

Table S1. Temperature-Dependant Ratios of *Bmp8b*^{-/-} Pups, Related to Figure 2

20°C			23°C		
Genotype	<i>Observed</i>	<i>Expected</i>	Genotype	<i>Observed</i>	<i>Expected</i>
(+/+)	142 (30%)	120	(+/+)	283 (28%)	252
(+/-)	283 (59%)	239	(+/-)	529 (53%)	502
(-/-)	54 (11%)	120	(-/-)	194 (19%)	252
Total	479	479	Total	1006	1006

Chi² = 48.4 P < 0.0001

Chi² = 18.6 P < 0.0001

Total numbers of pups of different genotypes born over the course of two years when ambient housing temperature was kept at the indicated temperature. Breeding was set up using mice heterozygous for the *Bmp8b* deletion. Percentages for that year indicated in brackets.

Table S2. Serum Biochemistry of *Bmp8b*^{-/-} Mice, Related to Figure 2

Marker	Units	Chow		HFD		Sig.
		<i>Bmp8b</i> ^{+/+}	<i>Bmp8b</i> ^{-/-}	<i>Bmp8b</i> ^{+/+}	<i>Bmp8b</i> ^{-/-}	
Cholesterol	mmol/L	1.85 (+/-) 0.13	1.79 (+/-) 0.15	3.83 (+/-) 0.14	4.22 (+/-) 0.20	b
Triglycerides	mmol/L	0.94 (+/-) 0.08	0.92 (+/-) 0.07	0.72 (+/-) 0.07	0.60 (+/-) 0.04	b
HDL	mmol/L	0.94 (+/-) 0.13	0.83 (+/-) 0.17	1.55 (+/-) 0.06	1.54 (+/-) 0.11	b
LDL	mmol/L	0.50 (+/-) 0.10	0.53 (+/-) 0.16	1.96 (+/-) 0.13	2.40 (+/-) 0.18	b
Glucose	mmol/L	11.29 (+/-) 0.59	10.68 (+/-) 0.46	12.74 (+/-) 0.45	13.20 (+/-) 0.59	
NEFA	μmol/L	1151(+/-) 94	1238 (+/-) 103	1048 (+/-) 104	949 (+/-) 104	
Insulin	μg/L	0.47 (+/-) 0.13	0.54 (+/-) 0.10	1.23(+/-) 0.24	1.78 (+/-) 0.30	b
Leptin	pg/ml	2813 (+/-) 399	4518 (+/-) 973	51029 (+/-) 10954	79060 (+/-) 9890	b
Corticosterone	ng/ml	112.3 (+/-) 31.6	68.7 (+/-) 21.2	140.8 (+/-) 28.9	153.5 (+/-) 14.8	
3-OH Butyrate	μmol/L	278.4 (+/-) 65.6	349.1 (+/-) 58.8	355.7 (+/-) 81.1	431.8 (+/-) 47.2	
T4	nmol/L	61.35 (+/-) 6.09	49.03 (+/-) 8.23	61.50 (+/-) 2.55	54.92 (+/-) 3.29	

Serum biochemistry analysis of levels of a range of metabolically relevant molecules in WT and KO mice fed standard chow and HFD. N = 7 per group, aged 20 weeks. Annotation indicates significant effect of a = genotype, b = diet, c = significant genotype-diet interaction where p < 0.05 using 2-Way ANOVA.

Table S3. List of Oligonucleotide Sequences, Related to Experimental Procedures

Gene	Forward Primer	Reverse Primer	Probe/SYBR green
MOUSE			
<i>18s</i>	CGGCTACCACATCCAAGGAA	GTCGGAATTACCGCGGCT	GAGGGCAAGTCTGGTGCCAG
<i>Actb</i>	GCTCTGGCTCCTAGCACCAT	GCCACCGATCCACACAGAGT	ATCAAGATCATTGCTCCTCCTGAGCGC
<i>Adra2a</i>	CGCAGGCCATCGAGTACAA	GGTGACAATGATGGCCTTGAT	SYBR
<i>Adrb3</i>	CGAGCCAGCCCTGTTGA	GGACGCGCACCTTCATAGC	SYBR
<i>Arbp</i> (36B4)	TCTCCAGAGGCACCATTGAAA	CTCGCTGGCTCCCACCTT	TCTGAGTGATGTGCAGCTGATAAAGACTG GA
<i>B2m</i>	GGTCTTTCTCTGGTGCCTTGTC	GTATGTTCCGGCTTCCCATTTC	SYBR
<i>Bmp2</i>	AACACCGTGCCGAGCTT	GCCGTTTTCCCACTCATCTC	SYBR
<i>Bmp4</i>	GCCATTCCGTAGTGCCATT	TTGCTGGAAAGGCTCAGAGA	SYBR
<i>Bmp5</i>	CAAGAAGCACGAACTCTATGTGAGT	CCCTTCTGGTCTATGATCCA	SYBR
<i>Bmp6</i>	CGCAGGACAGCGCTTTC	GTCGTACTCCACCAGGTTACA	SYBR
<i>Bmp7</i>	TGGATGGGCAGAGCATCAA	GGTCCATGCCGTCCTCAATC	SYBR
<i>Bmp8a</i>	AACCATGCCATCTTGCAGTCT	CAGAGGTGGCACTCAGTTTGG	TGTCCCAAGGCATGCTGTGCA
<i>Bmp8b</i>	TCCACCAACCACGCCACTAT	CAGTAGGCACACAGCACACCT	CAGGCCCTGGTACATCTGATGAAGCC
<i>Cd36</i>	GCCAAGCTATTGCGACATGA	TCTCAATGTCCGAGACTTTTCAAC	CACAGACGCGCCTCCTTCCACCT
<i>Cpt1b</i>	GCGTGCCAGCCACAATTC	TCCATGCGGTAATATGCTTCAT	CCGGTACTTGGATTCTGTGCGGCC
<i>Dio2</i>	TGCGCTGTGTCTGGAACAG	CTGGAATTTGGGAGCATCTTCA	SYBR
<i>Elovl3</i>	ATGAATTTCTCACGCGGGTTA	GAGCTTACCCAGTACTCCTCCAAA	SYBR
<i>Fas</i>	GCCCAGACAGAGAAGAGGCA	CTGACTCGGGCAACTCCC	GGAGGAGGTGGTGATAGCCGGTATGTC
<i>Hsl</i>	GGAGCACTACAACGCAACGA	TCGGCCACCGTAAAGAG	CAGGCCCTCAGTGTGACCCGCGATT
<i>Lcad</i>	GCATGAAACCAAACTCTGGA	TGTTTTGTAATTCAGATGCCAGT	TCCGGTTCTGCTTCCATGGCAAAA
<i>Pgc1a</i>	AACCACACCCACAGGATCAGA	CTCTTCGCTTTATTGCTCCATGA	CAAACCTGCCATTGTTAAGACCGAGAA
<i>Pgc1b</i>	GGCCTTGTGTCAAGGTGGAT	GGTGCTTATGCAGTTCCTGACA	AGACCCACACTGCGGGCTC
<i>Ppara</i>	CCTCAGGGTACCACTAGGGAGT	GCCCCAATAGTTCGCCGAAA	CACGCATGTGAAGGCTGTAAGCGCTT
<i>Pparg1</i>	TTTTAAAACAAGACTACCCCTTACTGAAATT	AGAGGTCCACAGAGCTGATTCC	AGAGATGCCATTCTGGCCCCACCAACTT
<i>Pparg2</i>	GATGCACTGCCTATGAGCACTT	AGAGGTCCACAGAGCTGATTCC	AGAGATGCCATTCTGGCCCCACCAACTT
<i>Prkaca</i>	TCCTTTGGGCGAGTGATGC	GCGAAGAAGGGTGGGTAAC	SYBR
<i>Prkar1a</i>	CTTTAGCCAAGGCCATCGAA	AATGTCACTTCTCTCGTTATCAT	SYBR
<i>Prkar2a</i>	AGAGTGACTCGGACTCGGAAG	GGTCAGTATGACAACCGTGCC	SYBR
<i>Srebp1c</i>	GCCATGGATTGCACATTTGA	GGCCCGGGAAGTCACTG	GACATGCTCCAGCTCATCAACAACCAAG
<i>Ucp1</i>	CCCGCTGGACACTGCC	ACCTAATGGTACTGGAAGCCTGG	AAGTCCGCCTTCAGATCCAAGGTGAAG
RAT			
<i>18s</i>	CGGCTACCACATCCAAGGAA	GTCGGAATTACCGCGGCT	GAGGGCAAGTCTGGTGCCAG
<i>Adra2a</i>	GGTGGTGATCGGCGTGTT	CGACGGCTATGAGCGTGATG	SYBR
<i>Adrb3</i>	CCTTCCCAGCTAGCCCTGTT	TGCTAGATCTCCATGGTCTTCA	SYBR
<i>Dio2</i>	ACGGAGGCAAACTGGTCCAT	CACTTAGTTCCTGTAAGCGTAGTC	SYBR
<i>Hprt</i>	AGCCGACCGGTTCTGTGCAT	GGTCATAACCTGGTTCATCATCAC	SYBR
<i>Pgc1α</i>	CGATCACCATATCCAGGTCAAG	CGATGTGTGCGGTGTCTGTAGT	SYBR
<i>Ucp1</i>	CAATGACCATGTACACCAAGGAA	GATCCGAGTCGCGAAAAGAA	SYBR

Comprehensive list of primers and probes used for TaqMan analysis of gene expression.

“SYBR” indicates no probe was required as SYBR Green reagent was used to quantify amplicon levels.

Table S4. Antisense Oligonucleotides for In Situ Hybridisation Analysis, Related to Experimental Procedures

mRNA	Genbank accession number	Sequence
AgRP	NM_007427	5' - CGACGCGGAGAACGAGACTCGCGTTCTGTGGATCTAGCACCTCTGCC - 3'
Bmp8b	NM_007559	5' - GAAATGGCACTCAGCTCAGTAGGCACAGCACACCTTGGG - 3'
CART	NM_013732	5' - ACAGTCACACAGCTTCCCGATCCTGGCCCCTTTC - 3'
NPY	AF273768	5' - GGGCGTTTTCTGTGCTTTCCTTCATTAAGAGGTCTG - 3'
POMC	NM_008895	5' - CTTGATGATGGCGTTCTTGAAGAGCGTCACCAGGGGCGTCTGGCTCTT - 3'

List of all hybridisation probes with accession numbers of the mRNA template used to generate them.