



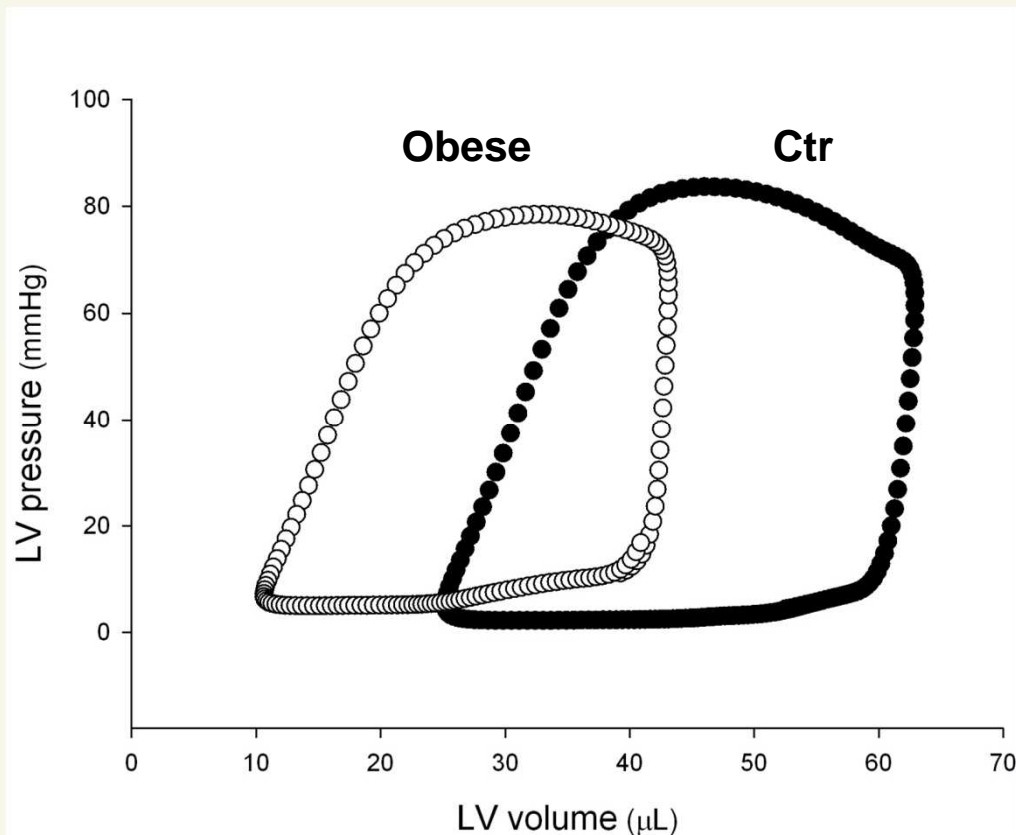
Calanus oil reduces diet-induced obesity and insulin resistance - and improves aerobic capacity in mice

Anje C Höper, **Terje S Larsen**, Jim Lund, Anne D Hafstad,

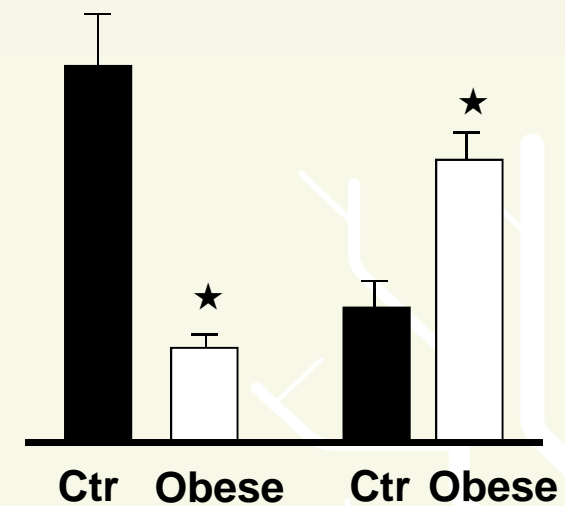
Ahmed M Khalid and Ellen Aasum

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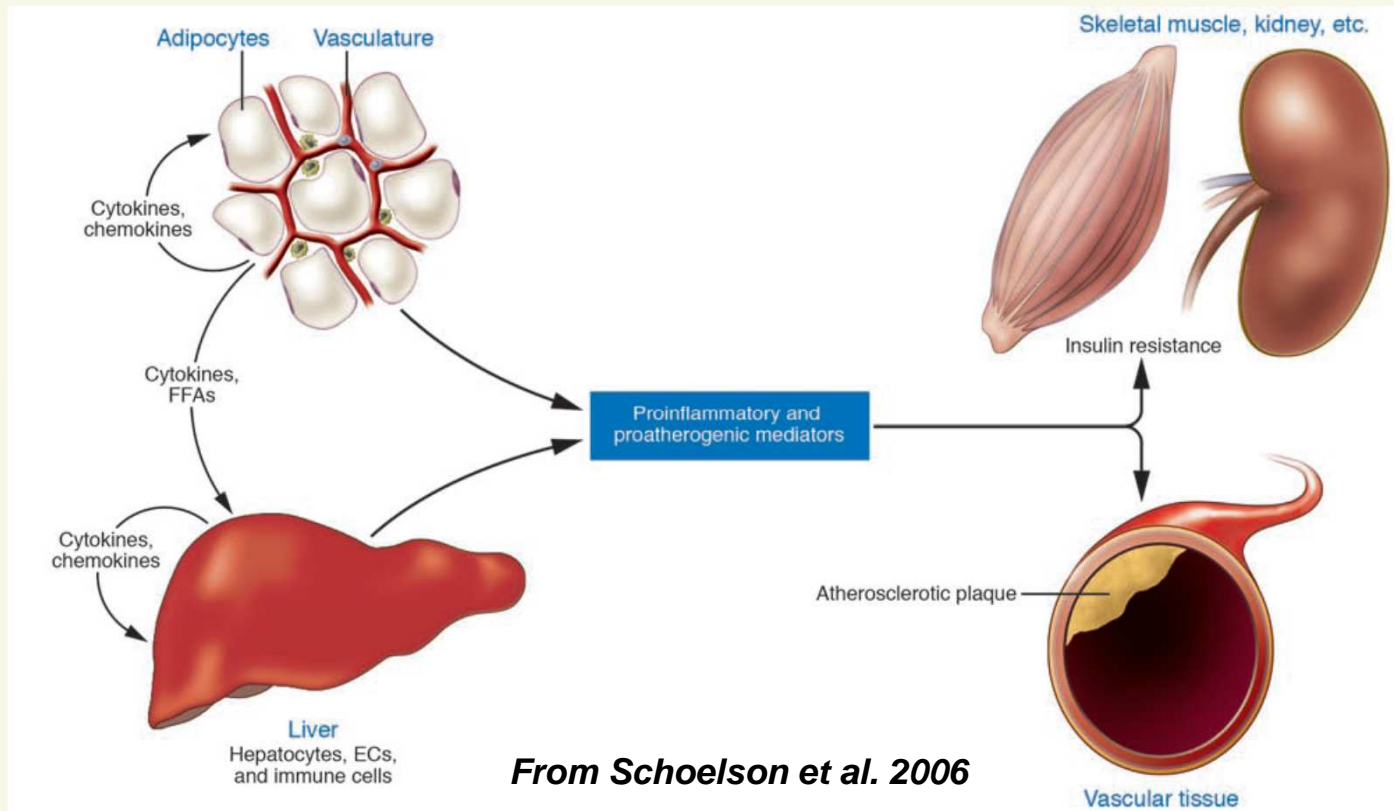
Obesity-related changes in cardiac function and metabolism



Glucose oxidation FA oxidation



Inflammation in obese fat and liver causes systemic insulin resistance



Calanus® Oil

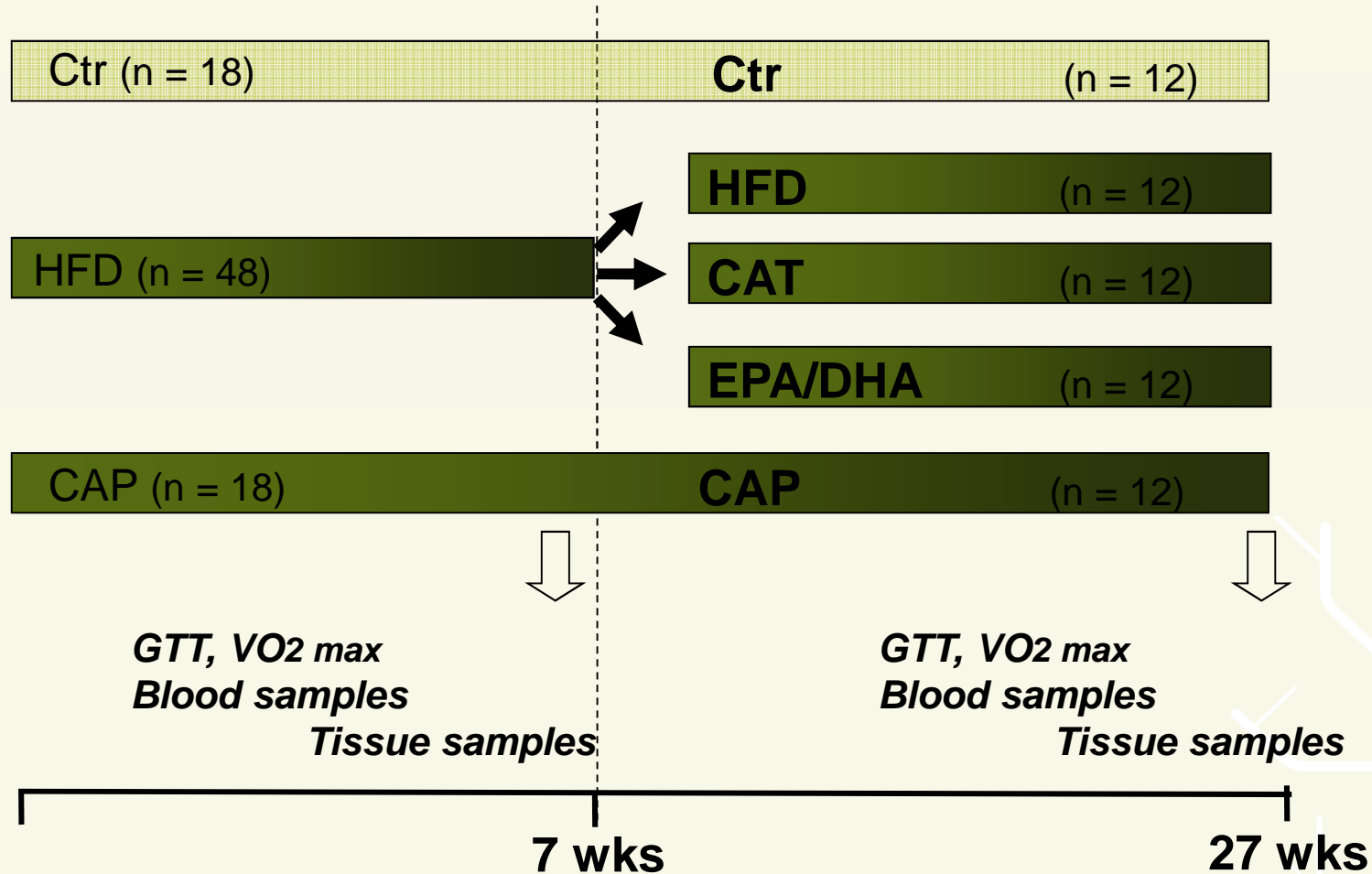
Calanus finmarchicus is a zooplankton species, which is found in enormous amounts in the North Sea.



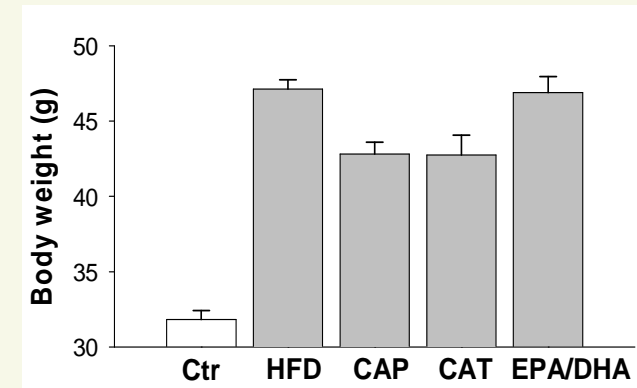
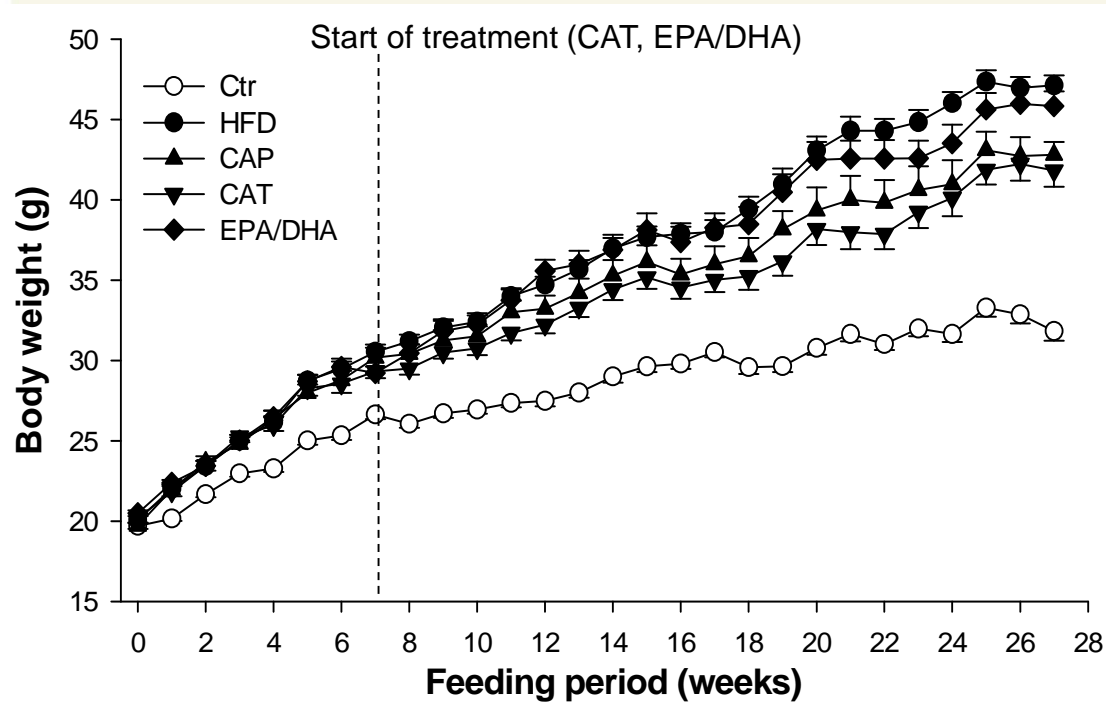
Composition:

- Rich in EPA, DHA and SDA (constitute 40% of the FAs in the oil)
- The essential FAs are present as:
 - Sterols (1%)
 - Triglycerides, fosfolipids, and non-esterified FAs (10-15%)
 - FA-monoesters - waxesters bound to unsaturated long-chain alcohols (80-85%)
- Vitamins, pigments and large amounts of astaxanthin (red color)

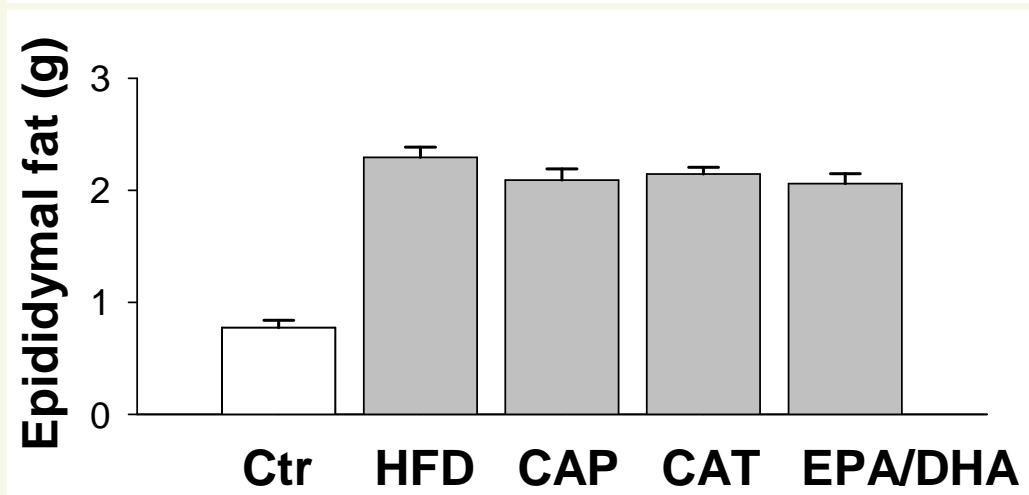
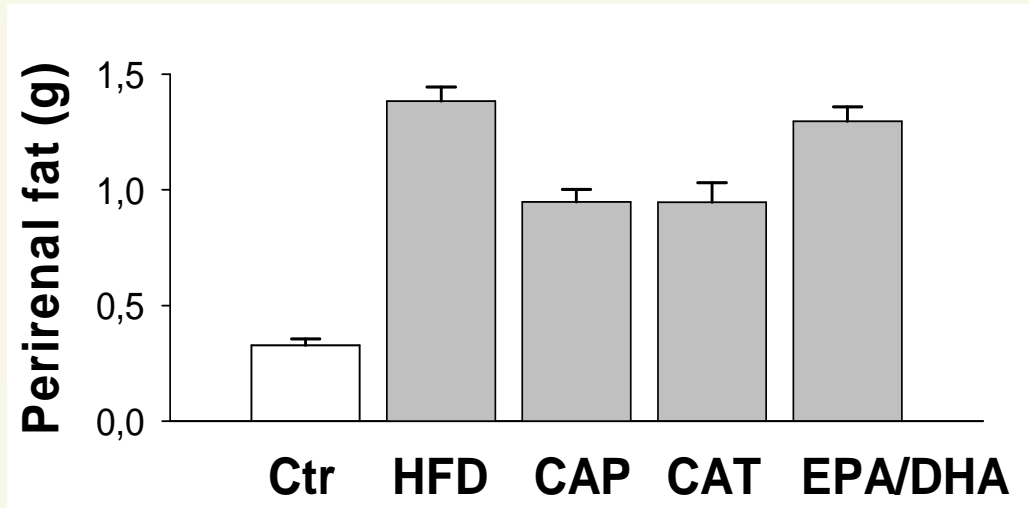
Experimental Protocol



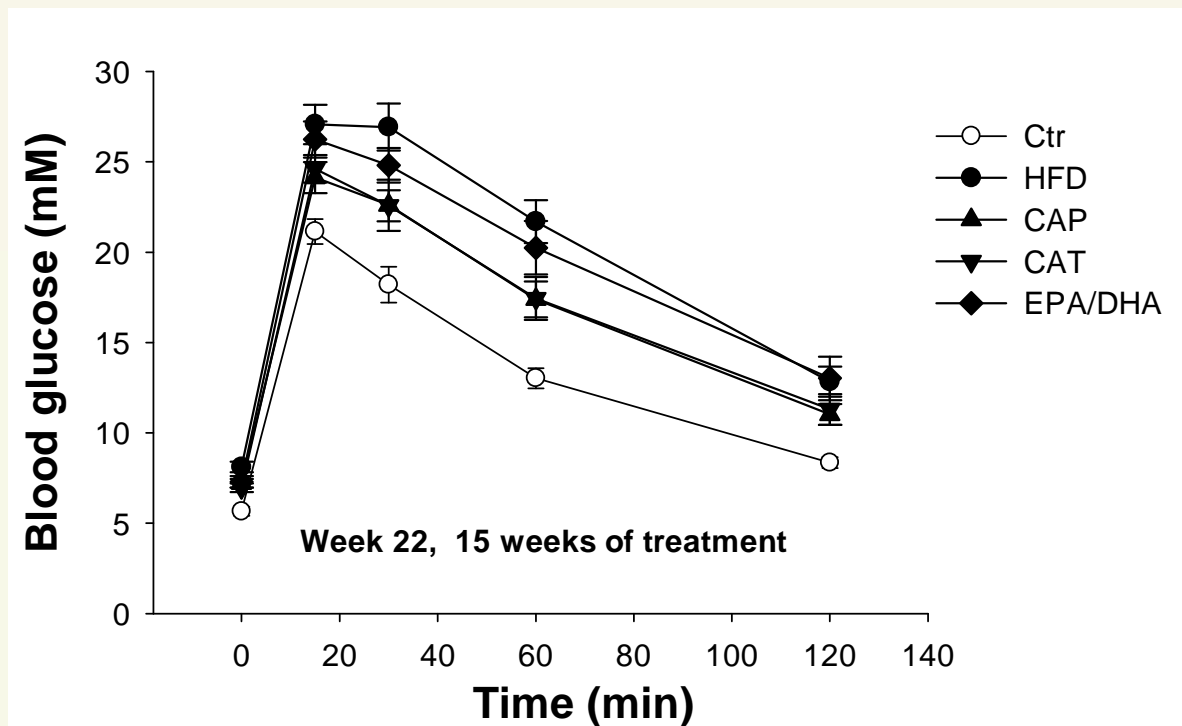
Body weight development in mice on normal or high fat diet (+/- additives)



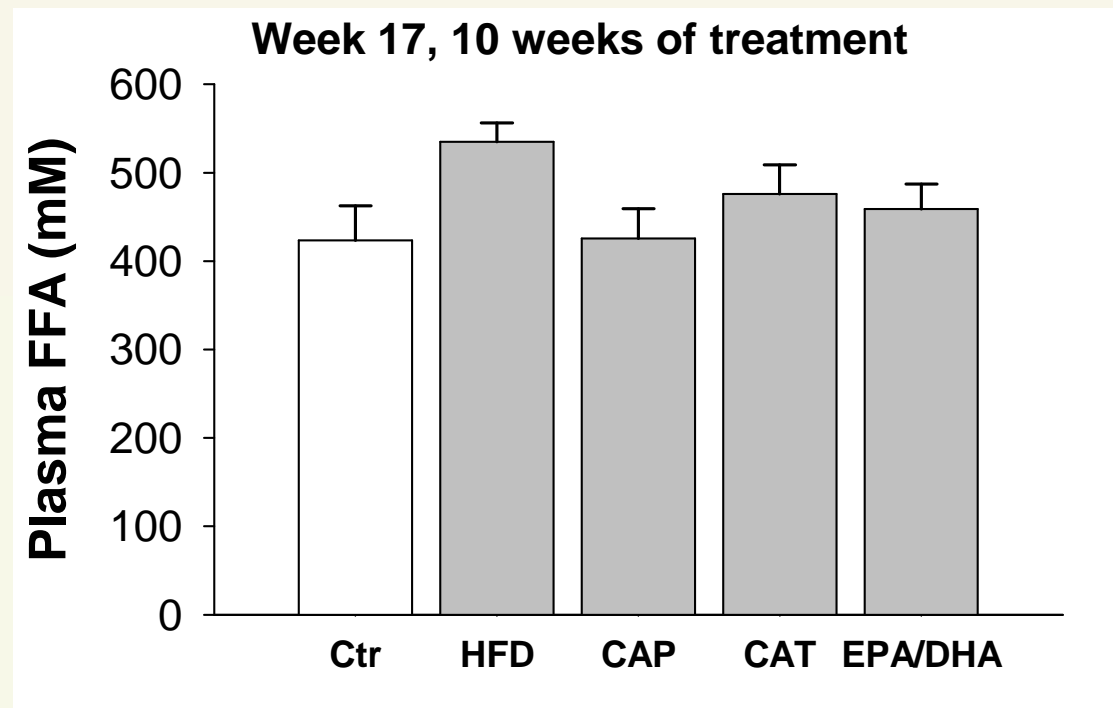
Reduced abdominal adiposity following Calanus oil supplementation



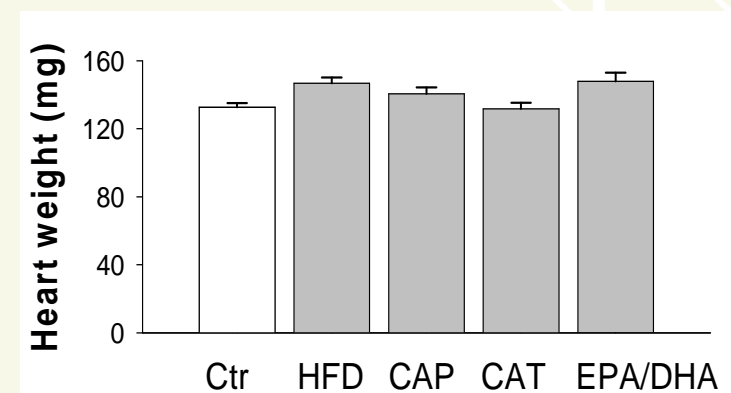
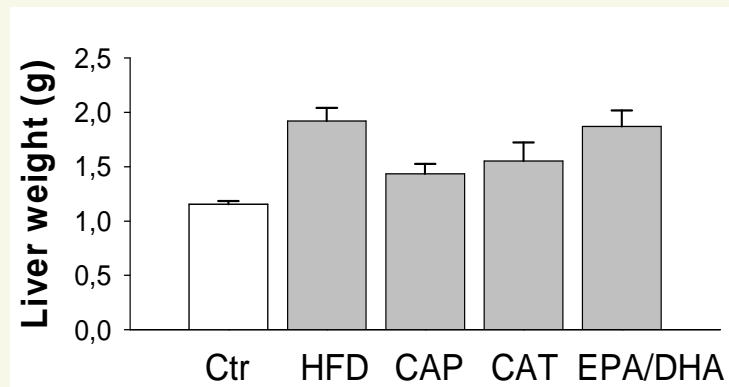
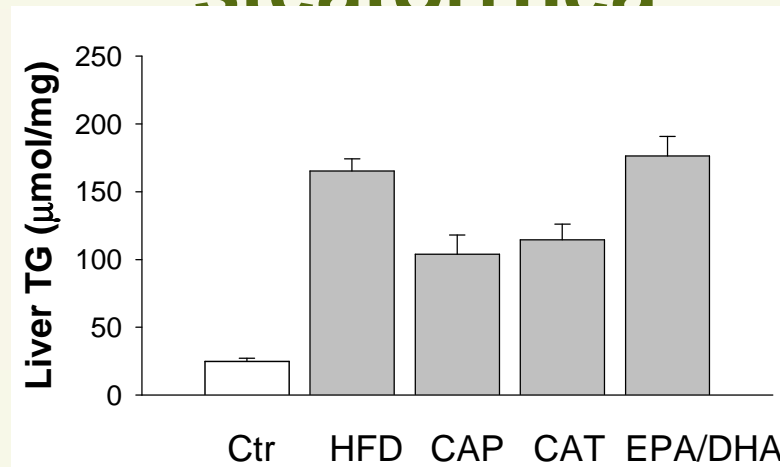
Improved glucose tolerance following Calanus oil supplementation



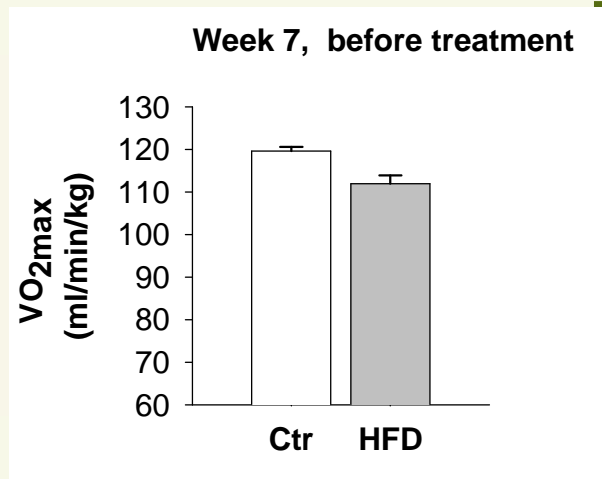
Calanus oil has only a modest effect on the concentration of plasma FA



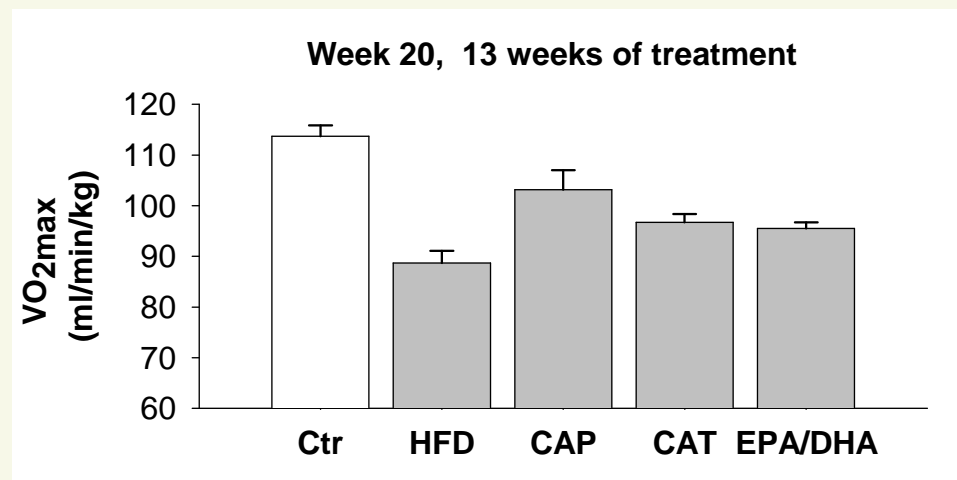
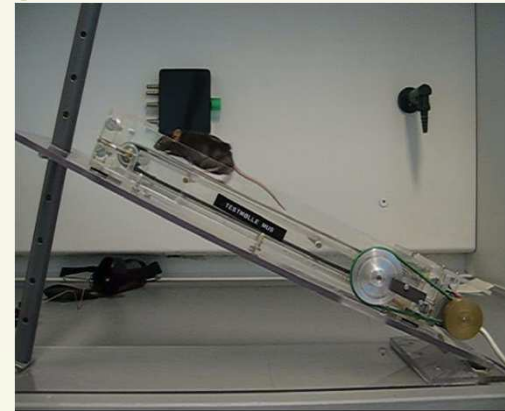
Calanus oil supplementation during high fat feeding reduces hepatic steatorrhea



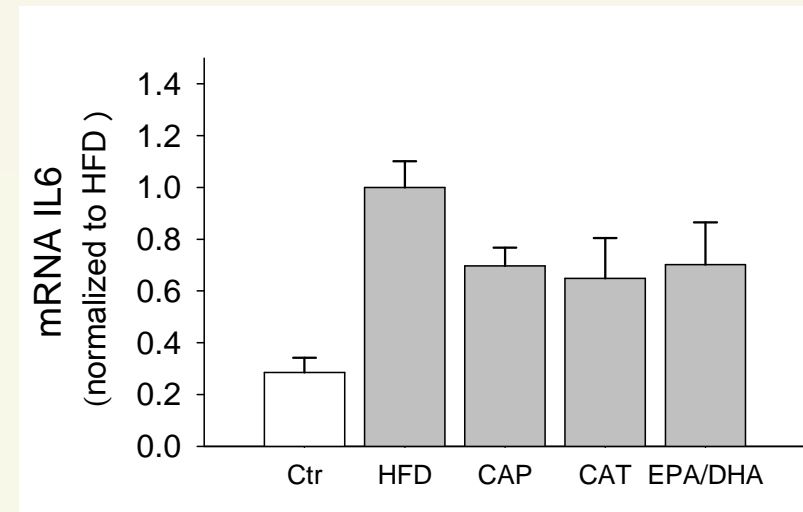
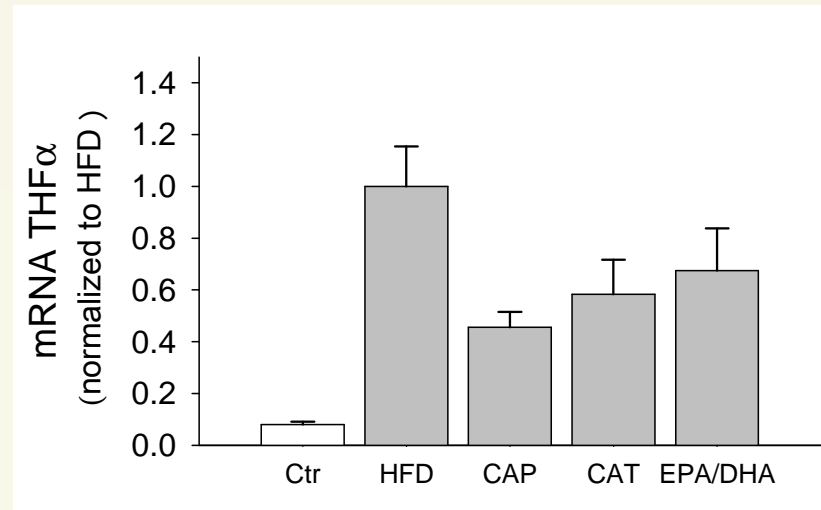
Calanus oil supplementation improves maximum oxygen capacity in obese mice



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mRNA expression of TNF α and IL-6 in perirenal adipose tissue



Summary of results



Administration of Calanus oil to high fat-fed mice (preventive or therapeutic)

- leads to plasma lipid-lowering and weight reduction
- counteracts abdominal, as well as ectopic fat accumulation
- improves glucose tolerance
- improves aerobic capacity
- reduces adipokine production in adipose tissue

Conclusion

Calanus oil given as a food supplement is able to counteract obesity-related alterations in metabolism. Hence, it could potentially reduce deleterious effects on organ function associated with obesity and type 2 diabetes.

Study supported by:

Calanus A/S

The University of Tromsø

Northern Norway Regional Health Authority (Helse Nord RHF)

