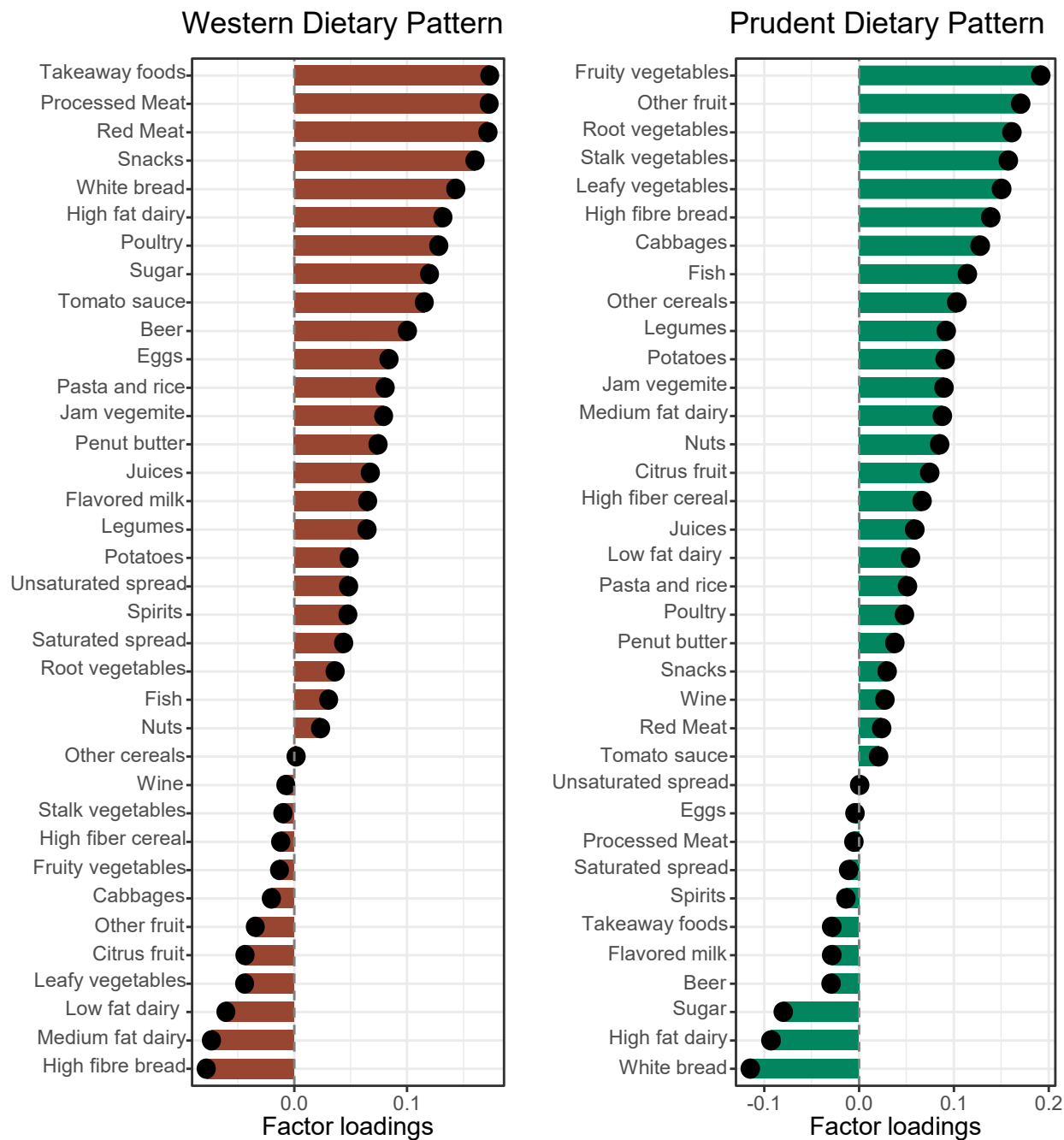


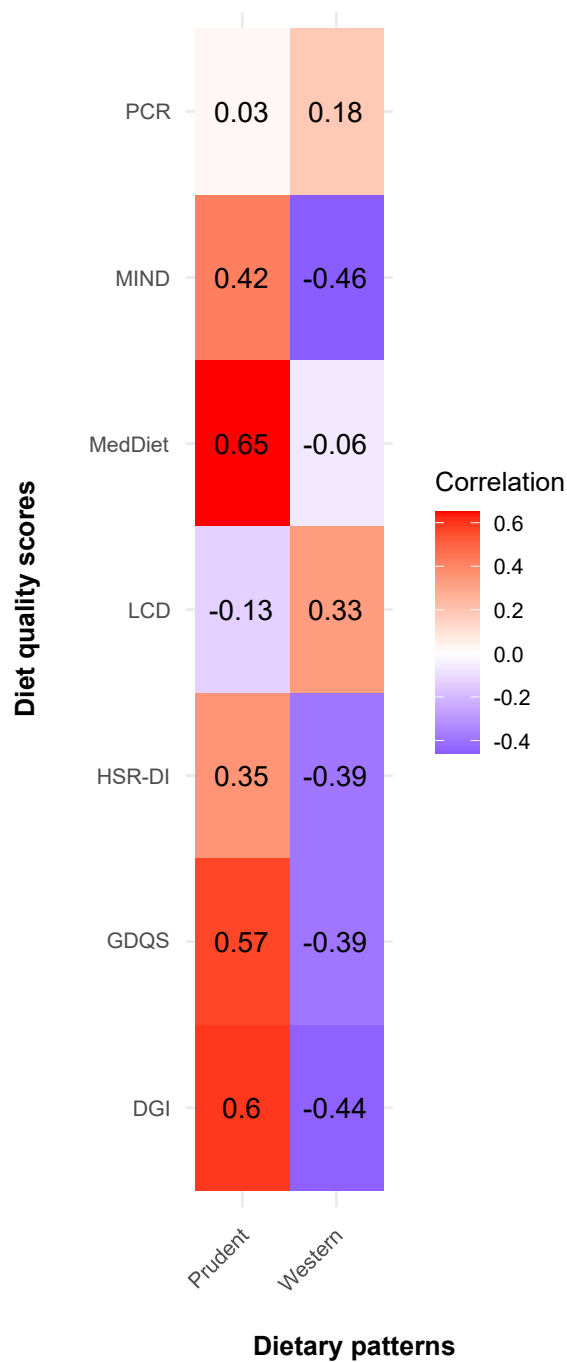
Empirically derived dietary patterns, plasma lipidome and their associations with cardiometabolic health and mortality: Findings from prospective cohort studies



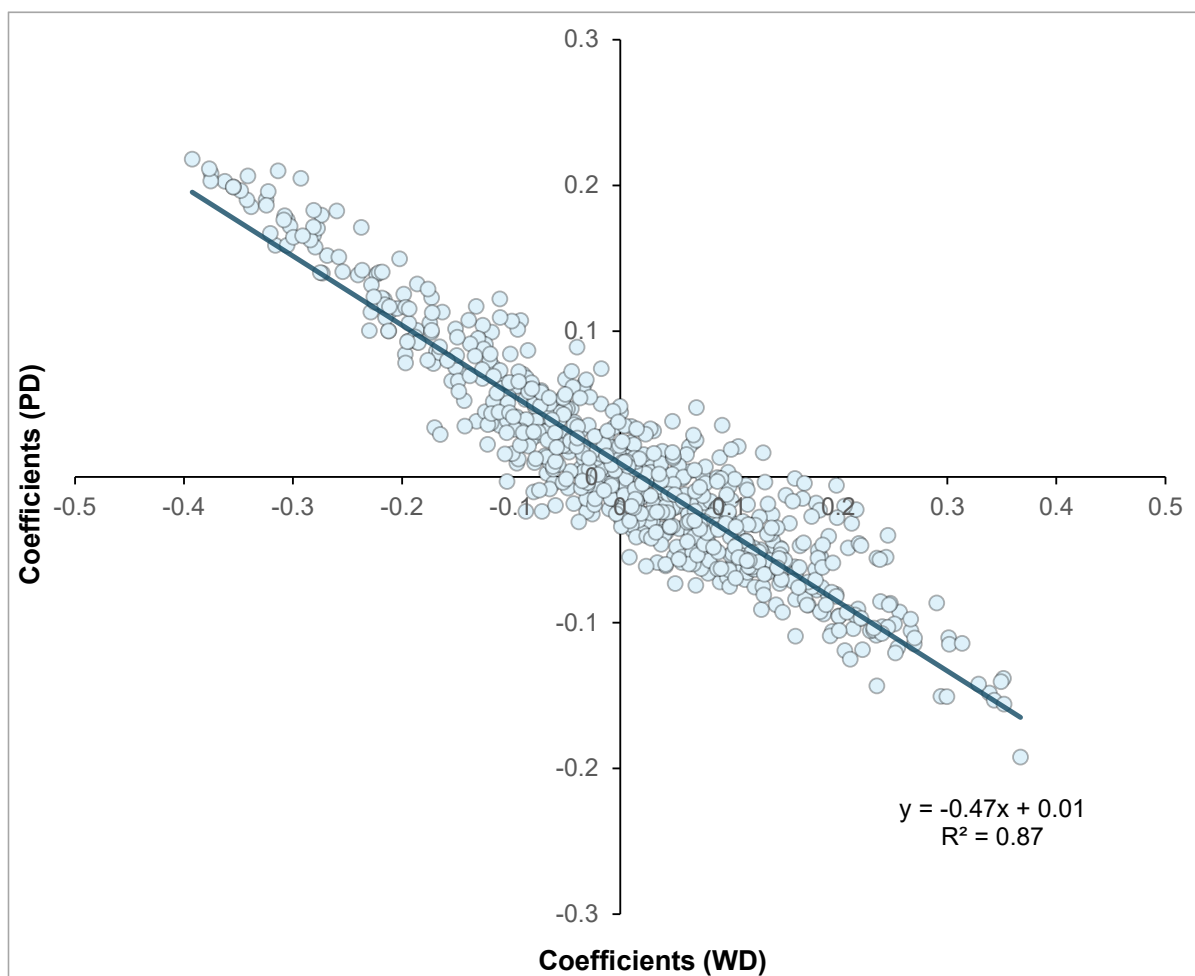
Supplementary Fig. 1 Factor loadings of dietary patterns according to factor analysis using all sample of AusDiab at baseline, n=10,339.

Food group	Western Diet	Prudent Diet
High fat dairy	0.44	-0.26
Medium fat dairy	-0.23	0.27
low fat dairy	-0.20	0.16
Flavored milk	0.22	-0.07
Juices	0.27	0.23
Red Meat	0.64	0.16
Processed Meat	0.63	0.06
Poultry	0.49	0.22
Fish	0.16	0.41
Takeaway foods	0.62	-0.02
Pasta and rice	0.32	0.21
High fiber cereal	-0.01	0.22
Other cereals	0.05	0.36
Potatoes	0.22	0.34
Citrus fruit	-0.12	0.24
Other fruit	-0.05	0.57
Fruity vegetables	0.04	0.66
Stalk vegetables	0.04	0.54
Root vegetables	0.21	0.57
Cabbages	-0.02	0.43
Leafy vegetables	-0.09	0.50
Legumes	0.28	0.35
High fibre bread	-0.22	0.44
White bread	0.47	-0.33
Eggs	0.31	0.02
Unsaturated spread	0.18	0.03
Saturated spread	0.16	-0.02
Beer	0.35	-0.05
Wine	-0.01	0.09
Spirits	0.17	-0.03
Snacks	0.60	0.18
Nuts	0.12	0.30
Penut butter	0.29	0.16
Jam vegemite	0.33	0.35
Tomato sauce	0.43	0.12
Sugar	0.40	-0.22

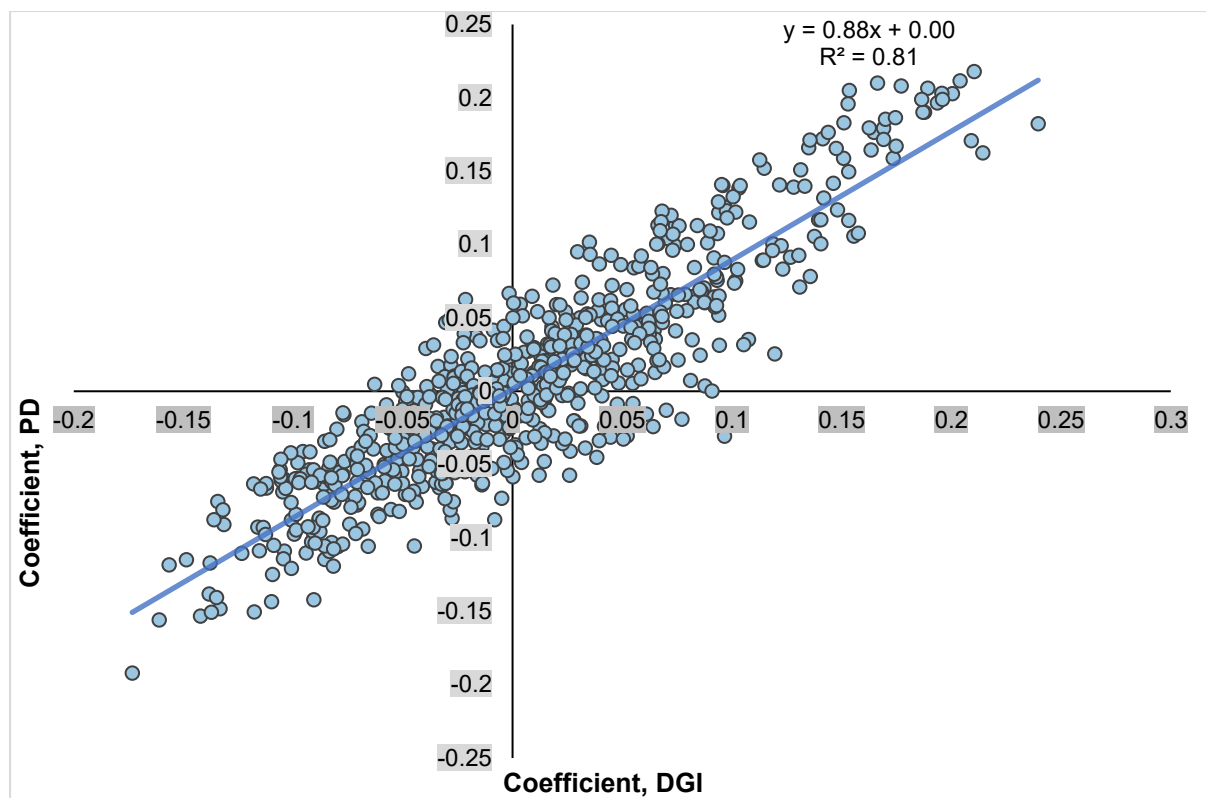
Supplementary Fig. 2 The Pearson's correlation between food groups and the dietary patterns in the AusDiab cohort.



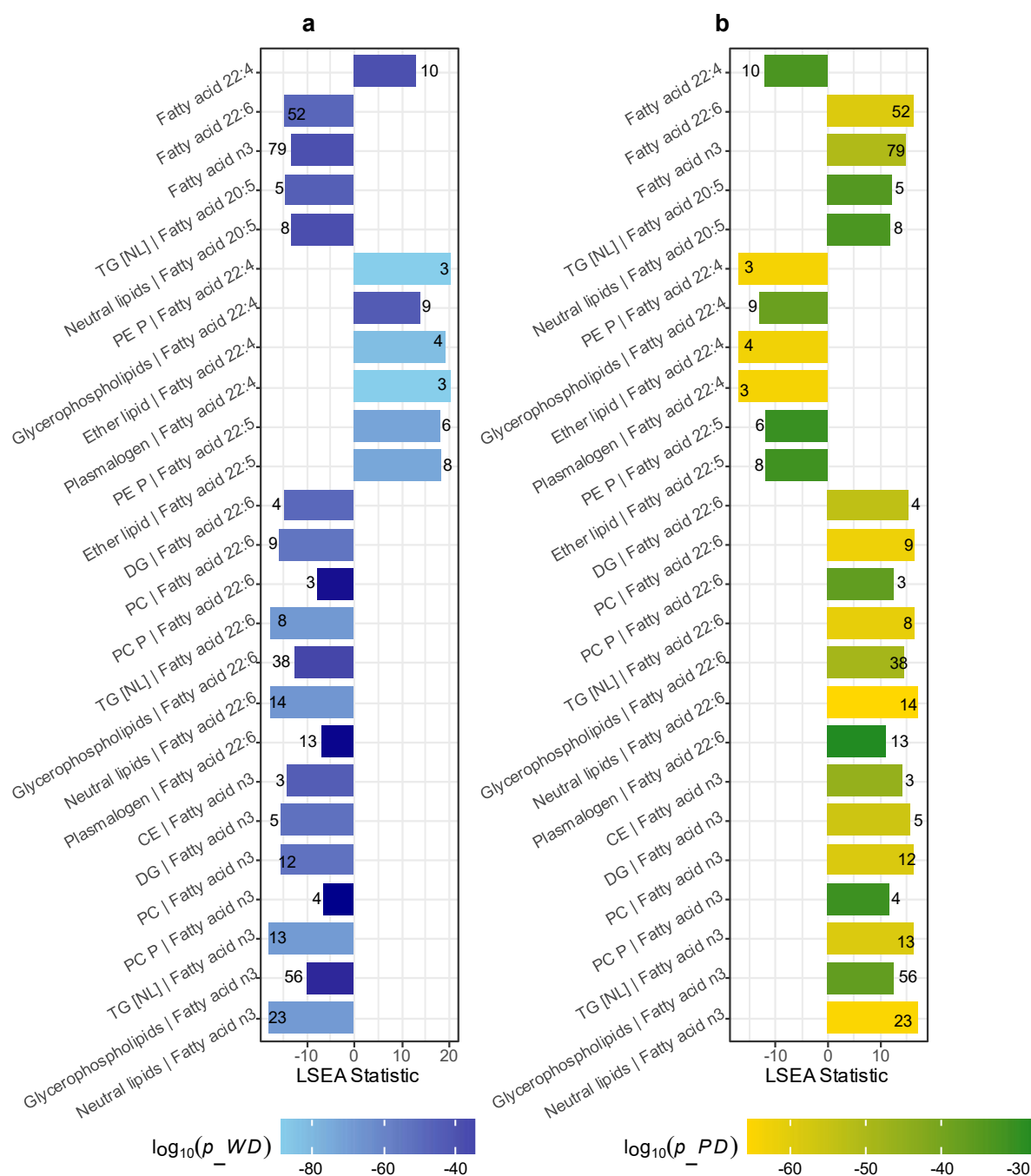
Supplementary Fig. 3 The correlation between dietary patterns calculated using factor analysis versus healthy diet scores in the cohort. HSR-DI, Health Star Rating Dietary Index; DGI, Australian Dietary Guideline Index; GDQS, Global Diet Quality Score; MIND, Mediterranean-DASH Diet Intervention for Neurodegenerative Delay; Med Diet, Mediterranean Diet; LCD, Low Carbohydrate Score.



Supplementary Fig. 4 The correlation between regression coefficients of each lipid species associated with WD (X-axis) versus PD pattern (Y-axis) in the AusDiab cohort. The underlying data can be found in the Supplementary Table 2 and 3. WD, Western diet; PD, prudent diet.

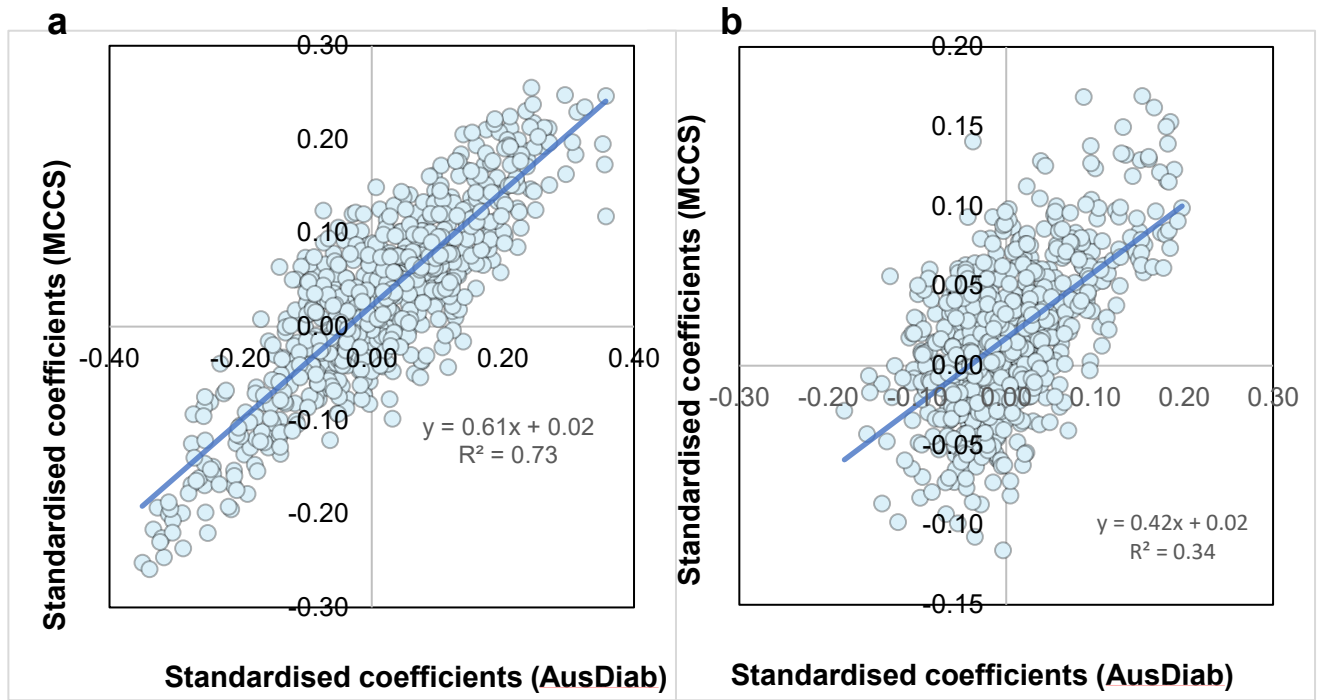


Supplementary Fig. 5 The correlation between regression coefficients of each lipid species associated with DGI (X-axis) versus PD pattern (Y-axis) in the AusDiab cohort. Dietary Guideline Index (DGI); PD, prudent diet.



Supplementary Fig. 6 Lipid Set Enrichment Analysis (LSEA) of a) WD and b) PD

patterns. LSEA was performed to identify groups of structurally or functionally related lipid species (lipid sets) significantly associated with Western and Prudent dietary patterns. LSEA statistics (x-axis) represents the correlation-adjusted sum of t-statistics for individual lipids against dietary pattern scores. Positive values mean that the lipid sets increase with higher dietary scores, while negative values indicate a decrease. Diet scores and lipidomic data were log transformed and scaled to unit SD before analysis. The y-axis depicts the pre-defined lipid sets used in the analysis (top 30 ranked by statistical significance based on p-values). The number of lipids details the number of individual lipid species within each lipid feature (at the end of the bars). Lipid sets are colour-coded based on their $-\log_{10}(BH)$ values, where a higher $-\log_{10}(BH)$ corresponds to a lower adjusted p-value, indicating a stronger and more statistically significant association. A higher $\log_{10}(BH)$ value, represented by a darker shade, indicates a stronger association. P values were corrected for multiple comparisons using the Benjamini-Hochberg method. Covariates include age, sex, BMI, energy, clinical lipids, exercise, diabetes, and smoking



Supplementary Fig. 7 The correlation between lipid coefficients for the a) Western diet and b) Prudent diet in the AusDiab (discovery cohort) against the coefficient in the replication cohort (MCCS).