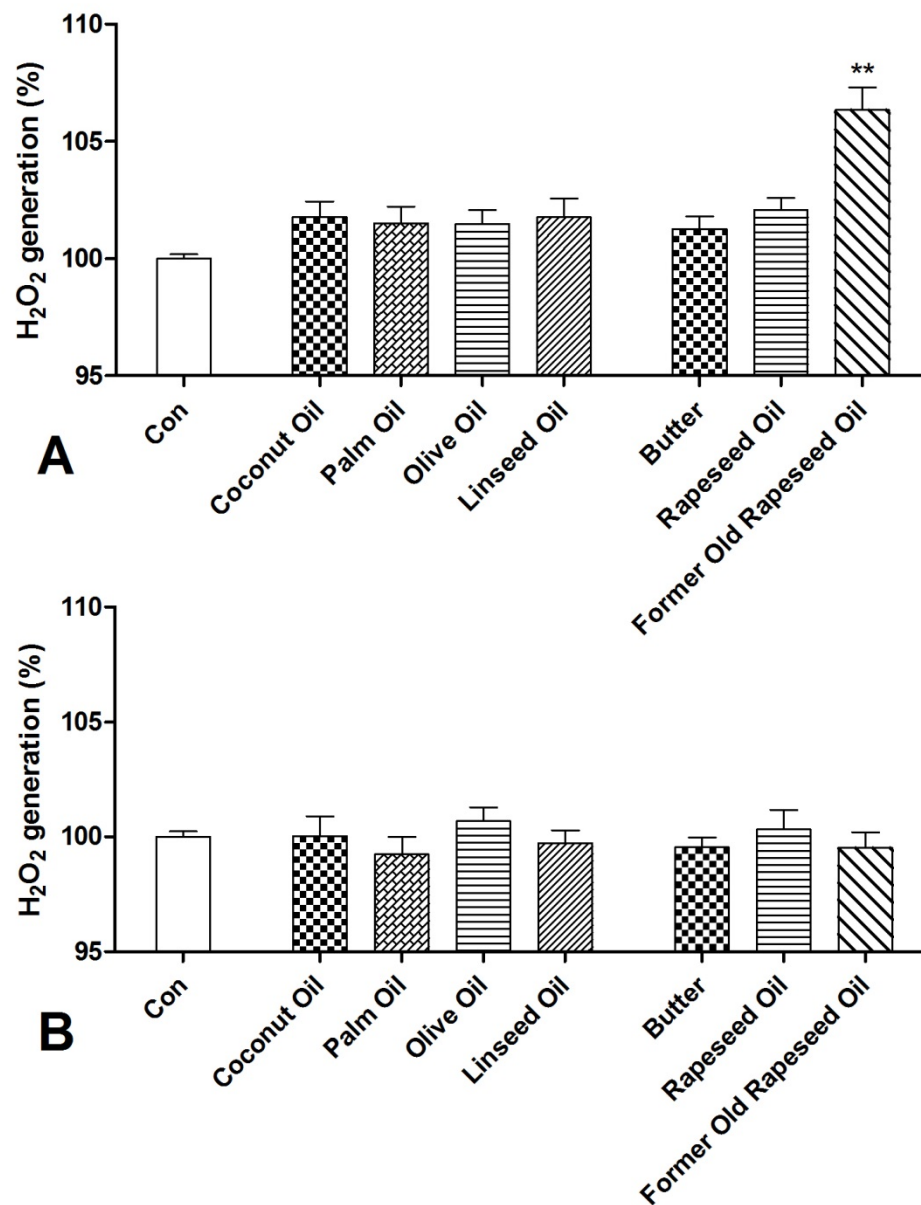


## Supplementary Information

FFA composition	caprylic acid	capric acid	lauric acid	myristic acid	palmitic acid	palmitoleic acid	stearic acid	oleic acid	linoleic acid	$\alpha$ -linolenic acid	erucic acid
	C 8:0	C 10:0	C 12:0	C 14:0	C 16:0	C 16:1	C 18:0	C 18:1	C 18:2	C 18:3	C 22:1
Coconut Oil	7.5%	7.5%	47.5%	17.5%	7.5%		2.5%	7.5%	2.5%		
Palm Oil					45.0%		5.0%	40.0%	10.0%		
Olive Oil					15.0%	2.5%	2.5%	70.0%	10.0%		
Linseed Oil					5.0%		2.5%	17.5%	15.0%	60.0%	
Butter	10.0%	2.5%	5.0%	12.5%	22.5%	2.5%	12.5%	30.0%	2.5%		
Rapeseed Oil					5.0%		2.5%	62.5%	20.0%	10.0%	
Former Old Rapeseed Oil					5.0%		2.5%	24.0%	15.0%	11.0%	45.0%
Palm Kernel Oil	2.5%	2.5%	47.5%	17.5%	10.0%		2.5%	15.0%	2.5%		
Peanut Oil					10.0%		2.5%	57.5%	30.0%		
Soybean Oil					10.0%		5.0%	25.0%	52.5%	7.5%	
Sunflower Oil					5.0%		5.0%	30.0%	60.0%		
Hazelnut Oil					5.0%		2.5%	80.0%	12.5%		
Sesame Oil					10.0%		5.0%	42.5%	42.5%		
Walnut Oil					7.5%		2.5%	20.0%	57.5%	12.5%	
Safflower Oil					5.0%		2.5%	15.0%	77.5%		
Mixture 1a	<b>Coconut Oil, Olive Oil, Linseed Oil, Palm Oil</b>										
	2.0%	2.0%	12.0%	4.0%	18.0%	0.5%	3.0%	34.0%	9.5%	15.0%	
Mixture 1b	<b>Palm Kernel Oil, Soybean Oil, Sunflower Oil, Safflower Oil</b>										
	0.5%	0.5%	12.0%	4.5%	7.5%		4.0%	21.0%	48.0%	2.0%	
Mixture 2a	<b>Rapeseed Oil, Sesame Oil, Peanut Oil, Walnut Oil</b>										
					8.0%		3.0%	45.5%	38.0%	5.5%	
Mixture 2b	<b>Linseed Oil, Soybean Oil, Rapeseed Oil, Walnut Oil</b>										
					7.0%		3.0%	31.0%	36.0%	23.0%	

**Tab. S1. FFA compositions mimicking edible oils, butter and mixtures composed of selected characteristic FFA compositions**

The different volumetric percentages (1-5) of saturated, mono-, di- and polyunsaturated FFAs of the employed FFA compositions mimicking edible oils and butter are depicted. Additionally different mixtures of selected FFA compositions were prepared as shown.



**Fig. S1. Peroxisomal (A) and mitochondrial (B) H<sub>2</sub>O<sub>2</sub> production in human EndoC-βH1 beta-cells after incubation with different FFA compositions**

EndoC-βH1 beta-cells stably expressing the H<sub>2</sub>O<sub>2</sub> sensor protein HyPer in peroxisomes (A) or mitochondria (B) were incubated for 48 h with different FFA compositions (total 500 μM each). Thereafter the fluorescence ratio was measured and normalized to control cells.

Data are means±SEM of 15-16 independent experiments. \*\*p<0.01 compared to untreated cells (Dunnett's Multiple Comparison Test).

## Supplementary Method

### *Analysis of H<sub>2</sub>O<sub>2</sub> generation using HyPer proteins*

EndoC-βH1 beta-cells stably expressing the H<sub>2</sub>O<sub>2</sub> sensor protein HyPer in peroxisomes or mitochondria were generated as described (6) and 48 h after treatment with different FFA compositions cell imaging analyses were performed (6).

## Supplementary References

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