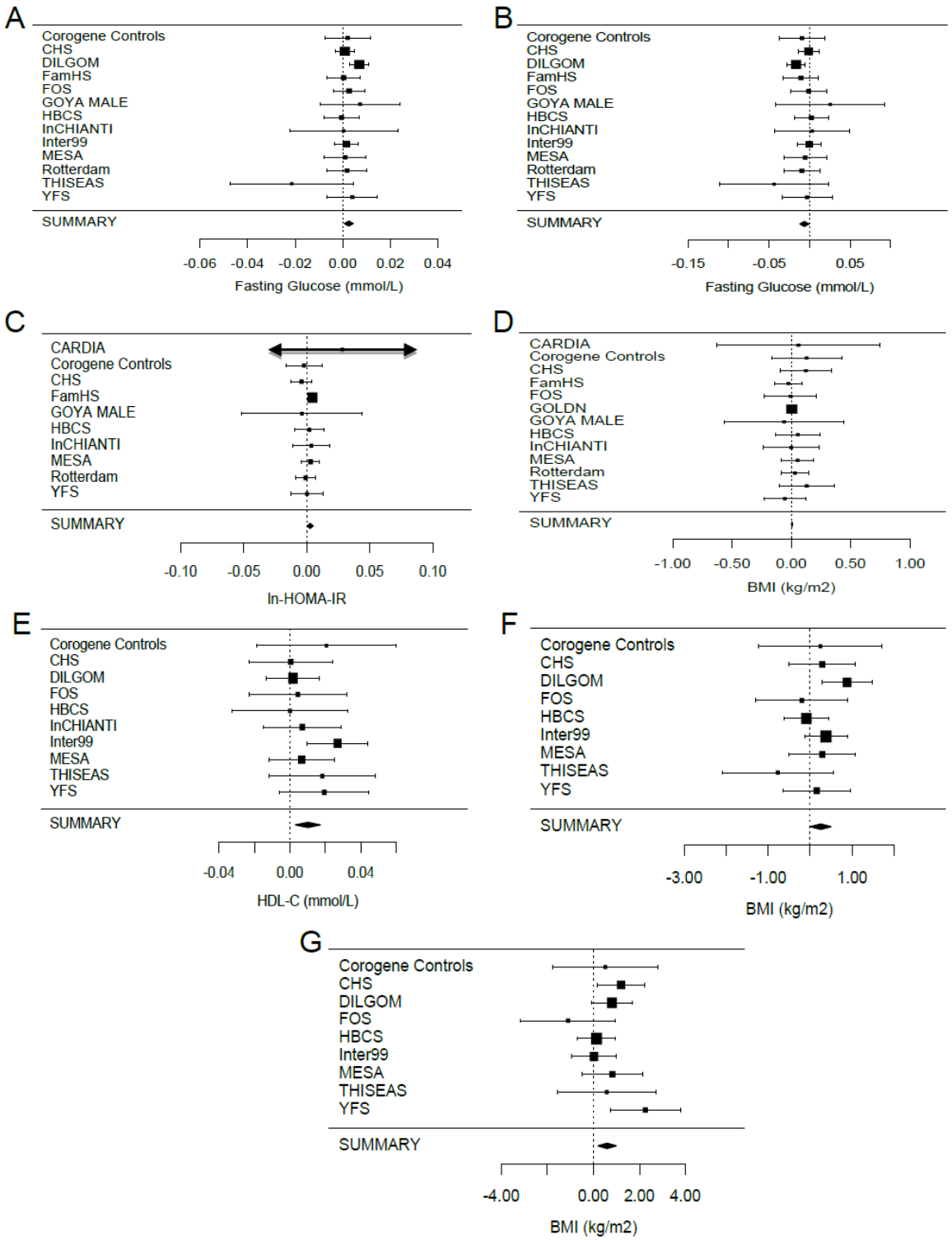
Supplementary Figure S1. Relationships between sleep duration and outcomes*.



*Plots represent the adjusted means [adjusted for age, sex, BMI (except when assessing BMI outcome), and study site (in CHS; MESA)] (dots) and standard deviations (bars) of selected outcomes by sleep duration in hours categorized as 4, 5, 6, 7, 8, and 9 h. Sample size varied by outcome: glycemic traits [4h (*n* =139), 5h (*n* =549), 6h (*n* =2,209), 7h (*n* =5,778), 8h (*n* =5,428), 9h (*n* =1,313)]; anthropometric and lipid traits [4h (*n* =144), 5h (*n* =563), 6h (*n* =2,244), 7h (*n* =5,817), 8h (*n* =5,469), 9h (*n* =1,345)].

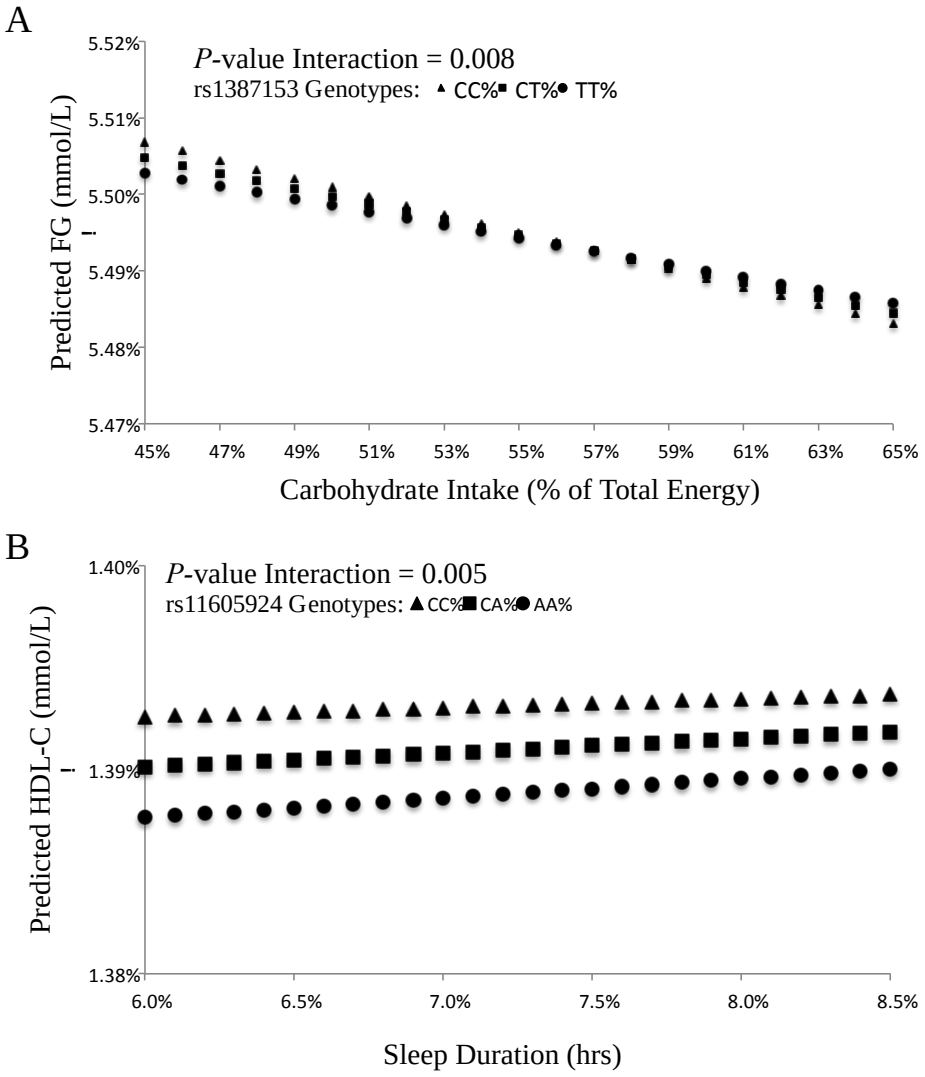
SUPPLEMENTARY DATA

Supplementary Figure S2. Forest plots for the interaction term between: (A) CHO intake and *MTNR1B*-rs1387153 for FG; (B) MUFA intake and *MTNR1B*-rs1387153 for FG; (C) total fat intake and *NR1D1*-rs2314339 for ln-HOMA-IR; (D) SFA intake and *NR1D1*-rs2314339 for BMI; (E) sleep duration and *CRY2*-rs11605924 for HDL-C; (F) short sleep duration (<7 h) and *MTNR1B*-rs1381753 for BMI; and (G) long sleep duration (≥9 h) and *MTNR1B*-rs1381753 for BMI. The squares represent the point estimate of the association; their size represents the number of participants in a given cohort relative to others presented; the bars represent the 95% confidence interval of the point estimate.



SUPPLEMENTARY DATA

Supplementary Figure S3. Plots of meta-analyzed interactions for: (A) CHO intake and *MTNR1B*-rs1387153 for FG*; and (B) sleep duration (continuous) and *CRY2*-rs11605924 for HDL-C†.

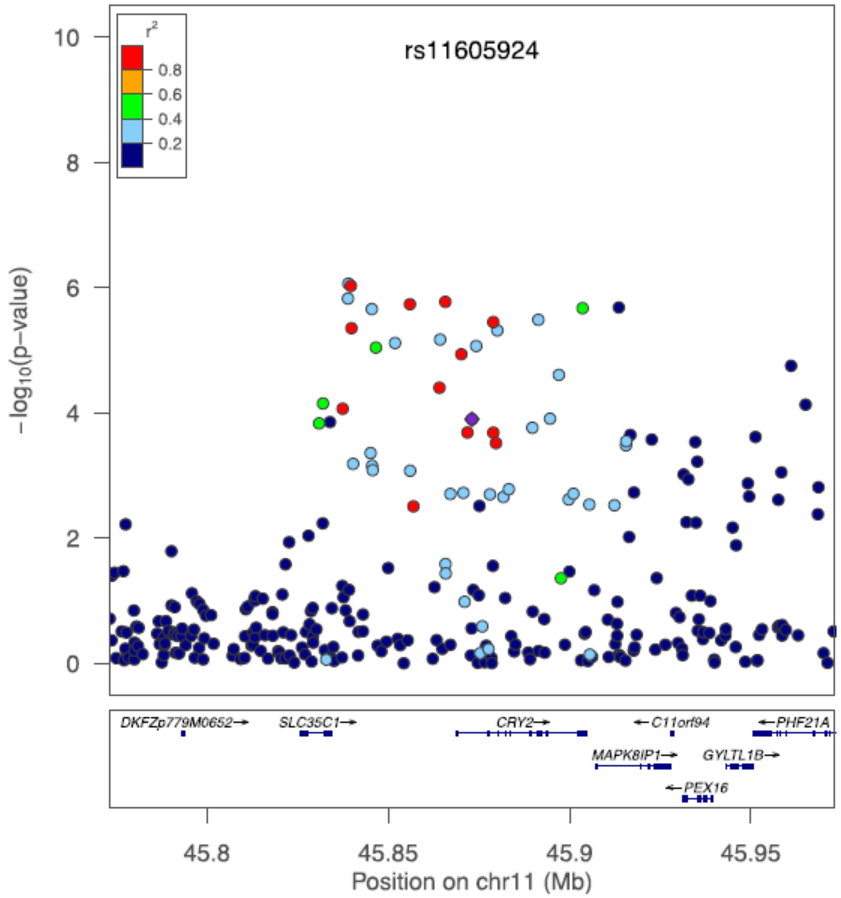


* Predicted change in FG (mmol/L) according to *MTNR1B*-rs1387153 (effect/noneffect: T/C; triangles =CC; squares =CT; circles =TT) plotted against CHO intake (% of total energy) evaluated continuously. Predicted change values for FG were calculated from a meta-analyzed linear regression model taking into account exposures' main effects (CHO intake and rs1387153), and their interaction term, after adjustment for age, sex, BMI, study site (in CARDIA; CHS; FamHS; GOLDN; InCHIANTI; MESA), family or population structure (in Corogene Controls; DILGOM; FamHS; FOS; GOLDN; MESA; Rotterdam; YFS), and genotype batch (in FamHS). *P*-value indicates the statistical significance of the interaction term in the adjusted regression model.

† Predicted values for change in HDL-C (mmol/L) according to *CRY2*-rs11605924 (effect/noneffect: A/C; triangles =CC; squares =CA; circles =AA)) plotted against sleep duration (h) evaluated continuously. Predicted values for HDL-C were calculated from a meta-analyzed linear regression model taking into account exposures' main effects (sleep duration and rs11605924), and their interaction term, after adjustment for age, sex, BMI, study site (in CARDIA; CHS; FamHS; GOLDN; InCHIANTI; MESA), family or population structure (in Corogene Controls; DILGOM; FamHS; FOS; GOLDN; MESA; Rotterdam; YFS), and genotype batch (in FamHS). *P*-value indicates the statistical significance of the interaction term in the adjusted regression model.

SUPPLEMENTARY DATA

Supplementary Figure S4. Regional associations of *CRY2* and HDL-C from Global Lipids Genetics Consortium genome-wide association study for HDL-C.



The panel shows $-\log_{10}P$ values for SNPs from the 11p11 locus (including *CRY2*) with HDL-C. Linkage disequilibrium (LD) is indicated by the color scale in relationship to highlighted marker in purple (rs11605924). The scheme is red for strong LD (r^2 ≥0.8), green for lower LD, and navy blue for no LD.
Abbreviations: Chr, chromosome; cM, centimorgan; Mb, mega base pair; SNP, single nucleotide polymorphism.

Global Lipids Genetics Consortium, Willer CJ, Schmidt EM, Sengupta S, Peloso GM, Gustafsson S, et al. Discovery and refinement of loci associated with lipid levels. Nat Genet. 2013 Nov;45(11):1274–83.

SUPPLEMENTARY DATA

Supplementary Table S1. Descriptions and acknowledgements of participating CHARGE cohorts.

Cohort	Study Description and Acknowledgements	Relevant References
Coronary Artery Risk Development in Young Adults Study (CARDIA) **USA**	CARDIA is a prospective multicenter study investigating the natural development of cardiovascular disease risk factors in young black and white men and women. The study population was composed of 5,115 young adults who were between the ages of 18 and 30 years at baseline. Participants were recruited from four sites: Birmingham, Alabama; Chicago, Illinois; Minneapolis, Minnesota; and Oakland, California. All procedures were conducted in accordance with CARDIA protocols approved by the institutional review boards at each center. Data for these analyses were obtained during the year 7 (1992–93) examination. A total of 4,086 (80 percent of the baseline cohort) participated in the Year 7 examination. The present study includes 1075 adults with available DNA and dietary information. We thank the investigators, staff, and participants of CARDIA for their contributions. A full list of participating CARDIA investigators and institutions can be found at http://www.cardia.dopm.uab.edu. The CARIDA datasets used for the analyses described in this manuscript were obtained from dbGaP at [http://www.ncbi.nlm.nih.gov/sites/entrez?Db=gap] through dbGaP accession number CARDIA Cohort [phs000285.v3.p2] and CARDIA Gene Environment Association Studies Initiative (GENEVA) [phs000309.v3.p2].	http://www.cardia.dopm.uab.edu
Corogene Controls **Finland**	Corogene controls (*n*=730) are selected healthy controls from FINRISK 2007 study living in Helsinki area for acute coronary syndrome patients. A total of 665 subjects had available DNA and dietary information. After exclusions there were 549 subjects left for statistical analyses. The study was approved by the Ethics Committee of Helsinki and Uusimaa Hospital District. The study was supported by the Academy of Finland (136635 and 139635) and the Finnish Foundation for Cardiovascular Research. [representing authors: LK, TP, MP, ASH, VS]	Int J Epidemiol. 2010;39:504-18 Br J Nutr. 2013 Nov 14:1-8. [Epub ahead of print]

Cardiovascular Health Study (CHS) **USA**	The CHS is a prospective population-based cohort study of people ≥ 65 years old at baseline initiated to evaluate risk factors for the development and progression of cardiovascular disease. Participants were recruited at four field centers (Forsyth County, NC; Sacramento County, CA; Washington County, MD; Pittsburgh, PA) from random samples of Medicare eligibility lists. The cohort consists of 5201 non-institutionalized men and women, recruited in 1989-1990, plus an additional 687 black participants recruited in 1992-93. A total of 1458 Caucasian adults with available DNA, valid dietary information, sleep duration data, and consent to share genetic data were eligible for the current analysis. This CHS research was supported by NHLBI contracts HHSN268201200036C, HHSN268200800007C, N01HC55222, N01HC85079, N01HC85080, N01HC85081, N01HC85082, N01HC85083, N01HC85086; and NHLBI grants HL080295, HL087652, HL105756, HL103612, HL120393, and HL053916 with additional contribution from the National Institute of Neurological Disorders and Stroke (NINDS). Additional support was provided through AG023629 from the National Institute on Aging (NIA). A full list of principal CHS investigators and institutions can be found at CHS-NHLBI.org/. The provision of genotyping data was supported in part by the National Center for Advancing Translational Sciences, CTSI grant UL1TR000124, and the National Institute of Diabetes and Digestive and Kidney Disease Diabetes Research Center (DRC) grant DK063491 to the Southern California Diabetes Endocrinology Research Center. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. [representing authors: TMB, RNL, BMP, DSS, DM, SAG]	http://www.chs-nhlbi.org/ Ann Epidemiol. 1(3): 263-276, 1991
Life Style, and Genetic Determinants of Obesity and Metabolic Syndrome (DILGOM) **Finland**	DILGOM1 (DIetary, Lifestyle and Genetic factors on the development of Obesity and Metabolic syndrome 1) Study is a population-based longitudinal study designed to examine five main areas related to the development of obesity and metabolic syndrome: lifestyle factors, psychosocial factors, metabolism and hormonal factors, exposure to environmental pollutants and genetics. The study population consists of 5,024 men and women who participated in the DILGOM baseline study in 2007. The study protocol includes a questionnaire on lifestyle and psychosocial factors, a validated food frequency questionnaire, measures and blood samples. From these individuals, genotype data was available for 3,792 subjects from FINRISK 2007 population cohort excluding people from Helsinki area. The study was approved by the Ethics Committee of Helsinki and Uusimaa Hospital District. The study was supported by the Academy of Finland (136635, 136895 and 263836). [representing authors: LK, TP, MP, ASH, VS, TE, SM]	Int J Epidemiol. 2010;39:504-18 Br J Nutr. 2013 Nov 14:1-8. [Epub ahead of print]

SUPPLEMENTARY DATA

Family Heart Study (FamHS) **USA**	The FamHS began in 1992 with the ascertainment of 1,200 families (50% randomly sampled, and 50% high risk for CHD). The families (~6,000 individuals,) were sampled on the basis of information on probands from four population-based parent studies: the Framingham Heart Study, the Utah Family Tree Study, and two ARIC centers (Minneapolis, and Forsyth County, NC). Approximately eight years later, study participants belonging to the largest pedigrees were invited for a second clinical exam. A total of 2,767 participants of European descent in 510 extended families were examined. A total of 3,523 adults with available DNA and who provided valid dietary information were eligible for the current study. The Family Heart Study (FamHS) work was supported by NIH grants R01-HL-087700 and R01-HL-088215 (Michael A. Province, PI) from NHLBI; and R01-DK-8925601 and R01-DK-075681 (Ingrid B. Borecki, PI) from NIDDK. The investigators thank the staff and participants of the FamHS for their important contributions. [representing authors: MKW, IBB]	https://dsgweb.wustl.edu/PROJECTS/MP1.html Higgins et al. Am J Epidemiol. 143 (12): 1219, 1996
Framingham Offspring Study (FOS) **USA**	The Framingham Offspring Study (FOS) is a community-based longitudinal study designed to examine cardiovascular disease risk in the offspring of the original participants and their spouses of the Framingham Heart Study (FHS) cohort. In 1971, 5,124 individuals were enrolled in the study; since then, the cohort has been examined every 3–4 y. Between January 1995 and December 1998, during the 6th examination cycles, a total of 976 adults with available DNA, anthropometric and biochemical measurements, valid dietary information, and consent to share genetic data were eligible for the current study. This study was approved by the Institutional Review Boards for Human Research at Boston University and Tufts University. Subjects with sleep duration data for this study are drawn from the 2,848 Framingham Offspring Study participants who completed sleep habits questionnaires between 1995 and 1998 (Offspring Examination Cycle 6) for the Sleep Heart Health Study, a longitudinal study of the cardiovascular consequences of sleep-disordered breathing. Of these subjects, 898 members with valid sleep phenotype data contributed to the analysis. The Framingham Offspring Study was conducted in part using data and resources from the Framingham Heart Study of the National Heart Lung and Blood Institute of the National Institutes of Health and Boston University School of Medicine. The analyses reflect intellectual input and resource development from the Framingham Heart Study investigators participating in the SNP Health Association Resource (SHARe) project. This work was partially supported by the National Heart, Lung and Blood Institute's Framingham Heart Study (Contract No. N01-HC-25195) and its contract with Affymetrix, Inc for genotyping services (Contract No. N02-HL-6-4278). The FHS datasets used for the analyses described in this manuscript were obtained from dbGaP at [http://www.ncbi.nlm.nih.gov/sites/entrez?Db=gap] through dbGaP accession number FHS Cohort [phs000007.v21.p8] and FHS SNP Health Association Resource (SHARe) [phs000342.v9.p8]. [representing authors: HSD]	http://www.framinghamheartstudy.org/ Prev Med.4:518–25, 1975 Am J Epidemiol. 165(11):1328-35, 2007

Genetics of Lipid Lowering Drugs and Diet Network (GOLDN) **USA**	The original study population consisted of 1,328 men and women from 148 families consisting of a mix of familial relationships including parent-offspring (N=614), siblings (N=667), grandparent-grandchild (N=89), avuncular (N=617), half-sibling (N=22), grand avuncular (N=69), half avuncular (N=23), first cousins (N=268), half grand avuncular (N=12), 1st cousin once removed (N=81), half 1st cousin (N=11), half 1st cousin once removed (N=4) and 2nd cousin (N=1) relationships. All participants were of European descent recruited in Minneapolis, Minnesota, and Salt Lake City, Utah. The primary aim of the GOLDN study was to characterize the role of genetic and dietary factors on an individual's response to both a high-fat meal challenge and fenofibrate intervention. Briefly, the study protocol consisted of an initial screening visit (visit 0), during which participants were asked to discontinue the use of lipid lowering drugs and over-the-counter medication that could affect lipid levels. Approximately 4 to 8 weeks later, baseline blood chemistries were measured (visit 1). A day later (during visit 2), participants' fasting (8-hour fast) blood samples were collected and the Diet History Questionnaire administered. Anthropometric measures (height and weight) were collected at this time. The final sample consisted only of those willing to undergo the high-fat meal protocol; N=1,036 individuals), and had genotype data after exclusions (N=818). The protocol was approved by the Institutional Review Boards at the University of Minnesota, University of Utah, Tufts University/New England Medical Center and the University of Alabama at Birmingham. Written informed consent was obtained from all participants. We are grateful to the staff of the GOLDN study for the assistance in data collection and management. This study was funded by NHLBI grant number U01HL072524. [representing authors: ACF-W, PNH, RJS, DKA]	http://www.ncbi.nlm.nih.gov/pubmed/18804210 Kabagambe EK, et al. Smoking, inflammatory patterns and postprandial hypertriglyceridemia.Atherosclerosis. 2009;203:633–9
GOYA MALE **Denmark**	The ADIGEN study is derived from the initial draftboard medical examination (baseline) of men (N=400,975) aged (19-22 years) that took place between 1943-1977 in Copenhagen and surrounding areas of Denmark. N=362,200 (90.3%) men were further investigated and divided into obese (BMI≥31kg/m2) cases (N=1930) and a random cohort (1% of 362,200; N=3601) forming a control group. These were then followed up three times as part of Copenhagen city heart study 2 (CCHS2(1981-1983): Obese=965, control= 1134 participated), Copenhagen city heart study 3 (CCHS3(1992-1994): Obese=795, controls=920 participated) which was the GWAS stage and finally the fourth visit was the ADIGEN ((1998-2000) Obese=234, controls=323 participated) stage. The DNA was available at the CCHS3 stage whereas the valid dietary information and biochemical data were collected at the ADIGEN stage along with the consent to share genetic data for the current analysis. This study was conducted as part of the activities of the Gene-diet Interactions in Obesity project (GENDINOB, www.gendinob.dk) and the MRC centre for Causal Analyses in Translational Epidemiology (MRC CAiTE). We thank the staff of the Copenhagen City Heart Study for their skillful examination of the study subjects in collection of baseline and follow-up data. [representing authors: TSA, LP, TH, AA, OP, TIAS]	J Nutr. 2009 Dec;139(12):2337-43. Epub 2009 Oct 14 (PMID:19828683) PLoS One. 2011;6(9):e24303. Epub 2011 Sep 15

SUPPLEMENTARY DATA

Helsinki Birth Cohort Study (HBCS) **Finland**	The Helsinki Birth Cohort Study (HBCS) is composed of 8,760 individuals born between the years 1934-44 in one of the two main maternity hospitals in Helsinki, Finland. Between 2001 and 2003, a randomly selected sample of 928 males and 1075 females participated in a clinical follow-up study with a focus on cardiovascular, metabolic and reproductive health, cognitive function and depressive symptoms. DNA was extracted from blood samples drawn at the clinical visit and genotyping was performed with the modified Illumina 610k chip by the Wellcome Trust Sanger Institute, Cambridge, UK according to standard protocols. Closely related individuals were screened for by examining pair-wise IBD estimates (>0.2 IBD-sharing was used as cut-off). Population stratification due to non-European ancestry was previously examined using multidimensional scaling analyses without LD pruning. No non-European individuals detected. Subjects with gender discrepancy were removed (after QC N = 1720). 1095 men and 798 women participated the second follow-up between 2009 and 2010 with assessment of sleep with the Basic Nordic Sleep Questionnaire (BNSQ; 36). There were 1184 women and men (39.3% men) with valid genotype and phenotype data. The mean age of the participants was 69.0 years (SD=2.9) and the average sleep duration was 8.2 hours (SD: 1.1; min: 3 hours, max: 12.5 hours). Detailed information on the selection of the HBCS participants and on the study design can be found elsewhere. Research plan of the HBCS was approved by the Institutional Review Board of the National Public Health Institute and all participants have signed an informed consent. We thank all study participants as well as everybody involved in the Helsinki Birth Cohort Study. Helsinki Birth Cohort Study has been supported by grants from the Academy of Finland, the Finnish Diabetes Research Society, Folkhälsan Research Foundation, Novo Nordisk Foundation, Finska Läkaresällskapet, Signe and Ane Gyllenberg Foundation, University of Helsinki, Ministry of Education, Ahokas Foundation, Emil Aaltonen Foundation. [representing authors: MMP, JL, KR, JGE]	http://www.thl.fi/en_US/web/en/project?id=23572 Barker DJP, Osmond C, Forsen TJ, Kajantie E, Eriksson JG. Trajectories of growth among children who have coronary events as adults. N Engl J Med 2005; 353(17) :1802-1809. Eriksson JG, Osmond C, Kajantie E, Forsen TJ, Barker DJP. Patterns of growth among children who later develop type 2 diabetes or its risk factors. Diabetologia 2006; 49(12) :2853-2858. Raikkonen K, Pesonen AK, Heinonen K, Lahti J, Kajantie E, Forsen T et al. Infant growth and hostility in adult life. Psychosom Med 2008; 70(3):306-313.

SUPPLEMENTARY DATA

Invecchiare in Chianti (aging in the Chianti area, InCHIANTI) **Italy**	InCHIANTI is a population-based study designed to evaluate the factors that influence mobility in older people in the Chianti region of Tuscany, Italy. A total of 1,616 residents were selected from the population registry of Greve (a rural area: 11,709 residents with 19.3% of the population greater than 65 years of age), and Bagno a Ripoli (Antella village near Florence; 4,704 inhabitants, with 20.3% greater than 65 years of age). The participation rate was 90% (n=1453), and the participants ranged between 21-102 years of age. For the present study, 912 adults with available DNA, sleep duration data, and who provided complete dietary information were eligible for the current study. **In**vecchiare in Chianti (aging in the Chianti area, InCHIANTI) study investigators thank the Intramural Research Program of the NIH, National Institute on Aging who are responsible for the InCHIANTI samples. Investigators also thank the InCHIANTI participants. The InCHIANTI study baseline (1998-2000) was supported as a "targeted project" (ICS110.1/RF97.71) by the Italian Ministry of Health and in part by the U.S. National Institute on Aging (Contracts: 263 MD 9164 and 263 MD 821336). [representing authors: TT, DGH, LF, SB]	http://www.inchiantistudy.net/bindex.html Ferrucci L, et al. J Am Geriatr Soc. 48:1618-1625, 2000
Inter99 **Denmark**	The Inter99 study (N=6,089, aged 30-60 years) is a Danish population-based, non-pharmacological intervention study for the prevention of ischemic heart disease conducted at the Research Centre for Prevention and Health (RCPH) in Glostrup, Copenhagen (ClinicalTrials.gov ID-no: NCT00289237, www.inter99.dk). The study was approved by the Scientific Ethics Committee of the Capital Region of Denmark (KA-98155) and all participants provided written informed consent. The Inter99 study was initiated by T. Jørgensen (principal investigator), K. Borch-Johnsen (co-principal investigator), H. Ibsen and T.F. Thomsen. The Steering Committee comprises of Torben Jørgensen and Charlotta Pisinger. The Inter99 was financially supported by research grants from the Danish Research Council, the Danish Centre for Health Technology Assessment, Novo Nordisk Inc., Research Foundation of Copenhagen County, Ministry of Internal Affairs and Health, the Danish Heart Foundation, the Danish Pharmaceutical Association, the Augustinus Foundation, the Ib Henriksen Foundation, the Becket Foundation, and the Danish Diabetes Association. Genetic studies were supported by The Lundbeck Foundation Centre for Applied Medical Genomics in Personalised Disease Prediction, Prevention and Care (LuCamp, www.lucamp.org). The Novo Nordisk Foundation Center for Basic Metabolic Research is an independent Research Center at the University of Copenhagen partially funded by an unrestricted donation from the Novo Nordisk Foundation (www.metabol.ku.dk). [representing authors: AJ, UT, NG, TJ, AL]	www.inter99.dk Jorgensen, T., et al. Eur J Cardiovasc Prev Rehabil, 2003. 10(5): p. 377-86 Glümer C, Jørgensen T, Borch-Johnsen K. Diabetes Care. 2003 Aug;26(8):2335-40

Multi-Ethnic Study of Atherosclerosis (MESA) **USA**	The Multi-Ethnic Study of Atherosclerosis (MESA) is a study of the characteristics of subclinical cardiovascular disease (disease detected non-invasively before it has produced clinical signs and symptoms) and the risk factors that predict progression to clinically overt cardiovascular disease or progression of the subclinical disease. MESA researchers study a diverse, population-based sample of 6,814 men and women asymptomatic at baseline aged 45-84 (38 percent of the recruited participants are white, 28 percent African-American, 22 percent Hispanic, and 12 percent Asian, predominantly of Chinese descent). Participants were recruited from six field centers across the United States: Wake Forest University, Columbia University, Johns Hopkins University, University of Minnesota, Northwestern University and University of California - Los Angeles. For the current study, data from Exam 5, from 2,028 individuals with completed diet questionnaires, have sleep duration data, and genotypes were available for analysis. The Multi-Ethnic Study of Atherosclerosis (MESA) is conducted and supported by contracts N01-HC-95159, N01-HC-95160, N01-HC-95161, N01-HC-95162, N01-HC-95163, N01-HC-95164, N01-HC-95165, N01-HC-95166, N01-HC-95167, N01-HC-95168, and N01-HC-95169 and RR-024156 from the National Heart, Lung, and Blood Institute (NHLBI). Funding for MESA SHARe genotyping was provided by NHLBI Contract N02-HL-6-4278. The authors thank the participants of the MESA study, the Coordinating Center, MESA investigators, and study staff for their valuable contributions. A full list of participating MESA investigators and institutions can be found at http://www.mesa-nhlbi.org. ACFW is funded by American Heart Association grant number 14BGIA18740011. [representing authors: ACFW, RS, WCJ, HMH, JIR, SSR]	Bild DE, et al. Am. J. Epidemiol. 156 (9): 871-881.2002

SUPPLEMENTARY DATA

Rotterdam Study **Netherlands**	The Rotterdam Study a prospective cohort study among, initially, 7,983 persons living in Rotterdam in The Netherlands (78% of 10,215 invitees). The first cohort (RS-I) started in 1990 in Ommoord, a suburb of Rotterdam, the Netherlands, comprising of 7,983 men and women aged 55 years and over. Baseline measurements were obtained between 1990 and 1993. Trained research assistants collected data on current health status, use of medication, medical history, lifestyle and risk indicators for chronic diseases during an extensive home interview. Subsequently, the participants visited the study center for detailed clinical examinations. Follow up visits were held every 2-3 years. The Rotterdam Study is supported by the Erasmus MC University Medical Center and Erasmus University Rotterdam; The Netherlands Organisation for Scientific Research (NWO); The Netherlands Organisation for Health Research and Development (ZonMw); the Research Institute for Diseases in the Elderly (RIDE); The Netherlands Genomics Initiative (NGI); the Ministry of Education, Culture and Science; the Ministry of Health, Welfare and Sports; the European Commission (DG XII); and the Municipality of Rotterdam. J.C. Kiefte de Jong, A. Vitezova, T. Muka and Oscar H. Franco work in ErasmusAGE, a center for aging research across the life course funded by Nestlé Nutrition (Nestec Ltd.); Metagenics Inc.; and AXA. The contribution of inhabitants, general practitioners and pharmacists of the Ommoord district to the Rotterdam Study is gratefully acknowledged. [representing authors: TM, AV, JCK, AH, AGU, HT, OHF]	Hofman et al. Eur J Epidemiol. 2013 Nov 21
The Hellenic Study of Interactions between SNPs and Eating in Atherosclerosis Susceptibility (THISEAS) **Greece**	The Hellenic Study of Interactions between SNPs and Eating in Atherosclerosis Susceptibility (THISEAS) study is a case- control study designed to investigate the association between genetic and lifestyle environmental factors and the risk of coronary artery disease in men and women aged >25 yrs. The control group consists of individuals with no history of cardiovascular disease, while cases are individuals with coronary artery disease. Hematological, biochemical and anthropometric measurements were conducted to all participants. Dietary assessment and physical activity data were collected through face-to-face interview by well-trained scientists. Metabochip was used for DNA analysis. Exclusion criteria for the control group were history of cardiovascular disease, cancer and/ or other inflammatory disease. The population for the present analysis was comprised of 420 subjects with phenotype, genotype, sleep duration data, and dietary data available. The Hellenic study of Interactions between SNPs and Eating in Atherosclerosis Susceptibility (THISEAS) study thanks the Genotyping Facility at the Wellcome Trust Sanger Institute for typing the THISEAS samples. PD's work forms part of the research themes contributing to the translational research portfolio of Barts Cardiovascular Biomedical Research Unit which is supported and funded by the National Institute for Health Research. [representing authors: IPK, LR, SK, PD, GD]	Clin Chem Lab Med. 2009;47(12):1471-3, BMC Med Genet. 2010 Feb 18;11:28

SUPPLEMENTARY DATA

Cardiovascular Risk in Young Finns Study (YFS) **Finland**	The Cardiovascular Risk in Young Finns Study (YFS) is a population-based 27-year follow-up study. The first cross-sectional survey was conducted in 1980, when 3,596 Caucasian subjects aged 3-18 years participated. In adulthood, the latest 27-year follow-up study was conducted in 2007 (ages 30-45 years) with 2,204 participants. A total of 1,415 participants with available DNA, sleep duration data, and who provided complete dietary information were eligible for the current study. The Young Finns Study has been financially supported by the Academy of Finland: grants 134309 (Eye), 126925, 121584, 124282, 129378 (Salve), 117787 (Gendi), and 41071 (Skidi), the Social Insurance Institution of Finland, Kuopio, Tampere and Turku University Hospital Medical Funds (grant 9M048 for 9N035 for TeLeht), Juho Vainio Foundation, Paavo Nurmi Foundation, Finnish Foundation of Cardiovascular Research and Finnish Cultural Foundation, Tampere Tuberculosis Foundation and Emil Aaltonen Foundation. The expert technical assistance in the statistical analyses by Irina Lisinen, Ville Aalto and Mika Helminen are gratefully acknowledged. [representing authors: VM, OR, MK, JV, IS, TL]	Raitakari OT et al. Cohort profile. Int. J Epidemiol. 2008;37:1220-6

SUPPLEMENTARY DATA

Supplementary Table S2. Dietary assessment methods of participating CHARGE cohorts.

Cohort	Dietary Assessment Method	Nutrient Database	Description	Relevant References
CARDIA	Interviewer-administered, diet history	University of Minnesota Nutrition Coordinating Center (NCC) Nutrient Database	Dietary intake data for exam 7 was obtained from an extensive nutritionist-administered diet history questionnaire developed for the CARDIA study. Study participants were asked to recall their usual dietary intake using the past month as the time frame. Participants had to report on the frequency, amount, and method of food preparation for this period. Validity and quality-control issues concerning the administration of the diet-history questionnaire have been described previously. Nutrients were calculated from food items using the University of Minnesota Nutrition Coordinating Center (NCC) Nutrient Database tapes 10 (baseline) and 20 (year 7).	McDonald A, J Am Diet Assoc. 1991 Sep;91(9):1104-12. Ethn Dis. 1994 Winter;4(1):15-27.
Corogene Controls	131-item, self-administered, THL FFQ 2007	The Finnish food composition database, Fineli.	Food intake over the previous 12 months was assessed with a validated FFQ. The average use of 131 food items and mixed dishes was recorded by nine frequency categories ranging from never or seldom to at least six times a day. The portion size was fixed for each food item or mixed dish based on the dietary interviews of the national FINDIET 2007 Study. The final decision for completeness of FFQs was made by a nutritionist. Exclusions were made due to incompletely filled FFQs (e.g., total or partly empty questionnaires or the idea of the FFQ not understood) and daily energy intake cut-off points corresponding to 0.5 % at both ends of the daily energy intake distributions for men and women. The average daily intakes of nutrients and food groups were calculated by the national food composition database, Fineli.	J Clin Epidemiol. 1996 Apr;49(4):401-9 Br J Nutr. 2012;107:1367-75 Salvini S et al. Int J Epidemiol 1989;18:858–67 J Clin Epidemiol. 2006 Sep;59(9):994-1001.
CHS	99-item, self- administered, picture-sort version of National Cancer Institute FFQ	Harvard	Usual dietary intake was assessed using a picture-sort version of the National Cancer Institute FFQ. This is a 99-item, self-administered FFQ. Participants were asked to indicate how often, on average, they consumed various foods and beverages over the past year according to 9 frequency categories, ranging from never to >5 times per week. Portion sizes were illustrated by color pictures or laminated 4 X 6 in (10 X 15 cm) index card with a black-and white line drawing. Dietary information was judged as unreliable and excluded from further analysis if calculated total kilocalories were < 500 or > 5000 kcal/d.	Kumanyika S, et al. J Am Diet Assoc. 1996 Feb;96(2):137-44
DILGOM	131-item, self-administered, THL FFQ 2007	The Finnish food composition database, Fineli.	Food intake over the previous 12 months was assessed with a validated FFQ. The average use of 131 food items and mixed dishes was recorded by nine frequency categories ranging from never or seldom to at least six times a day. The portion size was fixed for each food item or mixed dish based on the dietary interviews of the national FINDIET 2007 Study. The final decision for completeness of FFQs was made by a nutritionist. Exclusions were made due to incompletely filled FFQs (e.g., total or partly empty questionnaires or the idea of the FFQ not understood) and daily energy intake cut-off points corresponding to 0.5 % at both ends of the daily energy intake distributions for men and women. The average daily intakes of nutrients and food groups were calculated by the national food composition database, Fineli.	J Clin Epidemiol. 1996 Apr;49(4):401-9 Br J Nutr. 2012;107:1367-75 Salvini S et al. Int J Epidemiol 1989;18:858–67

SUPPLEMENTARY DATA

FamHS	66-item, interviewer-administered, modified Willett FFQ	Harvard	A 66-item questionnaire modified from the Willet FFQ administered by trained interviewers. Participants were asked to indicate how often, on average, they consumed various foods and beverages over the past year according to 9 frequency categories, ranging from never or <1 time/mo to ≥6 times/d. Portion sizes were specified. Dietary information was judged as unreliable and excluded from further analysis if reported energy intakes were <3347.2kJ/day (799.3 kcal/day) or >17572.8 kJ/day (4196.4 kcal/day) for men and <2510.4 kJ/d (599.5 kcal/day) or >14644 kJ/day (3497 kcal/day) for women.	Stein AD et al. Am J Epidemiol 1992;135(6):667-677 Willett WC, et al. Am J Epidemiol. Jul 1985;122(1):51-65
FOS	126-item, self-administered Willett FFQ	USDA	A self-administered 126-item FFQ at examination 6. Participants were asked to indicate how often, on average, they consumed various foods and beverages over the past year according to 9 frequency categories, ranging from never or <1 time/mo to ≥6 times/d. Portion sizes were specified. Separate questions about the use of vitamin and mineral supplements and the type of breakfast cereal most commonly consumed were also included in the FFQ. Dietary information was judged as unreliable and excluded from further analysis if reported energy intakes were < 2.51 MJ/d (600 kcal/d) or > 16.74 MJ/d (4000 kcal/d) for women and > 17.57 MJ/d (4200 kcal/d) for men or if >= 12 food items were left blank.	Rimm et al. Am J Epidemiol 1992;135:1114–26, 1127–36 Salvini S et al. Int J Epidemiol 1989;18:858–67 Epidemiology. 1992 Mar;3(2):171-7.
GOLDN	124-item NCI DHQ	USDA	Dietary intake was estimated using the DHQ, a food-frequency questionnaire developed by the National Cancer Institute. It consists of 124 food items and includes both portion size and dietary supplement questions. Two studies have favorably assessed its validity (Thompson 2002; Subar 2001). The food list and nutrient database used with the DHQ are based on national dietary data (US Department of Agriculture (USDA) 1994–1996 Continuing Survey of Food Intakes by Individuals, available from the USDA Food Surveys Research Group).	Thompson FE, Subar AF, Brown CC, et al. J Am Diet Assoc. 2002;102:212–225 Subar AF, Thompson FE, Kipnis V, et al. Am J Epidemiol. 2001;154:1089–1099
GOYA MALE	7-day estimated dietary record	The official Danish food composition tables	In this study the dietary intake was assessed with an estimated seven days dietary record method. The National Food Agency previously validated the method for reported protein intake with the 24-hr urinary nitrogen method and found a general 10% under reporting of protein intake; no analyses of misreporting of protein intake in relation to weight status was included. Participants were carefully instructed to fill in dietary records for 7 consecutive days. The preprinted questionnaires were chronologically divided into sections of food consumed for every meal and in-between snacks. The preprinted options of food items, dishes and beverages commonly consumed were complimented by an open answer option. Portion sizes were given in common household measures, but specific types of foods (rice, pasta, vegetables) or meals (mixed dish, mixed salad, raw food) were quantified using photos. Furthermore participants completed an additional questionnaire with details on use of household fats, milk, cream and sugar in coffee. Diet data was computerized twice and any discrepancy was adjusted.	J Nutr. 2009 Dec;139(12):2337-43. doi: 10.3945/jn.109.112599. Epub 2009 Oct 14. Br J Nutr. 2011 Oct;106(8):1245-52. doi: 10.1017/S0007114511001474. Epub 2011 May 18

SUPPLEMENTARY DATA

HBCS	Self-administered 128-item FFQ	The Finnish food composition database, Fineli	Diet was assessed with a validated, self-administered 128-item FFQ. The FFQ was designed to assess the ordinary diet over the previous 12 mo. The subjects were asked to indicate the average intake frequency of each food item and mixed dish presented as 12 subgroups, eg, dairy products and vegetables. The 9 possible frequency categories ranged from never or seldom to 6 times/d. The portion sizes were fixed, eg, a glass or a slice of bread. Subjects were excluded if their FFQ had >9 blank food items or if their calculated energy intake was <650 or >6100 kcal/d, corresponding to 0.5% at each end of the self-reported daily energy intake scale.	Paalanen L, et al. J Clin Epidemiol 2006;59:994–1001. Männistö S, et al. J Clin Epidemiol 1996;49:401–9.
InCHIANTI	236-item, interviewer-administered FFQ	Italian Food Composition Database for Epidemiological Studies	A 236 item, interviewer administered FFQ that investigates how frequently (weekly, monthly, yearly) each specific food was generally consumed. Participant is asked to specify the size of the portion usually consumed, in comparison to a range of portion that are shown in colored photographs. Nutrient data for specific foods were obtained from the Food Composition Database for Epidemiological Studies in Italy. Dietary information was judged as unreliable and excluded from further analysis if reported energy intakes less than 600 kcal/d or greater than 4,000 kcal/d and 4,200 kcal/d in women and men, respectively.	Bartali et al. Arch. Gerontol Geriatr. Geriatr. 38 2004; 51–60 Pisani et al. Int J Epidemiol. 1997; 26:152–160
Inter99	Food frequency questionnaire including 198 food items	Danish Food Composition Databank	All participants underwent a physical health examination and filled in a self-administered food frequency questionnaire (FFQ) and a standard questionnaire on health and lifestyle. The FFQ consisted of 198 food items and beverages; it included questions about breakfast foods; bread with sliced meat, fish, eggs, cheese, spread and vegetables; hot meals and accompaniments to hot meals; ready-prepared dishes and takeaway food; vegetables; salad dressing; sauce; fruits; snacks; cookies; candy and ice-cream; and beverages, including alcohol, but intake of soft drinks was not recorded. It also included questions about the type of fat used for food preparation and at the table. The participants could choose between seven and eleven possible responses, ranging from never to eight or more times per day. The consumed quantity was obtained by multiplying portion size by the corresponding consumption frequency reported. Standard portion sizes for women and men, separately, were used in this calculation.	Lau C, Færch K, Glümer C, Toft U, Tetens I, Borch-Johnson K, Jørgensen T. Scand J Nutr. 2004;48:136–43. Toft U, Kristoffersen L, Ladelund S, Bysted A, Jakobsen, J, Lau C, Jørgensen T, Borch-Johnsen K, Ovesen L. Relative validity of a food frequency questionnaire used in the Inter99 study. Eur J Clin Nutr 2008 Aug; 62(8):1038-46.
MESA	120-item, self-administered, modified-Block FFQ	Nutrition Data Systems for Research (NDS-R) software database	120-item modified Block FFQ [Block 1986] (interviewer administered when necessary) patterned after the FFQ used in the Insulin Resistance Atherosclerosis Study, which has been validated among Non-Hispanic White, African-American and Hispanics, and modified to include Chinese foods. For each food item, the consumption frequency (times per day, week, or month) and serving size (small, medium, or large) were recorded. Frequency options included nine responses ranging from “rare or never” to “≥2 times/day” for food items. Related line items were combined to form 47 different food groups. Daily macronutrient and micronutrient intakes from diet were estimated by multiplying frequency and serving size (age- and gender-specific and portion size gram weights) for each food/beverage consumed by the nutrient content of that food or beverage (Nutrition Data Systems for Research [NDS-R]; University of Minnesota; Minneapolis).	Block 1986; Am J Epidemiol 124(3): 453-469 Nettleton JA.; Br J Nutr 2009;102:1220-7 Mayer-Davis EJ; Ann Epidemiol 1999;9:314-24

SUPPLEMENTARY DATA

Rotterdam	170-item semi-quantitative food frequency questionnaire	Dutch Nutrient database (NEVO table Netherlands. The Hague: Voorlichtignsbureau voor de voeding. 1993).	At baseline, participants completed a checklist at home about foods and drinks they had consumed at least twice a month during the preceding year, as well as dietary habits, use of alimentary supplements, and prescribed diets. Next, during their visit to the research center, they underwent a standardized interview with a trained dietician based on the checklist, using a computerized validated 170-item semi-quantitative Food Frequency Questionnaire (FFQ), taking into account seasonal variations in fruit, vegetable and fish intake. For each item the frequency was recorded in times per day, week, or month. The number of servings per frequency was expressed in natural units (for example, slice of bread or apple), household measures (for example, cup or spoon) or grams (cooked vegetables or mixed dishes). These dietary data were converted into total energy intake and fatty acid intakes per day using the Dutch Food Composition Table of 1993.	Klipstein-Grobusch et al. Eur J Clin Nutr. 1998; 52(8):588-96
THISEAS	172-item FFQ	USDA	172-item FFQ (semi-quantitative, using standard portions and food pictures)	NA
YFS	131-item FFQ	The Finnish food composition database, Fineli.	Dietary data were collected using a 131-item food frequency questionnaire, self-administered and checked by a nurse. Participants were asked to report their food consumption during the previous 12 months. The questionnaire had fixed portion sizes and 9 response categories from “never or rarely” to “6 or more times per day”. The average daily intakes of nutrients and food groups were calculated by the national food composition database, Fineli, maintained by the National Institute for Health and Welfare, Finland.	Paalanen L, et al. J Clin Epid. 2006;59(9):994 –1001 Männistö S, et al. J Clin Epidemiol 1996;49:401–9.

SUPPLEMENTARY DATA

Supplementary Table S3. Assessment of additional characteristics of participating CHARGE cohorts.

Cohort	BMI	Waist Circumference	Fasting Glucose	Fasting Insulin	HDL Cholesterol	Sleep Duration
CARDIA	Calculated from measured weight (kg) / height (m)2	Waist circumference was measured with the participant standing, at the minimum abdominal girth, in duplicate, to the nearest 0.5 cm.	≥12-h fasting blood glucose was measured by the hexokinase method. Blind analysis of split specimens yielded a technical error of 2.0 percent of the mean and an r = 0.99.	≥12-h fasting blood insulin was measured by a modification of the immunoassay techniques of Herbert et al.(J Clin Endocrinol Metab. 1965 Oct;25(10):1375-84.)	≥8-h fasting blood, plasma HDL-C was measured using enzymatic methods after dextran sulphate/manesium precipitation.	NA
Corogene Controls	Height (to the nearest 0.1 cm) and weight (to the nearest 0.1 kg) were measured at the physical examination with the participant standing, shoes off, and wearing only a light clothing. Scale was calibrated daily. Calculated from measured weight (kg) / height (m)2.	Waist circumference was measured midway between the lower rib margin and iliac crest. Waist was rounded to the nearest 0.5 cm.	≥10-h fasting blood glucose was measured by hexokinase method with Abbott Architect reagents. The mean intra-assay coefficient of variations (CV%) was 1.5%.	≥10-h fasting blood insulin was measured by chemiluminescent microparticle immuno assay with Abbott Architect reagents. The mean intra-assay coefficient of variations (CV%) was 2.8%.	HDL-cholesterol was measured by direct enzymatic assay with Abbott Architect ci8200 analyzer. The mean intra-assay CV % was 2.4 %.	Usual sleep duration was defined as the response to the question, “How many hours of sleep do you usually get at night?” Responses were integer values.
CHS	Calculated from measured weight (kg) / height (m)2	Waist circumferences were measured on standing subjects at the level of the umbilicus.	≥8-h fasting glucose was quantified using a Kodak Ektachem 700 analyzer with reagents (Eastman Kodak, Rochester, NY). The overall CV was 1.86%, and the correlation coefficient between 169 pairs of blind replicates was 0.997.	≥8-h fasting insulin was quantified by radioimmunoassay (Coat-A-Count Insulin assay (Diagnostics Products Corp, Los Angeles, CA)	HDL-C was measured by an enzymatic method after precipitation of apolipoprotein B-containing lipoproteins with dextran sulfate/magnesium sulfate of blood samples collected following an overnight fast.	Usual sleep duration on weekdays was defined as the response to the question, “How many hours of sleep do you usually get at night (or your main sleep period) on weekdays or workdays?” Responses were integer values.
DILGOM	Height (to the nearest 0.1 cm) and weight (to the nearest 0.1 kg) were measured at the physical examination with the participant standing, shoes off, and wearing only a light clothing. Scale was calibrated daily. Calculated from measured weight (kg) / height (m)2.	Waist circumference was measured midway between the lower rib margin and iliac crest. Waist was rounded to the nearest 0.5 cm.	≥10-h fasting blood glucose was measured by hexokinase method with Abbott Architect reagents. The mean intra-assay coefficient of variations (CV%) was 1.5%.	≥10-h fasting blood insulin was measured by chemiluminescent microparticle immuno assay with Abbott Architect reagents. The mean intra-assay coefficient of variations (CV%) was 2.8%.	HDL-cholesterol was measured by direct enzymatic assay with Abbott Architect ci8200 analyzer. The mean intra-assay CV % was 2.4 %.	Usual sleep duration was defined as the response to the question, “How many hours of sleep do you usually get at night?” Responses were integer values.

SUPPLEMENTARY DATA

FamHS	Calculated from measured weight (kg) / height (m)2.	Waist circumference was measured by standard techniques.	≥8-h fasting blood samples were collected, allowed to clot, centrifuged, aliquoted, and frozen at -70 degrees Celsius before shipment to a central processing laboratory. At the central processing laboratory, glucose was quantified by a thin film adaptation of a glucose oxidase enzymatic, spectrophotometric procedure using the Vitros analyzer (Ortho Clinical Diagnostics, Rochester, NY).	≥8-h fasting insulin was quantified using the coated-tube radioimmunoassay method (Diagnostic Products Corp., Los Angeles, CA).	≥8-h fasting HDL was determined after precipitation of other lipoprotein fraction by dextran sulfate.	NA
FOS	Height (to the nearest 0.25 inches) and weight (to the nearest 0.5 lbs) were measured at the physical examination with the participant standing, shoes off, and wearing only a hospital gown. Scale was calibrated daily. Calculated from measured weight (kg) / height (m)2 .	Waist circumference was measured by a trained professional by applying anthropometric tape at the level of the umbilicus, underneath the gown, recording the reading at mid-respiration with participant breathing normally and rounding to the nearest 0.25 inches.	≥8-h fasting plasma glucose was quantified with a hexokinase reagent kit (A-gent glucose test, Abbott Laboratories, South Pasadena, CA). Glucose assays were run in duplicate, and the intra-assay coefficient of variation ranged from 2–3%, depending on the assayed glucose concentration.	≥8-h fasting insulin concentrations were quantified in plasma using human-specific RIA at exam 6 in the Framingham Offspring Cohort (assay from Linco Inc., St. Louis, MO).	Total cholesterol was measured enzymatically, and the HDL cholesterol fraction was measured after precipitation of LDL and VLDL particles with dextran sulfate magnesium. The Framingham laboratory participates in the lipoprotein cholesterol laboratory standardization program administed by the Centers for Disease Control and Prevention (Atlanta, GA).	Usual sleep duration on weekdays was defined as the response to the question, “How many hours of sleep do you usually get at night (or your main sleep period) on weekdays or workdays?” Responses were integer values.
GOLDN	Calculated from measured weight (kg) / height (m)2.	Waist circumference was measured by standard techniques.	≥8-h fasting serum glucose was determined by a hexokinase-mediated reaction on the Hitachi commercial kit (Linco Research, St. Charles, MO).	≥8-h fasting insulin was quantified through a solid-phase, two-site chemiluminescent immunometric assay (IMMULITE 2000 Insulin) (Linco Research, St. Charles, MO).	≥8-h fasting HDL was quantified using enzymatic assays following percipitation of non-HDL-C with magnesium/dextran.	NA

SUPPLEMENTARY DATA

GOYA MALE	Height was measured without shoes to the nearest 0.5 cm with the participant standing against a wall-mounted stadiometer (Hultafors AB, Hultafors, Sweden) with feet together and head in horizontal plane. Participants were weighed to the nearest 0.05 kg on an electronic scale (Lindelltronic 8000, Lindell AB, Kristianstad, Sweden) in their underwear after voiding. BMI was calculated as weight in kg divided by height (squared) in metres (kg/m^2).	Waist circumference was measured to the nearest 0.5 cm with subjects standing using a non-extendible linen tape measure according to WHO recommendations. WC was measured midway between the illiac crest and the rib cage.	≥12-hour overnight fasting blood samples were withdrawn from an antecubital vein into tubes containing EDTA/K3/sodium flouride and kept in ice until centrifugation. The sample was centrifuged at 2800 g for 10 min. At 4°C and stored at -20°C. Plasma glucose was analysed on a COBRAS MIRA (Roche Diagnostic Systems GmbH, Mannheim, Germany) using an end point analysis with MPR3 Gluco-quant glucose/Hexokinase kinetic (Boehringer and Mannheim GmbH Diagnostica, Germany) and the hexokinase/G6P-DH method.	≥12-hour overnight fasting blood samples were withdrawn from an antecubital vein into dry tubes, centrifuged at 1500 g for 10 mins at 20°C and stored at -20°C. Insulin was analysed on a 1235 Auto DELFIA automatic immunoassay system (Wallac OY, Turku, Finalsnd) using a fluroimmunometric assay with an Auto DELFIA Insulin Kit (Wallac OY, Turku, Finland).	Full blood was sampled in dry tubes, centrifuged at 2800g for 10 min at 4 degree C, and then stored at -20 degree C. HDL Cholesterol was analyzed on aCOBAS MIRA plus (Roche Diagnostic Systems GmbH, Mannheim, Germany) using a homogenous enzymatic colorimetric test with a HDL-C plus kit (Boehringer and Mannheim GmbH Diagnostica, Germany).	NA
HBCS	Height was measured to the nearest 0.1 cm and weight to the nearest 0.1 kg. Body mass index (BMI) was calculated as weight (in kg) divided by the square of height (in m).	Waist circumference was measured in standing position, with the legs slightly apart, in the midway between the lowest ribs and the iliac crest.	Plasma fasting glucose was measured by a hexokinase method.	Plasma insulin was determined by a two-site immunometric assay.	Serum HDL was measured using standard enzymatic methods.	Assessment of sleep with the Basic Nordic Sleep Questionnaire (BNSQ; Partinen & Gislason, 1994) Sleep duration was calculated from BNSQ self-reported bed and rise times. Weekday sleep duration was primarily used, but in those with missing weekday sleep duration, weekend sleep duration was used instead. Those with weekend/weekday difference > 2 hours or bedtime between 5am and 6pm were excluded.Partinen M & Gislason T. Basic Nordic Sleep Questionnaire (BNSQ): a quantitated measure of subjective sleep complaints. J Sleep Res 1995; 4(Suppl. 1): 150-155.

SUPPLEMENTARY DATA

InCHIANTI	Calculated from measured weight (kg) / height (m)2.	Waist circumference was measured to the nearest 0.5 cm by using a nonelastic plastic tape, with the participant standing upright, at the midpoint between the lower rib margin and the iliac crest (normally umbilical level).	≥8-h fasting blood glucose was determined by an enzymatic colorimetric assay using a modified glucose oxidase-peroxidase method (Roche Diagnostics GmbH, Mannheim, Germany) and a Roche-Hitachi 917 analyzer.	Fasting plasma fasting insulin concentrations were determined with a double-antibody, solid-phase radioimmunoassay (intra-assay CV: 3.1 ± 0.3%) (Sorin Biomedica, Milan, Italy).	Commercial enzymatic tests (Roche Diagnostics, Basel, Switzerland) was used for determining serum HDL-C concentrations from fresh samples drawn after 12 hours overnight fasting.	Self-reported habitual TST was inquired about with a question “During the past month, how many hours of actual sleep did you get on average at night?” The responses were recorded in whole numbers.
Inter99	Height was measured without shoes to the nearest cm, weight without shoes and overcoat to the nearest kg and body mass index (BMI) was calculated (kg/m2).	Waist circumference was measured by standard techniques.	≥8-h fasting blood glucose was analyzed by a glucose oxidase method (Granutest; Merck, Darmstadt, Germany).	Serum insulin (excluding des-31,32) was measured using the AutoDELFIA insulin kit (Perkin-Elmer, Wallac, Turku, Finland).	Total cholesterol, triglyceride and HDL cholesterol were determined with enzymatic techniques (Boeringer Mannheim, Germany). VLDL and LDL were calculated by Friedewald’s equation.	Usual sleep duration on weekdays was defined as the response to the question, “Minutes and hours of sleep and rest on a weekday” Responses were converted to integer values.
MESA	Calculated from measured weight (kg) / height (m)2	Waist circumference was measured using a steel measuring tape (standard 4-oz tension) from midway between the last rib and the iliac crest at normal breathing.	≥8-h fasting serum glucose was quantified by rate reflectance spectrophotometry using thin film adaptation of the glucose oxidase method on the Vitros analyzer (Johnson & Johnson Clinical Diagnostics, Rochester, NY) at the Collaborative Studies Clinical Laboratory at Fairview-University Medical Center (Minneapolis, MN).	≥8-h fasting insulin was quantified by raidoimmunoassay (Linco Human Insulin Specific RIA Kit; Linco Research, Inc., St. Charles, MO) at the Collaborative Studies Clinical Laboratory at Fairview-University Medical Center (Minneapolis, MN).	Blood was drawn following a 12 hour fast, and samples were stored at −70 degrees C. HDL-C was measured using the cholesterol oxidase method (Roche Diagnostics) after precipitation of non-HDL-C with magnesium/dextran (coefficient of variation (CV) = 2.9%)).	Sleep duration and symptoms were assessed by self-report questions administered at Exam 4. The questionnaire included self-reported habitual sleep duration including night sleep hours on weekdays.
Rotterdam	Anthropometric measures were obtained with subjects wearing lightweight clothes and no shoes and included height, weight, and waist and hip circumference. Body mass index ((BMI) weight/height2) and waist-to-hip ratio were calculated.	Anthropometric measures were obtained with subjects wearing lightweight clothes and no shoes and included height, weight, and waist and hip circumference. Body mass index ((BMI) weight/height2) and waist-to-hip ratio were calculated.	Fasting glucose was enzymatically determined using the Hexokinase method (Boehringer Mannheim) during the third visit to the research center (March 1997 - December 1999). Venous blood samples were taken at the research center after an overnight fast and stored at −80°C in a number of 5-mL aliquots. Serum glucose levels were determined within 1 week after sampling.	Fasting insulin levels were determined in samples that had been kept frozen from the third visit at the Research center (March 1997– December 1999) until usage in 2008 and were measured on a Roche Modular Analytics E170 analyzer (Roche Diagnostics GmbH, Mannheim, Germany) by electrochemiluminescence immunoassay technology.	High-density lipoprotein cholesterol (HDL-C) was determined using an automatic enzymatic procedure (Boehringer Mannheim, Mannheim, Germany) during the third visit to the research center (March 1997 - December 1999).	NA

SUPPLEMENTARY DATA

THISEAS	Calculated from measured weight (kg) / height (m)2.	Waist circumference was measured by standard techniques.	Enzymatic colorimetric assays. Analyser: COBAS 8000, Brand: Roche.	Chemiluminescence. Analyser: ADVIA CENTAUR, Brand: Siemens.	Enzymatic colorimetric assays. Analyser: COBAS 8000, Brand: Roche.	Sleep duration data derive from HAPAQ (Harokopio Physical Activity Questionnaire) [Kollia M, Gioxari A, Maraki M, Kavouras SA. Development, validity and reliability of the Harokopio Physical Activity Questionnaire in Greek adults. Athens. 8th Panhellenic Congress on Nutrition and Dietetics; 2006.]
YFS	Calculated from measured weight (kg) / height (m)2.	Waist circumference was measured by standard techniques.	≥8-h fasting glucose concentrations were analyzed enzymatically (Olympus Diagnostica GmbH, Hamburg, Germany).	≥8-h fasting serum insulin was quantified by microparticle enzyme immunoassay kit (Abbott Laboratories, Diagnostic Division, Dainabot, South Pasadena, CA).	Fasting HDL was measured with a fully enzymatic cholesterol oxidase p-aminophenazone method, quantified by precipitating with dextran sulphate and magnesium.	Sleep duration was defined as the response to the question, “How many hours of sleep do you usually get per day?” Original answering options were the following: 1 = 5 hours or less, 2 = 6 hours, 3 = 6.5 hours, 4 = 7 hours, 5 = 7.5 hours, 6 = 8 hours, 7 = 8.5 hours, 8 = 9 hours, 9 = 9.5 hours, 10 = 10 hours or more. "Five hours or less" and "10 hours or more" were treated as 5 and 10, respectively, otherwise the reported sleeping hours were used , so the range for sleep duration was from 5 to 10 hours.

SUPPLEMENTARY DATA

Supplementary Table S4. Genotyping information of participating CHARGE cohorts.

Cohort	Array	Imputed/Genotyped	Imputation Program	Quality Control (QC) and other procedural details	Study-Specific Covariates
CARDIA	Affymetrix Genome-Wide Human SNP Array 6.0	Imputed: rs2314339; Genotyped: rs11605924, rs1801260.	IMPUTE2	Call Rates < 95% and Hardy–Weinberg equilibrium (HWE) test at P value <10-6 were excluded.	Study site
Corogene Controls	Human660W-QUADchip	Genotyped: rs880358, rs11607883, rs1387153, rs2314339.	NA	SNP clustering probability for each genotype > 95%. Call rate > 95% both individuals and markers. MAF > 1%. HWE p > 1*10-6. Heterozygosity, gender check and relatedness checks have been performed and any discrepancies have been removed. 8 individuals have been removed due to cryptic relatedness.	Ancestry PCA
CHS	Illumina 370CNV	Imputed: rs1801260, rs11605924, rs10830963, rs2314339 Genotyped: rs1387153	BIMBAM	Call Rates < 97%, Hardy–Weinberg equilibrium (HWE) test at P value <10-5, >2 duplicate errors or Mendelian inconsistencies, and heterozygote frequency=0 were excluded. Individuals were excluded if they did not consent to participate in DNA studies, if they had a call rate <=95%, for sex mismatch and for discordance with prior genotyping.	Study site
DILGOM	Cardio-Metabo_Chip_11395247_A	Genotyped: rs11605924, rs1387153, rs10830963.	NA	QC for 95% success by individual and SNP done.	Ancestry PCA
FamHS	Illumina 510, 650, and 1M	Imputed: rs1801260, rs11605924, rs10830963; Genotyped: rs2314339, rs1387153.	MACH, build 36	Call Rates < 95% and Hardy–Weinberg equilibrium (HWE) test at P value <10-6 were excluded.	Field center, genotype batch, sex specific PCA
FOS	Affymetrix 500K	Imputed: rs1801260; Genotyped: rs2314339, rs11605924, rs1387153.	IMPUTE2	Call Rates < 95% and Hardy–Weinberg equilibrium (HWE) test at P value <10-6 were excluded.	Ancestry PCA
GOLDN	Affymetrix Genome-Wide Human SNP Array 6.0	Imputed: rs1801260, rs11605924, rs1387153; Genotyped: rs10830963, rs2314339.	MACH 1.0, build 36	Call Rates < 95% and Hardy–Weinberg equilibrium (HWE) test at P value <10-6 were excluded.	Ancestry PCA, study site
GOYA MALE	Illumina 610k Quad chip	Imputed: rs1801260, rs10830963, rs11605924; Genotyped: rs1387153, rs2314339.	MACH 1.0, Markov Chain Haplotyping.	Call Rates < 95% and Hardy–Weinberg equilibrium (HWE) test at P value <10-7 were excluded.	NA
HBCS	Modified Illumina 610k	Imputed: rs10830963; Genotyped: rs880358, rs11607883, rs1387153, rs2314339	MACH	Call Rates < 95% and Hardy–Weinberg equilibrium (HWE) test at P value <10-6 were excluded.	NA
InCHIANTI	Illumina 550K.	Imputed: rs1801260, rs10830963; Genotyped: rs2314339, rs11605924, rs1387153.	MACH	Call rate filter was set at >98.5%; sex misspecification. SNPs QC: MAF >1%; HWE >10-4; call rate >99%.	Study site
Inter99	Metabochip	Genotyped	NA	Individuals with a first- or second-degree familial relationship, an extreme inbreeding coefficient, a low call rate, mislabeled sex, and high discordance to previous genotyping were excluded. Genotyping quality for each SNP was assessed by the call rate (>98%) and the presence of Hardy-Weinberg equilibrium.	NA
MESA	Affymetrix Genome-Wide Human SNP Array 6.0	Imputed: rs1801260, rs11605924, rs1387153; Genotyped: rs10830963, rs2314339.	IMPUTE2 (1000 Genomes)	Pre-imputation: monomorphic SNPs, SNPs with observed heterozygosity > 53%, and SNPs with missing rate > 5%, across all samples, Call Rates < 95%.	Field center, Ancestry PCA

Rotterdam	Illumina 550K array	Imputed	MACH	We excluded participants for excess autosomal heterozygosity, mismatch between called and phenotypic gender, or being outliers identified by the IBS clustering analysis. SNPs with a low minor allele frequency (<0.01), SNPs violating the Hardy Weinberg equilibrium (P<1x10-6) and SNPs with low call rates (<95%) were excluded.	Ancestry PCA
THISEAS	HumanOmniExpress (OmniExpress) BeadChip	Genotyped	NA	Call Rates < 95% and Hardy–Weinberg equilibrium (HWE) test at P value <10-4 were excluded.	NA
YFS	Illumina BeadChip Human670K	Imputed	MACH 1.0 (HapMap II CEU, NCBI 36)	Genotyping was performed at the Sanger Institute (UK) using the custom-built Illumina BeadChip Human670K. Genotypes were called using Illumina's clustering algorithm. SNPs that were present on HapMap and that passed quality control measures were used for imputation with MACH version 1.0. After genotyping the following filters were applied: MAF < 0.01, GENO > 0.05, MIND > 0.05, and HWE p ≤ 1e-06.	NA

SUPPLEMENTARY DATA

Supplementary Table S5. Effect allele frequencies for investigated SNPs in participating CHARGE cohorts.

SNP	Chr	Nearest Gene	Allele (effect/ noneffect)	CARDIA	Corogene Controls	CHS	DILGOM	FOS	FamHS	GOLDN	GOYA MALE	HBCS	InCHIANTI	Inter99	MESA	Rotterdam	THISEAS	YFS
rs1801260	4	*CLOCK*	C/T	0.258*	0.330†	0.233	NA	0.289‡	0.281	0.281	0.252	0.317†	0.259	NA	0.265	0.271	0.309	0.347
rs11605924	11	*CRY2*	A/C	0.527§	0.53	0.552	0.53	0.473§	0.47	0.506	0.49	0.534‖	0.467	0.48‖	0.478	0.48	0.448	0.526
rs1387153	11	*MTNR1B*	T/C	NA	0.360	0.293	0.350	0.268	0.298	0.316	0.293	0.322	0.294	0.280	0.265	0.272	0.283	0.346
rs10830963	11	*MTNR1B*	G/C	NA	NA	0.293	0.370	NA	0.277	0.293	0.294	0.348	0.313	0.270	0.269	0.281	0.286	0.354
rs2314339	17	*NR1D1*	T/C	0.121	0.180	0.121	NA	0.135	0.134	0.128	0.123	0.175	0.136	NA	0.136	0.117	0.153	0.183

* Proxy SNP used: rs17721497
† Proxy SNP used: rs880358
‡ Proxy SNP used: rs6851971
§ Proxy SNP used: rs7121611
‖ Proxy SNP used: rs11607883

SUPPLEMENTARY DATA

Supplementary Table S6. Meta-analyzed main associations between dietary/sleep exposures and outcomes*.

	Glycemic Traits						Anthropometric Traits						Lipid Trait		
	Fasting Glucose (mmol/L) (*n* =27,881†)			ln-HOMA-IR (*n* =25,908†)			BMI (kg/m^2) (*n* =28,078†)			Waist Circumference (cm) (*n* =27,912†)			HDL-C (mmol/L) (*n* =27,906†)		
Environmental Exposure	*β* ± SE	*P*	I^2	*β* ± SE	*P*	I^2	*β* ± SE	*P*	I^2	*β* ± SE	*P*	I^2	*β* ± SE	*P*	I^2
CHO (% total energy)	-0.007 ± 0.001	2.75E-29	74	-0.001 ± 4e-04	0.002	71	-0.02 ± 0.004	5.94E-08	92	-0.05 ± 0.005	1.94E-26	62	-0.005 ± 0.0003	1.70E-74	69
Total Fat (% of total energy)	0.01 ± 0.001	8.36E-13	55	0.005 ± 5e-04	2.76E-16	9	0.02 ± 0.005	9.86E-05	91	0.05 ± 0.006	1.70E-16	63	7e-04 ± 0.0003	0.04	45
PUFA (% total energy)	0.002 ± 0.003	0.38	56	0.003 ± 0.002	0.20	43	0.003 ± 0.02	0.85	84	0.03 ± 0.02	0.23	70	0.001 ± 0.001	0.26	50
MUFA (% total energy)	0.01 ± 0.001	4.23E-12	35	0.01 ± 0.001	1.12E-13	0	0.04 ± 0.01	3.95E-05	91	0.13 ± 0.01	3.88E-19	64	0.002 ± 0.0008	0.006	5
SFA (% total energy)	0.01 ± 0.001	9.26E-13	64	0.01 ± 0.001	1.66E-19	48	0.009 ± 0.01	0.37	91	0.11 ± 0.01	8.18E-17	55	0.001 ± 0.0007	0.1191	28
Sleep Duration (continuous)‡	-0.01 ± 0.005	0.05	0	0.007 ± 0.004	0.11	59	-0.14 ± 0.03	2.88E-05	42	0.10 ± 0.04	0.02	59	-0.003 ± 0.003	0.27	0
Sleep Duration (categorical)‡															
< 7 h (short)	0.03 ± 0.01	0.01	0	-0.008 ± 0.01	0.46	35	0.45 ± 0.09	<0.001	13	0.01 ± 0.11	0.93	26	-0.001 ± 0.007	0.85	0
≥ 7 to < 9 h (reference)	*ref*	-	-	*ref*	-	-	*ref*	-	-	*ref*	-	-	*ref*	-	-
≥ 9 h (long)	-0.003 ± 0.02	0.84	15	0.03 ± 0.02	0.05	59	0.33 ± 0.14	0.02	0	0.76 ± 0.18	<0.001	0	-0.01 ± 0.01	0.08	0

* Adjusted for age, sex, BMI (except when assessing BMI outcome), and study site (in CARDIA; CHS; FamHS; InCHIANTI; MESA). Association coefficients are shown as *β* ± SE. *β* represents the direction and magnitude of the change in outcome trait per each additional % of macronutrient intake; per each additional hour of sleep; or compared to the reference sleep group (≥ 7 to < 9 h). I^2 represents the heterogeneity statistic, presented as %.

† Sample size varied for sleep duration: continuous [FG: *n* =15,416; HOMA-IR: *n* =13,969; Anthropometric/Lipid Traits: *n* =15,582]; categorical: short [FG: *n* =2,897; HOMA-IR: *n* =2,468; Anthropometric/Lipid Traits: *n* =2,951]; normal [FG: *n* =11,206; HOMA-IR: *n* =10,306; Anthropometric/Lipid Traits: *n* =11,286]; long [FG: *n* =1,313; HOMA-IR: *n* =1,195; Anthropometric/Lipid Traits: *n* =1,345].

‡ Weekday or workday self-reported sleep duration as usual hours of sleep per night.

SUPPLEMENTARY DATA

Supplementary Table S7. Meta-analyzed main associations between SNPs and outcomes*.

				Glycemic Traits				Anthropometric Traits				Lipid Trait	
				Fasting Glucose (mmol/L)		ln-HOMA-IR		BMI (kg/m^2)		Waist Circumference (cm)		HDL-C (mmol/L)	
SNP	Gene	Alleles (Effect/Noneffect)	Effect Allele Frequency	*β* ± SE	*P*	*β* ± SE	*P*	*β* ± SE	*P*	*β* ± SE	*P*	*β* ± SE	*P*
rs1801260	*CLOCK*	C/T	0.26	0.0003 ± 0.0094	0.98†	0.005 ± 0.007	0.48	-0.016 ± 0.021	0.44	-0.006 ± 0.009	0.50†	0.0012 ± 0.0007	0.09
rs11605924	*CRY2*	A/C	0.46	0.0122 ± 0.0067	0.06	-0.001 ± 0.005	0.77	0 ± 0.018	0.98	-0.003 ± 0.008	0.70	0.0007 ± 0.0006	0.27
rs1387153	*MTNR1B*	T/C	0.28	0.0577 ± 0.0067	1.7E-17†	0.008 ± 0.005	0.12†	0.024 ± 0.02	0.23†	0.003 ± 0.009	0.75	-0.0016 ± 0.0007	0.03
rs10830963	*MTNR1B*	G/C	0.30	0.0993 ± 0.0078	4.2E-35	0.016 ± 0.004	0.004	0.02 ± 0.021	0.34	0.009 ± 0.009	0.33	-0.0015 ± 0.0007	0.04†
rs2314339	*NR1D1*	T/C	0.13	-0.0056 ± 0.0133	0.68	0.014 ± 0.01	0.14†	-0.041 ± 0.027	0.12†	-0.013 ± 0.012	0.27	-0.0008 ± 0.0009	0.39

* Additive allele mode, adjusted for age, sex, BMI (except when assessing BMI outcome), study site (in CARDIA; CHS; FamHS; InCHIANTI; MESA), family or population structure (in Carogene Controls; DILGOM; FamHS; FOS; GOLDN; MESA; Rotterdam; YFS), and genotype batch (in FamHS). Association coefficients are shown as *β* ± SE. *β* represents the direction and magnitude of the change in outcome trait per each additional copy of the effect allele.

† I^2 >30%, where I^2 represents the heterogeneity statistic, presented as %.

SUPPLEMENTARY DATA

Supplementary Table S8. Interaction terms between environmental exposures and SNPs on outcomes in participating CHARGE cohorts*.

SNP	Meta Analysis		CARDIA	Corogene Controls	CHS	DILGOM	FamHS	FOS	GOLDN	GOYA MALE	HBCS	InCHIANTI	Inter99	MESA	Rotterdam	THISEAS	YFS
	n†	I^2															
Fasting Glucose (mg/dL)																	
Total Fats																	
rs1801260	18401	0	-0.021±0.127	-0.056±0.117	0.014±0.053	NA	0.211±0.090	0.094±0.077	0.000±0.000	-0.140±0.283	0.056±0.116	0.404±0.284	NA	0.000±0.101	0.061±0.9	0.311±0.308	-0.017±0.118
rs11605924	18389	0	0.044±0.110	0.022±0.105	0.003±0.048	0.000±0.044	0.041±0.080	0.047±0.067	0.000±0.000	-0.190±0.222	0.234±0.110	-0.027±0.234	0.033±0.047	-0.045±0.091	0.036±0.081	-0.239±0.312	0.028±0.114
rs1387153	26532	19	NA	-0.023±0.113	-0.004±0.047	-0.140±0.045	-0.062±0.088	0.013±0.082	-0.001±0.000	0.190±0.234	0.046±0.077	0.031±0.263	-0.002±0.052	-0.044±0.098	-0.007±0.09	-0.544±0.358	-0.037±0.117
rs10830963	27607	0	NA	NA	-0.007±0.060	-0.065±0.045	-0.054±0.098	NA	0.000±0.000	0.273±0.251	0.258±0.131	0.323±0.294	-0.028±0.053	0.043±0.100	0.084±0.092	-0.475±0.347	-0.100±0.141
rs2314339	25016	33	0.028±0.155	-0.071±0.144	-0.150±0.098	NA	0.061±0.117	0.074±0.108	0.000±0.000	0.146±0.426	-0.051±0.132	-0.452±0.356	NA	0.005±0.133	-0.029±0.125	-0.352±0.431	-0.104±0.149
PUFA																	
rs1801260	18401	28	-0.922±0.424	0.043±0.472	0.034±0.148	NA	0.454±0.498	0.097±0.313	0.001±0.001	1.551±1.976	-0.645±0.462	4.031±2.120	NA	0.019±0.398	0.32±0.194	1.099±1.244	0.607±0.539
rs11605924	18389	0	0.269±0.343	-0.266±0.409	0.121±0.126	-0.251±0.196	0.251±0.421	0.117±0.257	0.001±0.001	-2.086±1.474	0.130±0.454	-0.400±1.816	0.337±0.225	-0.080±0.346	0.035±0.176	-1.709±1.211	0.243±0.492
rs1387153	26532	30	NA	-0.237±0.479	0.126±0.128	-0.264±0.203	-0.593±0.451	-0.546±0.331	-0.001±0.001	3.130±1.720	0.313±0.396	-2.983±2.092	0.480±0.246	-0.118±0.397	-0.01±0.196	0.099±1.269	-0.096±0.538
rs10830963	27607	0	NA	NA	0.133±0.166	-0.124±0.199	-0.650±0.503	NA	0.000±0.001	2.774±1.727	0.488±0.567	-1.573±2.338	0.267±0.250	0.280±0.417	-0.043±0.202	-0.410±1.258	-0.350±0.637
rs2314339	25016	0	-0.035±0.494	-0.030±0.548	-0.254±0.278	NA	0.331±0.620	-0.052±0.452	0.002±0.001	0.876±2.755	0.421±0.597	-3.331±2.410	NA	0.939±0.547	-0.079±0.264	-0.592±1.670	-0.236±0.638
MUFA																	
rs1801260	18401	0	-0.163±0.302	-0.092±0.269	0.048±0.130	NA	0.449±0.204	0.172±0.185	0.001±0.001	-0.355±0.741	-0.090±0.288	0.119±0.471	NA	0.083±0.249	0.211±0.205	0.250±0.551	0.137±0.286
rs11605924	18389	2	0.145±0.265	-0.001±0.230	-0.020±0.118	-0.033±0.101	0.124±0.181	-0.106±0.166	0.000±0.001	-0.765±0.574	0.468±0.272	0.124±0.389	0.099±0.122	-0.151±0.222	-0.066±0.189	-0.499±0.553	0.069±0.277
rs1387153	26532	3	NA	-0.171±0.257	-0.022±0.115	-0.303±0.103	-0.192±0.200	-0.023±0.201	-0.001±0.001	0.458±0.617	0.038±0.196	0.055±0.425	-0.010±0.135	-0.099±0.242	-0.173±0.207	-0.789±0.620	-0.055±0.285
rs10830963	27607	0	NA	NA	-0.040±0.147	-0.141±0.101	-0.160±0.222	NA	-0.001±0.001	0.842±0.674	0.519±0.332	0.560±0.476	-0.087±0.135	0.118±0.248	0.152±0.213	-0.605±0.588	-0.187±0.340
rs2314339	25016	21	0.137±0.374	-0.134±0.310	-0.319±0.235	NA	0.145±0.269	0.197±0.261	0.001±0.001	0.443±1.118	-0.034±0.347	-1.388±0.600	NA	-0.056±0.322	-0.124±0.28	-0.567±0.793	-0.201±0.353
SFA																	
rs1801260	18401	52	0.408±0.274	-0.181±0.224	0.014±0.140	NA	0.543±0.213	0.260±0.177	-0.001±0.001	-0.694±0.578	0.458±0.233	1.135±0.679	NA	-0.029±0.218	-0.196±0.183	0.729±0.580	-0.233±0.239
rs11605924	18389	0	-0.035±0.231	0.140±0.217	-0.060±0.125	0.120±0.086	0.004±0.190	0.099±0.154	0.000±0.001	-0.176±0.440	0.373±0.232	-0.545±0.560	0.013±0.094	-0.058±0.196	0.188±0.163	-0.235±0.612	-0.017±0.231
rs1387153	26532	7	NA	0.164±0.235	-0.083±0.127	-0.228±0.090	0.028±0.205	0.208±0.169	-0.001±0.001	0.163±0.445	0.096±0.142	0.631±0.653	-0.105±0.105	-0.091±0.213	0.084±0.176	-0.801±0.672	-0.089±0.237
rs10830963	27607	0	NA	NA	-0.084±0.164	-0.092±0.090	0.037±0.226	NA	-0.001±0.001	0.366±0.483	0.454±0.276	1.006±0.726	-0.123±0.106	0.007±0.212	0.252±0.179	-0.669±0.665	-0.208±0.292
rs2314339	25016	5	0.060±0.352	-0.245±0.300	-0.400±0.255	NA	0.110±0.271	0.177±0.241	0.000±0.001	0.049±0.832	-0.235±0.282	0.299±0.784	NA	-0.219±0.281	-0.012±0.254	-0.772±0.843	-0.131±0.308
CHO																	
rs1801260	18401	5	0.028±0.110	-0.064±0.092	0.001±0.040	NA	-0.051±0.064	-0.158±0.060	0.000±0.000	-0.128±0.189	0.030±0.080	-0.312±0.215	NA	-0.031±0.083	-0.009±0.081	0.139±0.208	0.041±0.097
rs11605924	18389	0	-0.104±0.094	-0.016±0.082	0.035±0.037	-0.017±0.035	-0.008±0.059	-0.075±0.052	0.000±0.000	-0.034±0.156	-0.165±0.084	-0.185±0.190	0.016±0.042	0.045±0.071	0.017±0.073	0.262±0.205	0.001±0.096
rs1387153	26532	33	NA	0.037±0.087	0.016±0.036	0.125±0.036	0.006±0.065	0.047±0.061	0.001±0.000	0.131±0.153	-0.010±0.068	0.007±0.208	0.027±0.046	0.017±0.080	0.032±0.077	-0.386±0.240	0.072±0.096
rs10830963	27607	0	NA	NA	0.023±0.046	0.064±0.035	0.046±0.073	NA	0.000±0.000	0.069±0.161	-0.085±0.100	-0.213±0.232	0.054±0.047	-0.006±0.082	-0.016±0.08	0.008±0.233	0.062±0.114
rs2314339	25016	6	0.012±0.130	-0.063±0.102	0.101±0.073	NA	-0.065±0.083	0.032±0.079	-0.001±0.000	-0.342±0.256	0.057±0.090	-0.364±0.263	NA	-0.065±0.106	0.058±0.107	0.259±0.324	0.150±0.122
Sleep Duration (continuous)																	
rs1801260	10707	34	NA	1.189±0.578	-0.762±0.388	NA	NA	-0.192±0.447	NA	NA	0.430±0.546	0.999±1.019	NA	-0.351±0.648	NA	-0.123±1.454	-0.567±0.718
rs11605924	10706	0	NA	0.186±0.564	0.080±0.343	-0.276±0.216	NA	0.550±0.391	NA	NA	0.994±0.548	-1.857±0.892	0.303±0.386	-0.226±0.567	NA	0.871±1.309	-0.162±0.681
rs1387153	19911	21	NA	0.739±0.613	-0.241±0.301	-0.068±0.219	NA	-0.024±0.449	NA	NA	0.467±0.331	0.046±0.914	0.433±0.432	0.918±0.625	NA	-3.241±1.554	0.385±0.661
rs10830963	19913	29	NA	NA	-0.361±0.398	-0.182±0.219	NA	NA	NA	NA	1.254±0.632	-0.568±1.008	0.263±0.430	0.840±0.645	NA	-2.559±1.570	0.117±0.809
rs2314339	18404	33	NA	-0.470±0.801	-0.548±0.723	NA	NA	0.242±0.522	NA	NA	-0.036±0.655	0.317±1.356	NA	0.365±0.800	NA	1.095±1.802	1.156±0.845
Sleep Duration (<7 h)																	
rs1801260	2158	37	NA	-3.003±1.585	1.791±0.97	NA	NA	-0.684±1.147	NA	NA	-1.726±1.171	NA	NA	0.197±1.431	NA	0.383±1.879	0.179±1.473
rs11605924	3294	49	NA	-0.691±1.423	1±0.645	0.616±0.581	NA	-2.034±1.01	NA	NA	-2.746±1.171	NA	-0.377±0.722	1.642±1.244	NA	-1.05±1.726	-0.304±1.359
rs1387153	2158	0	NA	0.56±1.48	1.022±0.779	-0.255±0.59	NA	-0.111±1.19	NA	NA	-0.233±0.79	NA	0±0.788	-0.582±1.429	NA	1.034±1.881	2.816±1.41
rs10830963	3525	31	NA	NA	0.97±0.952	0.083±0.584	NA	NA	NA	NA	-2.572±1.425	NA	0.184±0.787	0.999±1.44	NA	1.129±1.856	3.474±1.686
rs2314339	3525	0	NA	-1.918±1.757	2.285±1.725	NA	NA	-0.724±1.498	NA	NA	0.068±1.323	NA	NA	-0.322±1.87	NA	0.243±2.47	0.613±1.719
Sleep Duration (≥9 h)																	
rs1801260	522	0	NA	-1.121±1.987	1.091±1.342	NA	NA	-1.72±2.231	NA	NA	-1.288±2.02	NA	NA	-1.189±2.876	NA	2.525±2.889	0.151±3.371
rs11605924	906	0	NA	1.142±2.126	1.455±1.216	-0.725±0.844	NA	1.007±1.944	NA	NA	-2.194±2.142	NA	-0.849±1.112	1.746±2.363	NA	3.035±2.504	0.003±3.16
rs1387153	522	3	NA	1.066±2.334	-0.129±1.091	-0.706±0.862	NA	-1.945±2.236	NA	NA	2.136±1.219	NA	0.694±1.306	-0.25±2.386	NA	0.033±3.285	5.087±2.683
rs10830963	961	5	NA	NA	-0.479±1.422	-0.101±0.832	NA	NA	NA	NA	0.76±2.379	NA	-0.037±1.246	-0.842±2.523	NA	2.143±3.496	8.2±3.446
rs2314339	961	0	NA	1.012±3.413	1.901±1.926	NA	NA	-0.201±2.326	NA	NA	-0.655±2.655	NA	NA	-2.391±3.085	NA	6.135±3.591	5.086±3.506
ln-HOMA-IR																	
Total Fats																	
rs1801260	16531	0	-0.021±0.127	0.007±0.006	0.001±0.003	NA	0.005±0.003	NA	0.002±0.004	0.010±0.016	-0.005±0.005	0.005±0.006	NA	-0.002±0.003	0.002±0.003	NA	-0.001±0.005
rs11605924	16520	0	0.044±0.110	0.006±0.005	0.000±0.002	0.000±0.002	-0.004±0.002	NA	-0.002±0.003	-0.021±0.013	0.005±0.005	-0.005±0.005	-0.003±0.001	0.004±0.003	0.004±0.003	NA	0.006±0.005
rs1387153	24438	47	NA	-0.001±0.006	0.000±0.002	-0.004±0.002	0.006±0.002	NA	0.009±0.004	0.013±0.013	-0.001±0.003	-0.006±0.005	0.000±0.002	-0.001±0.003	0.000±0.003	NA	-0.003±0.005
rs10830963	25513	48	NA	NA	-0.002±0.003	-0.002±0.002	-0.005±0.004	NA	0.006±0.004	0.016±0.015	0.003±0.006	-0.002±0.006	-0.001±0.002	0.000±0.003	0.002±0.003	NA	-0.001±0.006
rs2314339	23842	2	0.028±0.155	-0.002±0.007	-0.004±0.004	NA	0.004±0.002	NA	0.001±0.005	-0.004±0.024	0.002±0.006	0.003±0.007	NA	0.003±0.004	-0.001±0.004	NA	0.000±0.006
PUFA																	
rs1801260	16531	0	-0.922±0.424	0.009±0.024	-0.001±0.007	NA	0.004±0.019	NA	0.003±0.011	0.101±0.113	-0.035±0.020	-0.001±0.044	NA	-0.002±0.011	0.002±0.007	NA	0.003±0.023
rs11605924	16520	0	0.269±0.343	-0.009±0.021	-0.003±0.006	0.001±0.010	0.000±0.012	NA	-0.004±0.010	-0.164±0.084	-0.004±0.019	-0.042±0.038	-0.010±0.007	0.005±0.010	0.011±0.006	NA	0.010±0.021
rs1387153	24438	42	NA	-0.019±0.024	-0.002±0.006	-0.016±0.011	0.024±0.010	NA	0.024±0.011	0.138±0.099	0.002±0.017	-0.078±0.043	0.001±0.008	0.007±0.011	-0.007±0.007	NA	0.007±0.023
rs10830963	25513	0	NA	NA	-0.001±0.007	-0.010±0.011	0.020±0.019	NA	0.017±0.010	0.150±0.100	-0.003±0.024	-0.073±0.049	0.003±0.008	0.007±0.012	-0.011±0.007	NA	0.018±0.028
rs2314339	23842	0	-0.035±0.494	-0.013±0.028	-0.010±0.012	NA	0.011±0.008	NA	0.000±0.014	0.096±0.158	-0.009±0.026	0.052±0.050	NA	0.027±0.015	0.002±0.009	NA	-0.007±0.028
MUFA																	

SUPPLEMENTARY DATA

rs1801260	16531	0	-0.163±0.302	0.012±0.013	0.005±0.006	NA	0.012±0.008	NA	0.006±0.009	0.027±0.042	-0.021±0.012	0.005±0.010	NA	0.000±0.007	0.01±0.007	NA	0.000±0.012
rs11605924	16520	2	0.145±0.265	0.006±0.012	0.000±0.005	0.001±0.005	-0.010±0.005	NA	-0.001±0.007	-0.045±0.033	0.010±0.012	-0.008±0.008	-0.007±0.004	0.008±0.006	0.002±0.007	NA	0.013±0.012
rs1387153	24438	44	NA	-0.009±0.013	-0.001±0.005	-0.010±0.005	0.013±0.004	NA	0.020±0.009	0.035±0.035	-0.005±0.008	-0.002±0.009	-0.002±0.004	-0.002±0.007	-0.002±0.007	NA	-0.003±0.012
rs10830963	25513	11	NA	NA	-0.007±0.007	-0.003±0.005	-0.009±0.008	NA	0.015±0.008	0.029±0.039	0.011±0.014	0.004±0.010	-0.005±0.004	0.000±0.007	0.004±0.008	NA	0.002±0.015
rs2314339	23842	0	0.137±0.374	-0.010±0.016	-0.011±0.010	NA	0.010±0.004	NA	0.003±0.011	-0.047±0.063	0.002±0.015	-0.004±0.012	NA	0.006±0.009	-0.014±0.010	NA	-0.007±0.015
SFA																	
rs1801260	16531	3	0.408±0.274	0.014±0.011	0.003±0.007	NA	0.015±0.008	NA	0.002±0.009	0.016±0.033	0.006±0.010	0.015±0.014	NA	-0.008±0.006	0.001±0.006	NA	-0.005±0.010
rs11605924	16520	0	-0.035±0.231	0.017±0.011	0.001±0.005	0.003±0.005	-0.010±0.005	NA	-0.008±0.008	-0.033±0.025	0.008±0.010	-0.012±0.011	-0.004±0.003	0.012±0.005	0.004±0.006	NA	0.015±0.010
rs1387153	24438	12	NA	0.011±0.012	0.002±0.006	-0.005±0.005	0.009±0.004	NA	0.014±0.009	0.016±0.025	0.001±0.006	-0.017±0.013	0.000±0.003	-0.005±0.006	0.007±0.006	NA	-0.008±0.010
rs10830963	25513	41	NA	NA	-0.004±0.007	-0.003±0.005	-0.019±0.008	NA	0.006±0.009	0.023±0.028	0.007±0.012	-0.007±0.015	-0.003±0.003	-0.001±0.006	0.012±0.006	NA	-0.005±0.013
rs2314339	23842	9	0.060±0.352	0.000±0.015	-0.007±0.011	NA	0.008±0.004	NA	0.000±0.012	-0.007±0.048	0.006±0.012	0.013±0.016	NA	-0.002±0.008	0.000±0.009	NA	0.004±0.013
CHO																	
rs1801260	16531	30	0.028±0.110	-0.013±0.005	-0.001±0.002	NA	-0.004±0.002	NA	-0.001±0.003	-0.007±0.011	0.005±0.003	-0.006±0.004	NA	0.001±0.002	-0.001±0.003	NA	-0.001±0.004
rs11605924	16520	49	-0.104±0.094	-0.009±0.004	0.001±0.002	-0.001±0.002	0.002±0.002	NA	-0.003±0.003	-0.001±0.009	-0.006±0.004	0.011±0.004	0.003±0.001	-0.003±0.002	-0.002±0.003	NA	-0.006±0.004
rs1387153	24438	19	NA	-0.002±0.004	0.000±0.002	0.002±0.002	-0.002±0.001	NA	-0.005±0.003	-0.014±0.009	0.001±0.003	0.004±0.004	0.001±0.001	0.000±0.002	-0.001±0.003	NA	0.003±0.004
rs10830963	25513	63	NA	NA	0.001±0.002	0.000±0.002	0.005±0.003	NA	-0.004±0.003	-0.017±0.009	-0.002±0.004	0.000±0.005	0.002±0.001	-0.001±0.002	-0.001±0.003	NA	0.002±0.005
rs2314339	23842	29	0.012±0.130	0.004±0.005	0.003±0.003	NA	-0.002±0.001	NA	0.001±0.004	-0.024±0.015	-0.002±0.004	-0.016±0.005	NA	-0.007±0.003	0.007±0.004	NA	0.003±0.005
Sleep Duration																	
rs1801260	8902	0	NA	-0.017±0.029	-0.008±0.015	NA	NA	NA	NA	NA	0.038±0.023	0.004±0.021	NA	-0.020±0.018	NA	NA	-0.021±0.031
rs11605924	8901	39	NA	-0.019±0.028	-0.001±0.014	-0.005±0.011	NA	NA	NA	NA	0.028±0.023	-0.023±0.019	0.011±0.014	0.029±0.016	NA	NA	0.012±0.029
rs1387153	17882	7	NA	0.047±0.031	0.007±0.013	-0.005±0.012	NA	NA	NA	NA	0.002±0.014	0.018±0.019	0.008±0.016	-0.005±0.017	NA	NA	0.063±0.029
rs10830963	17884	7	NA	NA	-0.011±0.017	-0.007±0.012	NA	NA	NA	NA	0.000±0.027	0.010±0.021	-0.009±0.016	-0.014±0.018	NA	NA	0.085±0.035
rs2314339	17294	21	NA	0.033±0.040	-0.006±0.024	NA	NA	NA	NA	NA	-0.001±0.028	0.002±0.028	NA	0.011±0.022	NA	NA	0.109±0.036
Sleep Duration (<7 h)																	
rs1801260	1788	15	NA	0.01±0.081	0.048±0.04	NA	NA	NA	NA	NA	-0.08±0.05	NA	NA	-0.006±0.046	NA	NA	0.055±0.064
rs11605924	3122	32	NA	0.054±0.072	0.032±0.029	0.026±0.031	NA	NA	NA	NA	-0.097±0.05	NA	0.02±0.032	-0.058±0.04	NA	NA	0.028±0.059
rs1387153	1788	37	NA	0.105±0.075	0.035±0.033	-0.059±0.031	NA	NA	NA	NA	0.006±0.034	NA	0.016±0.035	0.023±0.046	NA	NA	-0.093±0.061
rs10830963	3122	38	NA	NA	0.066±0.04	0.039±0.031	NA	NA	NA	NA	-0.05±0.061	NA	0.063±0.034	-0.03±0.047	NA	NA	-0.095±0.073
rs2314339	3122	7	NA	-0.016±0.089	0.056±0.063	NA	NA	NA	NA	NA	-0.064±0.057	NA	NA	-0.018±0.061	NA	NA	-0.137±0.074
Sleep Duration (≥9 h)																	
rs1801260	425	0	NA	-0.059±0.1	0.033±0.059	NA	NA	NA	NA	NA	-0.004±0.086	NA	NA	-0.142±0.093	NA	NA	-0.11±0.146
rs11605924	858	0	NA	0.019±0.107	0.03±0.051	-0.003±0.045	NA	NA	NA	NA	-0.099±0.092	NA	-0.011±0.056	0.045±0.077	NA	NA	0.237±0.137
rs1387153	425	3	NA	0.054±0.116	0.045±0.048	-0.054±0.046	NA	NA	NA	NA	0.01±0.052	NA	0.07±0.065	0.028±0.078	NA	NA	-0.076±0.117
rs10830963	858	5	NA	NA	0.051±0.06	0.029±0.044	NA	NA	NA	NA	-0.138±0.102	NA	0.05±0.062	0.011±0.082	NA	NA	0.19±0.15
rs2314339	858	0	NA	-0.193±0.172	-0.045±0.093	NA	NA	NA	NA	NA	-0.028±0.114	NA	NA	-0.114±0.1	NA	NA	0.279±0.151
BMI (kg/m^2)																	
Total Fats																	
rs1801260	18950	0	-0.021±0.127	-0.076±0.059	0.009±0.027	NA	0.031±0.020	-0.008±0.035	0.001±0.001	0.142±0.086	0.023±0.039	-0.001±0.043	NA	0.002±0.025	-0.001±0.021	0.050±0.043	0.040±0.034
rs11605924	18938	0	0.044±0.110	-0.024±0.053	-0.031±0.021	-0.003±0.023	0.017±0.018	0.009±0.031	0.001±0.001	0.094±0.068	-0.090±0.038	-0.073±0.036	0.006±0.012	0.003±0.022	-0.001±0.019	-0.021±0.044	-0.069±0.033
rs1387153	27115	47	NA	-0.082±0.057	0.007±0.022	0.010±0.024	0.031±0.019	-0.093±0.038	-0.001±0.001	-0.037±0.073	-0.068±0.026	0.008±0.040	-0.016±0.013	0.010±0.024	0.006±0.004	0.062±0.050	-0.014±0.034
rs10830963	28190	31	NA	NA	-0.007±0.027	0.008±0.023	0.042±0.021	NA	0.000±0.001	-0.018±0.079	-0.088±0.045	0.001±0.045	-0.017±0.013	0.013±0.024	0.025±0.022	0.072±0.048	0.024±0.041
rs2314339	25598	20	0.028±0.155	0.040±0.073	0.022±0.040	NA	-0.003±0.025	0.032±0.051	0.001±0.001	-0.004±0.131	0.021±0.045	-0.025±0.054	NA	0.040±0.032	0.006±0.028	0.071±0.061	-0.023±0.043
PUFA																	
rs1801260	18950	19	-0.922±0.424	-0.307±0.237	0.074±0.070	NA	0.103±0.110	0.111±0.147	0.002±0.002	-1.029±0.599	-0.065±0.157	-0.038±0.325	NA	-0.032±0.097	-0.025±0.046	-0.091±0.179	0.218±0.155
rs11605924	18938	0	0.269±0.343	0.098±0.207	-0.039±0.055	0.031±0.102	0.048±0.092	-0.013±0.121	0.002±0.002	-0.532±0.452	-0.032±0.154	-0.012±0.278	-0.029±0.056	0.052±0.085	-0.056±0.041	0.465±0.171	-0.407±0.141
rs1387153	27115	0	NA	-0.243±0.241	0.005±0.058	0.129±0.106	0.121±0.098	-0.089±0.154	-0.001±0.002	0.067±0.536	-0.095±0.135	0.171±0.320	-0.070±0.062	0.180±0.097	0.009±0.047	0.201±0.180	0.141±0.156
rs10830963	28190	35	NA	NA	-0.018±0.073	0.132±0.105	0.154±0.110	NA	0.000±0.002	0.360±0.540	-0.049±0.192	0.010±0.359	-0.046±0.063	0.242±0.102	0.002±0.047	0.168±0.178	0.241±0.184
rs2314339	25598	15	-0.035±0.494	-0.168±0.277	-0.053±0.104	NA	-0.048±0.136	0.231±0.213	0.001±0.002	-0.227±0.844	-0.109±0.200	-0.179±0.368	NA	0.115±0.134	-0.022±0.062	0.065±0.239	0.016±0.184
MUFA																	
rs1801260	18950	0	-0.163±0.302	-0.171±0.135	0.011±0.064	NA	0.084±0.045	-0.061±0.086	0.001±0.002	0.271±0.227	-0.003±0.097	-0.017±0.072	NA	0.027±0.060	-0.030±0.048	0.090±0.078	0.121±0.082
rs11605924	18938	0	0.145±0.265	-0.008±0.116	-0.074±0.051	0.007±0.053	0.026±0.039	-0.008±0.077	0.002±0.001	0.183±0.177	-0.191±0.093	-0.081±0.059	0.001±0.030	0.002±0.054	-0.001±0.045	-0.036±0.077	-0.195±0.080
rs1387153	27115	38	NA	-0.187±0.129	0.025±0.053	0.024±0.054	0.065±0.044	-0.212±0.093	-0.004±0.002	-0.029±0.191	-0.165±0.067	0.071±0.065	-0.047±0.034	0.018±0.059	0.029±0.049	0.098±0.085	-0.001±0.083
rs10830963	28190	15	NA	NA	-0.003±0.067	0.017±0.053	0.086±0.049	NA	-0.002±0.002	-0.030±0.211	-0.248±0.112	0.074±0.073	-0.036±0.034	0.039±0.060	0.056±0.049	0.098±0.081	0.108±0.098
rs2314339	25598	26	0.137±0.374	0.046±0.157	0.057±0.099	NA	0.020±0.059	0.071±0.122	0.003±0.002	0.118±0.344	0.029±0.117	-0.072±0.091	NA	0.083±0.078	-0.015±0.063	0.135±0.110	-0.033±0.102
SFA																	
rs1801260	18950	11	0.408±0.274	-0.121±0.113	-0.019±0.070	NA	0.046±0.047	-0.023±0.082	0.001±0.002	0.440±0.174	0.049±0.079	0.040±0.104	NA	0.008±0.053	0.031±0.042	0.077±0.082	0.063±0.069
rs11605924	18938	0	-0.035±0.231	-0.116±0.109	-0.085±0.054	-0.012±0.045	0.048±0.041	0.037±0.072	0.000±0.001	0.287±0.133	-0.204±0.079	-0.227±0.085	0.026±0.023	-0.001±0.048	0.039±0.039	-0.087±0.085	-0.037±0.067
rs1387153	27115	38	NA	-0.127±0.119	0.010±0.058	-0.009±0.047	0.058±0.045	-0.214±0.078	-0.003±0.002	-0.105±0.138	-0.111±0.049	-0.093±0.100	-0.017±0.026	-0.024±0.052	0.042±0.042	0.075±0.092	-0.105±0.069
rs10830963	28190	49	NA	NA	-0.031±0.074	-0.015±0.047	0.082±0.049	NA	-0.001±0.002	-0.093±0.151	-0.124±0.095	-0.120±0.111	-0.028±0.026	-0.049±0.052	0.052±0.042	0.117±0.092	-0.044±0.085
rs2314339	25598	5	0.060±0.352	0.129±0.152	0.122±0.109	NA	-0.024±0.058	-0.006±0.112	0.005±0.002	-0.062±0.257	0.054±0.096	-0.001±0.120	NA	0.052±0.068	0.031±0.059	0.130±0.118	-0.055±0.089
CHO																	
rs1801260	18950	0	0.028±0.110	0.051±0.047	0.013±0.020	NA	-0.012±0.014	0.025±0.028	0.000±0.001	-0.018±0.058	0.002±0.028	0.003±0.033	NA	-0.022±0.020	-0.015±0.019	-0.036±0.030	-0.021±0.028
rs11605924	18938	0	-0.104±0.094	0.013±0.042	0.028±0.016	0.004±0.018	-0.023±0.013	-0.021±0.024	0.000±0.000	-0.127±0.046	0.070±0.029	0.073±0.029	-0.004±0.011	-0.002±0.017	-0.004±0.017	0.032±0.029	0.061±0.027
rs1387153	27115	29	NA	0.039±0.044	-0.012±0.017	0.008±0.019	-0.021±0.014	0.078±0.028	0.001±0.000	0.045±0.048	0.049±0.023	-0.029±0.032	0.007±0.012	0.003±0.019	-0.006±0.018	-0.022±0.034	-0.001±0.028
rs10830963	28190	59	NA	NA	0.000±0.021	0.010±0.018	-0.039±0.016	NA	0.000±0.000	0.042±0.050	0.069±0.034	-0.036±0.036	0.008±0.012	0.005±0.020	0.001±0.019	-0.012±0.033	-0.039±0.033
rs2314339	25598	23	0.012±0.130	-0.084±0.052	-0.016±0.030	NA	-0.009±0.018	0.017±0.037	-0.001±0.001	0.077±0.079	-0.001±0.031	-0.036±0.040	NA	-0.035±0.026	0.024±0.024	-0.056±0.046	-0.003±0.035
Sleep Duration (continuous)																	
rs1801260	11178	0	NA	0.241±0.292	0.058±0.163	NA	NA	0.331±0.209	NA	NA	-0.301±0.184	-0.252±0.157	NA	-0.164±0.157	NA	-0.024±0.189	-0.051±0.208
rs11605924	11177	0	NA	-0.005±0.283	-0.220±0.135	0.177±0.113	NA	0.179±0.183	NA	NA	0.189±0.186	-0.056±0.137	-0.034±0.109	-0.119±0.137	NA	-0.160±0.170	-0.160±0.196
rs1387153	20416	0	NA	0.016±0.310	0.094±0.135	0.152±0.115	NA	0.190±0.208	NA	NA	0.056±0.114	-0.177±0.140	-0.098±0.121	0.097±0.151	NA	-0.050±0.202	0.253±0.192
rs10830963	20418	0	NA	NA	0.153±0.174	0.059±0.116	NA	NA	NA	NA	-0.309±0.213	-0.167±0.155	-0.147±0.120	0.101±0.156	NA	0.058±0.204	0.101±0.235
rs2314339	18908	31	NA	0.268±0.406	-0.188±0.305	NA	NA	-0.204±0.245	NA	NA	-0.676±0.220	0.192±0.208	NA	-0.069±0.194	NA	-0.150±0.235	-0.091±0.244

SUPPLEMENTARY DATA

Sleep Duration (<7 h)																	
rs1801260	2325	0	NA	-1.115±0.803	-0.372±0.508	NA	NA	-0.66±0.537	NA	NA	0.233±0.396	NA	NA	0.226±0.405	NA	0.132±0.677	0.076±0.42
rs11605924	3512	44	NA	1.356±0.718	0.63±0.408	-0.589±0.304	NA	-0.714±0.474	NA	NA	0.136±0.399	NA	-0.013±0.238	0.103±0.355	NA	-0.249±0.62	0.531±0.391
rs1387153	2325	11	NA	0.241±0.75	0.287±0.406	0.878±0.308	NA	-0.2±0.558	NA	NA	-0.09±0.272	NA	0.376±0.26	0.288±0.406	NA	-0.771±0.674	0.154±0.407
rs10830963	3743	32	NA	NA	0.365±0.515	-0.697±0.307	NA	NA	NA	NA	0.087±0.484	NA	0.279±0.261	-0.401±0.408	NA	-0.633±0.672	0.348±0.486
rs2314339	3743	0	NA	0.98±0.891	0.524±0.748	NA	NA	0.275±0.703	NA	NA	0.839±0.451	NA	NA	0.427±0.525	NA	0.483±0.914	-0.133±0.494
Sleep Duration (≥9 h)																	
rs1801260	572	19	NA	0.773±1	-0.493±0.574	NA	NA	1.041±1.044	NA	NA	-0.611±0.684	NA	NA	0.164±0.823	NA	0.132±0.977	2.042±0.973
rs11605924	975	0	NA	1.612±1.058	0.509±0.513	0.378±0.443	NA	-0.48±0.914	NA	NA	1.334±0.723	NA	0.077±0.421	-0.401±0.67	NA	0.344±0.865	-0.776±0.913
rs1387153	572	30	NA	0.512±1.17	1.205±0.521	0.805±0.454	NA	-1.097±1.048	NA	NA	0.134±0.418	NA	0.026±0.5	0.828±0.671	NA	0.582±1.099	2.263±0.778
rs10830963	1030	70	NA	NA	1.861±0.641	-1.065±0.44	NA	NA	NA	NA	-1.191±0.799	NA	0.006±0.479	-1.09±0.726	NA	0.18±1.165	1.391±1.002
rs2314339	1030	0	NA	0.05±1.725	1.447±1.204	NA	NA	0.928±1.091	NA	NA	0.24±0.859	NA	NA	0.898±0.886	NA	0.52±1.207	-0.952±1.012
Waist Circumference (cm)																	
Total Fats																	
rs1801260	18775	0	-0.021±0.127	-0.043±0.068	-0.026±0.041	NA	-0.007±0.024	-0.006±0.049	0.000±0.000	0.113±0.164	0.011±0.043	0.022±0.063	NA	-0.031±0.033	-0.006±0.038	0.121±0.088	0.000±0.035
rs11605924	18763	0	0.044±0.110	-0.141±0.060	-0.012±0.032	0.006±0.027	-0.020±0.021	-0.039±0.043	0.000±0.000	-0.061±0.129	0.074±0.041	-0.038±0.052	-0.018±0.014	0.019±0.030	-0.002±0.034	0.134±0.090	-0.020±0.034
rs1387153	26889	5	NA	-0.072±0.066	-0.029±0.033	-0.031±0.027	0.025±0.023	-0.051±0.053	0.000±0.000	0.189±0.136	-0.062±0.029	0.005±0.059	-0.012±0.015	-0.003±0.032	0.038±0.038	0.003±0.101	0.018±0.035
rs10830963	27964	13	NA	NA	-0.043±0.043	-0.031±0.027	0.023±0.026	NA	0.000±0.000	0.308±0.147	-0.054±0.049	0.023±0.066	-0.016±0.015	0.023±0.033	0.050±0.039	0.017±0.098	0.021±0.042
rs2314339	25373	11	0.028±0.155	0.029±0.083	-0.045±0.063	NA	0.019±0.031	0.092±0.070	0.000±0.000	0.197±0.248	-0.029±0.050	-0.037±0.080	NA	-0.008±0.043	0.039±0.051	0.036±0.127	-0.038±0.044
PUFA																	
rs1801260	18775	21	-0.922±0.424	-0.345±0.274	-0.096±0.108	NA	-0.103±0.132	-0.055±0.202	0.001±0.001	1.932±1.143	0.094±0.173	0.473±0.474	NA	-0.179±0.130	0.052±0.082	0.293±0.350	-0.085±0.160
rs11605924	18763	0	0.269±0.343	-0.473±0.239	-0.045±0.086	0.144±0.119	-0.177±0.111	-0.000±0.165	0.000±0.001	-0.169±0.867	-0.077±0.170	0.050±0.407	-0.093±0.065	0.086±0.113	-0.101±0.074	-0.432±0.348	-0.027±0.145
rs1387153	26889	0	NA	-0.219±0.279	-0.013±0.091	-0.038±0.123	0.093±0.118	-0.041±0.214	0.000±0.001	1.191±1.018	-0.003±0.149	-0.342±0.469	0.009±0.072	0.070±0.130	0.059±0.083	-0.200±0.361	-0.025±0.160
rs10830963	27964	8	NA	NA	0.001±0.119	0.021±0.122	0.032±0.133	NA	0.000±0.001	1.739±1.023	-0.379±0.211	-0.470±0.525	-0.009±0.073	0.107±0.136	-0.007±0.084	-0.098±0.357	-0.030±0.189
rs2314339	25373	0	-0.035±0.494	-0.159±0.319	-0.122±0.170	NA	0.012±0.164	-0.388±0.291	0.000±0.001	0.866±1.614	0.002±0.221	0.294±0.541	NA	0.033±0.179	0.081±0.111	0.108±0.494	-0.043±0.188
MUFA																	
rs1801260	18775	0	-0.163±0.302	-0.125±0.155	-0.017±0.099	NA	-0.008±0.054	-0.027±0.119	0.000±0.001	0.177±0.428	0.008±0.107	0.074±0.105	NA	-0.098±0.081	0.100±0.085	0.054±0.155	0.011±0.085
rs11605924	18763	0	0.145±0.265	-0.325±0.133	-0.014±0.080	0.050±0.061	-0.056±0.048	-0.072±0.107	0.000±0.001	-0.005±0.334	0.120±0.102	-0.071±0.087	-0.021±0.035	0.024±0.073	0.076±0.080	0.176±0.161	-0.057±0.082
rs1387153	26889	0	NA	-0.186±0.148	-0.069±0.081	-0.071±0.062	0.034±0.053	-0.040±0.129	0.000±0.001	0.336±0.360	-0.124±0.073	0.022±0.095	-0.040±0.039	0.036±0.079	0.015±0.087	-0.026±0.173	0.019±0.085
rs10830963	27964	0	NA	NA	-0.103±0.104	-0.055±0.062	0.012±0.059	NA	-0.001±0.001	0.610±0.395	-0.160±0.123	0.028±0.107	-0.035±0.040	0.110±0.081	0.075±0.088	0.001±0.163	0.034±0.101
rs2314339	25373	0	0.137±0.374	-0.050±0.180	-0.070±0.151	NA	0.062±0.071	0.193±0.168	0.000±0.001	0.472±0.650	-0.028±0.128	-0.111±0.134	NA	0.030±0.105	0.041±0.112	-0.200±0.226	-0.041±0.104
SFA																	
rs1801260	18775	0	0.408±0.274	0.045±0.130	-0.084±0.112	NA	-0.015±0.056	0.015±0.114	0.000±0.001	0.019±0.337	-0.035±0.087	-0.051±0.151	NA	0.002±0.071	-0.117±0.075	0.120±0.168	0.017±0.071
rs11605924	18763	0	-0.035±0.231	-0.159±0.127	-0.033±0.088	-0.022±0.052	-0.008±0.050	-0.118±0.099	0.000±0.001	-0.209±0.257	0.172±0.087	-0.072±0.125	-0.039±0.027	0.046±0.064	0.016±0.069	0.355±0.173	-0.038±0.068
rs1387153	26889	25	NA	-0.047±0.137	-0.087±0.089	-0.055±0.055	0.061±0.054	-0.169±0.109	-0.001±0.001	0.305±0.261	-0.133±0.054	-0.012±0.146	-0.029±0.030	-0.069±0.070	0.087±0.074	0.100±0.189	0.064±0.071
rs10830963	27964	9	NA	NA	-0.143±0.116	-0.085±0.055	0.087±0.060	NA	-0.001±0.001	0.504±0.283	0.017±0.104	0.101±0.163	-0.043±0.031	-0.019±0.069	0.140±0.075	0.095±0.188	0.085±0.087
rs2314339	25373	32	0.060±0.352	0.157±0.175	-0.112±0.169	NA	0.025±0.070	0.337±0.155	0.001±0.001	0.391±0.486	-0.110±0.106	-0.020±0.175	NA	-0.071±0.092	0.014±0.104	0.106±0.250	-0.104±0.091
CHO																	
rs1801260	18775	0	0.028±0.110	-0.012±0.054	0.014±0.030	NA	-0.014±0.017	-0.041±0.039	0.000±0.000	0.156±0.108	-0.001±0.030	-0.053±0.048	NA	0.017±0.027	-0.003±0.034	-0.030±0.059	0.008±0.029
rs11605924	18763	1	-0.104±0.094	0.052±0.048	-0.016±0.025	-0.011±0.021	0.015±0.016	-0.008±0.034	0.000±0.000	-0.061±0.090	-0.037±0.032	-0.008±0.043	0.009±0.012	0.007±0.023	-0.017±0.031	-0.064±0.059	-0.016±0.028
rs1387153	26889	32	NA	0.068±0.050	0.033±0.025	0.014±0.022	-0.033±0.017	0.010±0.040	0.000±0.000	-0.199±0.088	0.055±0.025	0.032±0.047	0.003±0.013	0.000±0.026	-0.001±0.033	0.021±0.068	0.024±0.029
rs10830963	27964	0	NA	NA	0.045±0.032	0.018±0.021	-0.031±0.019	NA	0.000±0.000	-0.245±0.093	0.028±0.037	0.049±0.052	0.011±0.014	-0.013±0.027	-0.040±0.034	0.008±0.065	0.047±0.034
rs2314339	25373	39	0.012±0.130	0.016±0.060	0.000±0.046	NA	-0.016±0.022	-0.118±0.051	0.000±0.000	-0.276±0.148	0.003±0.033	-0.004±0.059	NA	0.033±0.035	-0.002±0.043	-0.118±0.093	0.016±0.036
Sleep Duration (continuous)																	
rs1801260	11007	0	NA	0.375±0.336	0.180±0.276	NA	NA	-0.013±0.288	NA	NA	0.054±0.202	0.204±0.229	NA	0.274±0.210	NA	-0.375±0.393	-0.207±0.213
rs11605924	11006	0	NA	-0.299±0.326	-0.139±0.230	0.268±0.131	NA	-0.313±0.252	NA	NA	-0.163±0.204	0.145±0.201	0.086±0.129	0.219±0.184	NA	0.227±0.357	0.052±0.201
rs1387153	20194	0	NA	0.690±0.355	0.105±0.220	0.050±0.134	NA	-0.123±0.290	NA	NA	0.007±0.125	0.098±0.206	0.093±0.143	0.087±0.203	NA	-0.060±0.418	0.276±0.197
rs10830963	20196	0	NA	NA	-0.002±0.291	0.284±0.135	NA	NA	NA	NA	-0.379±0.234	0.077±0.227	0.049±0.142	-0.028±0.209	NA	0.442±0.423	0.128±0.241
rs2314339	18687	13	NA	0.618±0.465	0.406±0.400	NA	NA	0.018±0.337	NA	NA	-0.311±0.243	-0.179±0.305	NA	-0.060±0.260	NA	0.257±0.494	0.254±0.250
Sleep Duration (<7 h)																	
rs1801260	2323	5	NA	-0.723±0.929	-0.805±0.687	NA	NA	-2.222±1.6	NA	NA	0.153±0.434	NA	NA	-0.6±0.542	NA	0.805±1.224	0.4±0.43
rs11605924	3503	0	NA	0.169±0.841	0.518±0.454	-0.684±0.353	NA	-0.92±1.476	NA	NA	-0.255±0.439	NA	0.019±0.285	-0.005±0.475	NA	0.607±1.121	0.023±0.4
rs1387153	2323	0	NA	1.415±0.864	0.024±0.561	-0.11±0.358	NA	1.392±1.796	NA	NA	-0.639±0.297	NA	-0.042±0.311	-0.109±0.543	NA	0.076±1.225	-0.623±0.416
rs10830963	3734	0	NA	NA	0.008±0.665	-0.513±0.358	NA	NA	NA	NA	-0.116±0.53	NA	0.093±0.312	0.224±0.546	NA	0.292±1.219	-0.265±0.498
rs2314339	3734	0	NA	1.446±1.026	0.033±1.067	NA	NA	-1.36±2.263	NA	NA	0.588±0.496	NA	NA	-0.047±0.704	NA	0.622±1.697	0.166±0.504
Sleep Duration (≥9 h)																	
rs1801260	573	0	NA	0.994±1.15	-1.323±0.936	NA	NA	-2.333±2.317	NA	NA	0.275±0.751	NA	NA	0.2±1.102	NA	-2.605±1.998	-0.561±0.999
rs11605924	971	0	NA	-1.003±1.227	0.163±0.782	0.058±0.515	NA	-2.249±2.52	NA	NA	-0.9±0.795	NA	0.117±0.498	0.473±0.896	NA	0.602±1.755	0.269±0.948
rs1387153	573	34	NA	-1.923±1.339	-0.763±0.782	-0.593±0.537	NA	0.636±2.598	NA	NA	-1.246±0.457	NA	0.389±0.591	1.008±0.898	NA	2.245±2.197	0.503±0.804
rs10830963	1026	42	NA	NA	-1.32±1.074	0.987±0.516	NA	NA	NA	NA	-1.754±0.876	NA	0.612±0.566	-0.15±0.973	NA	-1.227±2.337	0.512±1.033
rs2314339	1026	0	NA	0.593±1.981	0.415±1.209	NA	NA	0.404±3.052	NA	NA	0.5±0.944	NA	NA	-0.378±1.187	NA	2.001±2.441	1.289±1.041
HDL-C (mg/dL)																	
Total Fats																	
rs1801260	18767	6	-0.021±0.127	-0.425±0.159	-0.074±0.082	NA	0.007±0.048	0.055±0.105	-0.001±0.001	-0.335±0.286	0.032±0.135	-0.059±0.138	NA	0.102±0.065	1.429±2.896	0.074±0.150	0.002±0.086
rs11605924	18755	0	0.044±0.110	0.018±0.143	0.007±0.068	-0.031±0.060	0.047±0.042	-0.149±0.093	0.000±0.001	-0.013±0.226	-0.347±0.130	0.221±0.113	0.063±0.035	0.017±0.058	3.900±2.625	0.110±0.153	-0.026±0.083
rs1387153	26893	3	NA	0.367±0.155	0.014±0.072	0.031±0.062	-0.040±0.046	-0.067±0.113	0.002±0.001	0.228±0.238	-0.027±0.090	0.133±0.127	-0.022±0.039	0.102±0.063	-2.587±2.934	-0.087±0.174	0.044±0.086
rs10830963	27967	34	NA	NA	0.025±0.089	-0.026±0.061	-0.027±0.051	NA	0.002±0.001	0.306±0.257	0.015±0.154	0.147±0.143	0.007±0.040	0.088±0.064	-3.089±2.973	-0.038±0.173	0.036±0.104
rs2314339	25378	0	0.028±0.155	0.212±0.196	0.015±0.127	NA	-0.001±0.062	-0.191±0.150	0.001±0.001	0.215±0.432	-0.101±0.156	-0.329±0.172	NA	0.040±0.085	-0.849±3.900	-0.117±0.205	-0.166±0.109
PUFA																	
rs1801260	18767	39	-0.922±0.424	-0.324±0.646	-0.579±0.243	NA	0.082±0.263	-0.176±0.430	-0.002±0.002	-2.791±1.998	-0.337±0.542	0.188±1.032	NA	0.384±0.256	3.127±6.332	0.465±0.584	0.692±0.394
rs11605924	18755	0	0.269±0.343	0.323±0.561	0.223±0.186	-0.515±0.268	0.284±0.222	-0.160±0.354	0.002±0.002	-1.086±1.502	-0.898±0.532	0.930±0.878	0.133±0.169	0.112±0.223	-0.502±5.676	0.127±0.569	0.130±0.359

SUPPLEMENTARY DATA

rs1387153	26893	0	NA	0.892±0.657	0.202±0.197	0.277±0.276	0.103±0.237	-1.003±0.450	0.004±0.002	2.060±1.764	-0.025±0.466	-0.038±1.017	-0.042±0.186	-0.273±0.255	-4.324±6.371	0.055±0.592	-0.011±0.396
rs10830963	27967	0	NA	NA	0.315±0.254	0.140±0.273	0.301±0.264	NA	0.003±0.002	1.348±1.782	0.376±0.666	0.368±1.137	0.034±0.189	-0.234±0.269	-6.525±6.486	-0.002±0.598	0.504±0.468
rs2314339	25378	0	-0.035±0.494	0.539±0.750	0.120±0.347	NA	-0.018±0.328	-0.566±0.622	0.003±0.003	1.251±2.795	0.350±0.693	-2.101±1.169	NA	-0.014±0.352	0.425±8.533	-0.747±0.773	-0.823±0.464
MUFA																	
rs1801260	18767	0	-0.163±0.302	-0.630±0.367	-0.100±0.195	NA	0.043±0.107	0.198±0.255	-0.002±0.002	-0.376±0.747	0.043±0.335	-0.118±0.228	NA	0.220±0.160	-3.089±6.564	0.357±0.264	0.119±0.209
rs11605924	18755	0	0.145±0.265	0.002±0.315	-0.036±0.167	-0.080±0.138	0.097±0.095	-0.405±0.230	0.001±0.002	-0.470±0.581	-0.813±0.320	0.431±0.187	0.142±0.092	0.012±0.143	11.583±6.178	0.398±0.269	-0.051±0.202
rs1387153	26893	15	NA	0.922±0.350	-0.014±0.172	0.080±0.141	-0.071±0.105	-0.162±0.277	0.005±0.002	0.664±0.623	-0.014±0.231	0.149±0.206	0.023±0.102	0.269±0.156	-6.255±6.680	-0.405±0.305	0.039±0.210
rs10830963	27967	45	NA	NA	0.024±0.215	-0.046±0.139	-0.025±0.117	NA	0.004±0.002	0.843±0.686	0.186±0.389	0.200±0.231	0.099±0.102	0.202±0.160	-4.363±6.795	-0.407±0.303	0.134±0.250
rs2314339	25378	0	0.137±0.374	0.290±0.424	0.074±0.312	NA	0.020±0.142	-0.545±0.361	0.002±0.002	0.464±1.126	-0.111±0.403	-0.409±0.291	NA	0.068±0.207	-1.467±8.610	0.013±0.376	-0.400±0.258
SFA																	
rs1801260	18767	41	0.408±0.274	-0.883±0.306	0.122±0.212	NA	-0.016±0.112	0.179±0.245	-0.003±0.002	-0.767±0.585	0.219±0.271	-0.073±0.329	NA	0.193±0.140	4.324±5.753	-0.338±0.280	-0.274±0.174
rs11605924	18755	0	-0.035±0.231	-0.062±0.297	-0.124±0.182	0.046±0.118	0.076±0.100	-0.366±0.214	0.000±0.002	0.108±0.445	-0.581±0.274	0.247±0.270	0.125±0.071	0.016±0.126	7.799±5.290	-0.032±0.296	-0.057±0.169
rs1387153	26893	21	NA	0.560±0.321	-0.030±0.194	0.027±0.124	-0.155±0.108	0.041±0.234	0.003±0.002	0.273±0.452	-0.068±0.169	0.428±0.316	-0.077±0.079	0.378±0.137	-1.776±5.714	0.007±0.326	0.078±0.175
rs10830963	27967	7	NA	NA	-0.039±0.241	-0.108±0.123	-0.173±0.118	NA	0.004±0.002	0.486±0.493	-0.206±0.326	0.418±0.352	-0.024±0.080	0.298±0.136	-2.162±5.792	0.150±0.324	-0.138±0.215
rs2314339	25378	4	0.060±0.352	0.462±0.411	-0.081±0.347	NA	-0.012±0.143	-0.333±0.334	0.001±0.003	0.412±0.842	-0.371±0.331	-0.536±0.379	NA	0.111±0.181	-1.737±8.031	-0.164±0.401	-0.149±0.224
CHO																	
rs1801260	18767	0	0.028±0.110	0.140±0.128	0.027±0.060	NA	0.023±0.034	-0.078±0.082	0.000±0.001	0.028±0.187	0.011±0.095	0.036±0.104	NA	-0.036±0.052	0.154±2.587	-0.003±0.102	-0.076±0.070
rs11605924	18755	0	-0.104±0.094	-0.107±0.114	0.035±0.051	0.013±0.047	-0.024±0.031	0.132±0.071	0.000±0.001	0.084±0.155	0.198±0.100	-0.093±0.092	-0.047±0.032	0.040±0.045	-3.359±2.355	-0.059±0.100	0.026±0.069
rs1387153	26893	15	NA	-0.272±0.120	-0.011±0.053	-0.033±0.048	0.072±0.034	0.070±0.083	-0.001±0.001	0.024±0.153	-0.033±0.080	-0.060±0.101	0.018±0.035	-0.060±0.050	0.965±2.510	0.136±0.116	-0.056±0.070
rs10830963	27967	20	NA	NA	0.000±0.066	-0.039±0.048	0.059±0.038	NA	-0.001±0.001	-0.034±0.162	0.052±0.118	-0.093±0.113	-0.020±0.036	-0.066±0.052	2.471±2.587	0.027±0.116	-0.038±0.084
rs2314339	25378	0	0.012±0.130	0.009±0.141	0.003±0.098	NA	0.025±0.043	0.199±0.108	-0.002±0.001	0.057±0.255	-0.056±0.105	0.183±0.127	NA	0.084±0.066	2.008±3.320	0.159±0.154	0.018±0.088
Sleep Duration (continuous)																	
rs1801260	11057	52	NA	-0.512±0.794	0.110±0.498	NA	NA	1.084±0.617	NA	NA	-1.797±0.633	-0.118±0.499	NA	0.640±0.420	NA	0.383±0.674	-0.227±0.525
rs11605924	11056	0	NA	-0.792±0.770	-0.019±0.460	-0.068±0.296	NA	-0.175±0.539	NA	NA	-0.003±0.639	-0.267±0.435	-1.037±0.336	-0.256±0.361	NA	-0.706±0.591	-0.748±0.497
rs1387153	20256	0	NA	0.939±0.840	0.090±0.406	-0.110±0.301	NA	0.222±0.615	NA	NA	0.293±0.392	-0.424±0.447	-0.196±0.377	-0.302±0.399	NA	0.664±0.714	-0.253±0.485
rs10830963	20257	0	NA	NA	0.043±0.529	-0.301±0.302	NA	NA	NA	NA	-0.531±0.740	-0.322±0.493	0.019±0.374	-0.614±0.412	NA	0.628±0.722	0.229±0.594
rs2314339	18750	0	NA	0.548±1.098	0.236±0.822	NA	NA	-0.315±0.721	NA	NA	0.774±0.761	0.231±0.663	NA	0.147±0.510	NA	-0.690±0.821	-0.202±0.616
Sleep Duration (<7 h)																	
rs1801260	2325	0	NA	1.384±2.187	-1.086±1.361	NA	NA	-2.65±1.588	NA	NA	1.79±1.359	NA	NA	-0.558±1.069	NA	-1.454±2.385	0.061±1.062
rs11605924	3507	0	NA	0.152±1.966	0.402±1.018	0.223±0.795	NA	-0.091±1.402	NA	NA	-1.277±1.376	NA	1.021±0.741	0.526±0.933	NA	-0.16±2.116	1.569±0.992
rs1387153	2325	0	NA	1.82±2.036	-0.618±1.128	0.415±0.809	NA	-0.834±1.65	NA	NA	0.953±0.936	NA	-0.613±0.81	1.224±1.069	NA	-1.246±2.323	0.091±1.029
rs10830963	3738	0	NA	NA	-0.32±1.324	0.265±0.803	NA	NA	NA	NA	2.044±1.665	NA	-0.375±0.811	-1.037±1.075	NA	-0.429±2.332	-0.899±1.232
rs2314339	3738	0	NA	3.523±2.416	-0.712±2.095	NA	NA	-1.649±2.073	NA	NA	0.307±1.544	NA	NA	0.282±1.383	NA	-3.963±3.048	-0.273±1.246
Sleep Duration (≥9 h)																	
rs1801260	571	24	NA	-2.814±2.728	-2.304±1.963	NA	NA	0.601±3.09	NA	NA	-2.829±2.358	NA	NA	4.366±2.17	NA	-0.547±3.331	-1.614±2.455
rs11605924	973	0	NA	0.024±2.936	0.601±1.728	0.251±1.166	NA	-4.041±2.699	NA	NA	-0.972±2.496	NA	-2.207±1.305	-2.08±1.761	NA	4.285±2.932	-1.48±2.303
rs1387153	571	0	NA	-2.951±3.209	-0.742±1.552	1.549±1.187	NA	-0.096±3.099	NA	NA	2.595±1.438	NA	-0.842±1.548	-0.437±1.772	NA	-4.187±3.76	0.03±1.975
rs10830963	1028	0	NA	NA	-0.298±2.082	-1.077±1.149	NA	NA	NA	NA	2.188±2.783	NA	0.367±1.48	0.794±1.918	NA	-4.399±3.988	-1.13±2.535
rs2314339	1028	0	NA	1.424±4.69	-0.84±3.562	NA	NA	-3.444±3.22	NA	NA	2.939±2.964	NA	NA	2.892±2.335	NA	1.134±4.142	-2.738±2.555

* Additive allele mode, adjusted for age, sex, BMI (except when assessing BMI outcome), study site (in CARDIA; CHS; FamHS; InCHIANTI; MESA), family or population structure (in Carogene Controls; DILGOM; FamHS; FOS; GOLDN; MESA; Rotterdam; YFS), and genotype batch (in FamHS). Interaction coefficients are shown as $\beta \pm SE$. β represents the direction and magnitude of the change in outcome trait with each additional minor allele, per each additional % of macronutrient intake; per each additional hour of sleep; or compared to the reference sleep group (≥ 7 to < 9 h). I^2 represents the heterogeneity statistic, presented as %.macronutrient intake (%) or additional hour of sleep,. I^2 represents the heterogeneity statistic, presented as %.

† The number of independent observations in each interaction analysis.

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