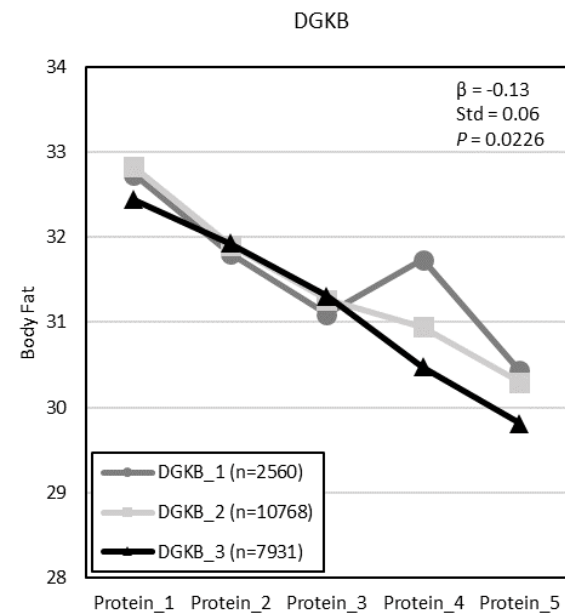
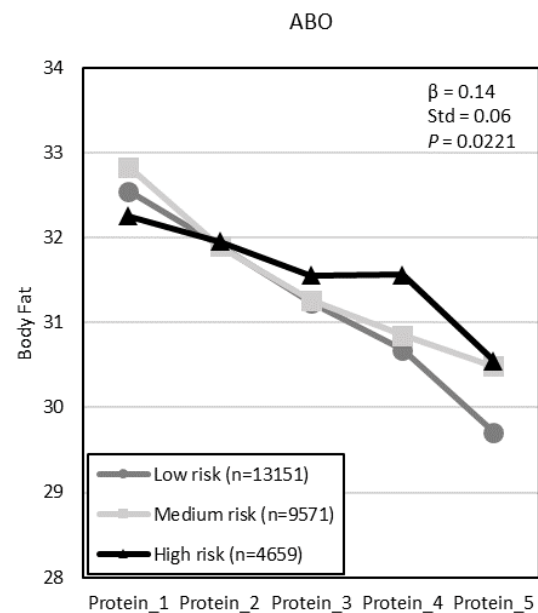
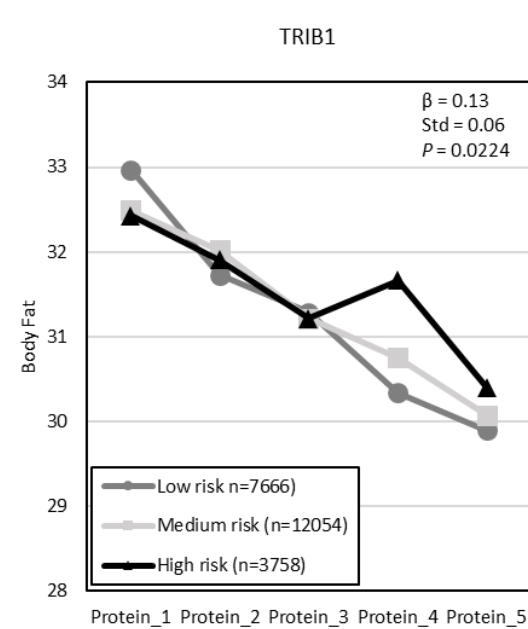
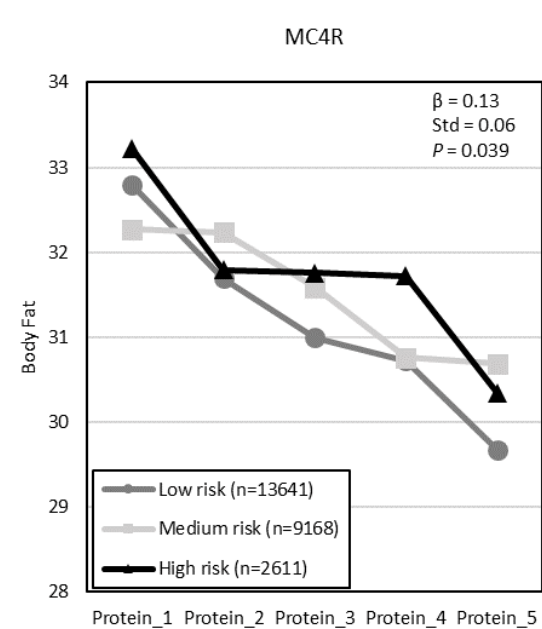
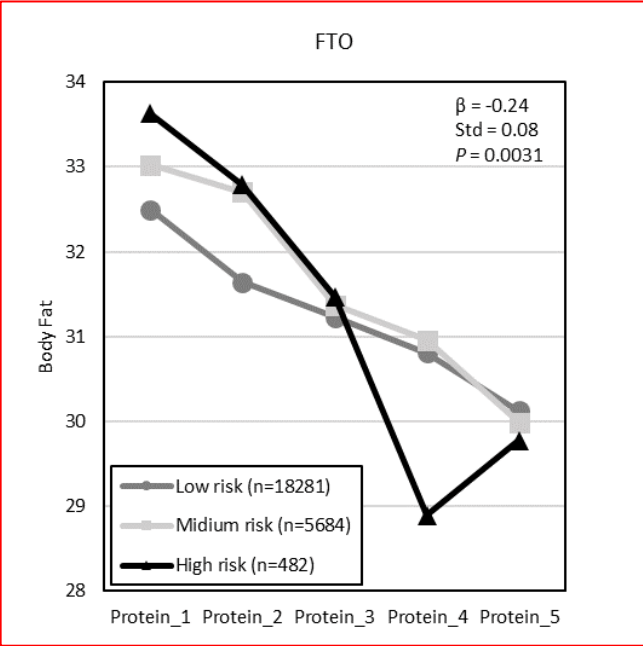


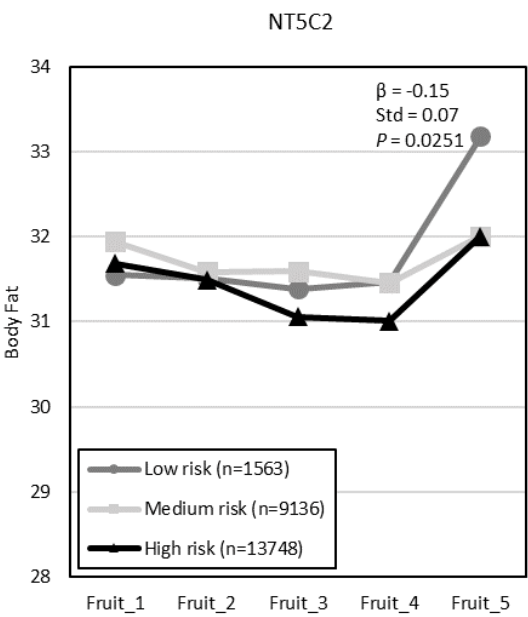
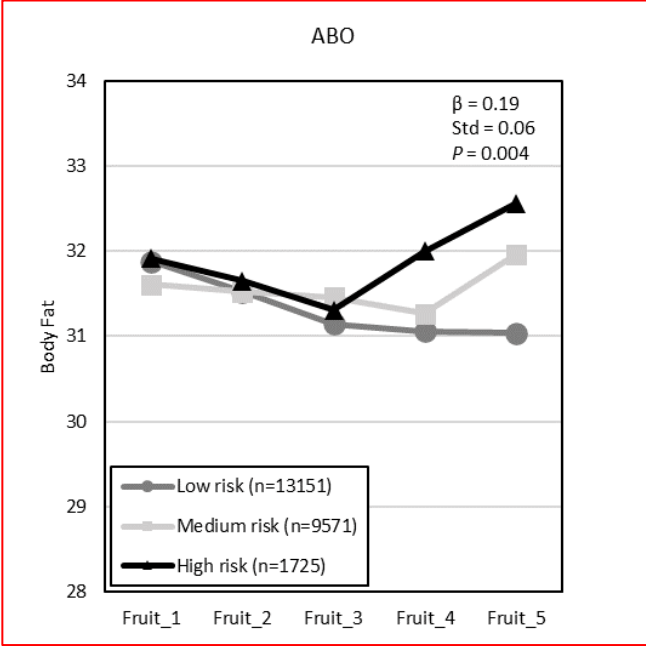
Supplementary Figure 1. Reference for Food_Daily intake food guide

Food group	The amount of food intake per day					
Meat, fish, eggs, beans						
	egg (80g)	Meat (60g)	1 piece of chicken (60g)	1 slice of fish (75g)	2 pieces of tofu (120g)	One protein shake (300ml)
Grain and whole grains						
	2/3 bowls of rice (140g)	1 bowl of noodles (dried noodles 60g)	2 pieces of bread (70g)	2 pieces of rice cake (100g)	six chestnuts (120g)	Cereal (60g)
Veggies						
	Bean sprouts (140g)	Spinach (140g)	green pumpkin (140g)	cabbage (140g)	shiitake (100g)	sea mustard (140g)
Fruit						
	1/2 apple (80g)	tangerine (120g)	1/2 oriental melon (150g)	1/3 grape (80g)	1/2 cup of orange juice (100g)	
Dairy						
	1 cup milk (200g)	1 cup soy milk (200g)	1/2 cup of yogurt (110g)	1.5 pieces of cheese (30g)		
Fat						
	1 tablespoon Oil (5g)	1 tablespoon butter (5g)	1 tablespoon mayonnaise (5g)	2 tablespoon salad dressing (10g)		

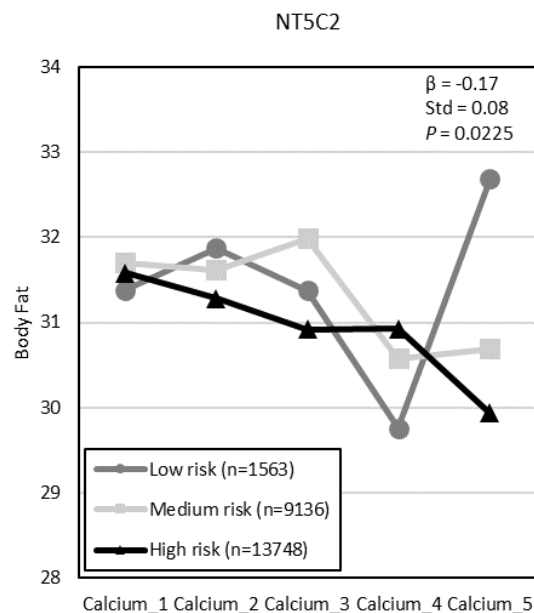
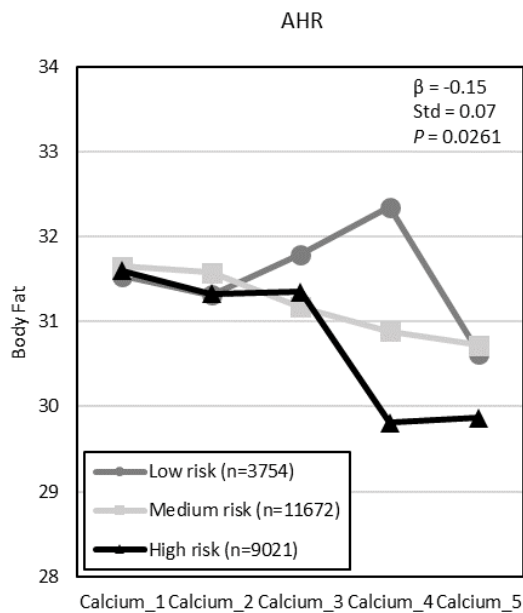
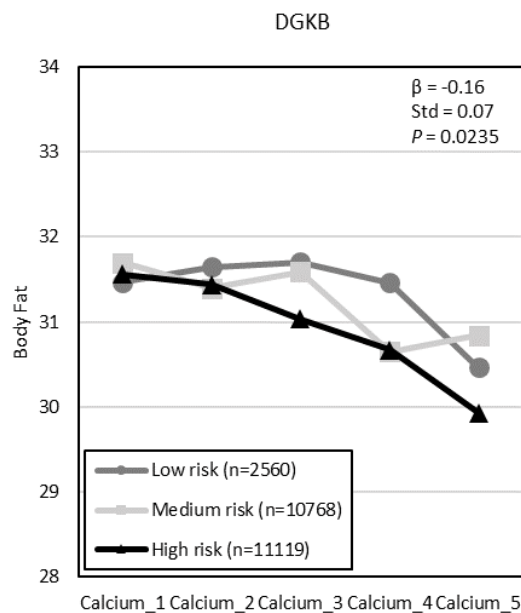
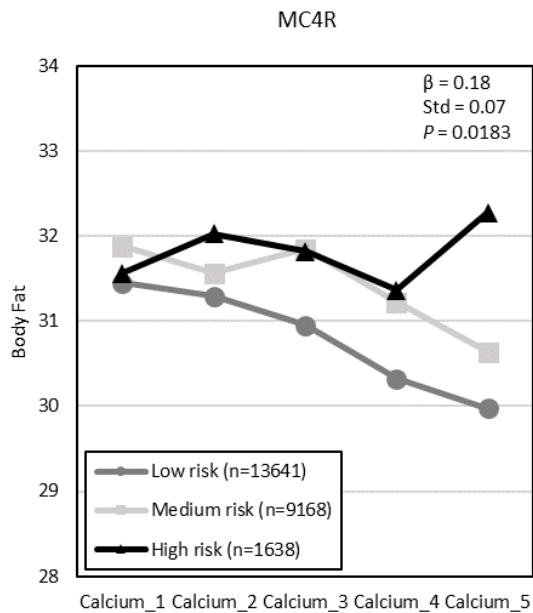
Supplementary Figure 2A. Significant Results of Gene and Protein interaction



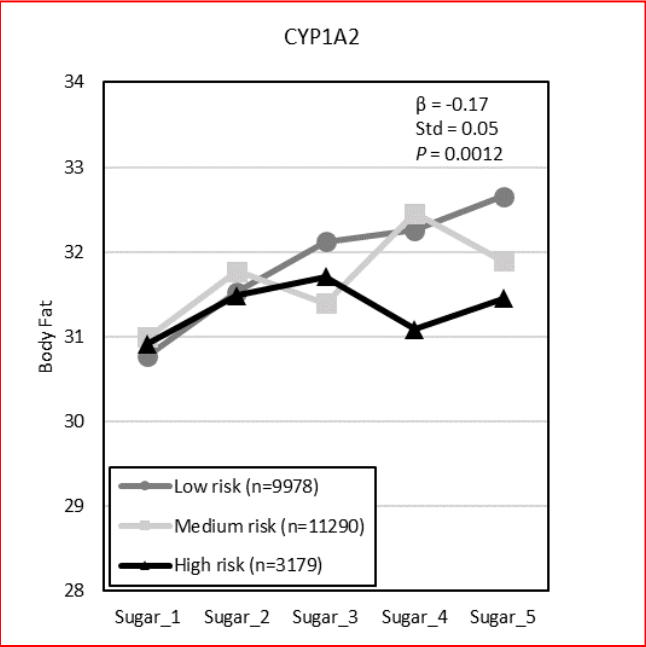
Supplementary Figure 2B. Significant Results of Gene and Fruits interaction



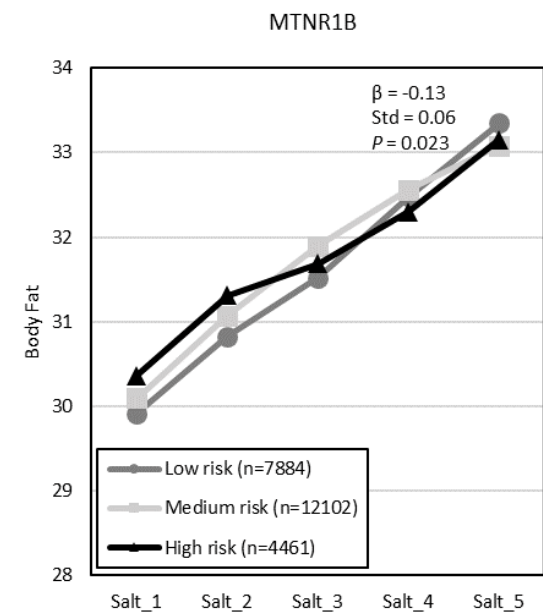
Supplementary Figure 2C. Significant Results of Gene and Calcium interaction



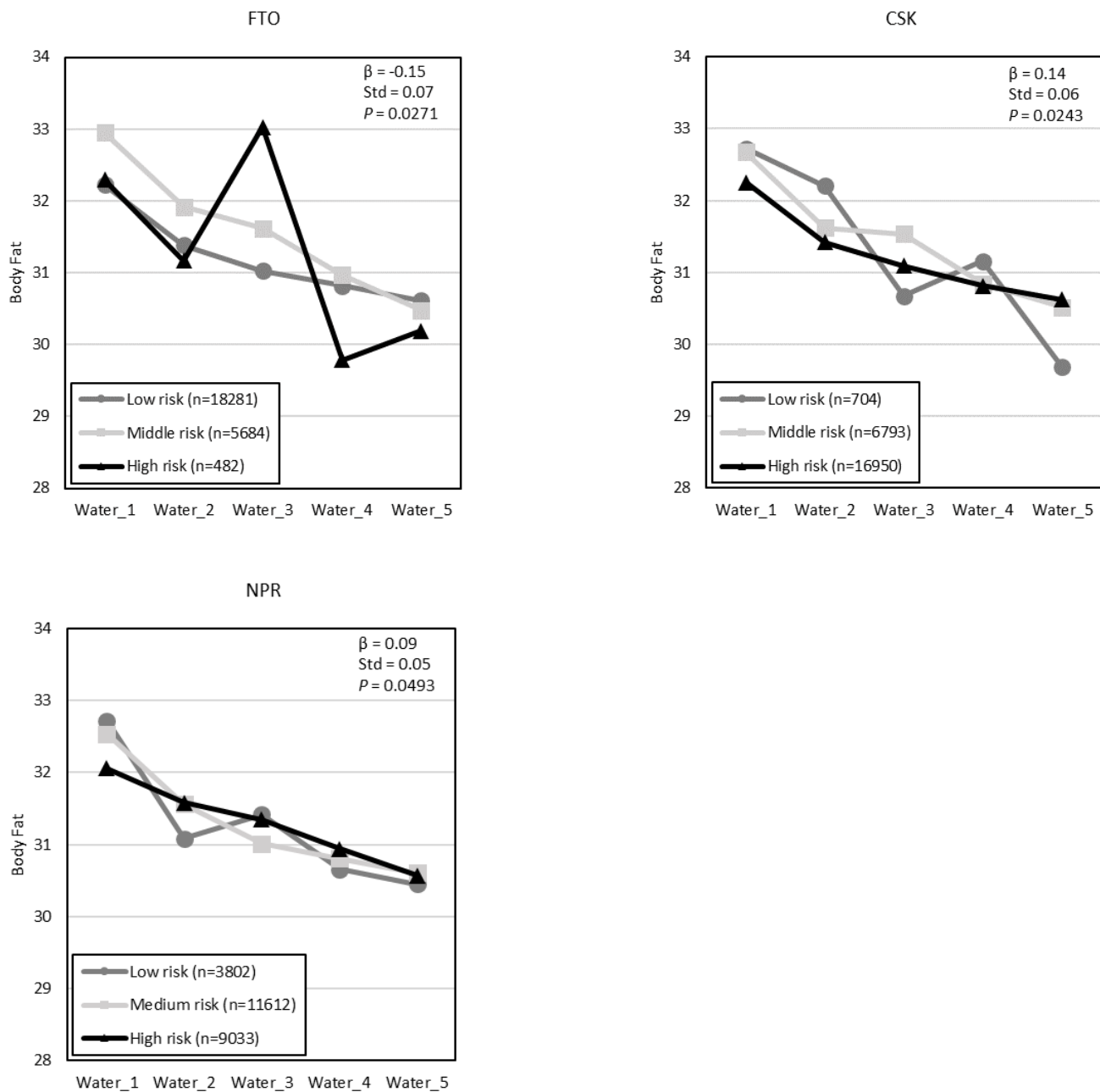
Supplementary Figure 2D. Significant Results of Gene and Sugary Food interaction



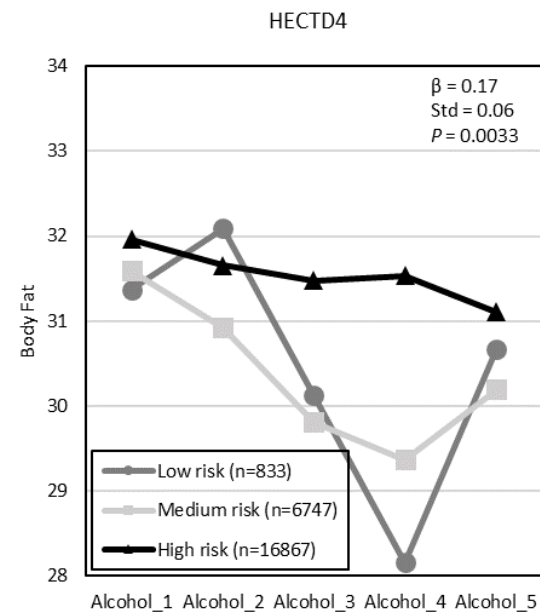
Supplementary Figure 2E. Significant Results of Gene and Salty Food interaction



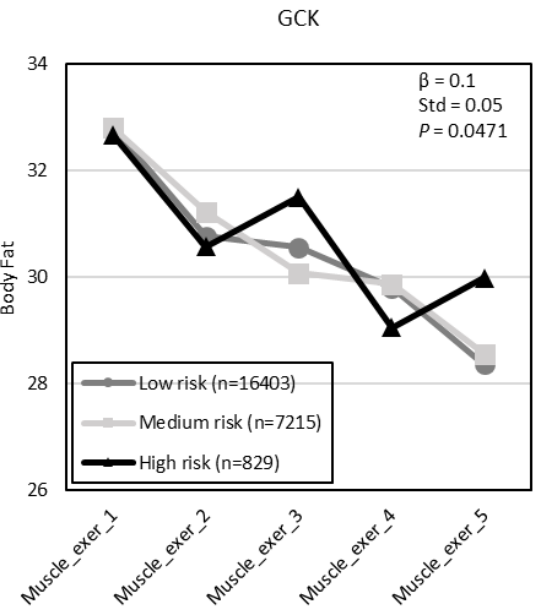
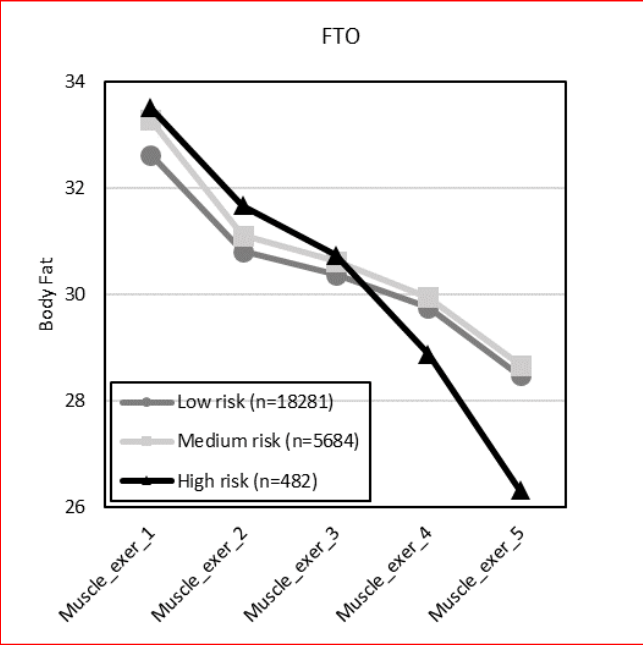
Supplementary Figure 2F. Significant Results of Gene and Water interaction



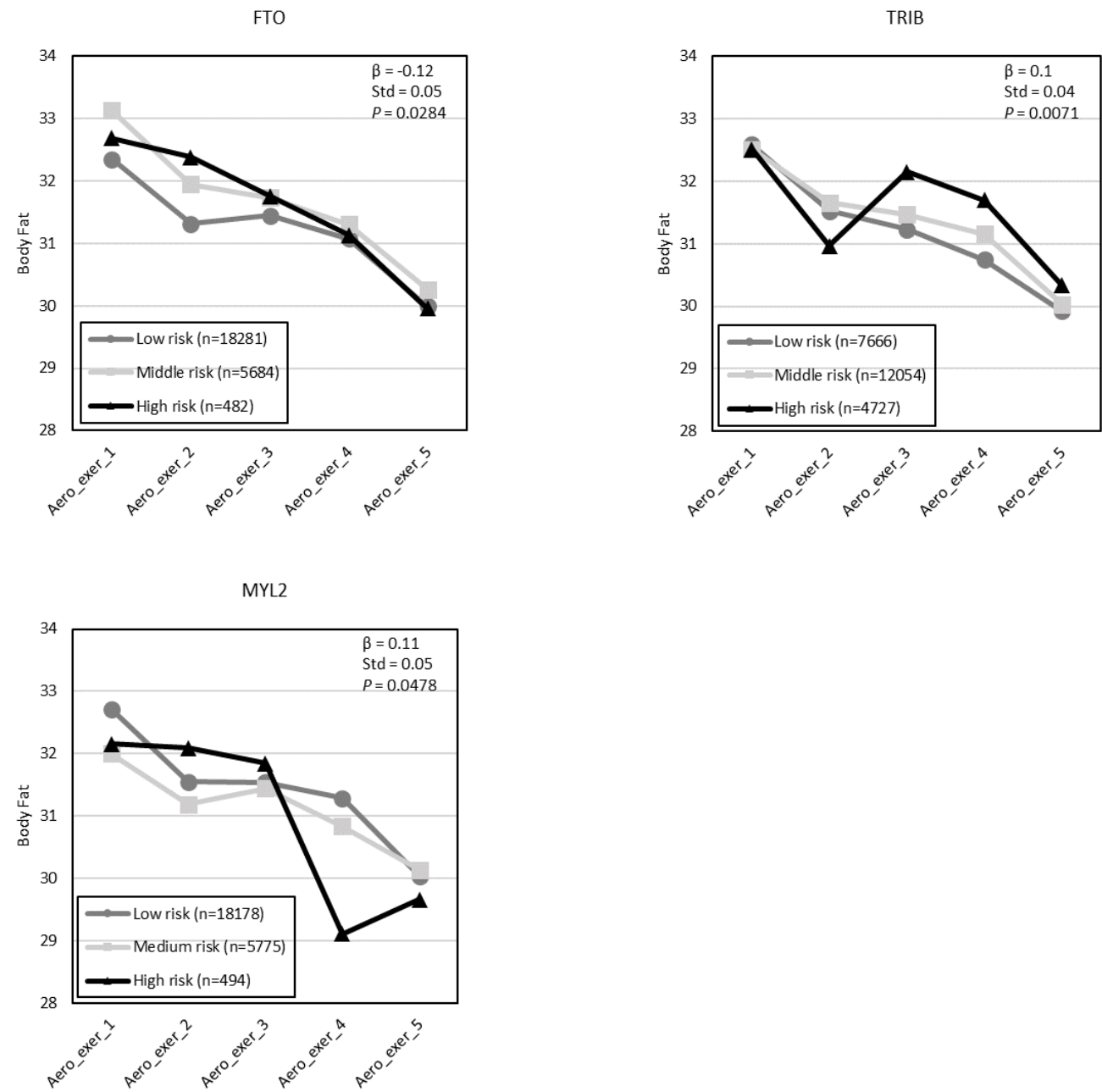
Supplementary Figure 2G. Significant Results of Gene and Alcohol Consumption interaction



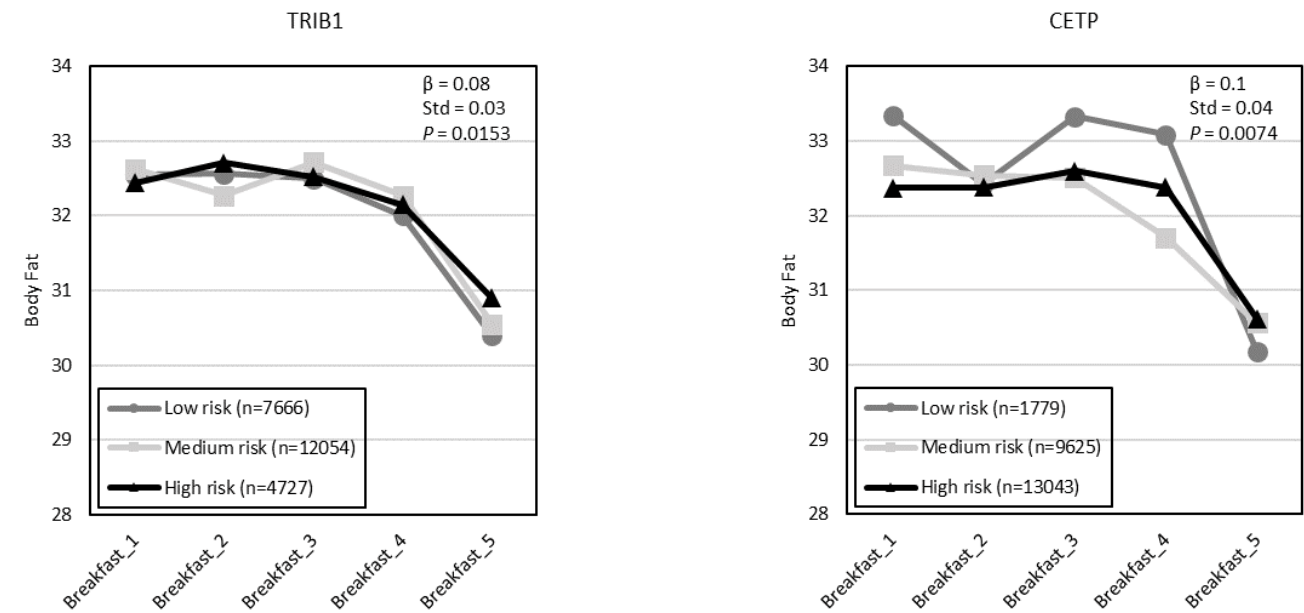
Supplementary Figure 2H. Significant Results of Gene and Muscle Exercise interaction



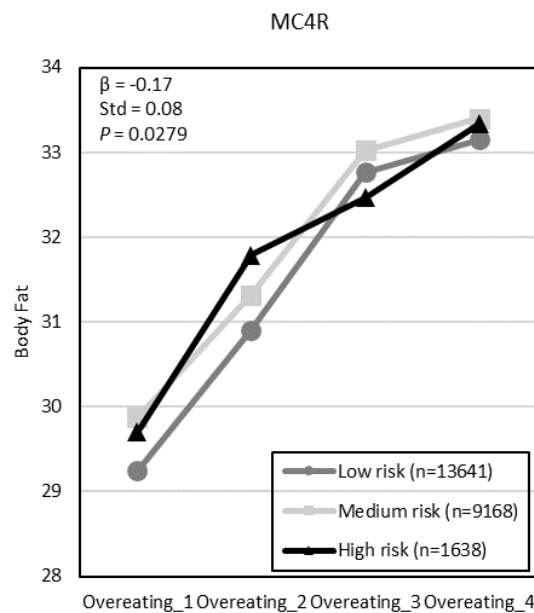
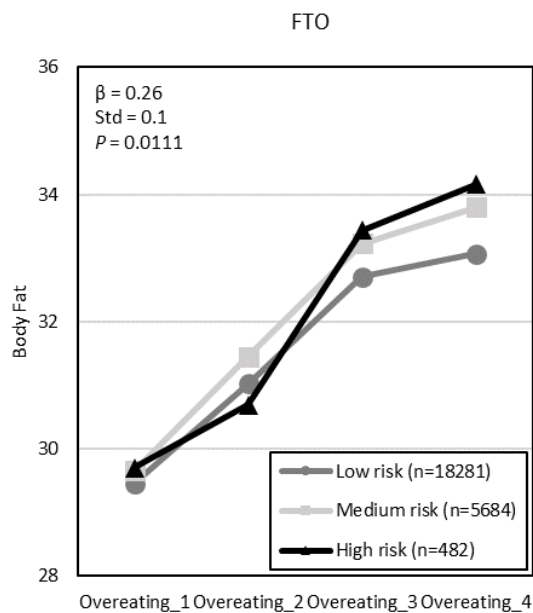
Supplementary Figure 2I. Significant Results of Gene and Aero Exercise interaction



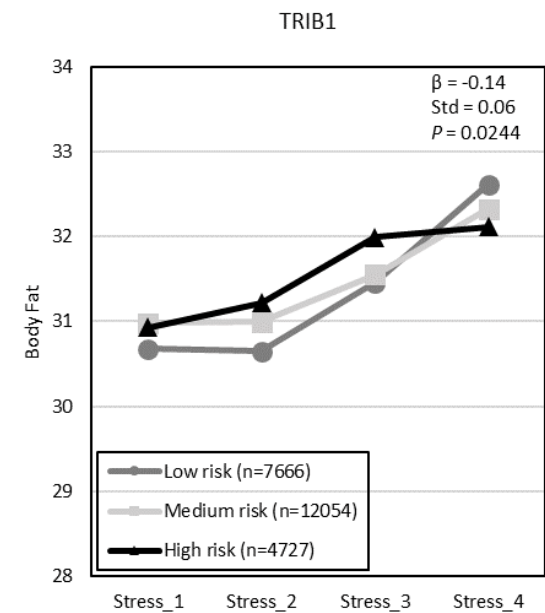
Supplementary Figure 2J. Significant Results of Gene and Breakfast interaction



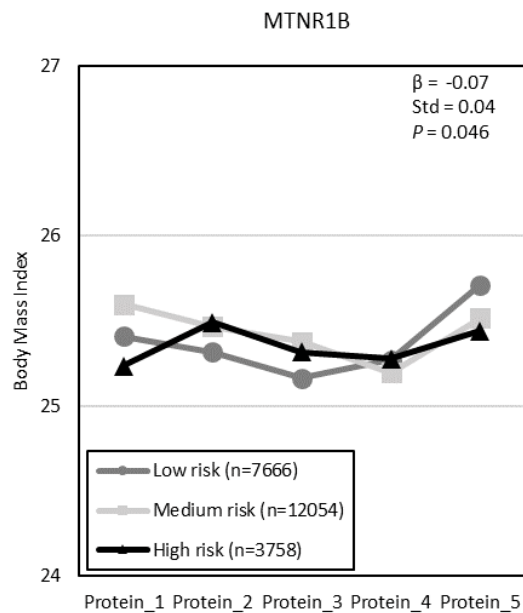
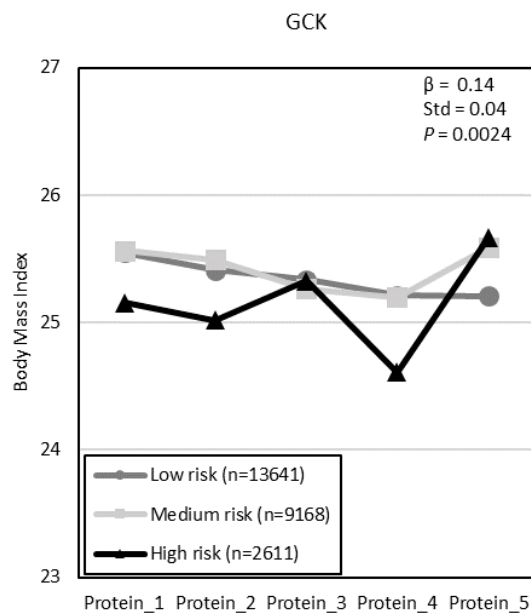
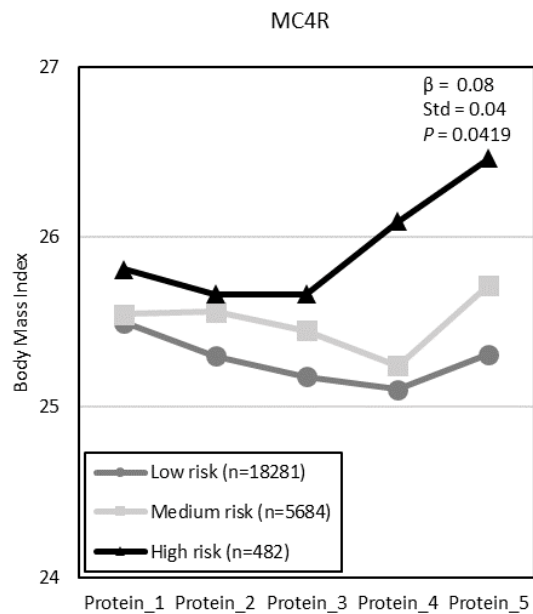
Supplementary Figure 2K. Significant Results of Gene and Overeating interaction



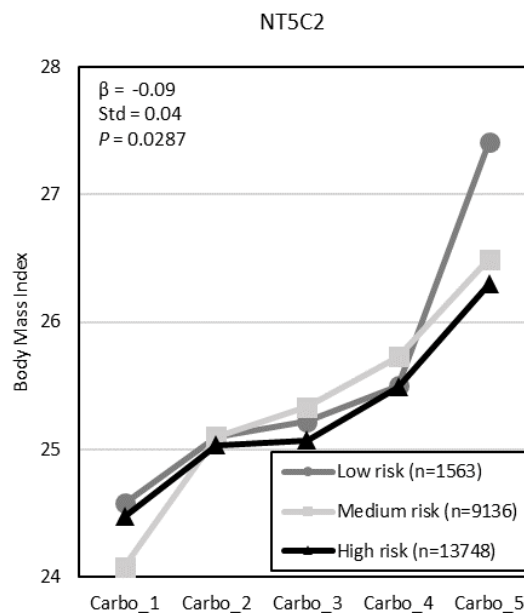
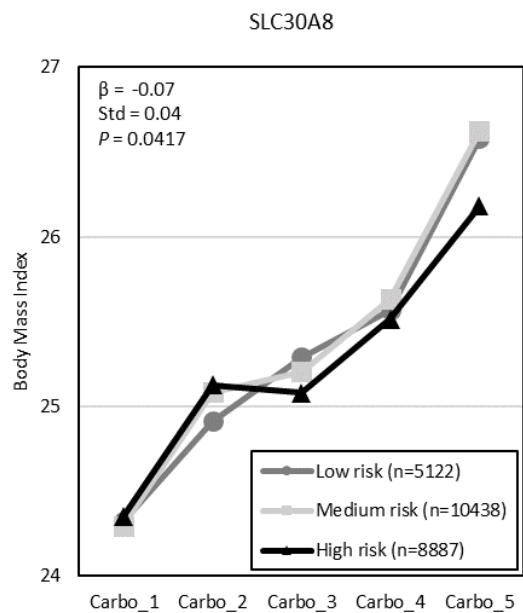
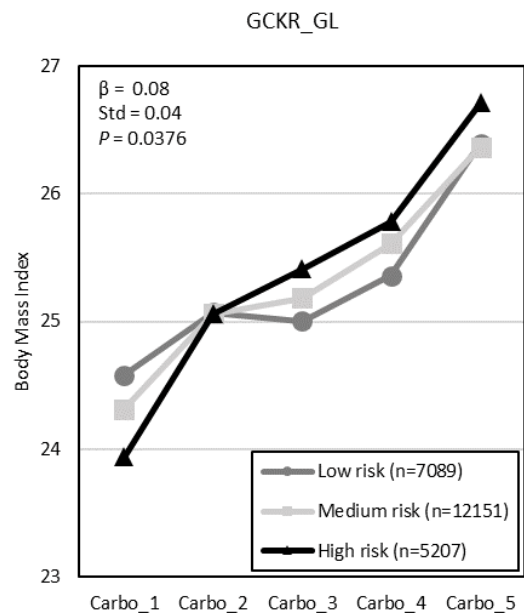
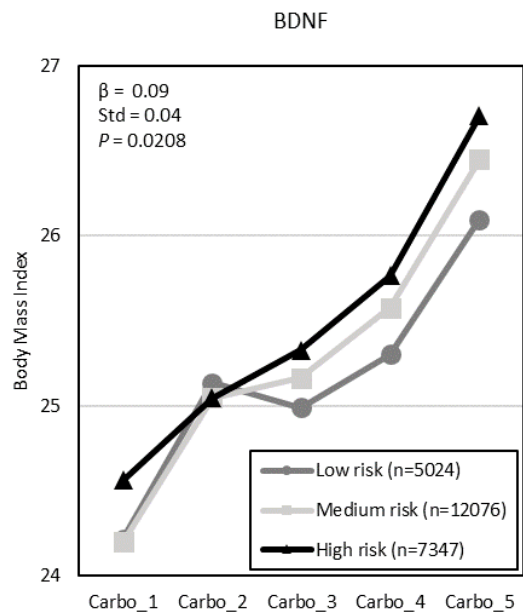
Supplementary Figure 2L. Significant Results of Gene and Stress interaction



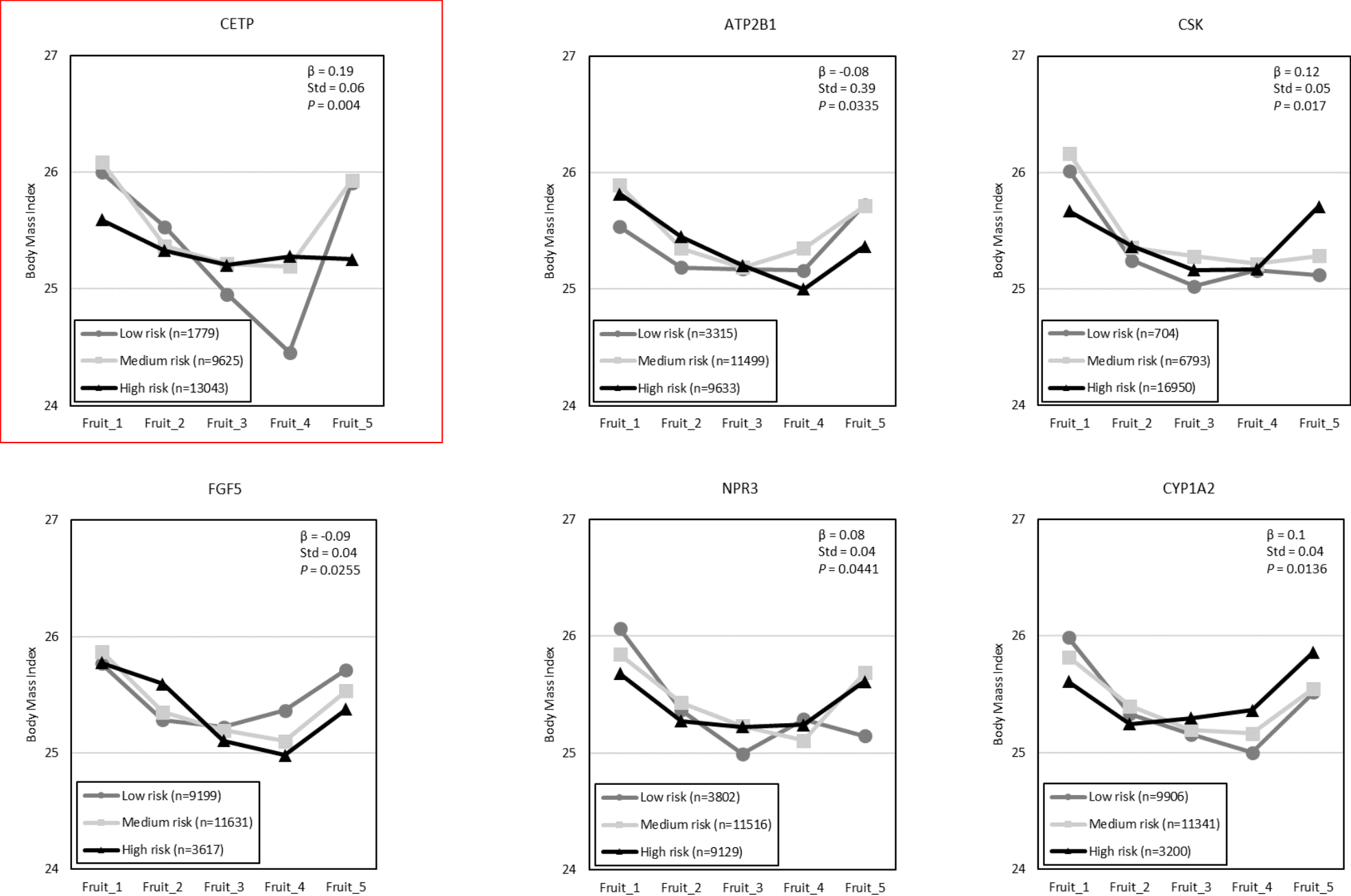
Supplementary Figure 3A. Significant Results of Gene and Protein interaction



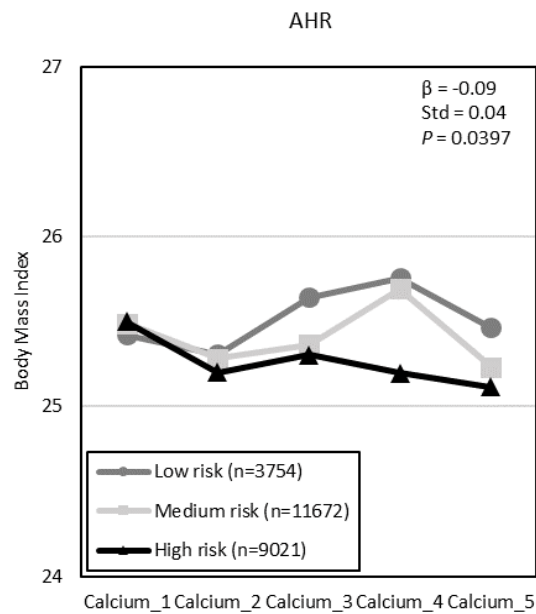
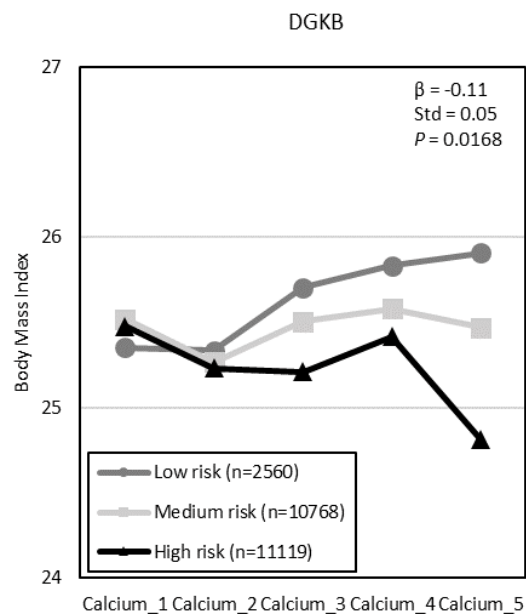
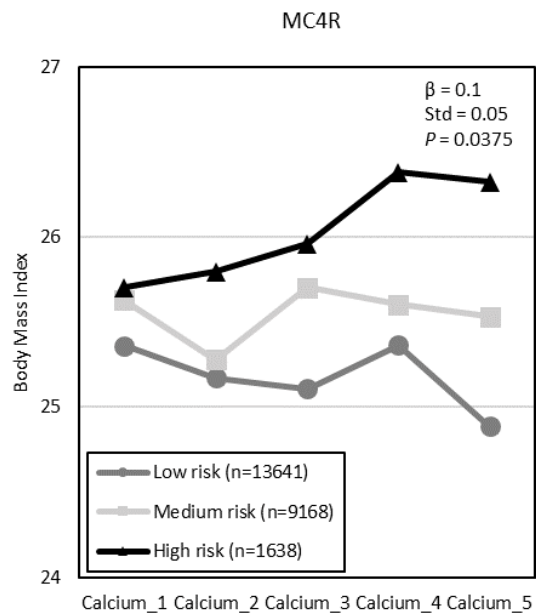
Supplementary Figure 3B. Significant Results of Gene and Carbohydrates interaction



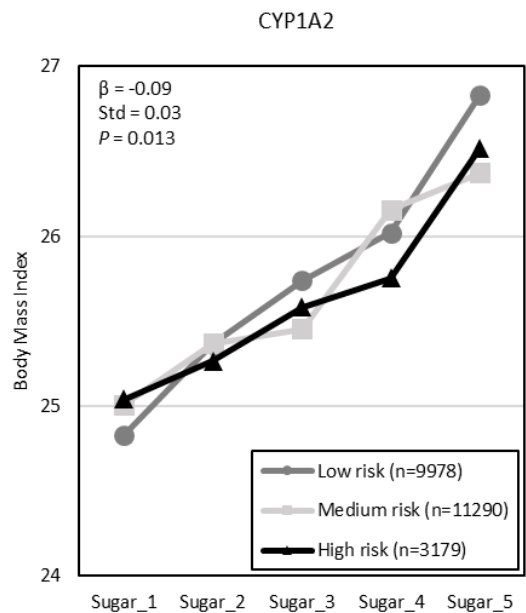
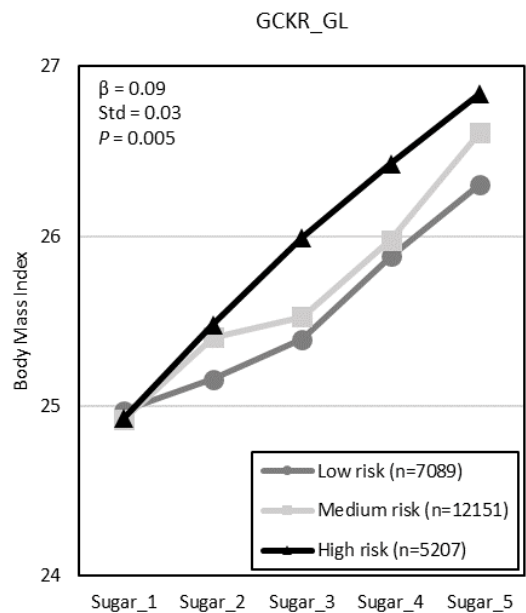
Supplementary Figure 3C. Significant Results of Gene and Fruits interaction



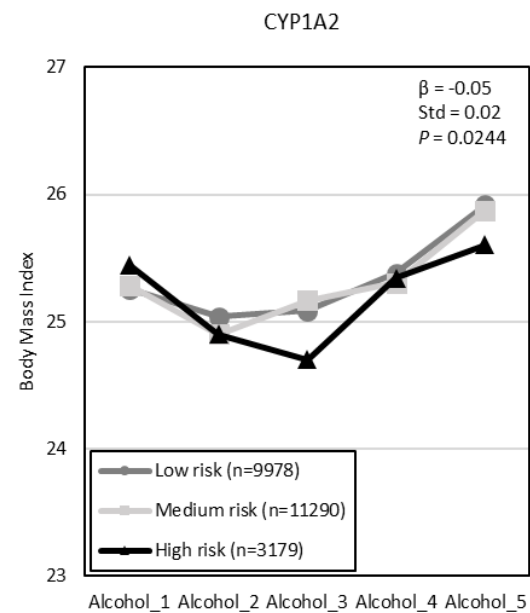
Supplementary Figure 3D. Significant Results of Gene and Calcium interaction



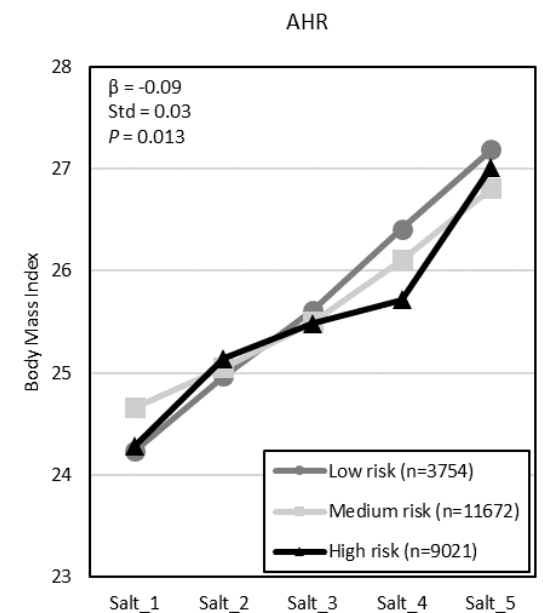
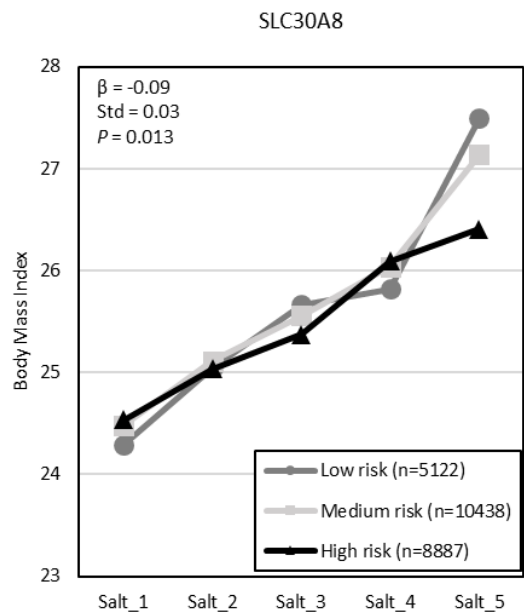
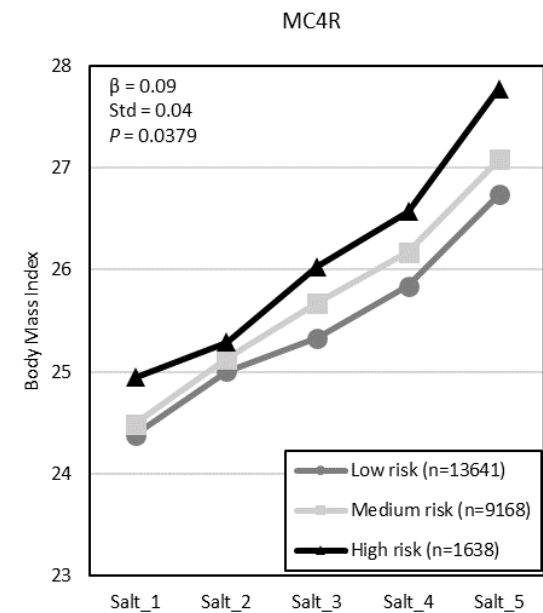
Supplementary Figure 3E. Significant Results of Gene and Sugary Food interaction



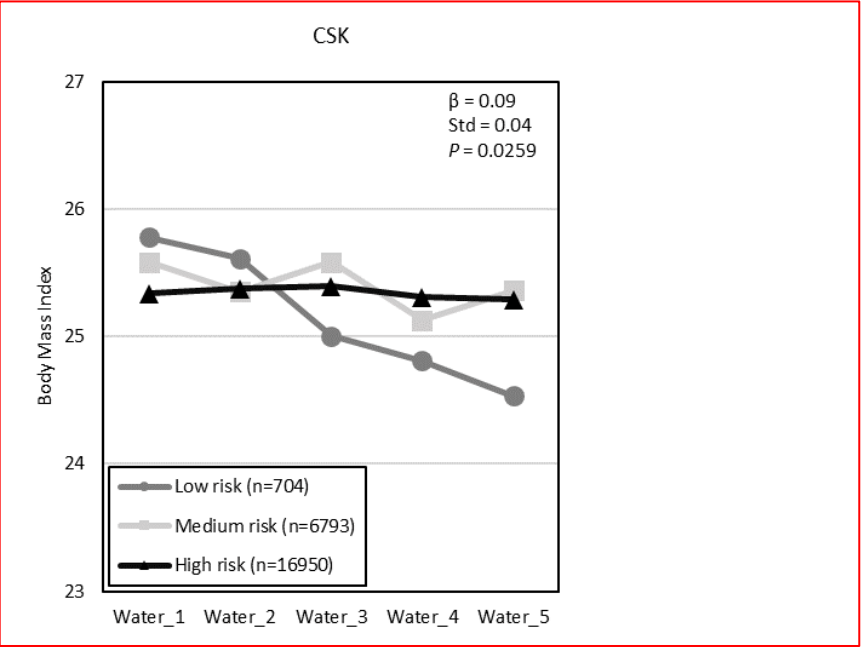
Supplementary Figure 3F. Significant Results of Gene and Alcohol Consumption interaction



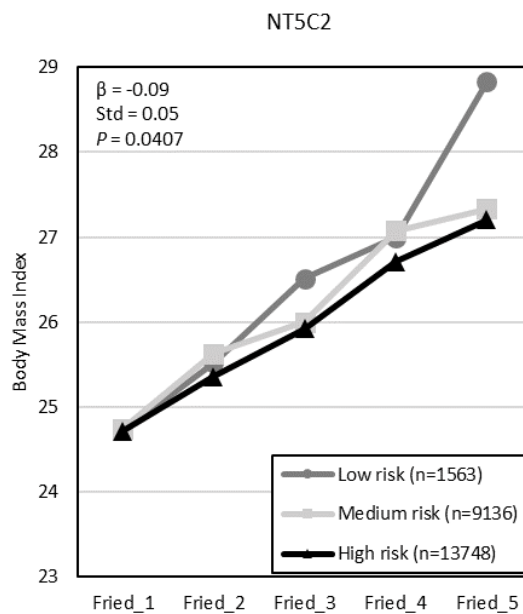
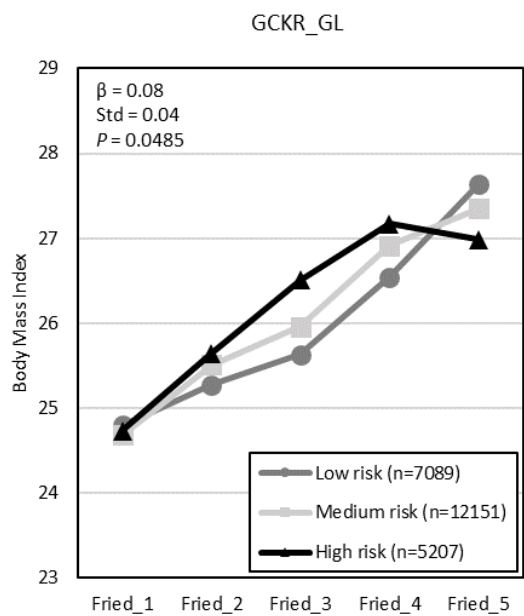
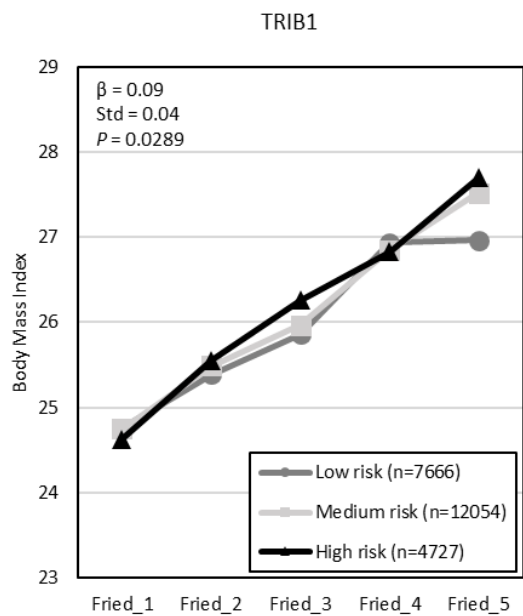
Supplementary Figure 3G. Significant Results of Gene and Salty Food interaction



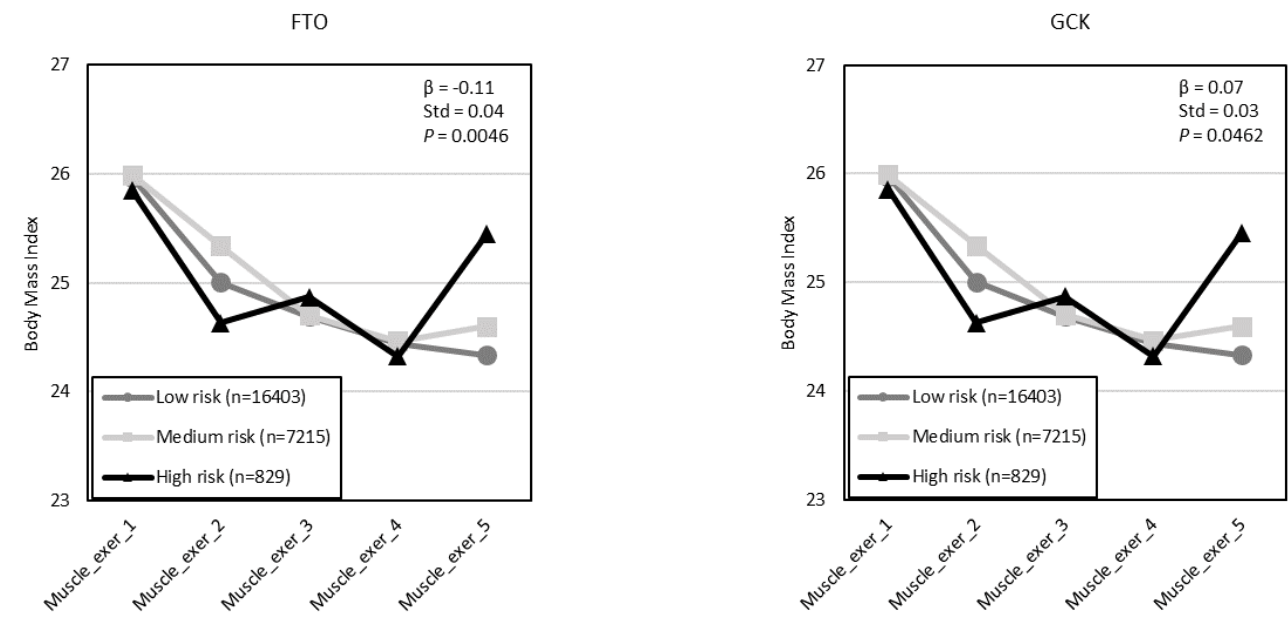
Supplementary Figure 3H. Significant Results of Gene and Water interaction



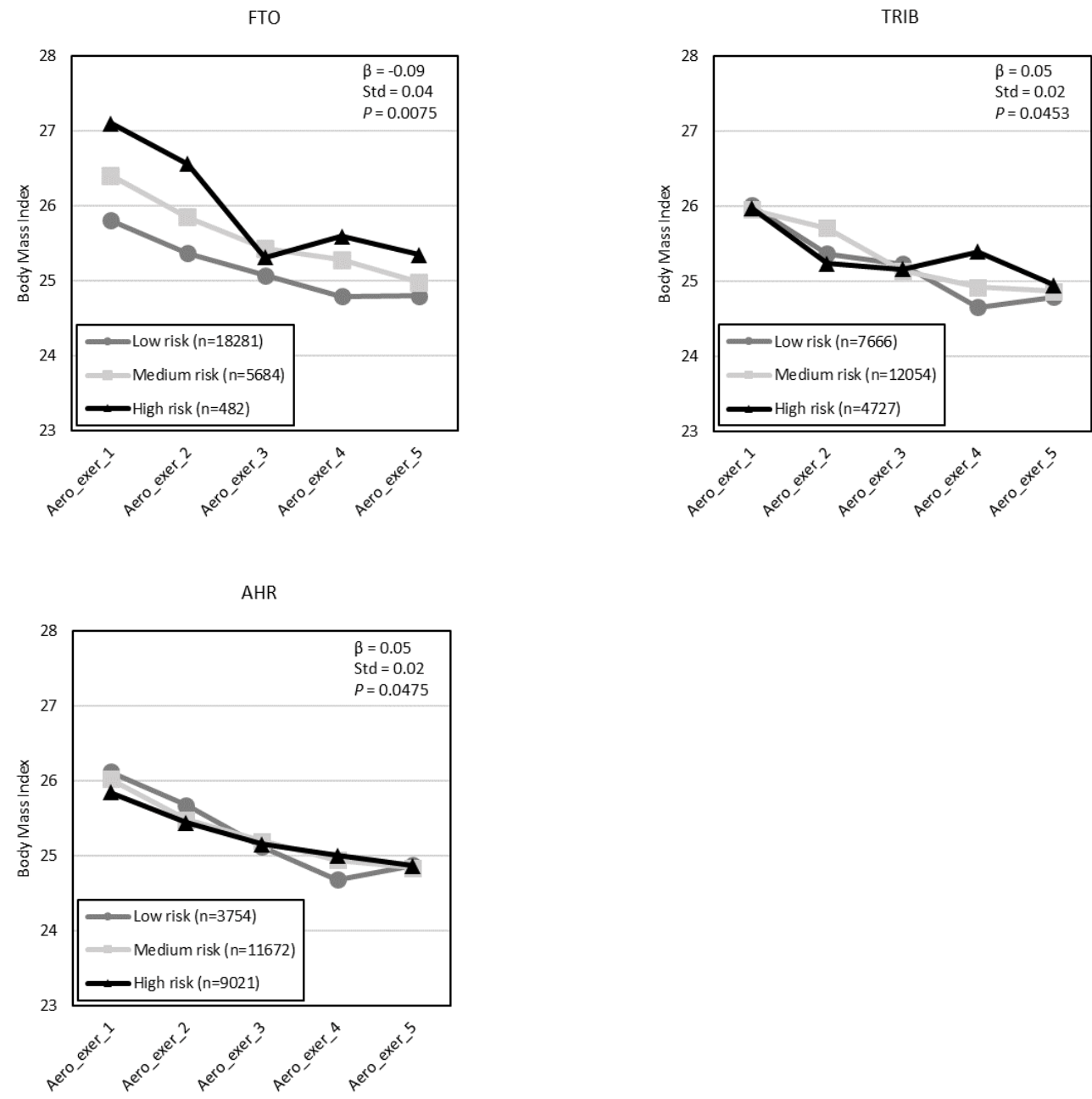
Supplementary Figure 3I. Significant Results of Gene and Fried Foods interaction



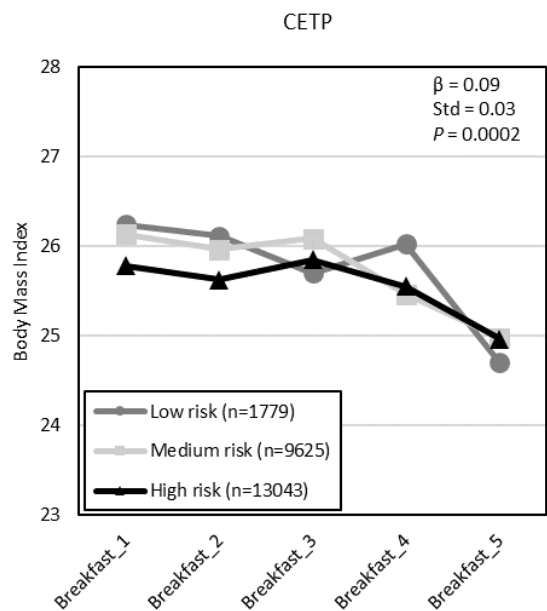
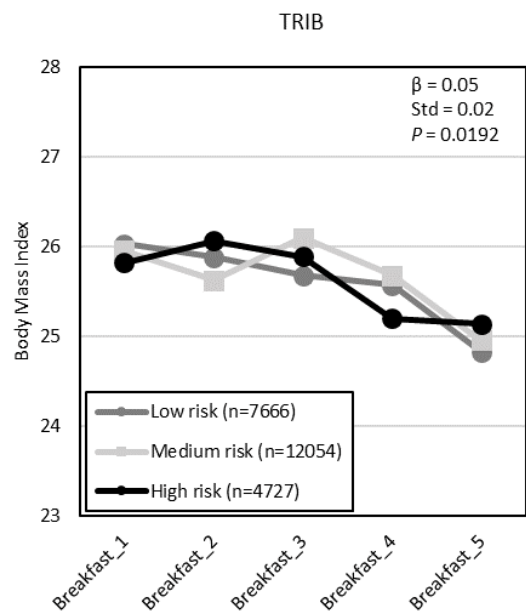
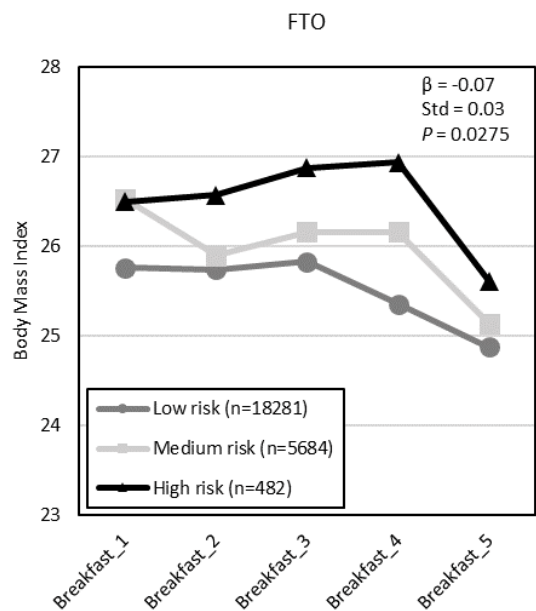
Supplementary Figure 3J. Significant Results of Gene and Muscle Exercise interaction



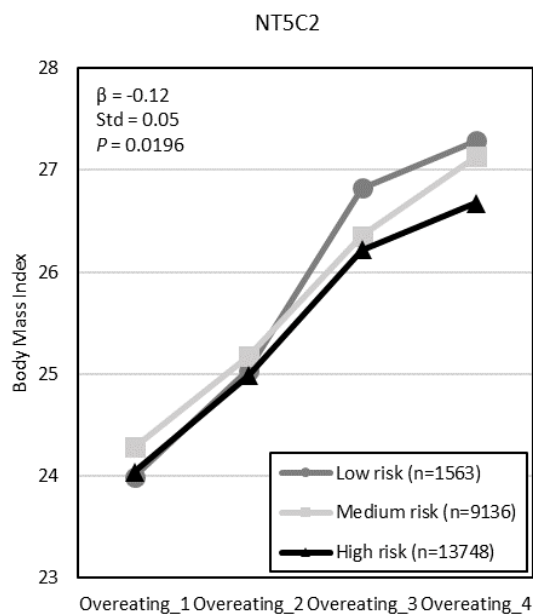
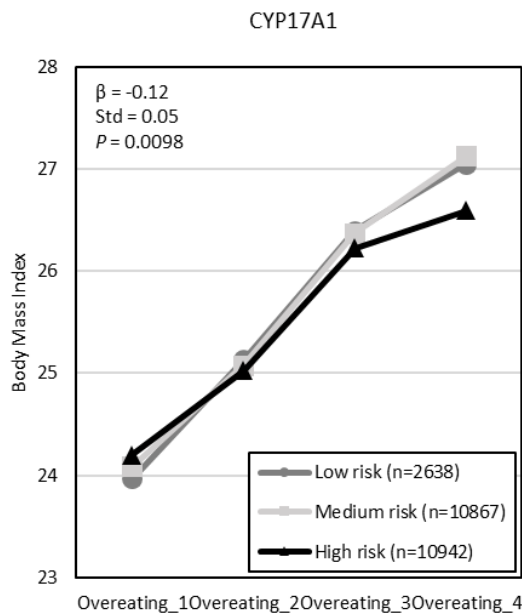
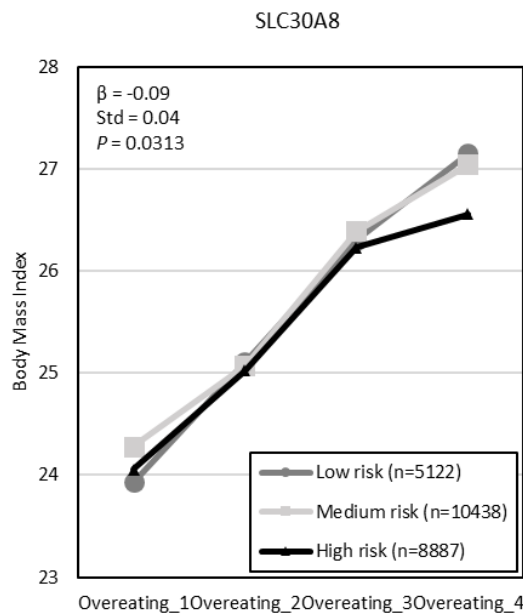
Supplementary Figure 3K. Significant Results of Gene and Aero Exercise interaction



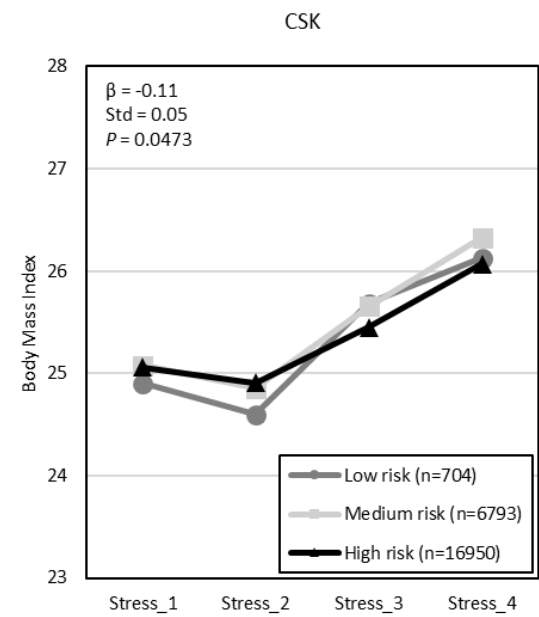
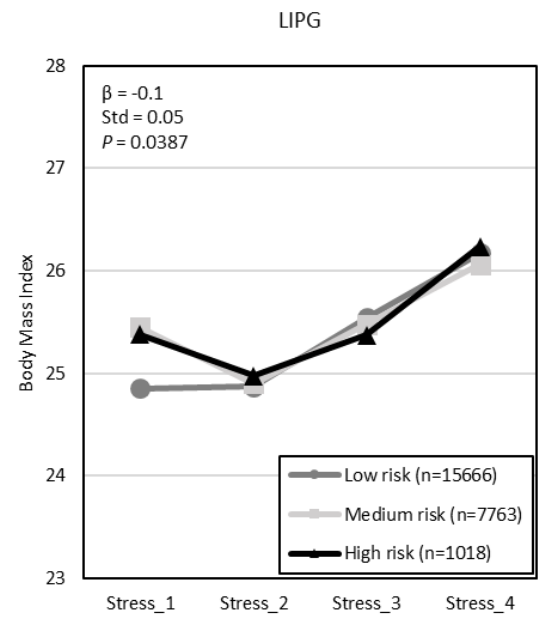
Supplementary Figure 3L. Significant Results of Gene and Breakfast interaction



Supplementary Figure 3M. Significant Results of Gene and Overeating interaction



Supplementary Figure 3N. Significant Results of Gene and Stress interaction



Supplementary Table 1. Life Style Questionnaire

HEALTH ASSESSMENT QUESTIONNAIRES						
Name:		Birth Date (Year/Month/date):		e-mail address :		
Address :				Waist Circumference :		
Height (m):		Weight (kg) :		Body Mass Index :		
		Score	1	2	3	4
Item (I)	Main Component	Please answer the following questions about your daily eating habits.	under 1	1	2	3
1	Protein	How many servings of protein-rich foods do you eat per day? Please refer to the picture's 1 serving and mark the number of protein intakes per day. (meat, fish, poultry, seafood, eggs, tofu, beans, dairy products, etc.)				
2	Carbohydrate	How many servings of refined or high carbohydrates do you eat per day? Please refer to the picture's 1 serving and mark the number of carbohydrates intakes per day. (white rice, white bread, rice cake, noodles, potato, corn, etc.)				
3	Vegetable	How many servings of fruit and vegetables(except kimchi) do you eat per day? Please refer to the picture's 1 serving and mark the number of intakes per day.				
4	Calcium	How many servings of dairy foods rich in calcium do you eat per day?				
5	Sugary food	How many servings of sugary foods do you eat per day? (sodas, fruit juice, sweet desserts, cookies, candies, cakes, ice-creams, syrup added coffee, etc.)				
6	Fatty food	How many servings of foods high in fat such as fries / greasy foods? (fried foods, burger, pizza, chicken, chips, snacks, butter, margarine, salad dressings, sirloin, rib eye, etc.)				
7	Salty food	How many servings of foods high in sodium do you eat per day? (canned foods, processed meats as ham and sausages, pickled fish/seafood/vegetables(Kim-chi), soybean paste, ramyeon, salty snacks, etc.)				
8	Caffeine	How many servings of coffee or other caffeine-containing beverages do you intake per day? (coffee, coke, green tea, black tea, etc.)				
9	Beverage	How many liters of total fluid do you drink per day? (including water, tea, coffee, milk, juice, etc.)				
			0/week	1~2 glass/week	3~4 glass/week	5~6 glass/week
10	Drinking	How many alcoholic drinks do you have per week?				over 7 glass/week
		Please answer the following questions about your weekly habits.	under 1	1	2	3
11	Sea food	How many servings of seafood do you consume per week?				
12	Weight work out	How many times per week do you engage in weight training?				
13	Cardio exercise	How many times per week do you exercise more than 30 minutes of cardio workout? (brisk walking, jogging, swimming, bicycling, hiking, etc)				
14	Breakfast	How many times do you eat breakfast per week?				
		Please answer the following questions about your usual living habits.	0/week	1~2/week	3~4/week	over 5/week
15	Overeating	How many times do you overeat?				
16	Stress frequency	How often do you feel stressed?				
17	Sun protection	How often do you wear sunscreen or wear long-sleeved clothes when going outdoor?				
			No	Yes		
18	Multi or Vit. C	Are you currently taking multivitamin or vitamin C supplement?				
19	Smoking	Do you smoke?				
20	Social Support	Is there anyone surroundings who advises or motivates you to maintain healthy eating habits and lifestyle?				

Supplementary Table 2. Summary of Gene and LifeStyle interaction p-values for Body Fat Percentages

	Main effect			Interaction p-value																			
	beta	STD	p-value	Protein	Carbo	Fruit	Calcium	Sugar	Fried	Salt	Caffeine	Water	Alcohol	Seafood	Muscle_exe	Aero_exer	Breakfast	Overeating	Stress	Sunprotecti	Vitamin	Smoking	Advise
FTO	0.3603	0.08545	<0.0001	0.0031	0.056	0.464	0.4658	0.9115	0.7213	0.3517	0.1765	0.0271	0.8954	0.5969	0.0031	0.0284	0.5561	0.0111	0.7538	0.1205	0.0542	0.7586	0.0544
MC4R	0.2786	0.0672	<0.0001	0.039	0.2936	0.4902	0.0183	0.1897	0.4327	0.6093	0.7664	0.2557	0.7858	0.071	0.1636	0.7365	0.1931	0.0279	0.8156	0.361	0.034	0.8799	0.6022
BDNF	0.1007	0.05908	0.0884	0.9208	0.6182	0.8626	0.7732	0.5589	0.5653	0.8408	0.6609	0.7779	0.945	0.2495	0.3555	0.3143	0.9902	0.8155	0.764	0.9626	0.1137	0.7029	0.8305
ANGPTL3	-0.01894	0.02107	0.3687	0.5184	0.8465	0.5077	0.3497	0.7148	0.4406	0.8845	0.5324	0.3276	0.8738	0.3025	0.2975	0.1191	0.538	0.2894	0.4766	0.6109	0.0903	0.6405	0.7879
MLXIPL	0.1494	0.09643	0.1213	0.8291	0.7697	0.5029	0.9519	0.6133	0.1091	0.7974	0.7404	0.5176	0.5228	0.6339	0.1877	0.5972	0.3804	0.7608	0.1512	0.8172	0.6104	0.8305	0.05
GCKR_TG	-0.09974	0.05907	0.0913	0.718	0.171	0.4943	0.39	0.2316	0.5371	0.4732	0.4632	0.4469	0.8605	0.4103	0.2769	0.3636	0.3559	0.8736	0.1701	0.4764	0.2057	0.0515	0.9726
TRIB1	0.1655	0.05934	0.0053	0.0224	0.7736	0.1513	0.084	0.3185	0.064	0.3796	0.2343	0.7878	0.3299	0.5213	0.1991	0.0071	0.0153	0.2917	0.0244	0.822	0.3528	0.4351	0.3657
ABO	0.09806	0.06669	0.1415	0.0221	0.3329	0.004	0.32	0.5751	0.8036	0.4695	0.1894	0.3177	0.8646	0.5908	0.6729	0.6838	0.4994	0.7902	0.2052	0.0302	0.3627	0.2196	0.2085
HMGR	-0.01239	0.05869	0.8328	0.9384	0.8976	0.6811	0.9287	0.7163	0.4715	0.7491	0.1114	0.483	0.9668	0.3063	0.3553	0.771	0.5159	0.1531	0.3369	0.9874	0.9904	0.2643	0.3777
SORT1	-0.03114	0.125	0.8032	0.5743	0.8014	0.6019	0.0629	0.3667	0.5265	0.8505	0.6941	0.6176	0.9088	0.8116	0.6683	0.9132	0.3402	0.7607	0.7501	0.0574	0.1732	0.1854	0.5217
ABCA1	0.06976	0.06727	0.2998	0.5144	0.7494	0.7665	0.3282	0.7758	0.1597	0.9946	0.4109	0.6022	0.5544	0.0822	0.5219	0.4103	0.1886	0.38	0.4588	0.3519	0.571	0.4209	0.1535
CETP	-0.04173	0.06635	0.5294	0.5195	0.4047	0.0958	0.6018	0.6438	0.6247	0.6993	0.2695	0.7563	0.8971	0.2359	0.8455	0.7488	0.0074	0.6612	0.5138	0.9894	0.6243	0.1872	0.7639
LIPG	0.01883	0.07323	0.797	0.1177	0.9238	0.8493	0.3314	0.3752	0.6327	0.3279	0.3554	0.8489	0.1696	0.5783	0.2393	0.5121	0.1422	0.2535	0.4938	0.1639	0.3811	0.012	0.2877
MYL2	-0.1717	0.08494	0.0433	0.3338	0.3167	0.8962	0.1935	0.7264	0.534	0.5185	0.3943	0.3624	0.0146	0.9209	0.3776	0.0478	0.6968	0.3606	0.0969	0.9179	0.3852	0.8201	0.2656
CDKN2A_E	-0.04435	0.05885	0.4511	0.3055	0.8621	0.6043	0.9815	0.7389	0.4614	0.0764	0.9311	0.5269	0.8993	0.6497	0.3796	0.4042	0.8987	0.9936	0.2466	0.8703	0.7019	0.1602	0.1626
DGKB	-0.08177	0.06301	0.1944	0.0226	0.9078	0.0746	0.0235	0.5266	0.6665	0.7862	0.1283	0.1179	0.7749	0.5316	0.6843	0.9202	0.2502	0.6814	0.0691	0.2376	0.6406	0.7639	0.472
G6PC2	0.2273	0.1838	0.2161	0.614	0.2221	0.1609	0.0637	0.4337	0.5522	0.9296	0.7359	0.9034	0.9768	0.8703	0.5914	0.3889	0.8527	0.5578	0.6088	0.3772	0.5602	0.7482	0.9719
GCK	-0.005891	0.07616	0.9384	0.0765	0.4601	0.4183	0.871	0.4166	0.8685	0.4309	0.2839	0.5369	0.2705	0.4337	0.0471	0.2549	0.2337	0.6839	0.739	0.6725	0.4736	0.6183	0.5399
GCKR_GL	0.09974	0.05907	0.0913	0.718	0.9898	0.4943	0.39	0.2316	0.5371	0.4732	0.4632	0.4469	0.8605	0.4103	0.1877	0.3636	0.3559	0.8736	0.1701	0.4764	0.2057	0.0515	0.9726
GLIS3	0.182	0.05982	0.0023	0.4594	0.3511	0.1145	0.4267	0.6048	0.6789	0.1258	0.7159	0.6359	0.4749	0.1939	0.0825	0.2713	0.0631	0.9166	0.5526	0.9305	0.3057	0.2796	0.5543
MTNR1B	0.1097	0.05978	0.0666	0.092	0.8712	0.5479	0.2909	0.8194	0.1222	0.023	0.9752	0.6388	0.6014	0.3972	0.3646	0.5052	0.3504	0.4328	0.5873	0.6121	0.9478	0.6481	0.6739
SLC30A8	-0.06704	0.05619	0.2329	0.7667	0.1492	0.255	0.5093	0.8053	0.305	0.0716	0.7648	0.7009	0.2735	0.8991	0.5406	0.501	0.5148	0.1047	0.9325	0.4717	0.1864	0.6843	0.6217
ATP2B1	0.05795	0.06122	0.3439	0.1694	0.364	0.0766	0.8624	0.6938	0.7157	0.6604	0.1685	0.8059	0.8442	0.2927	0.2554	0.606	0.8296	0.6753	0.8263	0.8294	0.8433	0.9157	0.6117
CSK	-0.1265	0.07864	0.1076	0.3006	0.3833	0.386	0.4172	0.7521	0.8043	0.8797	0.7561	0.0243	0.338	0.3047	0.5485	0.5449	0.346	0.1487	0.1128	0.0869	0.7647	0.0966	0.8385
CYP17A1	-0.1283	0.06911	0.0634	0.3517	0.9898	0.3076	0.0954	0.4815	0.4272	0.8221	0.678	0.7204	0.9972	0.1353	0.4228	0.7906	0.6996	0.1644	0.2034	0.8956	0.2519	0.8288	0.9796
FGF5	-0.03818	0.06061	0.5287	0.6958	0.4237	0.2772	0.9445	0.5821	0.8243	0.8966	0.6978	0.335	0.2213	0.1106	0.9451	0.9488	0.7369	0.1126	0.69	0.2202	0.198	0.6585	0.7068
GUCY1A3	0.0732	0.07108	0.3031	0.6663	0.865	0.9983	0.3703	0.4206	0.9437	0.6581	0.066	0.462	0.2296	0.4297	0.5236	0.9717	0.9905	0.9769	0.5804	0.2445	0.4317	0.7305	0.1465
HECTD4	0.1933	0.07684	0.0119	0.9248	0.1341	0.544	0.1108	0.4939	0.9562	0.8427	0.7485	0.3302	0.0033	0.8916	0.3907	0.2023	0.7216	0.4969	0.9369	0.2507	0.7493	0.1314	0.1989
NPR3	-0.02047	0.06017	0.7337	0.7038	0.0763	0.2354	0.6716	0.1357	0.2014	0.8772	0.6025	0.0493	0.0616	0.4793	0.0672	0.2981	0.9787	0.0505	0.8487	0.8971	0.0113	0.9919	0.2285
NT5C2	-0.1402	0.06775	0.0385	0.4941	0.4282	0.0251	0.0225	0.4467	0.8297	0.9581	0.9954	0.225	0.9626	0.0846	0.3294	0.6434	0.9127	0.4821	0.6278	0.7555	0.0862	0.8536	0.5817
AHR	-0.03834	0.06036	0.5153	0.7597	0.3403	0.5361	0.0261	0.9546	0.092	0.155	0.531	0.3494	0.5124	0.8797	0.4653	0.54	0.67	0.9927	0.1166	0.7771	0.4128	0.5763	0.389
CYP1A2	-0.04378	0.06135	0.4755	0.9263	0.2827	0.7955	0.7514	0.0012	0.1077	0.7198	0.0582	0.1266	0.4564	0.9068	0.7543	0.3636	0.1999	0.2607	0.6197	0.9492	0.4495	0.4537	0.3691

Supplementary Table 3. Summary of Gene and LifeStyle interaction p-values for Body Mass Index

	Main effect			Interaction p-value																			
	beta	STD	p-value	Protein	Carbo	Fruit	Calcium	Sugar	Fried	Salt	Caffeine	Water	Alcohol	Seafood	Muscle_exe	Aero_exer	Breakfast	Overeating	Stress	Sunprotecti	Vitamin	Smoking	Advise
FTO	0.4164	0.05575	<0.0001	0.1186	0.1775	0.4126	0.7554	0.8966	0.8122	0.4104	0.0731	0.1205	0.1705	0.4724	0.0046	0.0075	0.0275	0.0601	0.8771	0.0034	0.0766	0.5022	0.0706
MC4R	0.2709	0.04386	<0.0001	0.0419	0.1563	0.8755	0.0375	0.4328	0.9547	0.0379	0.5191	0.1547	0.4536	0.0869	0.8897	0.4011	0.9341	0.1824	0.9688	0.0282	0.3216	0.4392	0.7133
BDNF	0.1567	0.03856	<0.0001	0.5337	0.0208	0.9721	0.5921	0.771	0.5473	0.6687	0.7505	0.6548	0.5774	0.5024	0.3577	0.7158	0.9697	0.2428	0.9194	0.9017	0.5119	0.224	0.4543
ANGPTL3	-0.01249	0.01376	0.3639	0.7511	0.4114	0.7526	0.4082	0.8083	0.0716	0.7758	0.6016	0.4145	0.558	0.5885	0.524	0.4879	0.1324	0.0734	0.0944	0.737	0.1881	0.6972	0.7808
MLXIPL	0.008083	0.06296	0.8978	0.572	0.3616	0.8125	0.9023	0.3377	0.4422	0.844	0.195	0.6946	0.8095	0.3144	0.3324	0.6154	0.1156	0.3816	0.0736	0.9515	0.5445	0.4989	0.0262
GCKR_TG	-0.1445	0.03856	0.0002	0.8713	0.0376	0.3684	0.7756	0.005	0.0485	0.1981	0.4013	0.6596	0.5828	0.4076	0.6218	0.9445	0.8546	0.1875	0.1004	0.4715	0.0371	0.0787	0.5247
TRIB1	0.04408	0.03875	0.2553	0.2001	0.8561	0.319	0.2607	0.1677	0.0289	0.8277	0.2746	0.7301	0.7117	0.7309	0.4391	0.0453	0.01092	0.2792	0.1136	0.8777	0.1583	0.21	0.5851
ABO	0.03562	0.04354	0.4134	0.0621	0.7079	0.0966	0.2411	0.298	0.7923	0.6585	0.3502	0.7776	0.0366	0.7372	0.5452	0.6783	0.2832	0.8379	0.5227	0.0227	0.9032	0.8595	0.0658
HMGR	-0.04223	0.03832	0.2704	0.8913	0.6261	0.4111	0.8145	0.9239	0.4271	0.925	0.7695	0.2267	0.8627	0.1908	0.7485	0.5275	0.2756	0.3391	0.9651	0.4929	0.3295	0.4187	0.8983
SORT1	-0.08497	0.08159	0.2977	0.2692	0.5301	0.288	0.1704	0.0505	0.3911	0.9359	0.6748	0.8875	0.7445	0.6723	0.395	0.8218	0.7682	0.2686	0.7462	0.387	0.4664	0.3171	0.4412
ABCA1	0.08898	0.04392	0.0428	0.9961	0.8084	0.8632	0.8101	0.864	0.9964	0.2556	0.2011	0.9105	0.5461	0.1674	0.1054	0.8282	0.296	0.8115	0.5189	0.1945	0.5075	0.8451	0.3591
CETP	-0.05614	0.04332	0.195	0.1511	0.3242	0.0433	0.2314	0.5679	0.9982	0.9366	0.5546	0.9628	0.8273	0.2043	0.2418	0.3341	0.0002	0.8965	0.1781	0.2989	0.2388	0.2857	0.5848
LIPG	0.0261	0.04781	0.5852	0.0876	0.2393	0.8495	0.1205	0.7996	0.8558	0.7824	0.3821	0.8314	0.7782	0.8736	0.7954	0.2953	0.4661	0.1002	0.0387	0.8001	0.1831	0.0916	0.8818
MYL2	-0.04498	0.05546	0.4174	0.3453	0.6403	0.6742	0.3429	0.3871	0.1989	0.7342	0.079	0.7018	0.2138	0.9236	0.5	0.0816	0.3701	0.5734	0.2395	0.7242	0.9371	0.6072	0.2535
CDKN2A_E	-0.04383	0.03842	0.2539	0.9586	0.6809	0.4983	0.4168	0.4546	0.5602	0.0586	0.9529	0.379	0.5772	0.2117	0.2919	0.7392	0.744	0.1834	0.3833	0.7889	0.2929	0.0899	0.378
DGKB	-0.05954	0.04114	0.1478	0.0706	0.8816	0.1279	0.0168	0.4938	0.7539	0.4069	0.8354	0.0597	0.97	0.6098	0.8483	0.5723	0.7963	0.3875	0.4206	0.9301	0.8053	0.3001	0.4655
G6PC2	0.2647	0.12	0.0273	0.8562	0.482	0.0529	0.8135	0.4884	0.2692	0.3141	0.8521	0.5566	0.5273	0.4402	0.2014	0.2202	0.9022	0.2901	0.2419	0.468	0.7379	0.7233	0.9511
GCK	0.04309	0.04973	0.3863	0.0024	0.7956	0.8083	0.3778	0.2725	0.6367	0.8098	0.2939	0.0907	0.4849	0.7627	0.0462	0.3777	0.7789	0.2834	0.2916	0.5606	0.4206	0.8517	0.5971
GCKR_GL	0.1445	0.03856	0.0002	0.8713	0.0376	0.3684	0.7756	0.005	0.0485	0.1981	0.4013	0.6596	0.5828	0.4076	0.6218	0.9445	0.8546	0.1875	0.1004	0.4715	0.0371	0.0787	0.5247
GLIS3	0.1122	0.03906	0.0041	0.6222	0.9112	0.2637	0.1995	0.7168	0.6236	0.4786	0.5087	0.6596	0.622	0.3745	0.206	0.1988	0.2234	0.3412	0.8507	0.4354	0.1562	0.8207	0.8799
MTNR1B	0.07102	0.03903	0.0688	0.046	0.6389	0.3467	0.1616	0.9941	0.3494	0.2356	0.7668	0.5917	0.7467	0.3834	0.9034	0.4564	0.8518	0.299	0.3375	0.6835	0.691	0.9502	0.9213
SLC30A8	-0.05239	0.03669	0.1533	0.5892	0.0417	0.0626	0.5829	0.2177	0.1605	0.013	0.2223	0.7499	0.3831	0.9524	0.4249	0.2773	0.6749	0.0313	0.6139	0.3972	0.1792	0.201	0.1393
ATP2B1	0.03906	0.03997	0.3285	0.316	0.4522	0.0335	0.2857	0.8986	0.9156	0.2523	0.4581	0.7061	0.8127	0.1235	0.0641	0.4104	0.8266	0.7554	0.3481	0.5799	0.8566	0.5863	0.8161
CSK	-0.0612	0.05135	0.2333	0.3246	0.7246	0.017	0.8341	0.894	0.4198	0.3434	0.4687	0.0259	0.0716	0.088	0.204	0.3899	0.2691	0.4987	0.0473	0.1067	0.662	0.0216	0.6754
CYP17A1	-0.08147	0.04099	0.0468	0.2825	0.2592	0.7437	0.3692	0.0648	0.3957	0.3044	0.9816	0.538	0.5414	0.2849	0.5439	0.6703	0.8026	0.0098	0.0672	0.8116	0.7378	0.0687	0.8169
FGF5	0.01774	0.03958	0.654	0.2627	0.7911	0.0255	0.23	0.4467	0.8957	0.8319	0.3594	0.4344	0.9672	0.1922	0.5985	0.701	0.8794	0.0174	0.7872	0.01	0.1454	0.3814	0.9774
GUCY1A3	-0.03401	0.04641	0.4637	0.602	0.5368	0.9407	0.2147	0.277	0.8534	0.418	0.0679	0.7854	0.7307	0.9443	0.9698	0.5914	0.8827	0.4174	0.9274	0.5349	0.7917	0.4966	0.2265
HECTD4	0.1053	0.05107	0.0359	0.8665	0.7273	0.8598	0.2549	0.9435	0.5417	0.9179	0.572	0.8662	0.0951	0.932	0.3795	0.4786	0.5	0.7951	0.9585	0.1307	0.3992	0.2118	0.1059
NPR3	-0.01381	0.03928	0.7252	0.4951	0.5324	0.0441	0.8758	0.1917	0.1162	0.896	0.7714	0.3381	0.0908	0.5237	0.1193	0.6387	0.1011	0.1682	0.1657	0.912	0.2185	0.331	0.796
NT5C2	-0.1587	0.04423	0.0003	0.8357	0.0287	0.3084	0.099	0.1789	0.0407	0.0546	0.9796	0.13	0.3324	0.1301	0.2161	0.4087	0.4782	0.0196	0.0937	0.9448	0.8348	0.6897	0.4419
AHR	-0.0437	0.03941	0.2675	0.5782	0.2359	0.5974	0.0397	0.4702	0.2648	0.034	0.8427	0.5417	0.1433	0.752	0.2583	0.0475	0.2775	0.9876	0.1639	0.8649	0.6769	0.1934	0.5293
CYP1A2	-0.01733	0.04006	0.6654	0.6686	0.1093	0.0136	0.4685	0.0103	0.1369	0.4539	0.2443	0.1775	0.0244	0.1471	0.7888	0.0534	0.5952	0.1792	0.1279	0.7198	0.1143	0.3066	0.1175

Supplementary Table 4. Statistical Significant results of the Interaction Effects

Chromosome	SNP	bp	A1	Gene	MAF	Phe	Main term		Diet Habit	Interaction effect (p-value)
							Beta	p-value		
16	rs9939609	53,786,615	A	FTO	0.17	Body fat	0.36 ± 0.09	<0.0001	Protein	-0.24 (0.0031)
						BMI	0.42 ± 0.06	<0.0001	Water	-0.15 (0.0271)
18	rs17782313	60,183,864	C	MC4R	0.19	Body fat	0.28	<0.0001	Muscle exer	-0.167 (0.0031)
						BMI	0.27	<0.0001	Aero exer	-0.12 (0.0284)
11	rs6265	27,658,369	T	BDNF	0.49	Body fat	0.1 ± 0.06	0.09	Overeating	0.26 (0.0111)
						BMI	0.16 ± 0.04	<0.0001	Muscle exer	-0.11 (0.0046)
1	rs10889353	62,652,525	C	ANGPTL3	0.18	Body fat	-0.02 ± 0.02	0.37	Aero exer	-0.09 (0.0075)
						BMI	-0.01 ± 0.01	0.36	Breakfast	-0.07 (0.0275)
7	rs17145738	73,568,544	A	MLXIPL	0.09	Body fat	0.15 ± 0.1	0.12	Sunprotection	-0.13 (0.0034)
						BMI	0.01 ± 0.06	0.9		
2	rs780094	27,518,370	T	GCKR	0.48	Body fat	0.1 ± 0.06	0.09	Carbohydrate	0.08 (0.0376)
						BMI	0.14 ± 0.04	0.0002	Sugar	0.09 (0.005)
8	rs2954029	125,478,730	A	TRIB1	0.45	Body fat	0.17 ± 0.06	0.01	Fried	0.08 (0.0485)
						BMI	0.04 ± 0.04	0.26	Vitamin	-0.17 (0.0371)
9	rs635634	133,279,427	T	ABO	0.19	Body fat	0.1 ± 0.07	0.14	Protein	0.12 (0.0224)
						BMI	0.04 ± 0.04	0.41	Aero exer	0.1 (0.0071)
5	rs12654264	75,352,778	A	HMGCR	0.49	Body fat	-0.01 ± 0.06	0.83	Breakfast	0.08 (0.0153)
						BMI	-0.04 ± 0.04	0.27	Stress	-0.14 (0.0244)
1	rs646776	109,275,908	C	SORT1	0.05	Body fat	-0.03 ± 0.13	0.8	Fried	0.09 (0.0289)
						BMI	-0.08 ± 0.08	0.3	Aero exer	0.05 (0.0453)
9	rs1883025	104,902,020	T	ABCA1	0.24	Body fat	0.07 ± 0.07	0.3	Breakfast	0.05 (0.0192)
						BMI	0.09 ± 0.04	0.04		
16	rs1532624	56,971,567	A	CETP	0.29	Body fat	-0.04 ± 0.07	0.53	Protein	0.14 (0.0221)
						BMI	-0.06 ± 0.04	0.2	Fruit	0.19 (0.004)
18	rs4939883	49,640,844	T	LIPG	0.20	Body fat	0.02 ± 0.07	0.8	Sunprotection	0.11 (0.0302)
						BMI	0.03 ± 0.05	0.59	Sunprotection	0.08 (0.0227)
12	rs12229654	110,976,657	G	MYL2	0.16	Body fat	-0.17 ± 0.08	0.04		
						BMI	-0.04 ± 0.06	0.42		
9	rs10811661	22,134,095	C	CDKN2A/B	0.44	Body fat	-0.04 ± 0.06	0.45		
						BMI	-0.04 ± 0.04	0.25		
7	rs2191349	15,024,684	G	DGKB	0.32	Body fat	-0.08 ± 0.06	0.19	Protein	-0.13 (0.0226)
						BMI	-0.06 ± 0.04	0.15	Calcium	-0.16 (0.0235)
2	rs560887	168,906,638	T	G6PC2	0.02	Body fat	0.23 ± 0.18	0.22	Calcium	-0.11 (0.0168)
						BMI	0.26 ± 0.12	0.03		
7	rs1799884	44,189,469	T	GCK	0.18	Body fat	-0.01 ± 0.08	0.94	Muscle exer	0.1 (0.0471)
						BMI	0.04 ± 0.05	0.39	Protein	0.14 (0.0024)
9	rs7034200	4,289,050	A	GLIS3	0.47	Body fat	0.18 ± 0.06	0.0023	Muscle exer	0.07 (0.0462)
						BMI	0.11 ± 0.04	0.0041		
11	rs10830963	92,975,544	G	MTNR1B	0.42	Body fat	0.11 ± 0.06	0.07	Salt	-0.13 (0.023)
						BMI	0.07 ± 0.04	0.07	Protein	-0.07 (0.046)
8	rs13266634	117,172,544	T	SLC30A8	0.46	Body fat	-0.07 ± 0.06	0.23	Carbohydrate	-0.07 (0.0417)
						BMI	-0.05 ± 0.04	0.15	Salt	-0.09 (0.013)
12	rs17249754	89,666,809	A	ATP2B1	0.31	Body fat	0.06 ± 0.06	0.34	Overeating	-0.09 (0.0313)
						BMI	0.04 ± 0.04	0.33		
15	rs1378942	74,785,026	A	CSK	0.18	Body fat	-0.13 ± 0.08	0.11	Fruit	-0.08 (0.0335)
						BMI	-0.06 ± 0.05	0.23	Water	0.14 (0.0243)
10	rs1004467	102,834,750	C	CYP17A1	0.35	Body fat	-0.13 ± 0.07	0.06	Fruit	0.12 (0.017)
						BMI	-0.08 ± 0.04	0.0468	Water	0.09 (0.0259)
4	rs1458038	80,243,569	T	FGF5	0.39	Body fat	-0.04 ± 0.06	0.53	Stress	-0.11 (0.0473)
						BMI	0.02 ± 0.04	0.65	Smoking	-0.39 (0.0216)
12	rs11066280	112,379,979	A	HECTD4	0.22	Body fat	0.19 ± 0.08	0.01	Overeating	-0.12 (0.0098)
						BMI	0.11 ± 0.05	0.04		
5	rs1173771	32,814,922	A	NPR3	0.34	Body fat	-0.02 ± 0.06	0.73	Fruit	-0.09 (0.0255)
						BMI	-0.01 ± 0.04	0.73	Overeating	0.11 (0.0174)
10	rs11191548	103,086,421	C	NT5C2	0.29	Body fat	-0.14 ± 0.07	0.04	Sunprotection	0.08 (0.01)
						BMI	-0.16 ± 0.04	0.0003	Alcohol	0.17 (0.0033)
7	rs4410790	17,244,953	C	AHR	0.41	Body fat	-0.04 ± 0.06	0.52	Water	0.09 (0.0493)
						BMI	-0.04 ± 0.04	0.27	Vitamin	0.32 (0.0113)
15	rs762551	74,749,576	C	CYP1A2	0.33	Body fat	-0.04 ± 0.06	0.48	Fruit	0.08 (0.0441)
						BMI	-0.02 ± 0.04	0.67	Calcium	-0.15 (0.0251)
									Carbohydrate	-0.09 (0.0287)
									Fried	-0.09 (0.0407)
									Overeating	-0.12 (0.0196)
									Calcium	-0.15 (0.0261)
									Calcium	-0.09 (0.0397)
									Salt	-0.08 (0.034)
									Aero exer	0.05 (0.0475)
									Sugar	-0.17 (0.0012)
									Fruit	0.1 (0.0136)
									Sugar	-0.09 (0.013)
									Alcohol	-0.05 (0.0244)