SUPPLEMENTARY MATERIAL

Supplementary Methods

1. Body composition analysis

Body fat and lean mass were determined for each animal on weeks 0 ("initial" stage) and 9 ("final" stage) by nuclear magnetic resonance spectroscopy using the EchoMRI™ system (Echo Medical Systems, Houston, TX). Measures of body fat and lean mass were performed by triplicate and the ratio fat mass/lean mass was calculated for each animal at the initial and final stages.

Supplementary Tables

Supplementary Table 1. Main fatty acids composition in *Borago officinalis* oil (BSO) from Acofarma SA (Barcelona, Spain). Data obtained from the batch technical sheet provided by the manufacturer.

Code	Notation	IUPAC name (common name)	MW[1]	% in the oil
PA	16:0	hexadecanoic acid (Palmitic acid)	256.43	11.7 %
SA	18:0	octadecenoic acid (Stearic acid)	284.48	4.1 %
LA	18:2n-6	cis-9,12-octadecadienoic acid (Linoleic acid)	280.45	37.1 %
GLA	18:3n-6	cis-6,9,12-octadecatrienoic acid (γ-linolenic acid)	278.43	20.2 %
OLA	18:1n-9	cis-9-octadecenoic acid (Oleic acid)	282.46	17.8 %

[1]*MW: Molecular weight (g/mol).*

Supplementary Table 2. Minimum FA content (based on data from **Supplementary Table 1**) of the different doses of BSO used in C. elegans experiments.

FA	BSO 5 µM GLA	BSO 50 µM GLA	BSO 500 µM GLA	BSO 1000 µM GLA
LA (µM)	9.1	91.2	912	1824
PA (µM)	3.1	31.5	315	630
SA (µM)	1.0	9.9	99	198
GLA (µM)	5.0	50	500	1000
OLA (µM)	4.4	43.5	435	870
Minimum total FAs (µM)	22.6	226.1	2261	4522

Supplementary Table 3. Main nutritional characteristics of diets used in the assay with rats. Data calculated from the technical sheets provided by the manufacturers.

	CONTROL	HFS	HFS- BSO LOW	HFS- BSO HIGH
Nutrients (% of kcal)				
Protein	20	20	20	20
Carbohydrate	67	35	35	35
Fat	13	45	45	45
Energy density (kcal/g)	2.9	4.7	4.7	4.7
***Borago officinalis* oil (g/kg)**	-	-	0.24	2.4

Supplementary Table 4. Applied Biosystems™ (TaqMan® Gene Expression Assays) probes for qPCR assays of mRNA from epididymal fat samples of rats. *Tbp1* and *Actb* were used as housekeeping genes.

Gene	Reference
Cebpa	Rn00560963_s1
Pparg	Rn00440945_m1
Srebf1	Rn01495769_m1
Tbp1	Rn01455646_m1
Actb	Rn00667869_m1

Supplementary Table 5. Double quenched probes for qPCR assay of liver and gastrocnemius muscle samples of rats from IDT Technologies (Integrated DNA Technologies Inc., Coralville, IA). *Tbp1* (Rn01455646_m1) and *Actb* (Rn00667869_m1) from Applied Biosystems™ (TaqMan® Gene Expression Assays) were used as housekeeping genes.

Gen	***Fluoróforo***	***Quencher***	***Sequence (5'→3')***
Cpt-2	56-FAM	ZEN™-*Iowa Black*® FQ	Primer 1: TGATGGCTGAGTGTTCCAAATA Primer 2: CAGATAGCGCAGAGCATACAA Probe: AGCTGACCAAAGAAGCAGCGATGG
Slc25a20	56-FAM	ZEN™-*Iowa Black*® FQ	Primer 1: GTTGACTGAAGGCCCTACTTAC Primer 2: CTGGGTTAGCTGGTTGAGAATAG Probe: TTGATGGCTGACTCTCTGGATGCC
Hadhb	56-FAM	ZEN™-*Iowa Black*® FQ	Primer 1: CCTGCATTCATCAAACCCTATG Primer 2: GCTCTGTCCTCTACATGATTA Probe: TCTTTCCTGACTGATGGCGCTTCT
Acox-1	56-FAM	ZEN™-*Iowa Black*® FQ	Primer 1: GTGCAGCCAGATTGGTAGAA Primer 2: GAACAAGGTCGACAGAGGTTAG Probe: TGCTACTTCCTTGCTCTTCCTGTGAC
Hsd17b4	56-FAM	ZEN™-*Iowa Black*® FQ	Primer 1: TGAGATGTGGAAGGAAGGAAAC Primer 2: CGGAAACTCCAGATGTAGGAAC Probe: ACCAAGGTCCAAGAGACTGGAGACA
Scp-2	56-FAM	ZEN™-*Iowa Black*® FQ	Primer 1: CAACTGGTTCAGGGAGGTTTAG Primer 2: CAGTGGATTTGACCGATCTGAATA Probe: TGCGTGTTAGCTCTTGGGTTTGAGA

Supplementary Figures

Supplementary Figure 1. Hepatic TAG values of treated and untreated Wistar rats. Percentages of individual TAG/protein data (grey dots), mean values of each group (thick horizontal lines) and standard deviation (SD) of the mean (thin and shorter horizontal lines). CNT, control diet; HFS, high fat – high sucrose diet; HFS-BSO LOW, high fat – high sucrose diet supplemented with the low dose of borage seed oil; HFS-BSO HIGH, high fat – high sucrose diet supplemented with the high dose of borage seed oil. Asterisks indicate differences against CNT group (*, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$).