

Table S1: Nutrient composition of cracker and almond snacks

	Cracker*	Almond**
Weight, g	77.5 g (5 sheets)	56.7 g (2 oz.)
Energy, kcal	338	364
Carbohydrate, g (kcal)	62.5	12.6
Dietary fiber, g	2.5	8.1
Protein, g (kcal)	5	11.4
Total fat, g (kcal)	7.5	29.9
Total MUFA, g	1.25	19.1
Total PUFA, g	3.75	7.1
Total saturated fat, g	-	2.3

* Nutrient composition of Nabisco honey maid honey grahams crackers was obtained from the USDA food composition database.

** Nutrient composition of natural, whole, unsalted, nonpareil and dry roasted almonds was provided by the Almond Board of California

Table S2: Anthropometric, clinical, cardiovascular and appetite outcome changes over 8 weeks (baseline-week 8) by snack group

	Cracker		Almond		P-value Group
	Mean±SD	95% CI	Mean±SD	95% CI	
ΔBody mass, kg	-1.5±0.6	(-2.6,-0.3)	-2.1±0.5	(-3.2, -1)	0.4231
ΔFat mass, kg	-1.4±1	(-3.3,0.5)	-0.6±0.9	(-2.5, 1.2)	0.5702
ΔFat free mass, kg	-1.2±0.6	(-2.3,0)	-1.5±0.6	(-2.6, -0.3)	0.7322
ΔWaist circumference, cm	-0.1±0.1	(-0.4,0.2)	0.1±0.1	(-0.2, 0.4)	0.2822
ΔSystolic blood pressure, mmHg	0.3±1.8	(-3.3,3.8)	3.3±1.7	(-0.1, 6.7)	0.2189
ΔDiastolic blood pressure, mmHg	-0.8±1	(-2.8,1.3)	0.2±1	(-1.8, 2.1)	0.523
ΔTotal cholesterol, mg/dl	38.8±3.5	(31.9,45.8)	28.8±3.4	(22.1, 35.5)	0.0438
ΔLDL cholesterol, mg/dl	20.8±2.4	(16,25.7)	16.6±2.3	(12, 21.2)	0.2083
ΔHDL cholesterol, mg/dl	17.7±1.4	(14.9,20.5)	10.7±1.3	(8, 13.4)	0.0006
ΔTriglycerides, mg/dl	3.6±8.7	(-13.8,21.1)	5.6±8.4	(-11.2, 22.3)	0.8727
ΔGlucose, mg/dl	12±1.1	(9.8,14.3)	11.6±1.1	(9.5, 13.8)	0.8161
ΔInsulin, uU/ml	-0.2±0.6	(-1.3,1)	0.3±0.6	(-0.8, 1.4)	0.5794
ΔGLP-1, pg/ml	11.3±8.1	(-4.9,27.6)	-2.1±7.5	(-17, 12.8)	0.2285

Δ Leptin, ng/ml	-4±2	(-8,-0.04)	-0.8±1.9	(-4.5, 3)	0.2411
Δ NEFAs, mEq/l	0.1±0.02	(0.1,0.2)	0.1±0.02	(0.1, 0.2)	0.8292
Δ Adiponectin, ug/ml	1±0.7	(-0.3, 2.4)	0.8±0.6	(-0.4, 2)	0.7889
Δ QUICKI	0.01±0.01	(-0.01,0.02)	-0.01±0.01	(-0.02, 0.01)	0.3307
Δ HOMA- β	-28.1±8.2	(-44.5,-11.8)	-15.1±7.9	(-30.7, 0.6)	0.2539
Δ HOMA-IR	0.2±0.1	(-0.1,0.5)	0.2±0.1	(-0.03, 0.5)	0.8496
Δ Hunger, mm	2.1±2	(-2,6.1)	-0.7±1.9	(-4.5, 3.2)	0.33
Δ Fullness, mm	-0.7±2.1	(-4.9,3.6)	-0.9±2	(-4.9, 3.1)	0.9359
Δ Desire to eat, mm	2.1±2.1	(-2.1,6.4)	1.6±2	(-2.4, 5.6)	0.8637
Δ Prospective consumption, mm	1.4±2.1	(-2.7,5.6)	2±2	(-1.9, 5.9)	0.8301

Values are baseline-adjusted least square means \pm SEs of change (Δ , baseline-week 8) in outcomes. Positive values indicate decline over 8 weeks whereas negative values indicate increase over 8 weeks. Analysis was performed using a one-way ANOVA with snack (almond or cracker) as between subject factor and baseline value as covariate. Values in bold are P<0.05. HOMA- homeostasis model assessment, IR-insulin resistance, QUICKI- quantitative insulin sensitivity check

Table S3: Anthropometric, clinical, cardiovascular and appetite outcome changes over 8 weeks (baseline-week 8) by snack group and baseline BMI category

	Normal weight				Overweight				Obese				P-value (Group x BMI)
	Cracker		Almond		Cracker		Almond		Cracker		Almond		
	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	
Δ Body mass, kg	-1.7±2.9	22	-2.1±3.8	28	-1.2±1.8	8	-0.4±2	6	-0.9±3.1	5	-4.4±6	4	0.5223
Δ Fat mass, kg	-1.4±8.6	22	-0.6±2.9	28	-0.4±2.6	8	-1±3.1	6	-2.8±2.9	5	-0.3±12.2	4	0.8101
Δ Fat free mass, kg	-2±3.6 (32.3)	22	-1.5±2.6 (33.4)	28	-0.7±2.9 (39.8)	8	0.6±2.3 (48.2)	6	1.9±0.8	5	-4.2±8.3	4	0.0467
Δ Waist circumference, cm	-0.1±0.8	22	0.1±0.8	28	-0.2±0.8	8	0.4±0.4	6	0±1.6 (62.9)	5	0.1±0.1 (33)	4	0.5286
Δ Systolic blood pressure, mmHg	-3.9±13.6	22	3.3±7.7	28	4.1±6.1	8	1.6±5.7	6	6±7.7	5	14.4±30.6	4	0.1874
Δ Diastolic blood pressure, mmHg	-1.3±6.4	22	0.4±7.3	28	1.1±3.6	8	4.3±9.6	6	-1.6±8.1	5	-6.9±7.2	4	0.3907
Δ Total cholesterol, mg/dl	38.3±33.9	22	23.7±26.7	27	51±23.4	7	36.5±31.2	6	45.6±26.1	5	25±26.2	4	0.0991
Δ LDL cholesterol, mg/dl	23.5±22.7	22	13.3±18.9	27	21.7±8.3	7	17.7±15	6	20.8±12.4	5	20.8±13.5	4	0.4122
Δ HDL cholesterol, mg/dl	15.2±11.8 (39.5)	22	9.2±12.6 (26)a	27	28.9±13 (58)b	7	11.3±12.6 (34)	6	18.8±13 (44.9)	5	12.9±6.3 (37.6)	4	0.0072
Δ Triglycerides, mg/dl	-2.3±49.5	22	6±35.6	27	2.6±46	7	37±83.4	6	30.4±36.4	5	-43.3±124.5	4	0.7552

ΔGlucose, mg/dl	14.1±9	22	8.4±10.6	27	18.1±22.2	7	6.3±11.1	6	21.2±21.3	5	7.5±9	4	0.2543
ΔInsulin, uU/ml	-0.8±4.9	22	0.05±2.9	28	0.7±4.7	7	-1.7±1.4	6	2.7±2.6	5	3.1±4.6	4	0.1176
ΔGLP-1, pg/ml	-3.3±34.5	22	-0.5±75.3	28	0.8±52	5	-1.3±72	6	70.6±100.4	5	5.1±31.4	4	0.251
ΔLeptin, ng/ml	-4.8±14	22	-2.2±10.7	28	-3±5.9	7	1.1±19.2	6	-0.6±12.1	5	4.9±13.1	4	0.6776
ΔNEFAs, mEq/l	0.1±0.2 (34.2)	22	0.1±0.2 (35.4)	28	0.04±0.2 (26.3)	6	0.3±0.1 (56.8)	6	0.2±0.2 (46.8)	5	-0.1±0.2 (20)	4	0.0441
ΔAdiponectin, ug/ml	0.1±3.6	22	0.5±4.9	28	-0.9±5.1	6	7±8.4	6	0±2.6	4	2.8±4.3	4	0.2278
ΔQUICKI	-0.01±0.1	22	-0.01±0.1	26	0.04±0.1	7	0.02±0.03	6	-0.03±0.02	5	-0.01±0	4	0.4459
ΔHOMA-β	-35.8±62.3	22	-7.7±49.3	27	-27.2±22.2	7	-52.1±55.6	6	-8.4±25.1	5	7±57.3	4	0.2961
ΔHOMA-IR	0±1.1	22	0.1±0.6	27	0.6±1.6	7	-0.2±0.3	6	1.1±0.9	5	0.9±1.1	4	0.0773
ΔHunger, mm	1.2±13.3	21	1.2±13	28	2.4±16.2	8	-6±15	6	-1.7±12.6	5	3.2±20.4	4	0.9147
ΔFullness, mm	-0.7±15.2	21	0.2±12.9	28	-5.4±16.3	8	-2.1±17.3	6	8.2±11.6	5	-8.6±6.9	4	0.4805
ΔDesire to eat, mm	1.3±12.5	21	3.7±13.1	28	1.9±13.9	8	-4.8±13	6	-1.1±12.2	5	5.1±21.1	4	0.6883
ΔProspective consumption, mm	-0.4±14.6	21	3.6±13.8	28	2.1±16.3	8	-0.4±12.5	6	-2.7±6.8	5	7.7±13.3	4	0.789

Values are means ± SDs of change (Δ, baseline-week 8) in outcomes. Positive values indicate decline over 8 weeks whereas negative values indicate increase over 8 weeks. Analysis was performed using a Kruskal-Wallis test with snack (almond or cracker) x BMI (normal weight, overweight or obese) as between subject factor. Pairwise comparisons were performed using Dunn joint ranks method. Values in bold are P<0.05. Different letters between snack x BMI categories within each variable indicate significant (P<0.05) difference. The mean rank scores obtained from the Kruskal-Wallis test for significant variables are presented in brackets. HOMA- homeostasis model assessment, IR-insulin resistance, QUICKI- quantitative insulin sensitivity check

Table S4: Anthropometric, clinical, cardiovascular and appetite outcome changes over 8 weeks (baseline-week 8) by snack group and baseline fasting total cholesterol category

	Total cholesterol < 170 mg/dl				Total cholesterol ≥ 170 mg/dl				P-values (Group x cholesterol)
	Cracker		Almond		Cracker		Almond		
	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	
ΔBody mass, kg	2.5±12	12	3.8±22	22	2.8±23	23	4.1±16	16	0.8036
ΔFat mass, kg	3±12	12	3.3±22	22	8.4±23	23	5.8±16	16	0.9052
ΔFat free mass, kg	3.1±12	12	2.6±22	22	3.6±23	23	4.7±16	16	0.938
ΔWaist circumference, cm	1±12	12	0.7±22	22	0.9±23	23	0.7±16	16	0.2345
ΔSystolic blood pressure, mmHg	6.3±12	12	7.7±22	22	14.1±23	23	15.4±16	16	0.1877
ΔDiastolic blood pressure, mmHg	6.1±12	12	6.9±22	22	6.2±23	23	8.8±16	16	0.3732

ΔTriglycerides, mg/dl	17.7±11	11	31.6±21	21	56.7±23	23	85.5±16	16	0.9655
ΔGlucose, mg/dl	11.3±11 (32.7)	11	10.4±21 (26.1) ^a	21	14.7±23 (46.8) ^b	23	9.7±16 (35.7)	16	0.0096
ΔInsulin, uU/ml	2.8±11	11	2.8±22	22	5.3±23	23	3.4±16	16	0.2834
ΔGLP-1, pg/ml	27.7±10	10	83.9±22	22	65.5±22	22	43.3±16	16	0.137
ΔLeptin, ng/ml	14.5±11	11	12.4±22	22	11.4±23	23	12.4±16	16	0.3323
ΔNEFAs, mEq/l	0.2±11	11	0.2±22	22	0.2±22	22	0.2±16	16	0.8335
ΔAdiponectin, ug/ml	3.7±11	11	5.6±22	22	3.6±21	21	6.1±16	16	0.0995
ΔQUICKI	0.1±11	11	0.1±20	20	0.1±23	23	0.1±16	16	0.1339
ΔHOMA-β	22.3±11	11	53.1±21	21	60.5±23	23	48.4±16	16	0.0527
ΔHOMA-IR	0.8±11	11	0.6±21	21	1.4±23	23	0.8±16	16	0.3311
ΔHunger, mm	9.3±11	11	14.3±22	22	15.1±23	23	14.1±16	16	0.8705
ΔFullness, mm	13±11	11	13.8±22	22	16.4±23	23	11±16	16	0.1766
ΔDesire to eat, mm	7.3±11	11	14.7±22	22	14.3±23	23	13.2±16	16	0.9193
ΔProspective consumption, mm	8.1±11	11	15.3±22	22	16.1±23	23	10.3±16	16	0.5718

Values are means ± SDs of change (Δ, baseline-week 8) in outcomes. Positive values indicate decline over 8 weeks whereas negative values indicate increase over 8 weeks. Analysis was performed using a Kruskal-Wallis test with snack (almond or cracker) x total cholesterol categories (< 170 mg/dl or ≥ 170 mg/dl) as between subject factor. Pairwise comparisons were performed using Dunn joint ranks method. Values in bold are P<0.05. Different letters between snack x cholesterol categories within each variable indicate significant (P<0.05) difference. The mean rank scores obtained from the Kruskal-Wallis test for significant variables are presented in brackets. HOMA- homeostasis model assessment, IR-insulin resistance, QUICKI- quantitative insulin sensitivity check

Table S5: Anthropometric, clinical, cardiovascular and appetite outcome changes over 8 weeks (baseline-week 8) by snack group and baseline fasting glucose category

	Glucose < 100 mg/dl				Glucose ≥ 100 mg/dl				P-values (Group x glucose)
	Cracker		Almond		Cracker		Almond		
	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	
ΔBody mass, kg	-1.2±2.4	13	-2.4±4.1	23	-1.6±2.9	22	-1.6±3.8	14	0.8977
ΔFat mass, kg	-3.2±10.2	13	-1.3±4.1	23	-0.3±3.9	22	0.7±4.9	14	0.481
ΔFat free mass, kg	-1±3.3	13	-1.1±3.1	23	-1.3±3.5	22	-2.3±4.3	14	0.7644
ΔWaist circumference, cm	-0.1±1.1	13	0.1±0.7	23	-0.1±0.9	22	0.2±0.8	14	0.6878
ΔSystolic blood pressure, mmHg	-2.9±16.9	13	4.6±14.1	23	0.7±8.3	22	3.7±7.1	14	0.6425

ΔDiastolic blood pressure, mmHg	0.7±6.5	13	-0.2±8.8 15.6±17.1	23	-1.7±5.8	22	-0.2±5.4	14	0.3728
ΔTotal cholesterol, mg/dl	25.3±13.7 (31.5)	13	(22.4)a	23	52.3±33.9 (49)b	21	42.9±32 (43.2)b	14	0.0001
ΔLDL cholesterol, mg/dl	15.5±11 (33.2)	13	9.4±12.3 (24.4)a	23	27.2±21.6 (45.4)b	21	23.8±21.6 (43.7)b	14	0.0032
ΔHDL cholesterol, mg/dl	11.5±8.6 (34.8)	13	4.8±8 (19.6)a	23	22.9±13.6 (49.8)b	21	18.3±12.7 (43.4)b	14	<0.0001
ΔTriglycerides, mg/dl	-8.6±22.8	13	6.5±31.3	23	11±56.8	21	4.3±91.2	14	0.1229
ΔInsulin, uU/ml	-0.8±2.5	13	0.5±2.6	23	0.5±5.6	21	-0.2±3.6	14	0.0967
ΔGLP-1, pg/ml	6.2±26.3	11	7.5±83.6	23	10.3±67.7	21	-12±43.8	14	0.5955
ΔLeptin, ng/ml	-2.4±5.7	13	-2±13.2	23	-4.7±15.1	21	1±11.6	14	0.2876
ΔNEFAs, mEq/l	0.1±0.2	12	0.2±0.2	23	0.1±0.2	21	0.1±0.2	14	0.8496
ΔAdiponectin, ug/ml	0.3±3.5	12	2.6±6.9	23	-0.3±3.9	20	0.2±3.8	14	0.6019
ΔHunger, mm	3.9±8.9	12	-1.5±14.1	23	-0.5±15.5	22	4.4±13.3	14	0.3549
ΔFullness, mm	3±16.5	12	1.7±13.5	23	-2.4±14.4	22	-6.6±11.1	14	0.0573
ΔDesire to eat, mm	3.3±7.9	12	1.4±14.5	23	-0.03±14.3	22	5.4±13	14	0.5841
ΔProspective consumption, mm	2.7±10	12	2.3±14.5	23	-1.7±15.7	22	6.4±11.1	14	0.2533

Values are means ± SDs of change (Δ, baseline-week 8) in outcomes. Positive values indicate decline over 8 weeks whereas negative values indicate increase over 8 weeks. Analysis was performed using a Kruskal-Wallis test with snack (almond or cracker) x glucose categories (<100 mg/dl or ≥ 100 mg/dl) as between subject factor. Pairwise comparisons were performed using Dunn joint ranks method. Values in bold are P<0.05. Different letters between snack x glucose categories within each variable indicate significant (P<0.05) difference. The mean rank scores obtained from the Kruskal-Wallis test for significant variables are presented in brackets.

Table S6: Non-responders and responders of specific outcomes in the cracker and almond groups.

	Cracker		Almond		P-values
	Non-responders	Responders	Non-responders	Responders	
Body mass	26 (74)	9 (26)	28 (74)	10 (26)	0.9533
Waist circumference	24 (69)	11 (31)	18 (47)	20 (53)	0.0657
Total cholesterol	1 (3)	33 (97)	4 (11)	33 (89)	0.3591*
LDL cholesterol	1 (3)	33 (97)	8 (22)	29 (78)	0.029*
HDL cholesterol ^a	33 (97)	1 (3)	30 (81)	7 (19)	0.0569*
Triglycerides	12 (35)	22 (65)	14 (38)	23 (62)	0.8241

Glucose	5 (15)	29 (85)	9 (24)	28 (76)	0.3056
HOMA-IR	13 (38)	21 (62)	16 (43)	21 (57)	0.6679
Systolic blood pressure	14 (40)	21 (60)	13 (34)	25 (66)	0.6088
Diastolic blood pressure	17 (49)	18 (51)	20 (53)	18 (47)	0.7288

Values are n (%). Responders are individuals that demonstrated a decline in outcomes (except HDL cholesterol) over 8 weeks. Non-responders are individuals that had no change/increase in outcomes (except HDL cholesterol) over 8 weeks. a, responders for HDL are categorized as individuals that had an increase/no change in HDL over 8 weeks and non-responders are individuals that demonstrated a decline in HDL over 8 weeks.

Values in bold are P<0.05. Analysis was performed using a Chi-squared test. *, Fisher's exact test.

Table S7: P-values for Figures 2, 3, 4, 5, S1 and S2 main effects.

Main effects of intervention week analysis				
	Group	Week	Group x week	Figure no.
Total cholesterol, mg/dl	0.9648	<.0001	0.0892	2
LDL cholesterol, mg/dl	0.6036	<.0001	0.2369	2
HDL cholesterol, mg/dl	0.333	<.0001	0.0131	2
Triglycerides, mg/dl	0.8578	0.0073	0.6937	2
Glucose, mg/dl	0.0271 (NS adj.)	<.0001	0.0264	3
Insulin [†] , uU/ml	0.0668	0.0119	0.3652	3
GLP-1 [†] , pg/ml	0.807	<.0001	0.1385	3
Leptin [†] , ng/ml	0.4745	0.2127	0.5048	S1
NEFAs, mEq/l	0.9844	<.0001	0.549	S1
Adiponectin [†] , ug/ml	0.0464 (NS adj.)	0.0011	0.175	S1
Main effects of GTT time points analysis				
	Group	Time	Group x time	
Glucose [†] , mg/dl	0.0192	<.0001	0.2119	4
Insulin [†] , uU/ml	0.0701	<.0001	0.0662	4
C-peptide [†] , ug/l	0.1113	<.0001	0.0091	4
GLP-1 [†] , pg/ml	0.9973	<.0001	0.5926	4
Adiponectin [†] , ug/ml	0.0366 (NS adj.)	<.0001	0.4485	S2
Glucagon, pg/ml	0.4347	0.9218	0.1877	S2
NEFAs [†] , mEq/l	0.6962	<.0001	0.4991	S2
Group effect of AUC and indices analysis				

Glucose, mg/dl x 120 min	0.0223	4
Insulin, uU/ml x 120 min	0.0411	4
C-peptide, ug/l x 120 min	0.0337	4
GLP-1, pg/ml x 120 min	0.8181	4
Adiponectin, ug/ml x 120 min	0.1075	S2
NEFAs, mEq/l x 120 min	0.4249	S2
Glucagon, pg/ml x 120 min	0.3855	S2
IRI	0.0193	5
Matsuda index	0.0239	5
Disposition index	0.9031	5

Values are P-values. Values in bold are P<0.05. NS adj.: non-significant after baseline/time 0 adjustment. AUC: area under the curve, GTT: glucose tolerance test, IRI-insulin resistance index. I, variables transformed prior to analysis using Johnson's family of transformations

Table S8: OGTT area under the curves and indices by snack group and baseline BMI category

	Normal weight				Overweight				Obese				P-values (Group x BMI)
	Cracker		Almond		Cracker		Almond		Cracker		Almond		
	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	Mean±SD	N	
Adiponectin, ug/ml x 120 min	1497.3±455.2	11	1925.1±471.1	13	1478.3±245.6	4	1465.9±558.2	5	1313.6±707.3	5	1034.7±497	2	0.1113
C-peptide, ug/l x 120 min	235223.8±6 1293.4	11	181393.4±889 85.6	13	225224.3±38 345.1	4	238518.4±70128 .3	5	278756±98636.8	5	224278.5±122322	2	0.1212
GLP-1, pg/ml x 120 min	6630.7±147 9.9	11	6501.5±1795.7	13	6444.2±1356	4	5636.6±1127.5	5	6254.7±1827.8	5	8966.2±3586.4	2	0.6949
Glucagon, pg/ml x 120 min	755.4±218	9	653.3±551.2	10	642.8±317	4	668.1±0	1	657.8±654.9	5	391±0	1	0.4224
Glucose, mg/dl x 120 min	15970.2±23 13.2 (24.5)	11	13168.8±2093. 7 (12.2)	13	18819.4±476 1.3 (30.3)	4	15169.5±2321.6 (21.6)	5	15135±2531.1 (21)	5	18240±4974.5 (29)	2	0.0398
Insulin, uU/ml x 120 min	13219.9±35 78	11	7736.3±5721.1	13	11480.9±535 9.5	4	13664.2±5204.4	5	15575.2±6313.4	5	13050.4±7728.6	2	0.0641

NEFAs, mEq/l x 120 min	23.9±5.5	11	23±8.3	13	18.8±3.7	4	21.1±3.7	5	27.8±8.1	5	33.6±25.9	2	0.5113
IRI	212912541. 7±6773086		105235746.2± 78990967.1		227219229.3 ±156320762.		215765213.2±10 7874543.2		247456160.4±1327		257261852.5±2058		
	9.6 (24.8)	11	(11.5)	13	3 (23)	4	(24.8)	5	99644.7 (26.4)	5	88653.4 (24.5)	2	0.0422
Matsuda index	4.7±2.7 (18.3)	11	10.2±4.9 (31)a	13	4.5±2.9 (17)	4	3.4±1.1 (13.8)	5	3.1±1.3 (11.4)b	5	2.7±2.1 (11)	2	0.0041
Disposition index	11.5±35.9	11	2.8±44.2	13	-11.8±42.8	4	16.3±12.5	5	7.5±15.5	5	6±6.7	2	0.7254

Values are means ± SDs. Analysis was performed using a Kruskal-Wallis test with snack (almond or cracker) x BMI (normal weight, overweight or obese) as between subject factor. Pairwise comparisons were performed using Dunn joint ranks method. Values in bold are P<0.05. Different letters between snack x BMI categories within each variable indicate significant (P<0.05) difference. The mean rank scores obtained from the Kruskal-Wallis test for significant variables are presented in brackets. IRI-insulin resistance index.

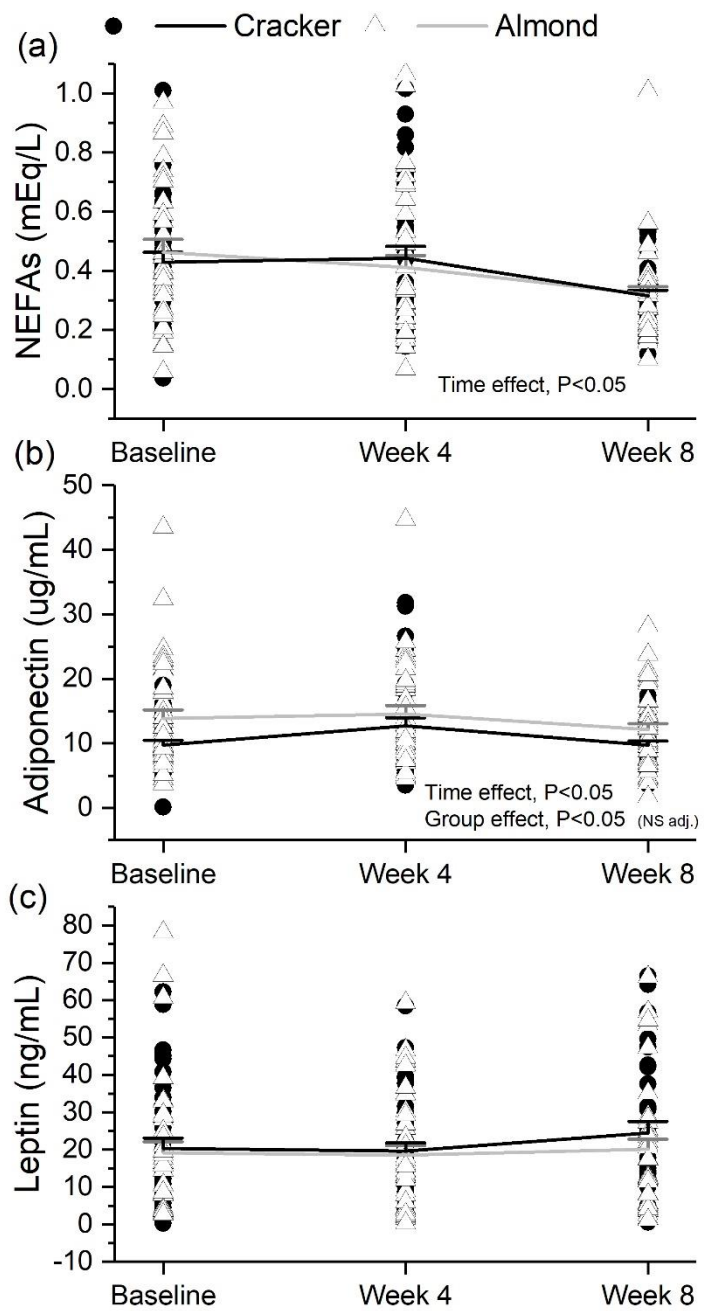


Figure S1: Fasting (a) serum non-esterified fatty acids (NEFAs), (b) serum adiponectin and (c) plasma leptin profiles of the cracker and almond groups at baseline, week 4 and week 8 of the intervention.

Values are individual data points representing each participant at baseline, week 4 and week 8. Means \pm SDs of the 2 snack groups at baseline, week 4 and week 8 are also plotted. Analysis was conducted using a linear mixed effects model with time as within-subject factor and snack group as between subject factor. Leptin and adiponectin values were transformed prior to analysis using Johnson's family of transformations. Cracker: N=35, Almond: N=38. Adiponectin time effect: baseline vs. week 4, $P < 0.05$; week 4 vs. week 8, $P < 0.05$. NEFAs time effect: baseline vs. week 8, $P < 0.05$; week 4 vs. week 8, $P < 0.05$. NS adj.: non-significant after baseline adjustment.

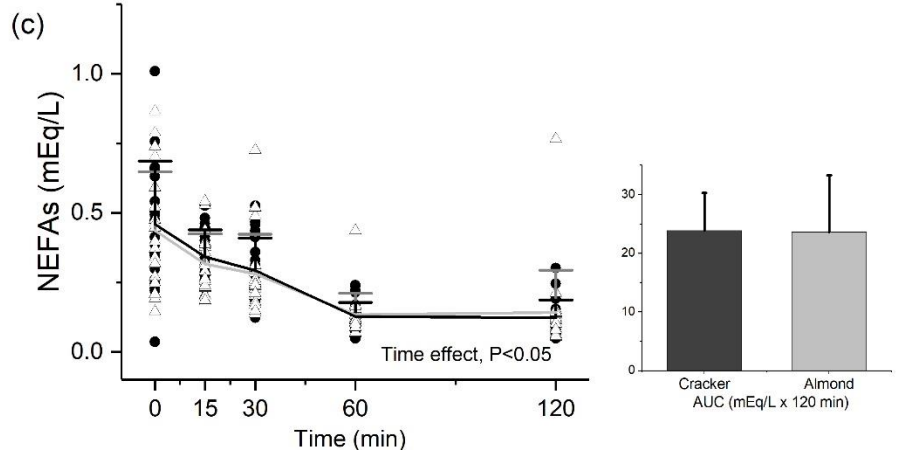
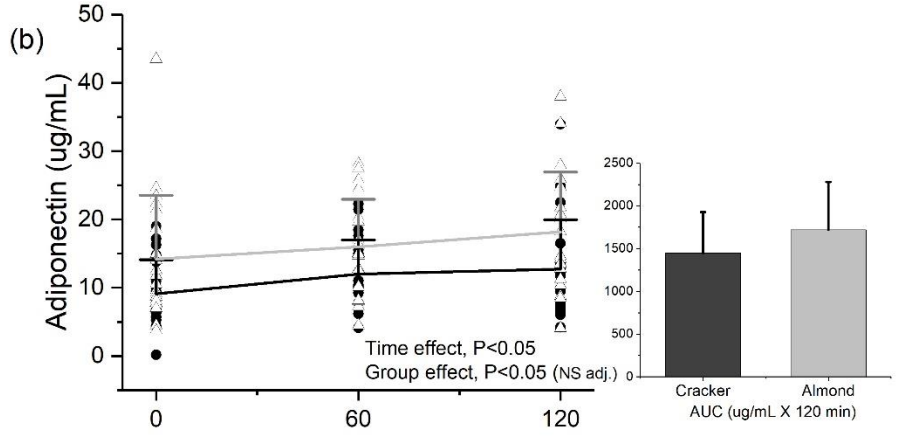
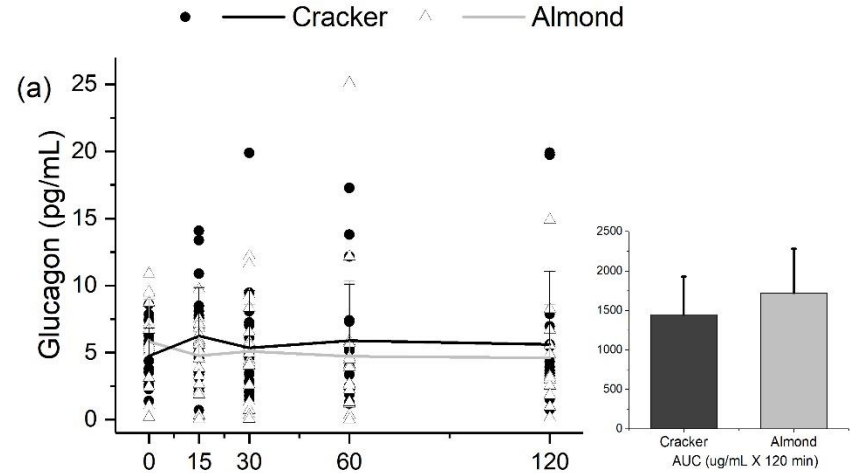


Figure S2: Serum (a) glucagon, (b) adiponectin, (c) and non-esterified fatty acids (NEFAs) profiles at 0, 15, 30, 60 and 120 minutes of an oral glucose tolerance test (OGTT) in the cracker and almond groups at week 8 of the intervention.

Values are individual data points representing each participant at each time point. Means \pm SDs of the 2 snack groups at each time point are also plotted. Analysis was conducted using a linear mixed effects model with time as within-subject factor and snack group as between subject factor. Adiponectin and NEFAs values were transformed prior to analysis using Johnson's family of transformations. Area under the curves (Means \pm SDs) are displayed adjacent to the respective OGTT profiles. Analysis was conducted using a one-way ANOVA with snack group as between subject factor. Cracker: N=20, Almond: N=20. Adiponectin time effect: 60, 120 vs. 0 min. NEFAs time effect: 30, 60, 120 vs. 0 min; 30, 60, 120 vs. 15 min; 60, 120 vs. 30 min, $P < 0.05$. NS adj.: non-significant after time 0 adjustment.

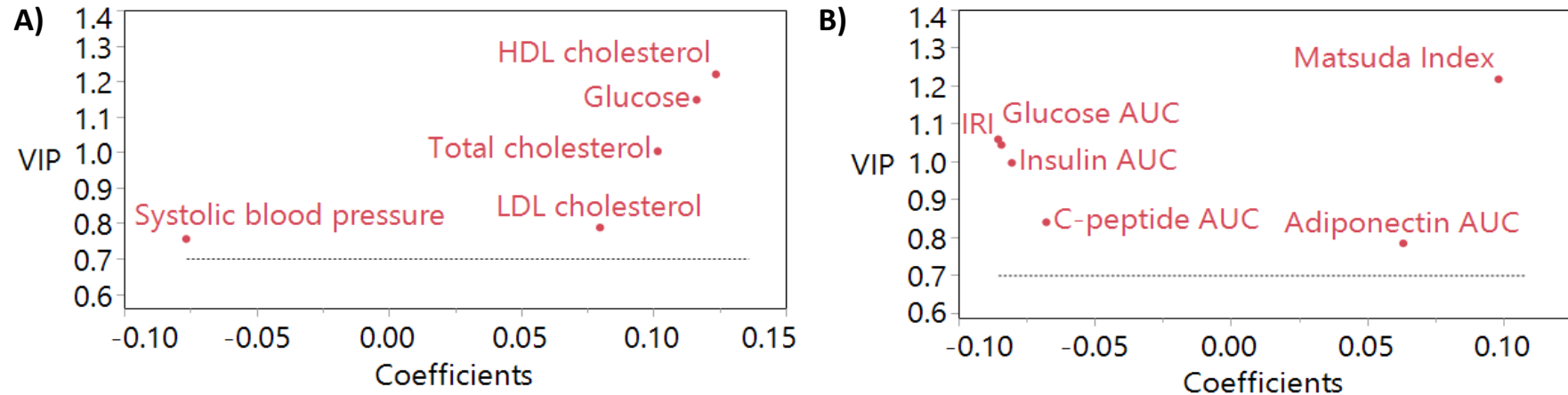


Figure S3: Variable importance projection (VIP) score vs coefficient plot from the pruned partial least squares discriminant analyses (PLS-DA) A) intervention snack model, B) OGTT snack model.

Partial least squares-discriminant analysis (PLS-DA) was conducted on: A) changes in anthropometric and clinical outcomes over 8 weeks, and B) OGTT AUCs and insulin sensitivity/resistance indices, to determine which features were the most discriminatory (VIP score > 0.7) between the snack groups. Input dataset for the intervention analysis comprised of changes in BM, fat mass, fat-free mass, waist circumference, systolic and diastolic blood pressure, total, HDL and LDL cholesterol, triglycerides, NEFAs, adiponectin, GLP-1, insulin, leptin, glucose, HOMA-IR, HOMA- β , QUICKI, and appetite ratings over the 8-week intervention. Input dataset for the OGTT analysis comprised of HOMA-IR, HOMA- β , QUICKI, IRI, DI, Matsuda index, and AUCs for adiponectin, GLP-1, insulin, C-peptide, NEFAs, glucose, and glucagon. Data were standardized (i.e. centered and scaled) prior to PLS-DA and the model was fit with SIMPLS algorithm. The model was pruned to determine best fit and validated with leave-one-out old cross validation. Principal component analysis (PCA) was conducted on the correlation matrix obtained from the discriminatory features (identified by PLS-DA) for visualization purposes.

AUC: area under the curve, HOMA-IR: homeostatic model assessment-insulin resistance, IRI; insulin resistance index; QUICKI: quantitative insulin-sensitivity check index, OGTT: oral glucose tolerance test

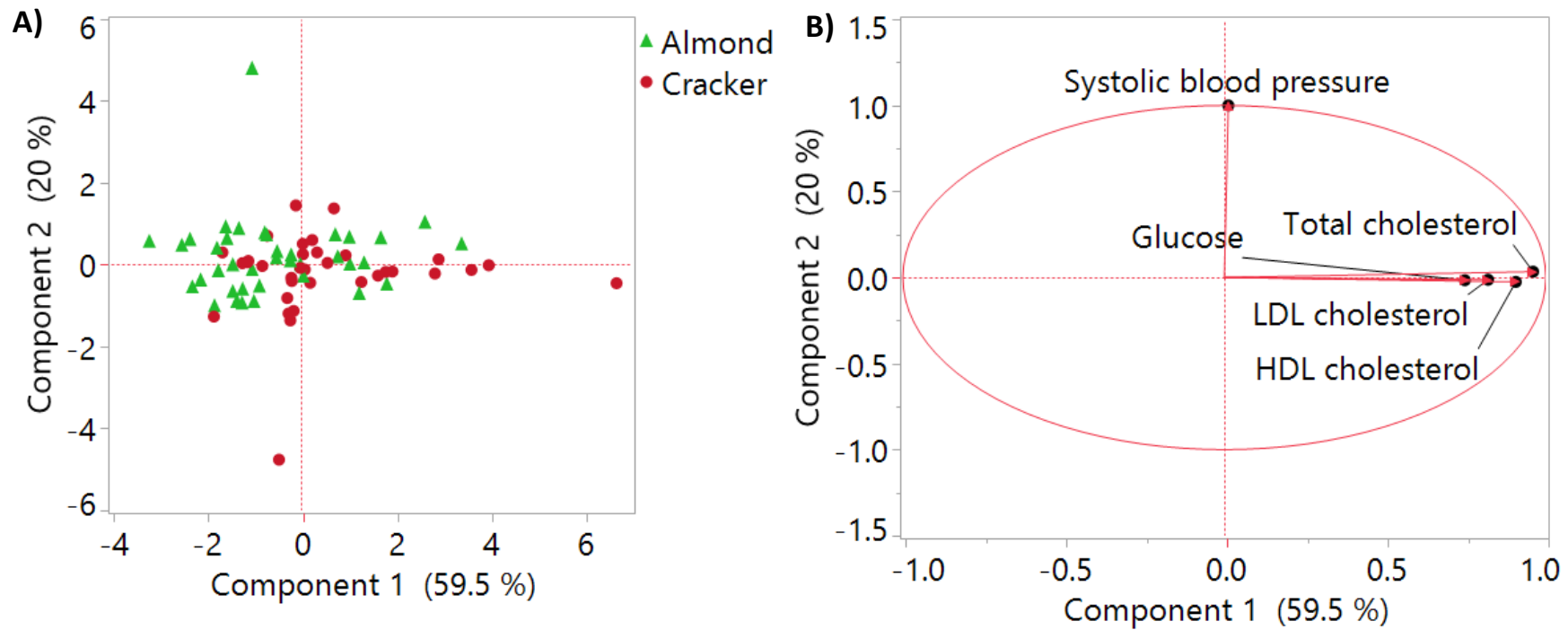


Figure S4: Principal component analysis A) score plot of participants and B) loading plot of variables- i.e. Δ glucose, Δ total cholesterol, Δ LDL cholesterol, Δ HDL cholesterol and Δ systolic blood pressure identified by PLS-DA as most discriminatory between the snack groups over the 8-week intervention. Δ , baseline-week 8.

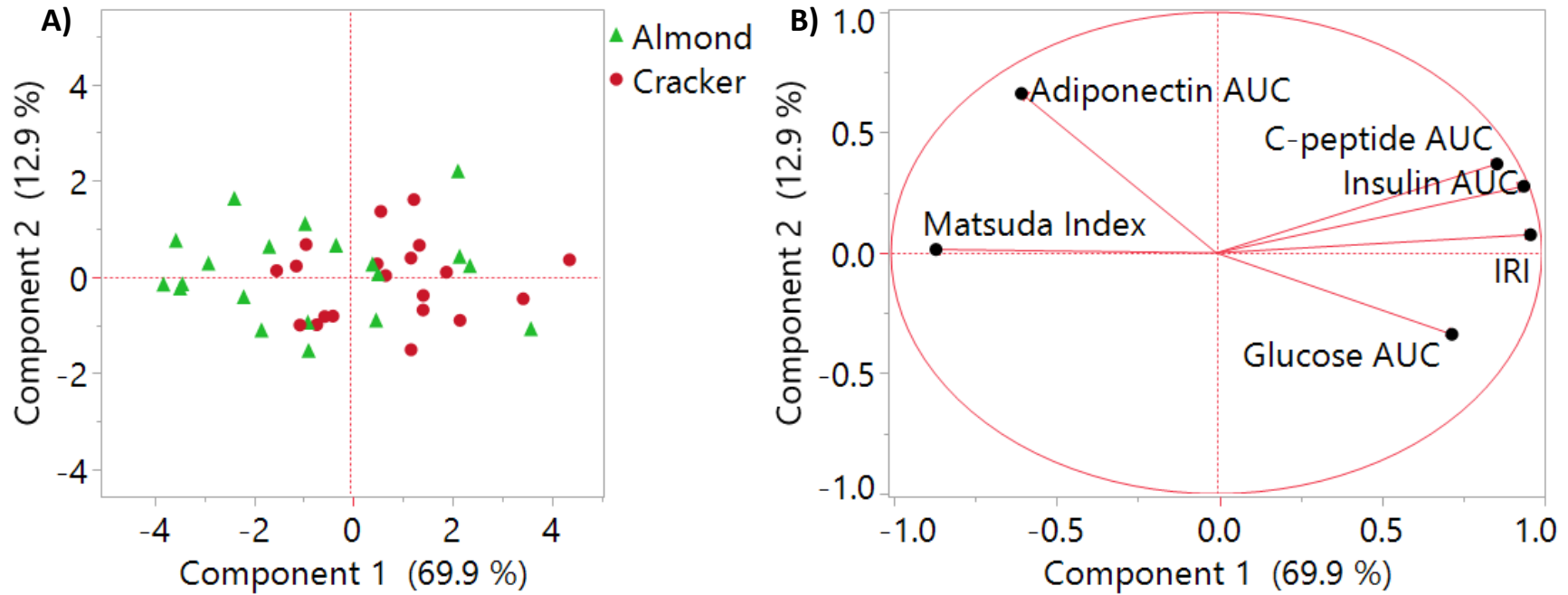


Figure S5: Principal component analysis A) score plot of participants and B) loading plot of variables i.e. adiponectin AUC, C-peptide AUC, insulin AUC, glucose AUC, IRI and Matsuda index identified by PLS-DA as most discriminatory between the snack groups during the OGTT.

AUC: area under the curve, IRI; insulin resistance index; OGTT: oral glucose tolerance test