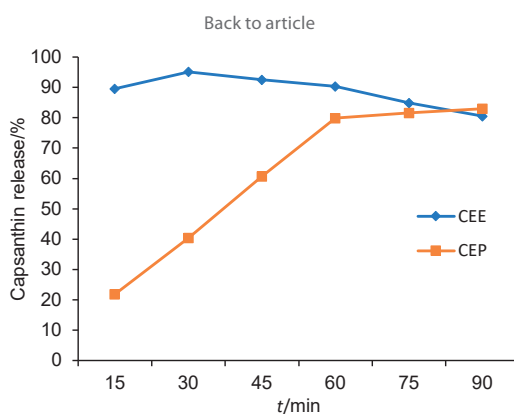


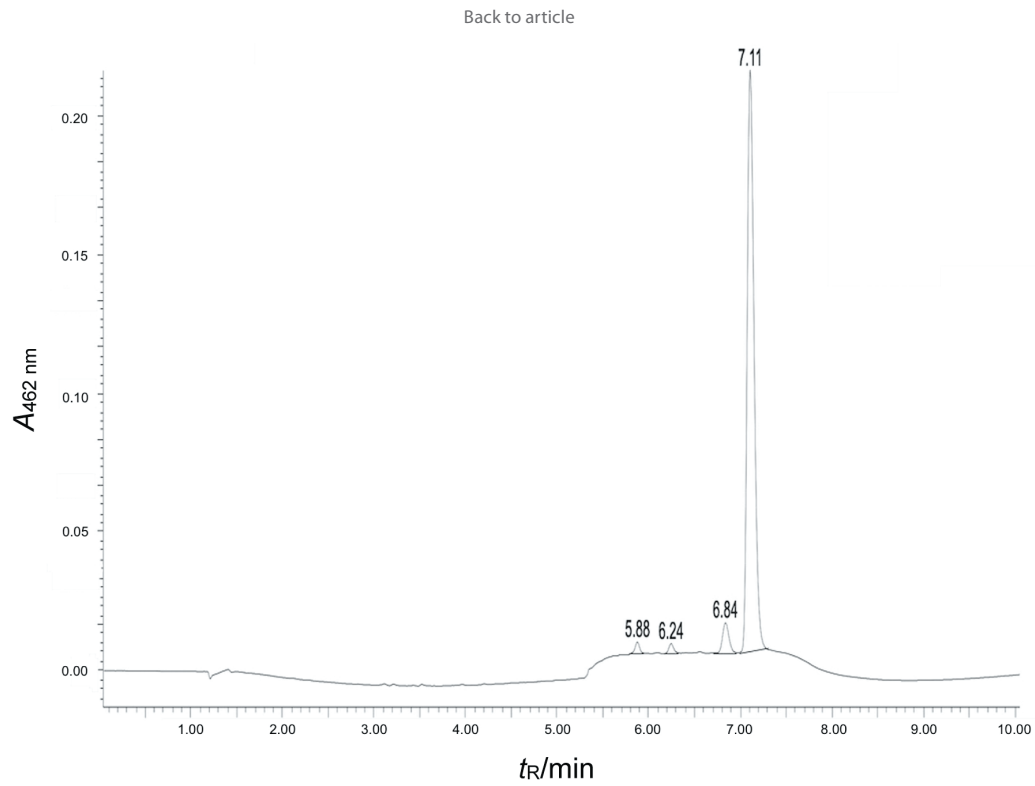
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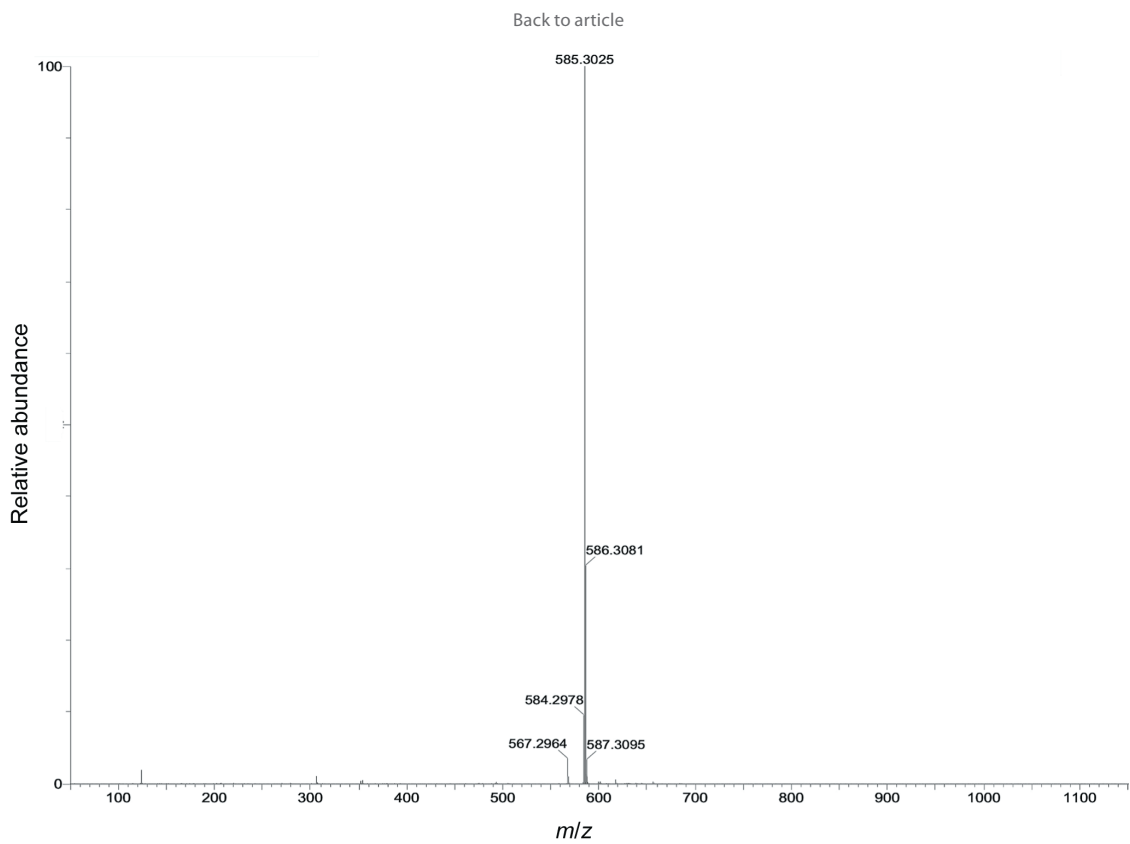
**Fig. S1.** The appearance of: a) capsanthin-enriched extract, b) capsanthin-enriched pellets, and c) capsaicin pellets. 10× magnification



**Fig. S2.** *In vitro* drug release of capsanthin-enriched extract and capsanthin-enriched pellets. CEE=capsanthin-enriched extract, CEP=capsanthin-enriched pellets



**Fig. S3.** HPLC chromatogram of capsanthin-enriched extract. Retention time 7.11 min corresponds to capsanthin



**Fig. S4.** Mass spectrum fragmentation of capsanthin ( $t_R=7.122$  min)

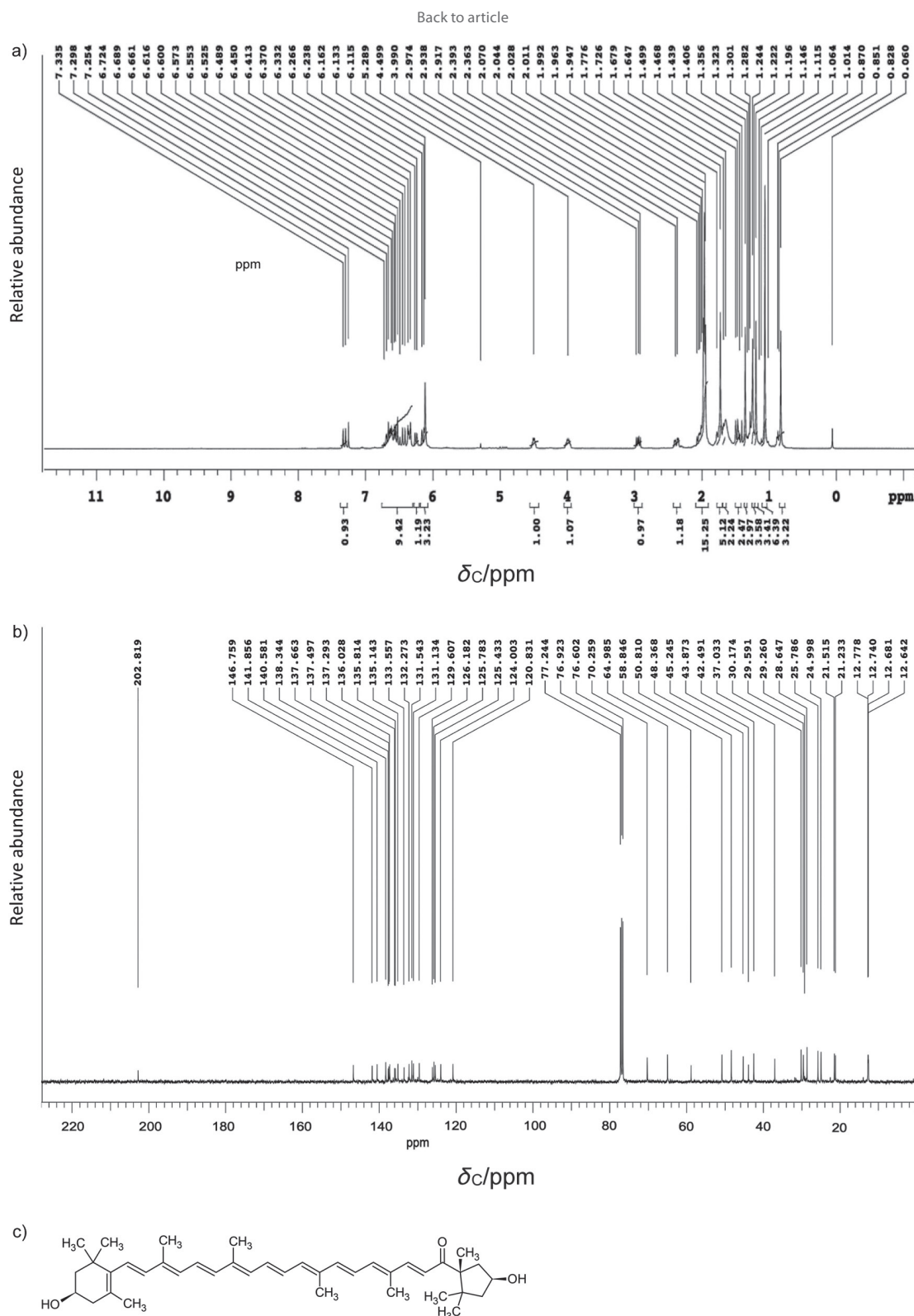


Fig. S5. Capsanthin characterization: a)  $^1\text{H}$  NMR spectra, b)  $^{13}\text{C}$  NMR spectra, and c) structure

[Back to article](#)**Table S1.** Composition of capsanthin-enriched pellets

Matrix	Ingredient	m(ingredient)/g
Core	capsanthin-enriched extract	1000
	pharmaceutical-grade sucrose	200
	microcrystalline cellulose	200
	polyvinyl pyrrolidone K 30 (5 %) in isopropyl alcohol	SQ
Coating	ethyl cellulose N-20	20
	sodium alginate	20
	ethanol	SQ
	water	SQ

SQ=sufficient quantity

[Back to article](#)**Table S2.** Specification of capsanthin-enriched pellets

Parameter	Specification	Method
Physical description	dark red pellets	Organoleptic
Identification	identified by UV	(22)
Solubility	slightly soluble in alcohol, insoluble in water	(19)
d(particle)/mesh	30 (90 % passes through)	(20)
w(loss on drying)/%	<2.0	(21)
<b>Chemical assay</b>		
w(capsanthin)/%	>50.0	(22)
w(carotenoids)/%	>60.0	(22)
<b>w(impurity)/(mg/kg)</b>		
Lead	<5.0	(23)
Arsenic	<3.0	(23)
Cadmium	<1.0	(23)
Mercury	<1.0	(23)
<b>N(microorganism)/(CFU/g)</b>		
Total aerobic microbial count	<3000	(24)
Total yeast and mold count	<100	(24)
<i>Escherichia coli</i>	negative in 10 g of sample	(25)
<i>Salmonella</i> sp.	negative in 10 g of sample	(25)
<i>Staphylococcus aureus</i>	negative in 10 g of sample	(25)
<i>Pseudomonas aeruginosa</i>	negative in 10 g of sample	(26)

UV=ultraviolet spectrophotometer, CFU=colony forming unit

[Back to article](#)**Table S3.** Room temperature stability data for capsanthin-enriched extract

Parameter	Specification	t/month			
		0	3	6	12
Description	Dark red pellets	Dark red pellets	Same as initial	Same as initial	Same as initial
Identification	Identification by UV	Identified	Identified	Identified	Identified
w(loss on drying)/%	1.24	1.32	1.88	1.52	1.79
w(capsanthin)/%	54.21	54.19	54.09	53.88	53.97
w(carotenoids)/%	62.86	62.99	61.79	62.16	62.58
Change of colour	–	No	No	No	No

Storage conditions: temperature=(25±2) °C, relative humidity=(60±5) %. UV=ultraviolet spectrophotometer

[Back to article](#)**Table S4.** Summary of feed consumption

t/day	Food consumption/(g/day)						
	G1	G2	G3	G4	G5	G6	G7
1–3	(4.2±0.5) <sup>a</sup>	2.7±0.3	2.4±0.4	2.5±0.3	2.5±0.5	2.5±0.7	2.7±0.3
3–6	(4.0±0.5) <sup>a</sup>	2.8±0.2	2.6±0.3	2.7±0.3	2.5±0.6	2.3±0.5	2.8±0.3
6–8	(4.0±0.4) <sup>a</sup>	3.0±0.4	2.8±0.7	(2.2±0.8) <sup>a</sup>	(2.3±0.7) <sup>a</sup>	2.9±0.7	2.6±0.4
8–10	(4.0±0.4) <sup>a</sup>	2.9±0.5	2.7±0.4	2.5±0.5	2.7±0.3	3.0±0.5	2.8±0.5
10–13	(3.8±0.2) <sup>a</sup>	2.9±0.3	2.8±0.2	2.7±0.5	(2.5±0.4) <sup>a</sup>	2.9±0.4	2.6±0.4
13–15	(3.7±0.6) <sup>a</sup>	3.0±0.3	2.7±0.3	2.6±0.5	2.4±0.6	3.1±0.6	2.7±0.6
15–17	(3.7±0.3) <sup>a</sup>	2.9±0.3	2.6±0.3	2.7±0.4	2.5±0.4	2.7±0.6	2.9±0.4
17–20	(4.1±0.5) <sup>a</sup>	2.9±0.5	2.7±0.2	2.9±0.5	2.7±0.2	2.7±0.6	2.8±0.5
20–22	(4.9±0.3) <sup>a</sup>	3.0±1.1	2.9±0.8	3.3±1.4	2.7±0.8	2.9±0.9	2.8±0.8
22–24	(4.1±0.5) <sup>a</sup>	2.8±0.5	3.0±0.4	2.9±0.3	2.9±0.4	3.1±0.3	3.0±0.3
24–27	(4.3±0.5) <sup>a</sup>	2.9±0.4	2.9±0.3	3.0±0.3	2.8±0.2	3.0±0.2	3.1±0.3
27–29	(4.9±0.3) <sup>a</sup>	3.0±0.3	3.0±0.3	3.0±0.4	2.9±0.4	3.0±0.2	3.1±0.2
29–31	(4.3±0.5) <sup>a</sup>	3.0±0.2	2.8±0.4	3.0±0.7	2.8±0.4	3.0±0.3	3.1±0.2
31–34	(4.1±0.3) <sup>a</sup>	3.0±0.3	2.9±0.3	2.9±0.3	3.0±0.3	3.3±0.7	3.1±0.3
34–36	(4.2±0.4) <sup>a</sup>	3.1±0.4	3.1±0.2	3.2±0.3	3.0±0.3	3.1±0.3	3.2±0.2

Values are expressed as mean±standard deviation (N=10). <sup>a</sup>Indicate statistically significant differences (p<0.05) with respect to G2. G1=normal control, G2=HFD control, G3=HFD+capsanthin-enriched pellets (low dose), G4=HFD+capsanthin-enriched pellets (medium dose), G5=HFD+capsanthin-enriched pellets (high dose), G6=HFD+capsaicin pellets, G7=HFD+orlistat, HFD=high fat diet

[Back to article](#)**Table S5.** Haematological parameters

Parameter	G1	G2	G3	G4	G5	G6	G7
N(WBC)/(10 <sup>3</sup> /μL)	5.8±1.1	3.8±1.1	4.6±1.1	4.7±1.5	4.6±0.8	3.7±0.8	4.6±0.4
N(RBC)/(10 <sup>6</sup> /μL)	10.7±1.5	12.7±0.7	12.6±1.5	12.2±0.5	11.4±1.7	(10.7±0.8) <sup>a</sup>	10.8±1.0
γ(Hb)/(g/100 mL)	(14.4±1.9) <sup>a</sup>	17.3±0.6	16.1±2.1	16.0±0.5	15.4±2.2	(14.6±1.0) <sup>a</sup>	(14.5±1.5) <sup>a</sup>
w(HCT)/%	52.3±7.3	61.4±3.2	61.1±7.3	58.8±2.3	54.72±8.18	51.56±4.03	51.74±5.23
N(PLT)/(10 <sup>3</sup> /μL)	1377±286	768±145	1165±234	1224±266	1501±114	1464±188	1551±15
V(MC)/μm <sup>3</sup>	49.0±0.0	48.4±0.6	48.2±0.5	48.4±0.6	47.8±0.5	48.2±0.5	48.2±0.8
m(MCH)/pg	13.4±0.2	13.7±0.3	(12.7±0.5) <sup>a</sup>	13.2±0.2	13.7±0.2	13.7±0.2	13.9±0.9
γ(MCHC)/(g/dL)	27.7±0.4	28.2±0.5	(26.3±0.9) <sup>a</sup>	(27.2±0.4) <sup>a</sup>	28.1±0.3	28.4±0.4	28.0±0.3
w(NEU)/%	23.6±2.2	26.0±4.0	27.6±3.6	24.0±2.8	26.0±2.8	28.8±3.6	25.6±3.3
w(LYM)/%	70.4±2.6	69.6±3.3	69.6±1.7	72.0±2.0	70.0±1.4	67.6±2.2	69.2±1.1
w(EOS)/%	2.8±0.9	2.2±0.8	1.2±1.1	1.4±1.1	3.0±1.9	1.8±0.8	2.2±1.3
w(MON)/%	3.2±0.8	2.2±0.8	1.6±1.3	2.6±1.1	3.0±1.9	1.8±1.3	3.0±1.9
w(BAS)/%	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00

Values are expressed as mean±standard deviation (N=10). <sup>a</sup>Indicates statistically significant differences (p<0.05) with respect to G2. G1=normal control, G2=HFD control, G3=HFD+capsanthin-enriched pellets (low dose), G4=HFD+capsanthin-enriched pellets (medium dose), G5=HFD+capsanthin-enriched pellets (high dose), G6=HFD+capsaicin pellets, G7=HFD+orlistat, HFD=high fat diet, WBC=total leukocyte count, RBC=erythrocyte count, Hb=haemoglobin, HCT=haematocrite, PLT=platelet, MC=mean corpuscular, MCH=mean corpuscular haemoglobin, MCHC=mean corpuscular haemoglobin concentration, NEU=neutrophils, LYM=lymphocytes, EOS=eosinophils, MON=monocytes, BAS=basophils