Supplemental Table 1. Diet formulations*.

	0.06% diet			0.2% diet			0.6% diet		
Ingredients	L	10	M	L	10	M	L	10	M
	gm	gm	gm	gm	gm	gm	gm	gm	gm
Casein	189.6	189.6	189.6	189.6	189.6	189.6	189.6	189.6	189.6
L-Cystine	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Corn Starch	298.5	298.6	298.6	298.6	298.6	298.6	298.6	298.6	298.6
Maltodextrin 10	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2
Sucrose	331.7	331.8	331.8	331.8	331.8	331.8	331.8	331.8	331.8
Cellulose	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4
Soybean Oil	23.1	23.1	23.1	21.7	21.7	21.7	17.7	17.7	17.7
Lard	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Linoleic acid	**0.6**	**0.3**	0	**2.0**	**1.0**	0	**6.0**	**3.0**	0
9,11 CLA	0	0	**0.3**	0	0	**1.0**	0	0	**3.0**
10,12 CLA	0	**0.3**	**0.3**	0	**1.0**	**1.0**	0	**3.0**	**3.0**
Mineral Mix S10026	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
DiCalcium Phosphate	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3
Calcium Carbonate	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Potassium Citrate, 1 H_2O	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6
Vitamin Mix V10001	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Choline Bitartrate	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Total	1000	1000	1000	1000	1000	1000	1000	1000	1000

*L, linoleic acid controls; 10, 10,12 CLA plus linoleic acid; M, 10,12 CLA plus 9,11 CLA.

Supplemental Table 2. Fat composition of the diet*.

Ingredients	0.06% diet			0.2% diet			0.6% diet		
	L	10	M	L	10	M	L	10	M
	%	%	%	%	%	%	%	%	%
Soybean Oil	54.1	54.1	54.1	50.8	50.8	50.8	41.4	41.4	41.4
Lard	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5
Linoleic acid	**1.4**	**0.7**	0	**4.7**	**2.35**	0	**14.1**	**7.05**	0
9,11 CLA	0	0	**0.7**	0	0	**2.35**	0	0	**7.05**
10,12 CLA	0	**0.7**	**0.7**	0	**2.35**	**2.35**	0	**7.05**	**7.05**

* Data were expressed as a percentage of total fat. L, linoleic acid controls; 10, 10,12 CLA plus linoleic acid; M, 10,12 CLA plus 9,11 CLA.

Supplemental Table 3. Fatty acids analysis of the diets [*,**].

	0.06% diet			0.2% diet			0.6% diet		
	L	10	M	L	10	M	L	10	M
C14:0	0.027	0.033	0.017	0.027	0.033	0.027	0.028	0.023	0.024
C16:0	0.509	0.607	0.359	0.525	0.605	0.502	0.460	0.468	0.462
C16:1	0.032	0.038	0.021	0.033	0.038	0.032	0.033	0.029	0.029
C18:0	0.171	0.226	0.157	0.201	0.231	0.188	0.152	0.174	0.188
C18:1	0.800	0.987	0.606	0.858	0.972	0.827	0.704	0.766	0.746
C18:2	1.521	1.822	1.023	1.652	1.787	1.515	1.685	1.452	1.228
C18:3 (n6)	0.004	0.006	0.005	0.004	0.006	0.005	0.004	0.004	0.004
C18:3 (n3)	0.198	0.243	0.137	0.188	0.232	0.206	0.158	0.136	0.150
9,11 CLA	**0.005**	**0.005**	**0.016**	**0.008**	**0.006**	**0.069**	**0.005**	**0.013**	**0.225**
10,12 CLA	**0.003**	**0.022**	**0.015**	**0.006**	**0.069**	**0.067**	**0.004**	**0.220**	**0.220**
C20:0	0.003	0.005	0.004	0.004	0.006	0.005	0.003	0.003	0.004
C20:1	0.007	0.010	0.008	0.009	0.011	0.009	0.007	0.008	0.009
C20:2	0.010	0.013	0.009	0.011	0.014	0.011	0.009	0.011	0.011
Fat%	3.369	4.096	2.410	3.637	4.069	3.517	3.309	3.300	3.364

[*] Data were expressed as fatty acid g / 100 g diet. L, linoleic acid controls; 10, 10,12 CLA plus linoleic acid; M, 10,12 CLA plus 9,11 CLA.

[**] C20:3 (n6), C20:3 (n3), C20:4, C20:5, C22:0, C22:1, C22:2, C22:3, C22:4, C22:6, and C24:1 were underdectable.

Supplemental Table 4. Fatty acid content of muscle*.

mg/g	0.06% diet			0.2% diet			0.6% diet		
tissue	L	10	M	L	10	M	L	10	M
C12:0	0.03 ± 0.01	0.01 ± 0.00	0.02 ± 0.00	0.04 ± 0.02	0.02 ± 0.00	0.03 ± 0.00	0.02 ± 0.00	0.01 ± 0.00	0.01 ± 0.00
C14:0	0.63 ± 0.14^{a}	0.30 ± 0.02^{abc}	0.36 ± 0.04^{abc}	0.63 ± 0.19^{a}	0.48 ± 0.07^{ab}	0.67 ± 0.07^{a}	0.33 ± 0.05^{abc}	0.07 ± 0.01^{c}	0.12 ± 0.04^{bc}
C14:1	0.18 ± 0.05	0.08 ± 0.01	0.11 ± 0.02	0.15 ± 0.03	0.13 ± 0.02	0.18 ± 0.02	0.09 ± 0.02	0.01 ± 0.00	0.01 ± 0.00
C15:0	0.05 ± 0.01	0.03 ± 0.00	0.03 ± 0.00	0.04 ± 0.01	0.04 ± 0.01	0.05 ± 0.00	0.03 ± 0.00	0.02 ± 0.00	0.02 ± 0.00
C16:0	6.0 ± 1.5^{a}	3.2 ± 0.2^{ab}	3.4 ± 0.3^{ab}	5.1 ± 0.9^{a}	3.8 ± 0.4^{ab}	4.7 ± 0.4^{ab}	3.4 ± 0.3^{ab}	1.6 ± 0.1^{b}	2.9 ± 1.1^{ab}
C16:1	5.1 ± 1.1	2.5 ± 0.2	3.1 ± 0.4	4.4 ± 0.8	3.8 ± 0.6	5.0 ± 0.5	2.8 ± 0.4	0.4 ± 0.1	0.8 ± 0.3
C17:1	0.08 ± 0.01	0.04 ± 0.00	0.05 ± 0.01	0.07 ± 0.01	0.07 ± 0.01	0.08 ± 0.01	0.05 ± 0.01	0.01 ± 0.00	0.03 ± 0.01
C18:0	0.77 ± 0.23	0.8 ± 0.04	0.60 ± 0.03	0.68 ± 0.04	0.56 ± 0.05	0.59 ± 0.03	0.67 ± 0.03	0.54 ± 0.02	0.56 ± 0.09
C18:1c	8.1 ± 2.0	3.8 ± 0.3	4.5 ± 0.5	5.5 ± 0.7	5.4 ± 0.7	6.8 ± 0.8	4.3 ± 0.5	1.5 ± 0.1	3.5 ± 1.5
C18:2c	4.5 ± 1.1	2.0 ± 0.2	2.4 ± 0.3	3.1 ± 0.5	2.8 ± 0.4	3.6 ± 0.4	2.5 ± 0.4	0.7 ± 0.1	0.9 ± 0.2
C18:2t	0.03 ± 0.01	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.03 ± 0.01	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.01
9,11 CLA	**0.07 ± 0.01^{b}**	**0.03 ± 0.00^{b}**	**0.05 ± 0.01^{b}**	**0.05 ± 0.01^{b}**	**0.05 ± 0.01^{b}**	**0.14 ± 0.03^{a}**	**0.03 ± 0.00^{b}**	**0.01 ± 0.00^{b}**	**0.06 ± 0.02^{b}**
10,12 CLA	**0.04 ± 0.01^{b}**	**0.02 ± 0.00^{ab}**	**0.03 ± 0.00^{ab}**	**0.02 ± 0.00^{ab}**	**0.06 ± 0.01^{a}**	**0.06 ± 0.01^{a}**	**0.02 ± 0.00^{ab}**	**0.03 ± 0.00^{ab}**	**0.04 ± 0.01^{b}**
C18:3n3	0.33 ± 0.09	0.12 ± 0.01	0.15 ± 0.02	0.28 ± 0.09	0.17 ± 0.03	0.21 ± 0.03	0.13 ± 0.03	0.03 ± 0.01	0.04 ± 0.01
C18:3n6	0.08 ± 0.02	0.05 ± 0.00	0.05 ± 0.00	0.05 ± 0.01	0.06 ± 0.02	0.05 ± 0.00	0.05 ± 0.00	0.05 ± 0.00	0.06 ± 0.01
C20:1	0.07 ± 0.02	0.04 ± 0.00	0.04 ± 0.00	0.05 ± 0.01	0.06 ± 0.01	0.06 ± 0.01	0.04 ± 0.00	0.03 ± 0.00	0.05 ± 0.02
C20:2	0.08 ± 0.03	0.04 ± 0.00	0.04 ± 0.00	0.05 ± 0.01	0.09 ± 0.04	0.05 ± 0.00	0.04 ± 0.00	0.03 ± 0.01	0.04 ± 0.01
C20:3n6	0.08 ± 0.05	0.05 ± 0.00	0.03 ± 0.00	0.05 ± 0.00	0.04 ± 0.01	0.04 ± 0.00	0.04 ± 0.00	0.03 ± 0.00	0.04 ± 0.01
C20:4n6	0.80 ± 0.46	0.57 ± 0.03	0.38 ± 0.03	0.62 ± 0.06	0.37 ± 0.04	0.43 ± 0.02	0.58 ± 0.06	0.39 ± 0.02	0.42 ± 0.06
C22:5	0.13 ± 0.03	0.17 ± 0.01	0.12 ± 0.01	0.14 ± 0.03	0.12 ± 0.02	0.14 ± 0.01	0.21 ± 0.02	0.17 ± 0.02	0.16 ± 0.03
C22:6n3	0.62 ± 0.26	0.54 ± 0.04	0.39 ± 0.05	0.65 ± 0.07	0.33 ± 0.05	0.42 ± 0.33	0.59 ± 0.08	0.31 ± 0.02	0.32 ± 0.05
C24:0	0.04 ± 0.01	0.06 ± 0.01	0.04 ± 0.00	0.06 ± 0.01	0.04 ± 0.01	0.05 ± 0.01	0.06 ± 0.01	0.04 ± 0.00	0.04 ± 0.01
SAT	7.5 ± 1.8	4.4 ± 0.2	4.5 ± 0.3	6.6 ± 1.1	5.0 ± 0.5	6.1 ± 0.5	4.5 ± 0.4	2.3 ± 0.1	3.6 ± 1.2
MUFA	13.4 ± 2.7	6.5 ± 0.5	7.9 ± 0.9	9.6 ± 1.2	9.4 ± 1.3	12.1 ± 1.3	7.2 ± 0.1	2.0 ± 0.2	4.4 ± 1.9
PUFA	6.8 ± 1.9	3.6 ± 0.3	3.6 ± 0.4	4.7 ± 0.6	4.1 ± 0.5	5.1 ± 0.5	4.2 ± 0.5	1.8 ± 0.1	2.1 ± 0.4

*Means ± SEM, not sharing a common letter within the same row differ ($p<0.05$). L, linoleic acid controls; 10, 10,12 CLA plus linoleic acid; M, 10,12 CLA plus 9,11 CLA.

Supplemental Table 5. The effects of CLA on body weight gain (BWG), food intake (FI), food conversion efficiency (FCE), fasting blood glucose (BG), glucose tolerance test (GTT) area under the curve (AUC), fasting insulin, and HOMA-IR index*.

Diets	Total BWG (g)	Total FI (per cage, g)	FCE (per cage)	Fasting BG (mg/dL)	GTT AUC	Fasting insulin (ng/mL)	HOMA-IR index
Type	< 0.0001	0.0003	< 0.0001	0.3661	0.7136	0.7590	0.9649
Dose	< 0.0001	0.9844	< 0.0001	0.2580	0.5534	0.0640	0.0378
Interacti-on	< 0.0001	0.6104	0.0016	0.1085	0.5043	0.0412	0.0956
0.06 L	5.7± 0.1^{ab}	276 ± 3.0	25.1 ± 1.5^{b}	78.1 ± 3.8	23640 ± 808	0.51 ± 0.11^{ab}	2.35 ± 0.55
0.06 10	5.5± 0.1^{abc}	265 ± 3.9	24.2 ± 0.9^{b}	74.8 ± 2.6	23344 ± 919	0.39 ± 0.05^{b}	1.69 ± 0.21
0.06 M	5.0± 0.2^{abc}	269 ± 4.1	28.3 ± 2.4^{b}	73.4 ± 3.8	21418 ± 995	0.53 ± 0.09^{ab}	2.31 ± 0.48
0.2 L	6.2± 0.2^{a}	280 ± 2.4	22.8 ± 1.3^{b}	79.8 ± 2.1	23112 ± 1124	0.60 ± 0.11^{ab}	2.85 ± 0.54
0.2 10	3.9± 0.1^{cde}	261 ± 4.7	33.6 ± 1.4^{b}	75.6 ± 4.7	24082 ± 1000	0.44 ± 0.08^{ab}	1.96 ± 0.37
0.2 M	4.4± 0.1^{bcd}	270 ± 2.2	31.2 ± 1.6^{b}	78.5 ± 4.0	23230 ± 1084	0.47 ± 0.06^{ab}	2.22 ± 0.35
0.6 L	6.4± 0.1^{a}	282 ± 2.1	22.2 ± 0.8^{b}	74.6 ± 2.8	22193 ± 469	0.49 ± 0.09^{ab}	2.28 ± 0.50
0.6 10	2.8± 0.1^{de}	262 ± 2.5	52.1 ± 5.2^{a}	77.9 ± 4.8	22436 ± 1126	0.94 ± 0.21^{a}	4.20 ± 0.98
0.6 M	2.6± 0.1^{e}	264 ± 2.3	53.7 ± 4.7^{a}	89.5 ± 4.9	23194 ± 1350	0.60 ± 0.09^{ab}	3.18 ± 0.64

* Means ± SEM without a common letter in the same column differ ($p<0.05$). L, linoleic acid controls; 10, 10,12 CLA plus linoleic acid; M, 10,12 CLA plus 9,11 CLA.

Supplemental Table 6. Probability levels for the main effects of fatty acid type and dose and their interactions for the experimental outcomes.

Dependent variable	Type	Dose	Interaction
Fig 1			
EPI	< 0.0001	< 0.0001	< 0.0001
ING	< 0.0001	< 0.0001	< 0.0001
MEN	< 0.0001	< 0.0001	0.0007
RET	< 0.0001	< 0.0001	0.0002
Total WAT	< 0.0001	< 0.0001	< 0.0001
BAT	< 0.0001	< 0.0001	0.0002
Fig 2B			
Liver Weight	< 0.0001	< 0.0001	< 0.0001
Liver TG	< 0.0001	< 0.0001	< 0.0001
Fig 3			
MCP1	0.0142	< 0.0001	0.0044
IL6	< 0.0001	0.001	0.0019
Serum TG	< 0.0001	< 0.0001	< 0.0001
Fig 4A			
UCP1	< 0.0001	< 0.0001	< 0.0001
Elovl3	< 0.0001	0.0001	0.0706
Cidea	< 0.0001	< 0.0001	< 0.0001
CPT1b	< 0.0001	< 0.0001	< 0.0001
Cox8b	< 0.0001	< 0.0001	< 0.0001
PPARα	< 0.0001	< 0.0001	< 0.0001
COX2	< 0.0001	< 0.0001	< 0.0001
PGF2α	< 0.0001	< 0.0001	< 0.0001
synthase			
TMEM26	< 0.0001	< 0.0001	< 0.0001
Fig 4B			
UCP1	0.0012	< 0.0001	< 0.0001
Elovl3	0.0629	0.019	< 0.0001
Cidea	0.2104	< 0.0001	< 0.0001
CPT1b	0.0002	< 0.0001	< 0.0001
Cox8b	< 0.0001	0.0019	0.0003
PPARα	< 0.0001	< 0.0001	< 0.0001
COX2	< 0.0001	0.0003	< 0.0001
PGF2α	< 0.0001	< 0.0001	< 0.0001
synthase			
TMEM26	< 0.0001	< 0.0001	0.0175
Fig 6A			
MCP1	< 0.0001	< 0.0001	< 0.0001
TNFα	< 0.0001	< 0.0001	< 0.0001
F4/80	< 0.0001	< 0.0001	< 0.0001
IL6	< 0.0001	< 0.0001	< 0.0001
Arginase 1	< 0.0001	< 0.0001	< 0.0001
Mrc 1	< 0.0001	< 0.0001	< 0.0001
Clec 10	< 0.0001	< 0.0001	< 0.0001
Fig 6B			
MCP1	< 0.0001	< 0.0001	< 0.0001
TNFα	< 0.0001	< 0.0001	0.0001
F4/80	< 0.0001	< 0.0001	< 0.0001
IL6	< 0.0001	0.1794	0.0003
Arginase 1	0.2374	0.2133	0.4565
Mrc 1	< 0.0001	0.0535	< 0.0001
Clec 10	< 0.0001	0.1012	0.0028

Dependent variable	Type	Dose	Interaction
Fig 7A			
PPARγ	< 0.0001	< 0.0001	< 0.0001
Perilipin	< 0.0001	0.0093	< 0.0001
FABP4	< 0.0001	0.2678	< 0.0001
HSL	0.0004	< 0.0001	< 0.0001
ATGL	0.0007	< 0.0001	< 0.0001
Fig 7B			
PPARγ	0.8922	< 0.0001	0.0002
Perilipin	< 0.0001	< 0.0001	< 0.0001
FABP4	0.0039	0.0173	< 0.0001
HSL	0.0398	< 0.0001	0.0012
ATGL	0.7346	< 0.0001	0.001
Fig 8A			
GPR120	< 0.0001	0.313	< 0.0001
GPR40	0.0443	0.3533	0.0132
Fig 8B			
GPR120	0.5264	< 0.0001	< 0.0001
GPR40	< 0.0001	< 0.0001	0.0433
Suppl Fig 1			
UCP1	0.8595	0.0022	0.1126
Elovl3	< 0.0001	< 0.0001	< 0.0001
Cidea	0.0792	< 0.0001	< 0.0001
CPT1b	0.0012	< 0.0001	0.0001
Cox8b	< 0.0001	< 0.0001	< 0.0001
PPARα	0.0033	< 0.0001	< 0.0001
COX2	0.0013	< 0.0001	< 0.0001
PGF2α	< 0.0001	0.0011	0.0422
synthase			
TMEM26	< 0.001	< 0.001	< 0.001
Suppl Fig 2			
MCP1	< 0.0001	< 0.0001	< 0.0001
TNFa	< 0.0001	< 0.0001	< 0.0001
F4/80	< 0.0001	< 0.0001	< 0.0001
IL6	< 0.0001	< 0.0001	< 0.0001
Arginase 1	< 0.0001	< 0.0001	< 0.0001
Mrc 1	< 0.0001	< 0.0001	< 0.0001
Clec 10	< 0.0001	0.036	0.0164
Suppl Fig 3			
PPARg	0.0466	< 0.0001	< 0.0001
Perilipin	< 0.0001	< 0.0001	< 0.0001
FABP4	0.0003	< 0.0001	< 0.0001
HSL	0.0631	< 0.0001	0.0001
ATGL	0.0368	< 0.0001	0.0022
Suppl Fig 4			
GPR120	< 0.0001	< 0.0001	< 0.0001
GPR40	0.0044	0.0229	0.0635

Supplemental Fig. 1. Differential effects of CLA dose and treatments on markers of browning in retroperitoneal (RET) WAT. Panel A; direct markers of browning. Panel B; markers of prostaglandin production that are associated with the activation of browning. mRNA levels of markers of brown fat-like adipocytes were measured in RET WAT by real time qPCR. Means ± SEM without a common letter differ ($P<0.05$). L, linoleic acid; 10, 10,12 CLA plus linoleic acid; M, 10,12 CLA plus 9,11 CLA; UCP-1, uncoupling protein 1; Elovl3, elongation of very long chain fatty acids 3; Cidea, cell death-induced DNA fragmentation factor-a-like effector A; CPT-1b, carnitine palmitoyltransferase 1 b; Cox8b, cytochrome c oxidase subunit VIII b; PPARα, proliferator-activated receptor alpha; TMEM26, transmembrane protein 26; COX-2, cyclooxygenase-2; PGF2α,prostaglandin F2 alpha.

Supplemental Fig. 2. Intermediate and high dose of CLA treatments increase marker of low grade inflammation in retroperitoneal (RET) WAT. Panel A; markers of classically-activated M1 macrophage. Panel B; markers of alternatively-activated M2 macrophage. mRNA levels of markers of low grade inflammation were measured in RET WAT by real time qPCR. Means ± SEM without a common letter differ ($P<0.05$). L, linoleic acid; 10, 10,12 CLA plus linoleic acid; M, 10,12 CLA plus 9,11 CLA; COX-2, cyclooxygenase 2; MCP-1, monocyte chemoattractant protein 1; IL-6 , interleukin 6; TNFα = tumor necrosis factor alpha

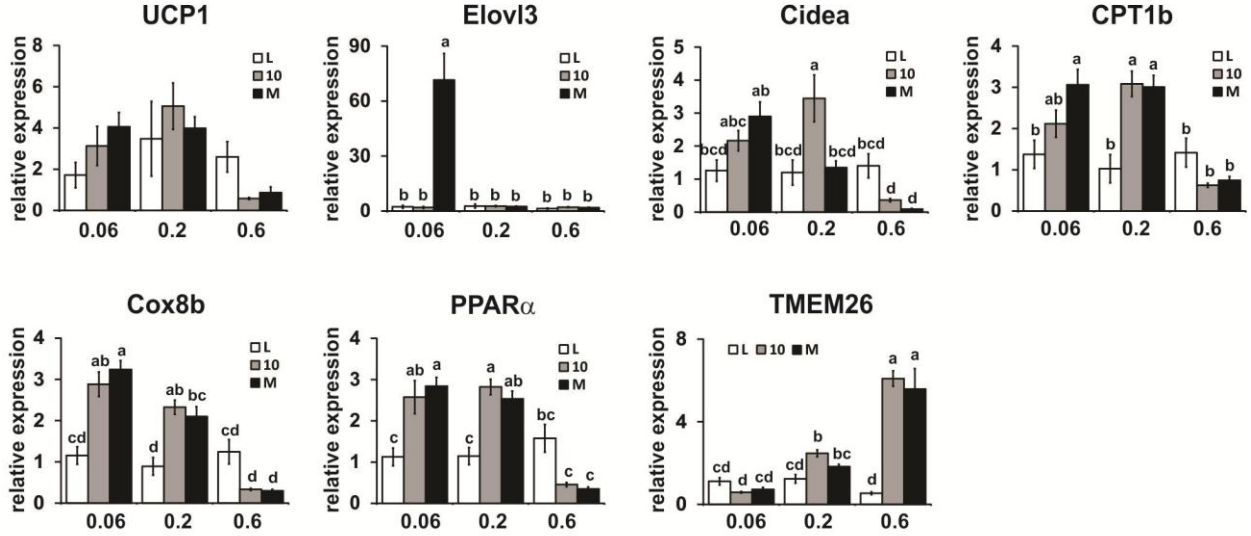
Supplemental Fig. 3. Differential effects of CLA dose and treatments on markers of lipogenesis and lipolysis in retroperitoneal (RET) WAT. mRNA levels of markers of lipogenesis (Panel A) and lipolysis (Panel B) were measured in RET WAT by real time qPCR. Means ± SEM without a common letter differ ($P<0.05$). L, linoleic acid; 10, 10,12 CLA plus linoleic acid; M, 10,12

CLA plus 9,11 CLA; PPARα, peroxisome proliferator-activated receptor alpha; FABP4, fatty acid binding protein 4,; HSL, hormone sensitive lipase; ATGL, adipose tissue TG lipase.

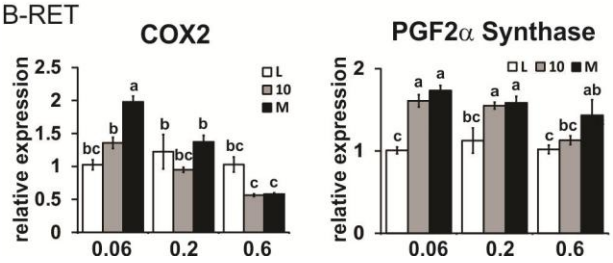
Supplemental Fig. 4. FFA receptors GPR120 and 40 in retroperitoneal (RET) WAT are differentially regulated by CLA**.** mRNA levels of markers of GPR 120 and 40 were in RET WAT measured by real time qPCR. Means $\pm$ SEM without a common letter differ ($P<0.05$). L, linoleic acid; 10, 10,12 CLA plus linoleic acid; M, 10,12 CLA plus 9,11 CLA; GPR, G protein receptor

Supplemental Fig 1.

A-RET

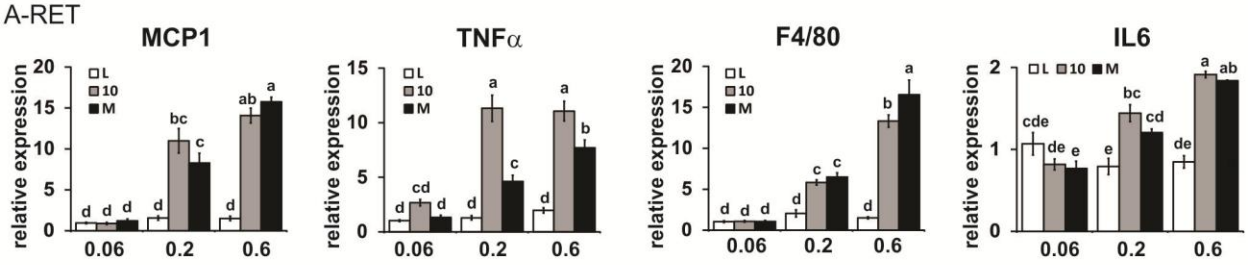


B-RET



Suppmental Fig 2.

A-RET



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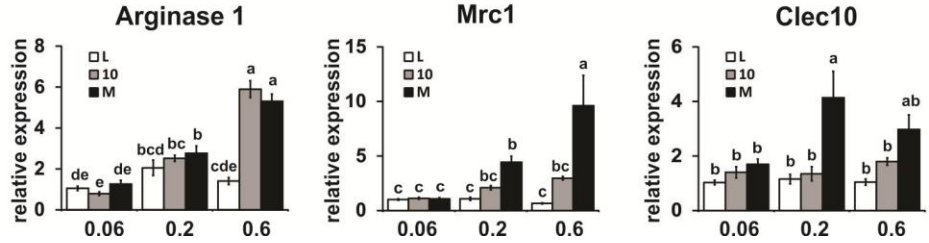
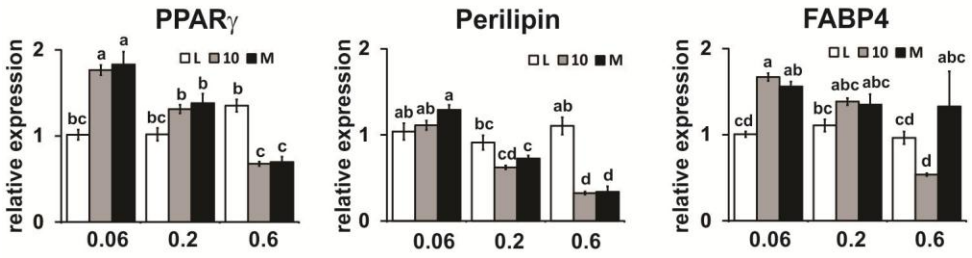
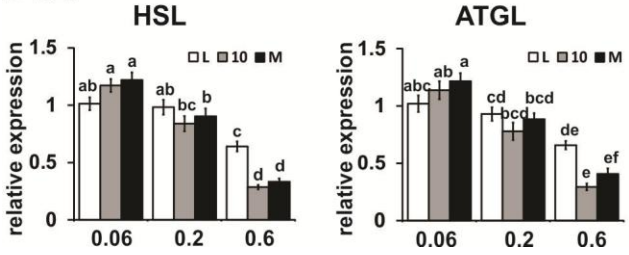


Supplemental Fig 3.

A-RET



B-RET



Supplemental Fig 4.

RET