Appendix 2. Data extraction table of the reported associations between diet and physical activity before/during pregnancy on offspring cardiovascular health.

Randomized controlled trials

Study	Intervention	In- and exclusion criteria	Population characteristics	Analysis	Results
Pre-, Peri- and Postnatal Programming and Origins of Disease: Early Targeting the Epidemics of Allergy and Overweight (NAMI)					
Aaltonen, 2008 [1,2]	**1. Probiotics/diet**: Probiotic capsules (Lactobacillus rhamnosus GG and Bifidobacterium lactis Bb12) combined with detailed dietary counselling by a dietician, focussed on current recommendations with special attention to type of fat and amount of dietary fibre. **2. Placebo/diet:** Placebo capsules (microcrystalline cellulose) and dietary counselling as described above. 3. **Control/placebo:** Placebo capsules (microcrystalline cellulose) and no dietary counselling by a dietician. Duration of the intervention from the first trimester of pregnancy until the end of exclusive breast feeding, with a maximum of 6 months; 3 study visits during pregnancy and 1 at six months postpartum.	**Inclusion:** Pregnant women from families with at least one family member having an allergic disease. **Exclusion:** 1. Women presenting severe immunological or other chronic diseases. 2. Women who cannot be expected to comply with treatment. 3. Women currently participating or having participated in other clinical trial during the last 2 months prior to the beginning of the intervention.	**Maternal characteristics** **Age (mean; SD):** Probiotics/diet 29.7 (4.1) Placebo/diet 30.1 (5.2) Control/placebo 30.2 (5.0) **Higher degree education:** Probiotics/diet 79% Placebo/diet 67% Control/placebo 79% All participants were **Caucasian** **Pre-pregnancy BMI (mean; SD):** Diet/probiotics 22.9 kg/m^2 (3.2) Diet/placebo 24.3 kg/m^2 (4.4) Control/placebo 23.7 kg/m^2 (3.5) **Offspring characteristics** Median infant **age** 6 months (range 5.6 to 8.0 months) **Gender:** Probiotics/diet 52% male Placebo/diet 49% male Control/placebo 56% male	Mean dietary intake during pregnancy was divided into quartiles; univariate ANOVA analyses and multivariate ANCOVA analyses.	Significant results (U-shaped) were found for maternal **carbohydrate intake** on infant **systolic** (P=0.006) and **diastolic** blood pressure (P=0.015); maternal **monounsaturated fatty acids** and infant **diastolic** blood pressure (P=0.029). Trends toward a U-shaped relationship were found between maternal **total energy** intake and infant **systolic** blood pressure (P=0.066); maternal **fibre** intake and infant **diastolic** blood pressure (P=0.093). A reversed U-shaped trend was found between maternal **fruit** intake and infant **systolic** blood pressure (P=0.077). After **adjustment for breastfeeding and infant length at 6 months** a U-shaped trend was found between maternal **carbohydrate** intake and infant **systolic** (P=0.019) and **diastolic** blood pressure (P=0.027).

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Study	Intervention	In- and exclusion criteria	Population characteristics	Analysis	Results
Normia, 2013 [2,3]	Idem ditto	Idem ditto	<u>**Maternal characteristics**</u> **Age (mean; SD)**: 29.6 years (4.5). All participants were **Caucasian.** **Pre-pregnancy BMI (mean; SD):** 23.4 kg/m^2 (3.2) <u>**Offspring characteristics**</u> Median infant **age** 4 years (range 3.9-4.2 years) **Gender:** 48.6% male, N=53	Maternal dietary intake is divided into tertiles (T1=lowest; T3=highest).; prediction model using four blocks: 1) maternal characteristics, 2) maternal intake of nutrients during pregnancy, 3) childhood anthropometrics, 4) childhood dietary intake at the age of 4 years. First, correlation analysis and ANOVA to identify the most significant predictor variables, thereafter multivariate linear models (forward stepwise model). The final model was constructed using the variables in the blocks and the backward stepwise method.	Final model (study group; fat intake; carbohydrate intake; weight child; fat intake child): **Fat intake as % of energy intake** predicting systolic blood pressure T1=reference; T2=-3.0(-6.2 to 0.2); T3=2.8(-0.5 to 6.2); P=0.003 (p-value for separate model=0.031) **Carbohydrate intake in grams** predicting systolic blood pressure T1=reference; T2=2.2(-1.2 to 5.6); T3=5.5 (2.5 to 9.0); P=0.003 (p-value for separate model=<0.001) No associations were found between maternal dietary characteristics and childhood diastolic blood pressure.

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Study	Intervention	In- and exclusion criteria	Population characteristics	Analysis	Results
GI Baby 3 study/GI Baby 4 study					
Kizirian, 2016 [4]	Participants were randomized into one of two healthy diets of similar macronutrient composition: protein (15–25en%), fat (25–30en%), and carbohydrate content (40–45en%). One group was asked to follow a low-GI diet (LGI) (target GI≤50) and the other group a high-fibre, moderate-GI diet (HF), similar to the Australian population average (target GI 60). The low GI diet group as well as the HF diet group attended a total of five individual dietary consultations with a dietician during pregnancy. A selection of recipes was provided, and subjects were provided with food samples containing key foods for the assigned diet at all five consultations. At mid study visits (2, 3, and 4) four-stage multiple pass 24 hour recalls were performed to check dietary compliance, if not compliant suitable alternative foods were encouraged.	**Inclusion:** - Singleton pregnant women - Week 12-20 of gestation - At least one of the following risk factors: pre-pregnancy BMI ≥30 kg/m^2, age ≥ 35 years, PCOS, previous history of GDM or glucose intolerance, history of previous new-born weighing >4000 grams, family history of type 2 DM, or belonging to an ethnic group with a high prevalence of GDM. - Infants with no congenital defects or metabolic disturbances influencing growth. **Exclusion:** - Women with special dietary requirements (gluten-intolerant, celiac disease). - Women with pre-existing DM.	**Maternal characteristics** **Age at study entry (mean; SD):** - low GI-group: 34.9 years (0.8) - HF group: 35.5 years (0.7) **Education:** - low GI-group: secondary 13%, tertiary 53%, postgraduate 23% - HF group: secondary 14%, tertiary 55%, postgraduate 31% **Pre-pregnancy BMI (mean; SD):** - low GI-group: 25.8 kg/m^2 (1.0) - HF group: 25.9 kg/m^2 (1.0) **Ethnicity:** - low GI group: Asian 20%, White 63%, Others 17% - HF group: Asian 14%, White 80%, Others 7% **Offspring characteristics** **Age:** Multiple measurement moments: 3, 6 and 12 months of age **Gender:** - low GI-group: 54% female - HF group: 62% female	Linear regression Models were adjusted for maternal pre-pregnancy BMI, gestational weight gain, GDM, gestational age, gender and feeding practice; exception is weight at 6 and 12 months which are only adjusted for maternal pre-pregnancy BMI, gestational weight gain and GDM.	Maternal GI at 36 weeks of gestation was not associated with offspring aortic IMT at 12 months (P=0.60). Aortic IMT was significantly thinner in the low GI-group compared with the HF group (**657 (12) vs. 696 (12) µm; P=0.02**). Maximum aortic IMT was not significant between groups (P=0.11).

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Observational studies

Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Aarhus Birth Cohort					
Hrolfsdottir, 2017 [5,6]	Women were included if they had a singleton pregnancy and were scheduled to attend a route midwife visit in gestation week 30 at an antenatal centre that covered a geographically well-defined area of Aarhus. Time period from April 1988 to January 1989.	**Maternal characteristics** **Age (mean; SD):** 29 years (4.0) **University education:** 56% **Pre-pregnancy BMI (mean; SD):** 21 kg/m2 (3.0) **Offspring characteristics** **Age:** ~20 years **Gender:** Male: 40%	Regression models; substitution model reflecting isocaloric substitution of carbohydrates with protein; macronutrient variables were energy adjusted by the residual model. Protein intake was modelled continuous and in quintiles; test for trend was used across quintiles (t-test with maternal protein intake as categorical variable). Final model: Model Adjusted for maternal pre-pregnancy body mass index, maternal age, parity, smoking status during pregnancy, maternal educational level, offspring sex, offspring body mass index at age 20.	Crude model (β and 95% C.I) with protein, fat and total energy intake entered simultaneously into the model: **Systolic blood pressure:** - Total protein (per 10g change/day): 0.7 (-0.2; 1.7) - Q1: reference - Q2: 2.5 (-0.7; 5.7) - Q3: 1.7 (-1.6; 4.9) - Q4: 2.8 (-0.5; 6.0) - Q5: 2.8 (-0.5; 6.0) P for trend: 0.12 **Diastolic blood pressure:** - Total protein (per 10g change/day): 0.6 (0.0; 1.2) - Q1: reference - Q2: 0.7 (-1.3; 2.7) - Q3: 1.6 (-0.4; 3.6) - Q4: 1.1 (-0.9; 3.1) - Q5: 2.4 (0.4; 4.5) P for trend: 0.02	**Systolic blood pressure –** Total protein (per 10g change/day): 0.6 (-0.1; 1.3) - Q1: reference - Q2: 2.1 (-0.4; 4.7) - Q3: 1.9 (-0.6; 4.4) - Q4: 2.4 (-0.1; 5.0) - Q5: 2.1 (-0.4; 4.7) P for trend: 0.12 **Systolic blood pressure – Animal protein:** - Total animal protein (per 10g change/day): 0.8 (0.1; 1.6) - Q1: reference - Q2: 3.3 (0.6; 6.0) - Q3: 2.1 (-0.8; 4.9) - Q4: 2.3 (-0.7; 5.3) - Q5: 4.1 (0.9; 7.4) P for trend: 0.07 **Systolic blood pressure – Plant protein:** - Total plant protein (per 10g change/day): 2.0 (-0.5; 4.5) - Q1: reference - Q2: 2.5 (-0.3; 5.3) - Q3: 2.8 (-0.2; 5.7) - Q4: 2.5 (-0.7; 5.7) - Q5: 2.9 (-0.6; 6.4) P for trend: 0.19 **Diastolic blood pressure –**- Total protein (per 10g change/day): 0.5 (-0.0; 1.0) - Q1: reference - Q2: 1.2 (-0.8; 3.1) - Q3: 1.4 (-0.6; 3.4) - Q4: 1.4 (-0.6; 3.4) - Q5: 2.1 (0.1; 4.1) P for trend: 0.05

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Diastolic blood pressure – Animal protein:
- Total animal protein (per 10g change/day): 0.7 (0.1; 1.3)
- Q1: reference
- Q2: 2.0 (-0.1; 4.1)
- Q3: 1.5 (-0.6; 3.7)
- Q4: 1.4 (-0.9; 3.7)
- Q5: 2.8 (0.3; 5.2)

P for trend: 0.11

Diastolic blood pressure – Plant protein:
- Total plant protein (per 10g change/day): 1.6 (-0.3; 3.5)
- Q1: reference
- Q2: 1.7 (-0.4; 3.8)
- Q3: 1.9 (-0.3; 4.1)
- Q4: 1.3 (-1.1; 3.8)
- Q5: 2.1 (-0.6; 4.7)

P for trend: 0.25

Similar results were found when changing the substitution condition (i.e. protein could be replaced by either carbohydrates or fat).

Analyses of protein intake from food groups showed that a higher maternal protein intake from milk and milk products was associated with higher offspring DBP. Each 10-g higher milk protein intake was associated with a 0.5-mm Hg mean increase in DBP (95% CI 0.01–1.00) and 0.7-mm Hg mean increase in SBP (95% CI 0.02–1.33).

The increase in offspring BP was similar for both genders.

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Rytter, 2013 [6,7]	Idem ditto	<u>**Maternal characteristics**</u> **Age** while given birth per quintile of marine N-3 PUFA (mean; SD): 1=29.2 years (3.9); 2=28.9 years (3.8); 3=28.9 years (4.1); 4=29.9 years (4.2); 5=29.0 years (4.3) **Education** per quintile of marine N-3 PUFA intake: 1= Elementary=15%; High school or technical school=22%; University=36%; Higher academic=17%; Other=11% 2= Elementary=8%; High school or technical school=29%; University=34%; Higher academic=15%; Other=14% 3= Elementary=13%; High school or technical school=21%; University=41%; Higher academic=19%; Other=6% 4= Elementary=8%; High school or technical school=21%; University=47%; Higher academic=18%; Other=6% 5= Elementary=6%; High school or technical school=18%; University=43%; Higher academic=27%; Other=7% **Pre-pregnancy BMI** per quintile of marine N-3 PUFA intake (mean; SD): 1=21.7 kg/m^2 (3.2); 2=20.8 kg/m^2 (2.1); 3=21.3 kg/m^2 (2.7); 4=21.6 kg/m^2 (3.7); 5=21.7 kg/m^2 (3.0) <u>**Offspring characteristics**</u> **Age:** Between 19 and 20 years old **Gender:** Percentage male per quintile of marine N-3 PUFA intake: First: 40%; Second: 43%; Third: 36%; Fourth: 39%; Fifth: 40%	Multiple linear regression modelling Final model: Adjusted for maternal pre-pregnancy BMI, maternal education, smoking during pregnancy, maternal age, parity, energy intake and gender of the child.	No crude outcomes reported	There was no association between the intake of marine n-3 PUFA during pregnancy and offspring cardio metabolic risk (P for trend over quintiles of energy adjusted intake): - SBP: P=0.854 - DBP: P=0.484 - HR: P=0.852 - SDNN in a 2 min heart rate recording: P=0.162 - HR E/I: P=0.923

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
ALSPAC cohort					
Leary, 2013 [8,9]	All pregnant women living in three health districts of Bristol, England, date of delivery had to lie between 1st of April 1991 and 31st of December 1992. Women who left the study area shortly after enrolment were omitted from further follow-up, but leaving women that completed the questionnaire scheduled for the third trimester of pregnancy have retained in the study.	<u>**Maternal characteristics**</u> **Age (mean; SD)**: 29.2 years (4.6) Maternal **education**: None/Certificate of Secondary Education: N=506; 11.0% Vocational: N=361; 7.9% O levels: N=1591; 34.7% A levels: N=1299; 29.3% Degree: N=827; 18.0% 98% were **Caucasian** **Pre-pregnancy BMI (mean; SD):** 22.8 kg/m^2 (3.7) <u>**Offspring characteristics**</u> **Age (mean; SD):** 15.5 years (0.3) **Gender:** Male = 2254 (47.7%) Female = 2469 (52.3%)	Linear regression analysis with BP at age 15 as main outcome. Models were refitted using SBP and DBP at age 7 as the outcome, to allow for comparison between time points. Final model: Adjusted for gender, age at the time of blood pressure measurement, maternal/paternal energy intake, blood pressure measurement factors, current anthropometry, maternal/paternal factors (as appropriate), social factors, gestation and birth weight.	No crude outcomes reported	There were no significant associations between maternal carbohydrate intake (P=0.3 trend across the quartiles), protein intake (P=0.6), total fat intake (P=0.3), saturated fat intake (P=0.08), polyunsaturated fat intake (P=0.3), monounsaturated fat intake (P=0.6), omega-3 fatty acid intake (P=0.5), with child's **systolic blood pressure** at age 15 years. All analyses were repeated with DBP as an outcome, but there were no associations found between maternal dietary exposure and offspring blood pressure.

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Leary, 2005 [9,10]	Idem ditto	<u>**Maternal characteristics**</u> **Age (mean; SD)**: 29.1 years (4.5) **Maternal education**: CSE: N=906, 13.1% Vocational: N=595, 8.6% O level: N=2478, 35.8% A level: N=1844, 26.6% Degree: N=1102, 15.9% **Pre-pregnancy BMI (mean; SD):** 22.9 kg/m^2 (3.7) <u>**Offspring characteristics**</u> **Age (mean; SD):** 90.2 months (2.2) ~ 7.5 years **Gender:** Male: N=3515, 50.6% Female: N=3429, 49.4%	Linear regression analysis Final model: Adjusted for gender, child's age for BP, maternal pregnancy energy intake, measurement factors, current anthropometry, maternal and social factors, birth weight, and gestation.	No crude outcomes reported	**Dietary quartiles as categorical variables, systolic blood pressure:** Carbohydrate (gram): Q1 <182 = reference; Q2 182-218: β=0.98 (0.16; 1.79); Q3 218-258: β=1.00 (0.02; 1.97); Q4 >258: β=1.52 (0.17; 2.87); P trend across categories=0.04 **Dietary quartiles as continuous variables:** 0.44 (95% CI 0.01 to 0.88) mmHg SBP for a quartile increase in carbohydrate intake. No significant association between maternal intake of protein, total-, saturated-, polyunsaturated-, monounsaturated-, protein/carbohydrate, animal protein, omega-3 fatty acids, milk, meat, fish, fruit, vegetables and offspring systolic blood pressure. If males and females were analysed separately, findings were similar. There were no relations between maternal diet in pregnancy and offspring diastolic blood pressure.

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Millard, 2013 [9,11]	Idem ditto	<u>**Maternal characteristics**</u> **Mothers education:** <o-level: N=875; 19.2% o-level: N=1595; 35.0% a-level: N=1292; 28.3% degree or above: N=797; 17.5% **Pre-pregnancy weight (mean; SD):** 60.56 kg (11.91) <u>**Offspring characteristics**</u> **Age (mean; SD):** 808.22 weeks (17.45) ~ 15.5 years **Gender:** Female: N=2436; 52.2% **Ethnicity:** White N=4450; 95.7%	Multivariate linear regression model Final model: Adjusted for child gender, child age at 15 year clinic, household social class, maternal education, ethnicity, parity, maternal smoking during pregnancy, previous hypertension, maternal pre-pregnancy BMI and gestational weight gain 0-18 weeks, gestational diabetes, hypertensive disorders of pregnancy, gestational weight gain, gestational age, birthweight, offspring physical activity.	No crude outcomes reported	Coefficients from regression models represent the mean difference in cardiovascular risk factors (in their measured units) for a one SD increase in MET physical activity, which is equivalent to approximately 15 MET h/week. No significant associations between maternal leisure time PA during pregnancy and offspring SBP and DBP: SBP: 0.017 (-0.301; 0.334) DBP: 0.018 (-0.250; 0.286) There was no evidence that the associations differed either by offspring gender or maternal pre-pregnancy BMI status.

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Generation R					
van den Hil, 2013 [12,13]	Mothers with a residency in Rotterdam, the Netherlands, at their delivery date, which should between April 2002 and January 2006. In this particular study, only Dutch mothers, enrolled before a gestational age of 25 weeks, were included. Multiple births and stillbirths were excluded.	**<u>Maternal characteristics</u>** Characteristics based on not imputed data: **Age (median; 95% range):** 31.8 years (22.2-39.6) **Education:** Primary: 2.5%; Secondary: 36.6%; Higher: 60.9% **Dutch** women only **Pre-pregnancy BMI (median; 95% range):** 22.3 kg/m^2 (18.2-34.3) **<u>Offspring characteristics</u>** **Age (median; 95% range):** - Boys: 6.0 years (5.6-7.5) - Girls: median 6.0 (5.6-7.1) **Gender:** 49.8% male	Mixed models; four child BP measurements were used as repeated outcomes. Test for trends were conducted by using maternal dietary intake variables as the continuous variable in the linear mixed models. Final model: Adjusted for child's gender, child's age at BP measurement, maternal age, pre-pregnancy BMI, alcohol use and smoking during pregnancy, educational level, gestational age at birth, birth weight, current BMI and month in which the blood pressure measurement was taken. For macronutrients analyses, analyses were adjusted for energy intake of the other nutrients.	Crude models were adjusted for child's gender and age at BP measurement. Significant results in SBP (regression coefficient; 95% C.I.): Protein:carbohydrate ratio: - Second quintile vs. first quintile = -1.11 (-2.05; -0.17) - Fifth quintile vs. first quintile = -0.99 (-1.93;-0.06) No significant associations for total energy intake, carbohydrate intake, fat intake and protein intake. Significant results in DBP (regression coefficient; 95% C.I.) : Protein:carbohydrate ratio: - Third quintile vs. first quintile = -0.80 (-1.58;-0.02) No significant associations for total energy intake, carbohydrate intake, fat intake and protein intake.	There were no significant associations between maternal daily energy intake, intake of carbohydrates, fat and proteins and childhood SBP and DBP, nor with the protein:carbohydrate ratio.

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Leermakers, 2017 [13,14]	Idem ditto	<u>**Maternal characteristics**</u> **Age (mean; SD):** 31.7 years (4.2) **Pre-pregnancy BMI (mean; SD):** 23.3 kg/m^2 (3.9) **Education level:** - Primary or secondary: 1019 (37.8%) - Higher: 1640 (61.7%) - Missing: 36 (1.3%) Only women of **Dutch** national origin <u>**Offspring characteristics**</u> **Age:** 6 years **Gender:** Boys: 1351 (50.1%)	Linear regression models; dietary patterns were analysed categorically (in quartiles) as well as linear. Final model: Adjusted for maternal age at intake, gestational age at dietary assessment, folic acid use, smoking and alcohol during pregnancy, maternal educational level, family income, parity, maternal pre-pregnancy BMI, maternal stress during pregnancy, child gender, breast feeding, watching television at age 2 years, participation in sports at age 6 years and height at age 6 years.	**DHD score; PWV:** Q1 (low): reference Q2: -0.01 (-0.13; 0.12) Q3: -0.17 (-0.29; -0.05) P<0.0125 Q4: -0.09 (-0.21; 0.04) Per SD: -0.05 (-0.10; -0.01) P linear trend = 0.02 **DHD score; SBP:** Q1 (low): reference Q2: -0.10 (-0.21; -0.01) Q3: -0.11 (-0.20; 0.01) Q4: -0.04 (-0.15; 0.06) Per SD: -0.02 (-0.05; 0.02) P linear trend = 0.45 **DHD score; DBP:** Q1 (low): reference Q2: -0.05 (-0.15; 0.06) Q3: -0.03 (-0.14; 0.08) Q4: 0.03 (-0.08; 0.14) Per SD: 0.01 (-0.03; 0.05) P linear trend = 0.60 **A posteriori-dietary patterns:** <u>Vegetable, fish and oil dietary pattern - Pulse wave velocity:</u> Q1 (low): reference Q2: -0.09 (-0.21; 0.04) Q3: -0.10 (-0.23; 0.02) Q4: -0.19 (-0.31; -0.07) Per SD: -0.05 (-0.10; -0.01) P linear trend = 0.02 There were no statistically significant associations between the vegetable, fish and oil dietary pattern SBP (P trend=0.13; with exception of Q3 vs. Q1: -0.18 (-0.28; -0.07);	**DHD score; PWV:** Q1 (low): reference Q2: -0.01 (-0.14; 0.11) Q3: -0.18 (-0.30; -0.05) P<0.0125 Q4: -0.09 (-0.22; 0.04) Per SD: 0.05 (-0.10; -0.01) P linear trend = 0.03 There were no statistically significant associations between maternal DHD index and childhood systolic BP (P trend = 0.99); diastolic BP (P trend = 0.23). **A posteriori-dietary patterns:** <u>Vegetable, fish and oil dietary pattern - Pulse wave velocity:</u> Q1 (low): reference Q2: -0.09 (-0.22; 0.04) Q3: -0.11 (-0.24; 0.02) Q4: -0.19 (-0.33; -0.06) Per SD: -0.05 (-0.10; -0.01) P linear trend = 0.03 For the other a posteriori dietary patterns, no statistically significant associations were observed. No effect modification by maternal pre-pregnancy BMI, child birth, weight for gestational age, or child gender was observed.

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DBP (P trend=0.10; with exception of Q3 vs. Q1: -0.15 (-0.26; -0.04).

The nuts, soy and high fibre cereals dietary pattern – SBP:
Q1 (low): reference
Q2: -0.02 (-0.13; 0.09)
Q3: -0.04 (-0.15; 0.07)
Q4: -0.13 (-0.24; -0.02)
Per SD: -0.05 (-0.09; -0.01)
P linear trend = 0.01
There were no statistically significant associations between the nuts, soy and high fibre cereals dietary pattern and PWV (P trend =0.34); DBP (P trend =0.43).

There were no statistically significant associations between the margarine, snacks and sugar dietary pattern and PWV (P trend=0.31); SBP (P trend=0.78); DBP (P trend=0.60).

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Multiple mother-child cohorts combined					
Chatzi, 2016 [15–18]	**Project VIVA:** Women were recruited between April 22, 1999, and July 31, 2002 when attending their initial prenatal visit at eight urban and suburban obstetric offices of a multispecialty group practice in eastern Massachusetts. Inclusion criteria were fluency in English, gestational age less than 22 weeks at the initial prenatal clinical appointment, and singleton pregnancy. Women became ineligible after multiple gestation, transferring obstetric care to a non-study site, or when no longer pregnant. **Rhea cohort:** Residents of the prefecture of Heraklion were recruited when becoming pregnant between February 2007 and February 2008; first contact before 15 weeks' gestation at the time of the first major ultrasound examination.	**Maternal characteristics** **Age (N; %):** Project VIVA <25: 25 (2.5) 25-35: 655 (65.7) ≥35: 317 (31.8) Rhea <25: 13 (2.3) 25-35: 461 (81.4) ≥35: 92 (16.3) **College graduate (N; %):** Project VIVA No: 289 (29.0) Yes: 708 (71.0) Rhea No: 381 (67.4) Yes: 184 (32.6) **Pre-pregnancy BMI ≥25 kg/m^2 (N; %):** Project VIVA No: 651 (65.5) Yes: 343 (34.5) Rhea No: 377 (67.0) Yes: 186 (33.0) **Offspring characteristics** **Gender (N; %):** Project VIVA Male: 491 (49.2) Female: 506 (50.8) Rhea Male: 308 (54.1) Female: 261 (45.9) **Age (median; IQR):** Project VIVA: 7.7 years; 7.3–8.3 Rhea: 4.2 years; 4.1–4.3	Linear regression models First associations were analysed separately for each cohort, thereafter a pooled effect was estimated using mixed model, finally random effects meta-analysis was used to estimate the overall summary effect of the individual cohorts to check consistency with the pooled analysis. Final model: Adjusted for child gender, age at outcome, maternal age, pre-pregnancy body mass index, race/ethnicity, education level, parity, and smoking during pregnancy, birth weight for gestation age z-score and breastfeeding duration, fast food intake, TV viewing Effect modification was tested for maternal pre-pregnancy BMI (≥25 vs. <25 kg/m2), maternal smoking during pregnancy (yes vs. no), and breastfeeding duration (>3 vs. ≤ 3 months).	Results of the crude model includes child gender and age at outcome: Association of MDS (per 3 point increment on a 0-9 scale) and child health outcomes: **Project VIVA** SBP: -1.58 (-2.59; -0.57) DBP: -0.83 (-1.50; -0.16) **Rhea** SBP: -0.35 (-1.70; 1.00) DBP: -0.12 (-1.02; 0.79) **Combined effect-pooled analysis** SBP: -1.13 (-1.93; -0.33) DBP: -0.56 (-1.04; -0.07) **Study-level meta-analysis** SBP: -1.0 (-2.2; 0.1) DBP: -0.5 (-1.2, 0.1)	Association of MDS (per 3 point increment on a 0-9 scale) and child health outcomes: **Project VIVA** SBP: -1.17 (-2.18; -0.17) DBP: -0.77 (-1.48; -0.05) **Rhea** No statistically significant results on blood pressure outcomes. **Combined effect-pooled analysis** SBP: -0.82 (-1.40; -0.25) DBP: -0.49 (-0.96; -0.02) **Study-level meta-analysis** SBP: -0.9 (-1.7; -0.1) No statistically significant results on DBP. There was no evidence for a multiplicative interaction of adherence to the Mediterranean diet during pregnancy with pre-pregnancy BMI, maternal smoking during pregnancy and breastfeeding.

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Other mother-child cohorts					
Adair, 2001 [19]	All pregnant women in the 33 selected Philippines communities, that gave birth between May 1, 1983, and April 30, 1984.	**<u>Maternal characteristics</u>** No maternal characteristics are mentioned, with exception of weight 2 months after giving birth, +/- 15% of women had a BMI suggestive of chronic energy deficiency. **<u>Offspring characteristics</u>** **Age (mean; SD)**: Boys 16.08 years (0.33); Girls 15.04 years (0.34) **Gender:** Boys N=967; girls N=1059	Least-square regression Final model: Adjusted for birth weight, birth length, current height, age and BMI (all child characteristics), mother's height during pregnancy and mother's triceps during pregnancy, mother's diet variables during pregnancy, mother's current SBP.	No crude outcomes reported	B-coefficients of models that included maternal diet during pregnancy: **Systolic blood pressure - Boys:** Energy intake: -0.16 % energy from fat: -0.03 % energy from protein: -0.15 (P≤0.10). **Systolic blood pressure - Girls:** Energy intake: 0.01 % energy from fat: -0.08 (P≤0.01) % energy from protein: -0.02 **Diastolic blood pressure - Boys:** Energy intake: 0.01 % energy from fat: 0.03 % energy from protein: -0.02 **Diastolic blood pressure - Girls:** Energy intake: -0.04 % energy from fat: -0.07 (P≤0.05) % energy from protein: -0.01

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Blumfield, 2015 [20]	Pregnant women from the antenatal clinic at the John Hunter Hospital from July 2006 to June 2008. No exclusion criteria were used during recruitment.	**Maternal characteristics** **Age (mean; SD)**: 29.1 years (5.4). 74.4% of all women had/had more than Australian **year 12 high school** certificate; 93% were born in Australia. **Pre-pregnancy weight** median = 65.0 kg (IQR: 58.0-79.0) **Offspring characteristics** **Age:** Outcomes were measured at birth (no BP); 3; 6; 9; 12; 24; 36 and 48 months. **Gender:** Male N=67 (51.9%); female N=62 (48.1%).	Linear mixed models In addition, effects of maternal macronutrient intake during pregnancy on child mean SBP was plotted using a surface plot. Final model: Adjusted for maternal energy intake and child birthweight, and child BMI z-score.	Significant results for systolic blood pressure (mmHg): - Omega-6 fatty acids (en%): β=0.84 (95% C.I. =0.05;1.64) P=0.04 Energy adjusted using the residual method: - Polyunsaturated fat (g): β=0.43 (95% C.I.=0.06;0.80) P=0.02. - Omega-6 fatty acids (g): β=0.50 (95% C.I.=0.10; 0.90) P=0.02. There were no significant results for diastolic blood pressure. Results of the surface plot: mean child systolic BP remained constant with changing proportions of dietary fat, but was influenced by the P:C ratio of maternal diet during pregnancy. A maternal diet with a P:C ratio of 0.29 corresponded with a child systolic BP of 104.5, compared with a systolic BP of 97.5 for a P:C ratio of 0.9. Child systolic BP was greatest at low proportions of dietary protein (<16% of energy) and high carbohydrate (>40% of energy) intakes.	Significant results for systolic blood pressure (mmHg): - Omega-6 fatty acids (en%): β=0.89 (0.09;1.69) P=0.03 - P:C ratio: β=-14.14 (-27.68;-0.60) P=0.04 Energy adjusted using the residual method: - Polyunsaturated fat (g): β=0.44 (0.06;0.81) P=0.02 - Omega-6 fatty acids (g): β=0.51 (0.10;0.92) P=0.01 There were no significant results for diastolic blood pressure.

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Bryant, 2015 [21,22]	Female patients aged 20-34 years in Southampton between 1998 and 2002. Women who become pregnant are recruited into the pregnancy phase of the SWS.	**<u>Maternal characteristics</u>** No specific age given for this subsample of the SWS cohort. **Educational attainment:** 11.5% none/minimal; 56% standard school qualifications age 16-18 y; 32.5% post school qualifications. Only few subjects that were non-white Caucasian were included in the SWS cohort. **Pre-pregnancy BMI (mean; IQR):** 24.1 kg/m^2 (22.2-27.7) **<u>Offspring characteristics</u>** **Age:** 9.4 years (IQR=9.3-9.6) **Gender:** Male N=116; female N=118	Multivariate linear regression models Final model: Adjusted for social class (3 groups high-low), educational attainment (3 groups high-low), BMI (kg/m2), breastfeeding duration (months), child gender (reference category is male).	Crude (adjusted for gender) analyses of maternal characteristics and child's PWV (m/s): - Maternal early pregnancy oily fish consumption: β=-0.062 (-0.124, -0.001); p-value = 0.046. - Maternal late pregnancy oily fish consumption: β=-0.084 (-0.138, -0.031); P= 0.002.	Maternal late pregnancy oily fish portions/week; β=-0.083 (-0.136, -0.030); p-value=0.002. No significant association for maternal early pregnancy oily fish with offspring PWV. After adjusting for mother's qualification level and child's gender, maternal oily fish consumption was not associated with childhood heart rate (beats per minute), SBP, DBP, nor mean arterial pressure (all mmHg).

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Danielsen, 2013 [6,23]	Women scheduled to attend the routine 30th week antenatal visit at a midwifery practice that covers a geographically well-defined area of the city of Århus in Denmark.	**Maternal characteristics** Based on min/day maternal walking and bike riding (% women): **Pre-pregnancy BMI (mean):** **0-19 min/d:** 1-18.5: 12.7%; 18.6-24.9: 8.7%; 25-29.9: 20.8%; 30-: 5.0% **20-49 min/d:** 1-18.5: 38.0%; 18.6-24.9: 45.0%; 25-29.9: 39.6%; 30-: 55.0% **50-99 min/d:** 1-18.5: 31.6%; 18.6-24.9: 34.3%; 25-29.9: 31.3%; 30-: 30.0% **100- min/d:** 1-18.5: 17.7%; 18.6-24.9: 12.0%; 25-29.9: 8.3%; 30-: 10.0% **Education:** **0-19 min/d:** None: 7.0%; Vocational: 11.5%; Bachelor: 11.7%; Academic: 6.9% **20-49 min/d:** None: 40.9%; Vocational: 45.7%; Bachelor: 42.5%; Academic: 46.6% **50-99 min/d:** None: 34.8%; Vocational: 33.2%; Bachelor: 31.6%; Academic: 38.9% **100- min/d:** None: 17.4%; Vocational: 9.6%; Bachelor: 14.2%; Academic: 7.6% **Offspring characteristics** Based on min/day maternal walking and bike riding (% offspring): **Gender:** **0-19 min/d:** Male:10.5%; Female: 9.8% **20-49 min/d:** Male: 46.0%; Female: 41.5% **50-99 min/d:** Male: 32.3%; Female: 35.2% **100- min/d:** Male: 11.3%; Female: 13.5% **Age:** 20 years, no range given	Multiple linear regression analysis Finale model: Adjusted for pre-pregnancy BMI (kg/m2), height (cm), smoking, education, and offspring sex (when not stratified for sex).	MS markers in male and female offspring/1 h increment/day in their mothers' daily amount of walking and bike riding (hours/day) in the second trimester, difference: - Diastolic blood pressure: 1.19 (0.08 to 2.29); P=0.04 No significant results for SBP. MS markers in male offspring/1 h increment/day in their mothers' daily amount of walking and bike riding (h/day) in the second trimester: - Systolic blood pressure: 2.64 (0.18 to 5.11); P=0.04 No significant results for DBP. MS markers in female offspring/1 h increment/day in their mothers' daily amount of walking and bike riding (hours/day) in the second trimester: No significant results for SBP and DBP.	MS markers in male and female offspring/1 h increment/day in their mothers' daily amount of walking and bike riding (hours/day) in the second trimester: - DBP: 1.12 (0.03 to 2.20); P=0.04 No significant results for SBP. MS markers in male offspring/1 h increment/day in their mothers' daily amount of walking and bike riding (h/day) in the second trimester: - SBP: 2.61 (0.18 to 5.04); P=0.04 No significant results for DBP. MS markers in female offspring/1 h increment/day in mothers' daily amount of walking and bike riding (hours/day) in the second trimester: No significant results for SBP and DBP.

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Gale, 2006 [24]	In 1991 to 1992, white women aged 16 years or older with singleton pregnancies at 17 weeks of gestation were recruited at the Princess Anne Maternity Hospital in Southampton, UK; diabetics and those who had undergone hormonal treatment to conceive were excluded.	**Maternal characteristics** **Mean age (SD) at 15 weeks of gestation:** 27.0 years (4.9) **Social class at 15 weeks of gestation:** - I/II = 25.8% - III = 56.8% - IV/V = 17.4% All women were **white** **Pre-pregnancy BMI** (asked at 15 weeks of gestation): 21.9 kg/m2 (IQR: 20.2-24.3 kg/m2) **Offspring characteristics** **Age:** 9 years **Gender:** At birth 46.8% was female	Partial correlation coefficients; relations between maternal nutrient intake and IMT. Linear regression analyses; mean differences in IMT according to quarters of the distribution of nutrient intakes. Final model; Adjusted for gender, current weight, systolic blood pressure, and exercise, maternal social class, pre-pregnancy BMI, smoking, and strenuous exercise during pregnancy.	**Partial correlation coefficients between IMT and maternal nutrient intake in early and late pregnancy adjusted for gender:** **15 weeks of gestation:** - Energy (kcal): r=-0.181;P=0.0009 - Protein (g): r=-0.151; P=0.030 - Total fat (g): r=-0.180; P=0.004 - Saturated fat (g): r=-0.187; P=0.007 - Carbohydrate (g): r=-0.155; P=0.025 - Ratio of energy intake to BMR: r=-0.191; P=0.005 No significant associations with energy percentages. **32 weeks of gestation:** - Energy (kcal): r=-0.225; P=0.001 - Protein (g): r=-0.158; P=0.023 - Total fat (g): r=-0.236; P=0.001 - Saturated fat (g): r=-0.241; P=<0.001 - Carbohydrate (g): r=-0.188; P=0.007 - Ratio of energy intake to BMR: r=-0.225; P=0.001 No significant associations with energy percentages.	**Maternal intake in early pregnancy with differences in IMT.** **Early pregnancy:** Energy intake: Q1: 0.025 (0.001, 0.048) Q2: 0.024 (0.001, 0.048) Q3: 0.024 (0.001, 0.047) Q4: Reference P linear trend: 0.026 Total fat: Q1: 0.025 (0.002, 0.049) Q2: 0.013 (-0.010, 0.037) Q3: 0.013 (-0.010, 0.036) Q4: Reference P linear trend: 0.012 Protein: Q1: 0.027 (0.003, 0.050) Q2: 0.022 (-0.001, 0.044) Q3: 0.019 (-0.005, 0.042) Q4: Reference P linear trend: 0.018 No significant linear trend for carbohydrate intake (P=0.057) **Maternal intake in late pregnancy with differences in IMT.** **Late pregnancy:** Energy intake: Q1: 0.027 (0.004, 0.049) Q2: 0.037 (0.014, 0.060) Q3: 0.009 (-0.013, 0.032) Q4: Reference P linear trend: 0.007 Total fat: Q1: 0.034 (0.011, 0.057) Q2: 0.018 (-0.006, 0.041) Q3: 0.014 (-0.009, 0.037) Q4: Reference

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	P linear trend: 0.004 Protein: Q1: 0.025 (0.002, 0.048) Q2: 0.016 (-0.008, 0.039) Q3: 0.019 (-0.003, 0.043) Q4: Reference P linear trend: 0.032 Carbohydrate: Q1: 0.024 (0.001, 0.047) Q2: 0.011 (-0.012, 0.034) Q3: 0.005 (-0.018, 0.29) Q4: Reference P linear trend: 0.012

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Huh, 2005 [17,25]	Women were recruited between April 22, 1999, and July 31, 2002 when attending their initial prenatal visit at eight urban and suburban obstetric offices of a multispecialty group practice in eastern Massachusetts. Inclusion criteria were fluency in English, gestational age less than 22 weeks at the initial prenatal clinical appointment, and singleton pregnancy. Women became ineligible after multiple gestation, transferring obstetric care to a non-study site, or when no longer pregnant.	<u>**Maternal characteristics**</u> **Age (mean, years) per quartile of second trimester protein intake (as % of energy):** 1=31.2; 2=32.9; 3=32.8; 4=32.8 **Education per quartile of second trimester protein intake (%):** High school: 1=8.4; 2=3.9; 3=5.7; 4=5.7 <4yr of college: 1=25.3; 2=22.6; 3=15.4; 4=18.5 4yr of college: 1=35.6; 2=40.0; 3=33.8; 4=37.9 Graduate degree: 1=30.7; 2=33.5; 3=45.2; 4=37.9 **Race per quartile of second trimester protein intake (%):** White: 1=68.0; 2=80.0; 3=80.7; 4=70.5 Black: 1=16.4; 2=7.8; 3=7.5; 4=11.5 Hispanic: 1=6.7; 2=4.4; 3=4.0; 4=4.4 Asian: 1=4.4; 2=4.4; 3=4.0; 4=8.8 Other: 1=4.4; 2=3.5; 3=4.0; 4=4.9 **Pre-pregnancy BMI per quartile of second trimester protein intake (mean, kg/m2):** 1 = 24.5; 2 = 24.5; 3 = 24.2; 4 = 24.3 <u>**Offspring characteristics**</u> **Age (mean) at 6-months visit per quartile of second trimester protein intake:** 1=6.4 months; 2=6.5 months; 3=6.5 months; 4=6.6 months **Gender by quartile of second trimester protein intake:** 1=49.8% male; 2=48.7% male; 3=48.7% male; 4=52.4% male	Mixed effect regression models, incorporating each of the up to 5 BP measurements per infant as repeated outcome measures. Final model: Adjusted for energy, blood pressure measurement order, cuff size, appendage, position, state, and machine model, birth weight for gestational age z-score, gestational age, infant age, gender, and 6-months length and weight, maternal race/ethnicity, income	No crude outcomes reported	**Change in 6-month infant SBP (mmHg) per each 1% of energy from protein in the first trimester:** -0.01 (SE 0.12; 95% C.I. -0.24, 0.23) **Change in 6-month infant SBP (mmHg) per each 1% of energy from protein in the second trimester:** 0.14 (SE 0.13) 95% C.I. -0.12, 0.40 Second trimester absolute maternal protein intake was not associated with SBP; Multivariable substitution models, substituting protein from carbohydrate intake, did not affect offspring SBP; No difference between boys and girls in the association between second trimester protein intake and offspring SBP; No associations between animal protein intake and SBP. Results for DBP were very similar to those for SBP. The fully adjusted model estimated a -0.13 mmHg increase in DBP for each 1% increase in energy from protein (95% C.I. -0.07, 0.32) during the second trimester; and of -0.07 mmHg (95% C.I. -0.25, 0.12) for each 1% increase in protein intake during the first trimester.

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
May, 2014 [26,27]	**Inclusion**: 20-35 years of age, less than 28 weeks' gestation, non-smoking, and no history of alcohol or illicit drug use. **Exclusion:** expecting multiple infants, considered to have a high risk pregnancy.	**<u>Maternal characteristics</u>** **Age (mean; SD)**: 28.95 years (3.90) **Pre-pregnancy BMI (mean; SD):** 24.65 kg/m^2 (4.81) **<u>Offspring characteristics</u>** **Age:** 1 month **Gender:** 23 females and 20 males	Women were assigned to the exercise group if they engaged in moderate to vigorous aerobic exercise for a minimum of 30 minutes, 3x per week throughout pregnancy, otherwise they were assigned to the control group. Student's t-tests were used to compare infant outcomes between the exercise group and the control group.	Mean (SD): - Infant heart rate: control 153 (15.5) vs. exercise 147 (10.0); P= 0.185 - SDNN (ms): control 34.8 (14.6) vs. exercise 38.8 (10.8); P=0.342 - log RMSSD: control 0.87 (0.21) vs. exercise 1.03 (0.14); P=0.010 - log LF: control 2.06 (0.36) vs. exercise 2.38 (0.20); P=0.002 - log HF: control 1.38 (0.39) vs. exercise 1.72 (0.27); P=0.004 - LF/HF: control 5.23 (2.24) vs. exercise 5.02 (2.16); P=0.763	N.A.

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Study	In- and exclusion criteria	Population characteristics	Analysis	Crude results	Adjusted results**
Rerkasem, 2012 [28,29]	Pregnant women with a gestational age of less than 24 weeks. Excluded were women who did not give birth in the Maharai Nakorn Chiang Mai Hospital or the Maternal-Child Health Care Centre, Chiang Mai, Thailand, the birth of twins, stillbirth and abortions.	**<u>Maternal characteristics</u>** **Age (mean; 95% C.I.) stratified by gender offspring:** - Mothers of male offspring: 26.0 years (25.5-26.5) - Mothers of female offspring: 26.5 years (26.0-27.0) **Education** of the mothers included in this subsample is similar to the original study population: majority (78.1%) attended school up to grade 6; 1/3 of the women were housewives; most common occupation was agricultural work. Household incomes were not high, almost one half having an average monthly income of 2.500 baht of less. **Pre-pregnancy BMI (mean; 95% C.I.) stratified by gender offspring:** - Mothers of male offspring: 21.3 (21.0-21.6) - Mothers of female offspring: 21.4 (21.1-21.6) **<u>Offspring characteristics</u>** **Age:** 20 years **Gender:** N=304 female; N=260 males	Linear regression analysis Final model: Analyses were adjusted with all factors that were positively associated and correlated with CIMT: gender, fasting blood sugar of the child, body mass index of the child, SBP of the child. In addition, maternal energy intake is included as a confounder.	No crude outcomes reported	Mean (95% C.I.) of CIMT by quartiles of nutrient intakes: **First trimester:** Protein intake: Q1: 0.452 (0.440-0.463) Q2: 0.443 (0.437-0.449) Q3: 0.435 (0.429-0.441) Q4: 0.426 (0.415-0.438) P-value for trend = 0.02 No significant associations with fat intake (P=0.06, negatively correlated) and carbohydrate intake (P=0.39). **Second trimester:** No significant associations with protein (P=0.27), fat (P=0.33) and carbohydrate intake (P=0.34). **Third trimester:** No significant associations with protein (P=0.69), fat (P=0.44) and carbohydrate intake (P=0.27). **Secondary outcomes:** Correlations between the amount of maternal **protein intake** in the **first trimester** and blood pressure: statistically significant negative correlation only with diastolic BP (p=0.02).

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