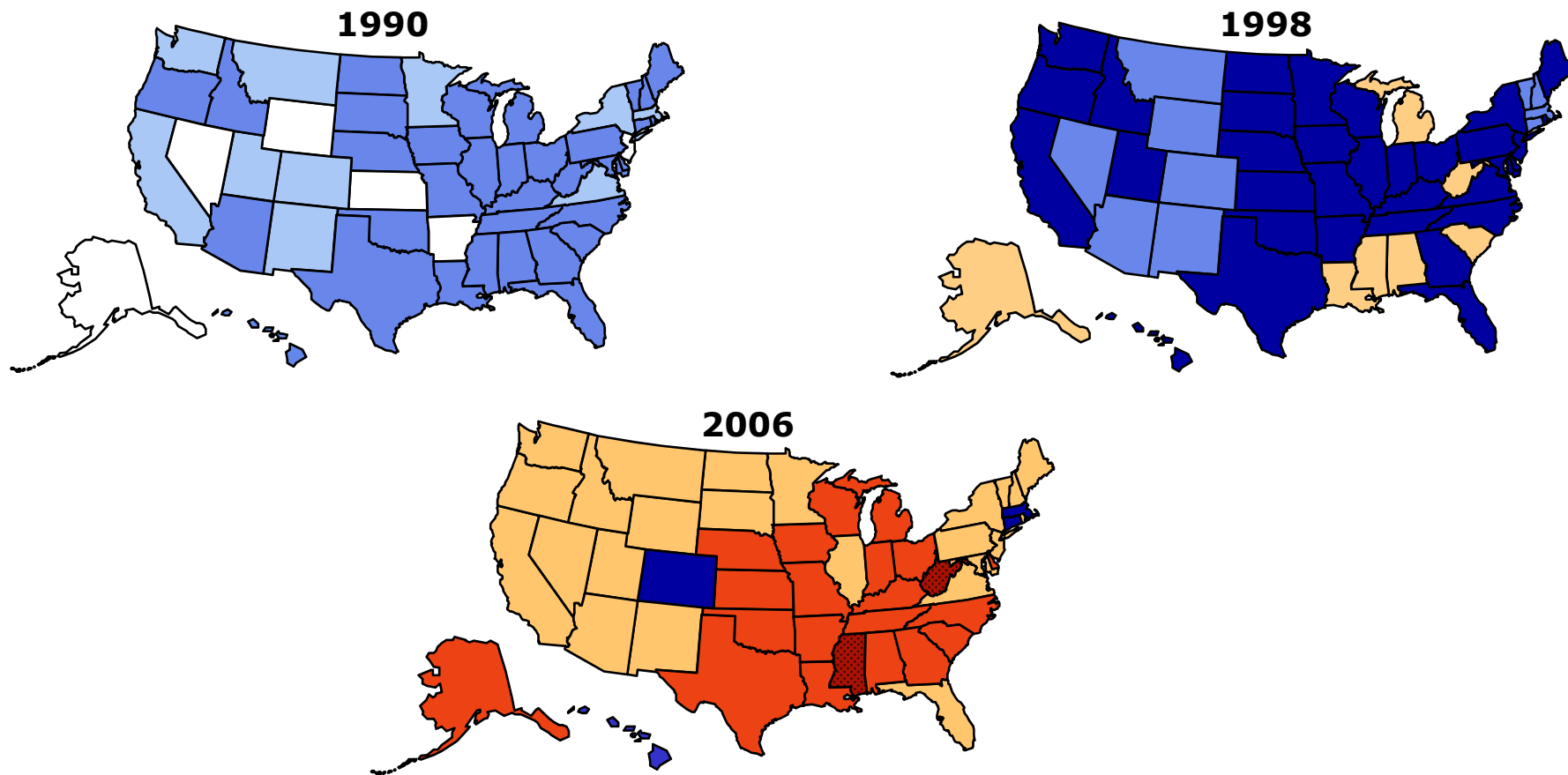


Fiskeproteinhydrolysat (FPH) reduserer fedme. Kjenner vi årsaken?

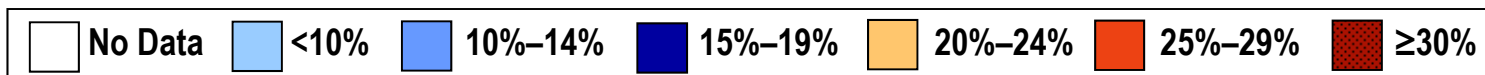
Bjørn Liaset

Sjømat og helse,
Nasjonalt institutt for ernærings- og
sjømatforskning (NIFES)

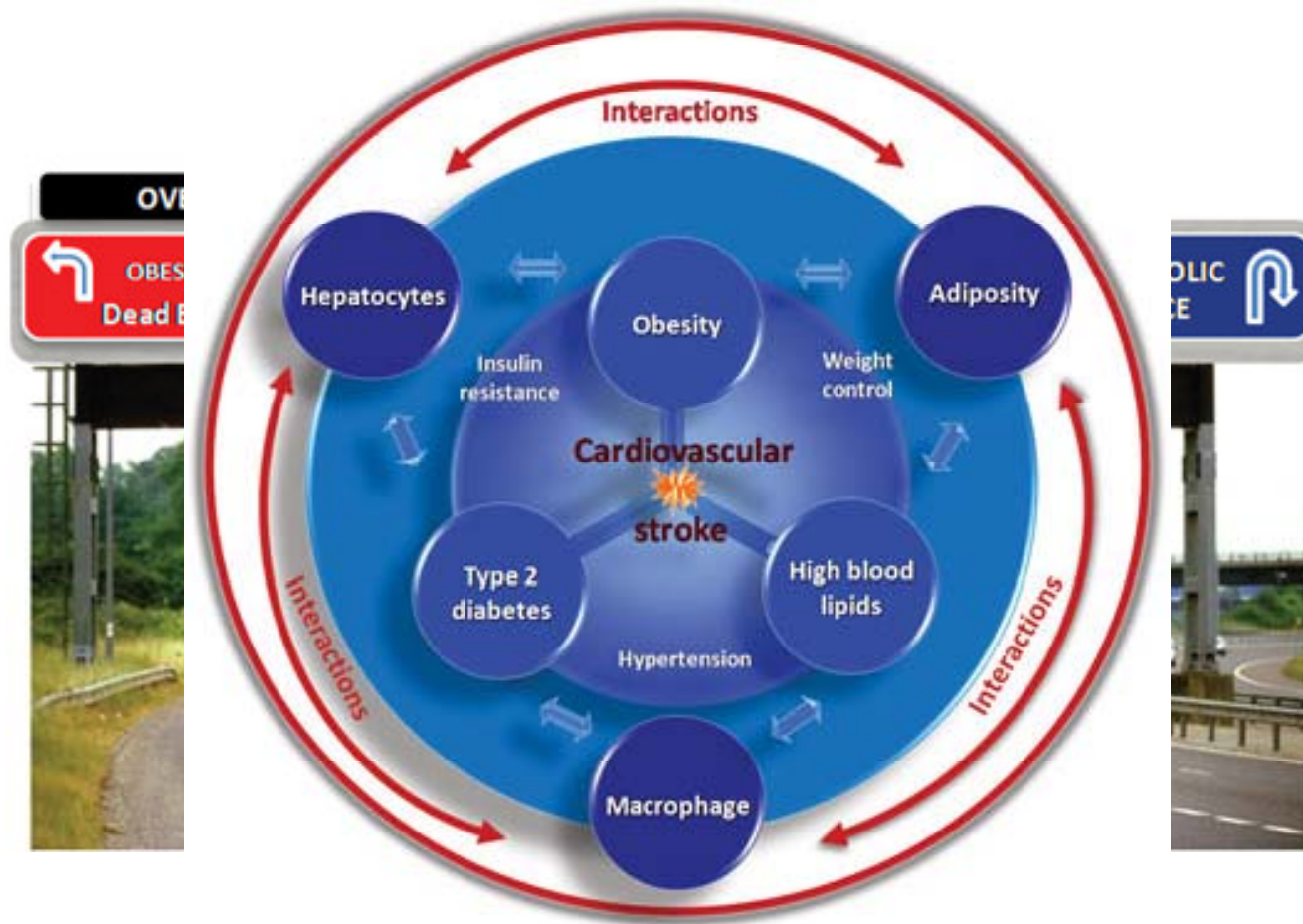
BMI ≥ 30 (kg/m²) i USA



Source: <http://www.cdc.gov>



Overvekt aukar – so what?



Fedme og metabolisk syndrom

Definitions for the Metabolic Syndrome

WHO 1999

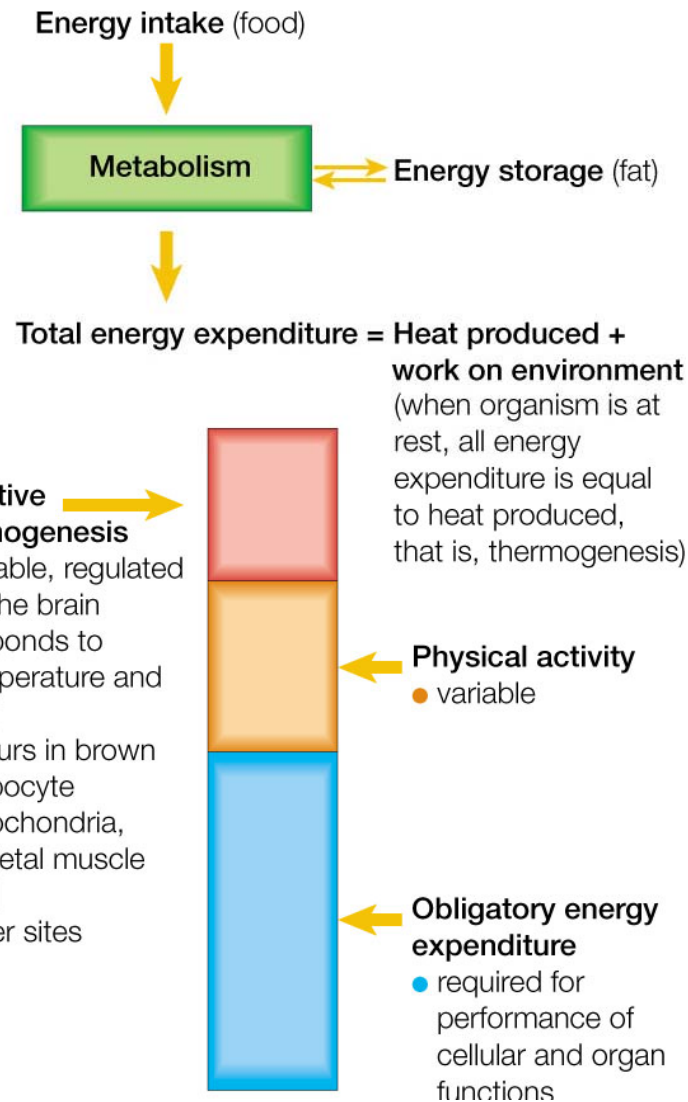
- Dysglycemia (DM, IFG, IGT, IR) + 2 of:
 - BMI > 30 or ↑WHR (>0.90 males/>0.85 females)
 - Dyslipidemia (Trig ≥ 1.7 mmol / low HDL (<0.9 males/<1.0 females))
 - BP >140/90 mmHg
 - Micro alb (alb excm > 20 µg/min)

ATP III

- 3 or more of:
 - ↑ waist (>102 cm in males/>88 females)
 - Dyslipidemia (Trig ≥ 1.7 mmol/low HDL (<1.0 mmol/<1.3 mmol))
 - BP ≥ 135/85 mmHg
 - FPG ≥ 6.1 mmol/L

Kvifor overvekt ?

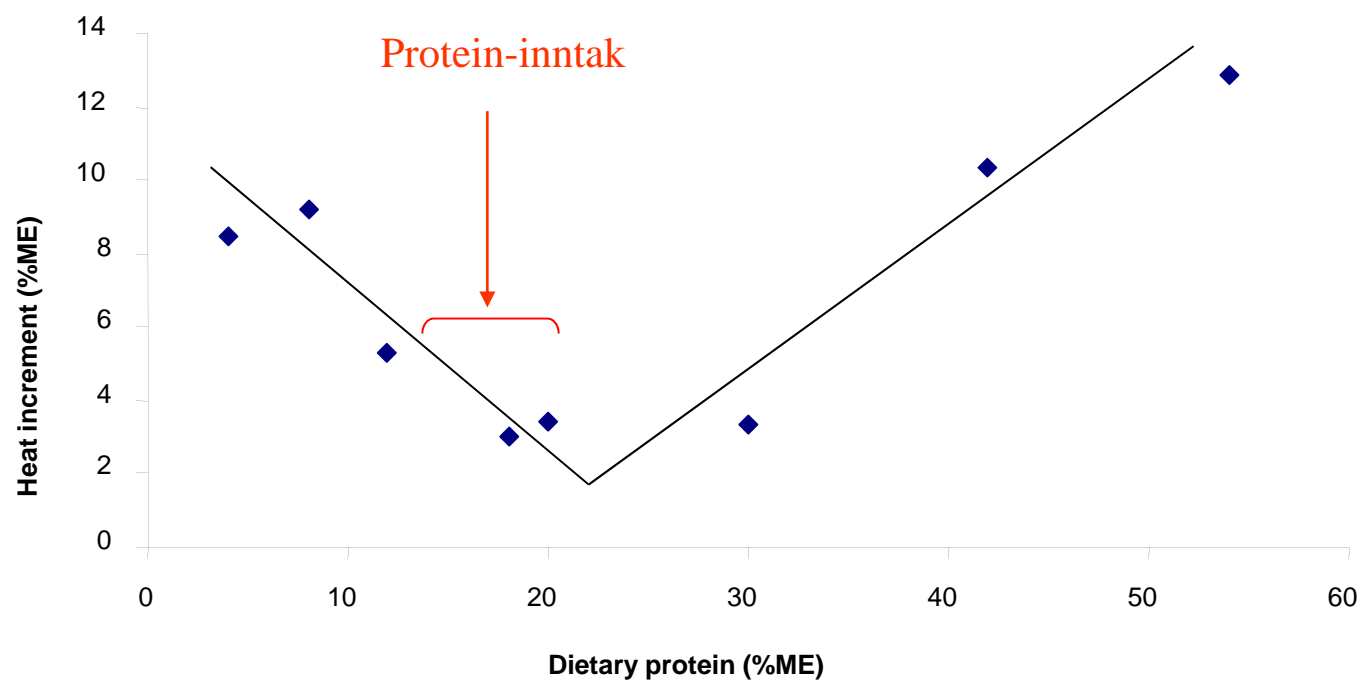
- Protein !!!**



Lowell & Spiegelman 2000
Nature 404: 652

Protein i kosten og energiforbruk

Data frå TS Hamilton 1939 J Nutr

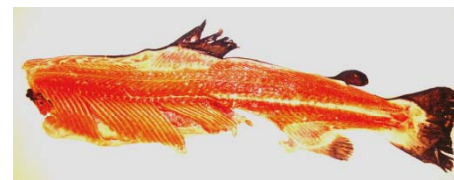
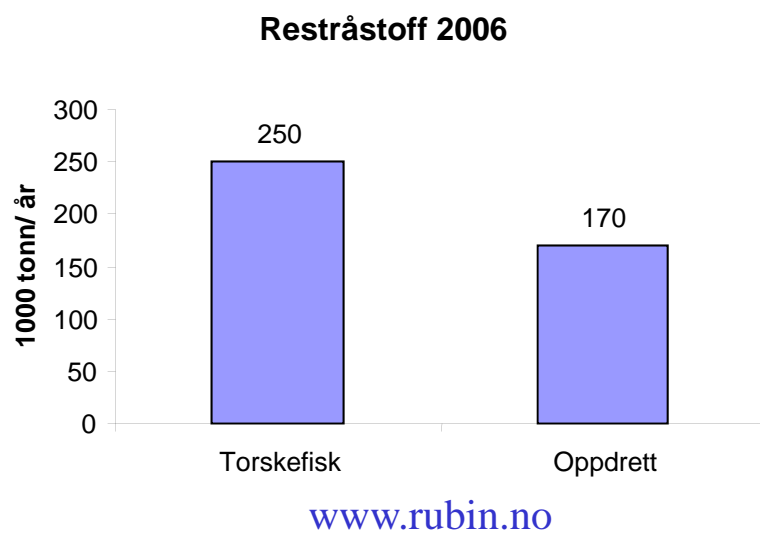


- Anbefalt protein inntak: 15 (10-35) energi%

Diett protein og energi-omsetnad

- **Lavt** diett-protein aukar energi-omsetnad
- **Høgt** diett-protein aukar energi-omsetnad
- Kan proteinkjelder med ulik aminosyresamansetnad påverke energi-omsetnad ved **normalt** diett-protein?

Fiskeprotein hydrolysat



Enzymatisk hydrolyse



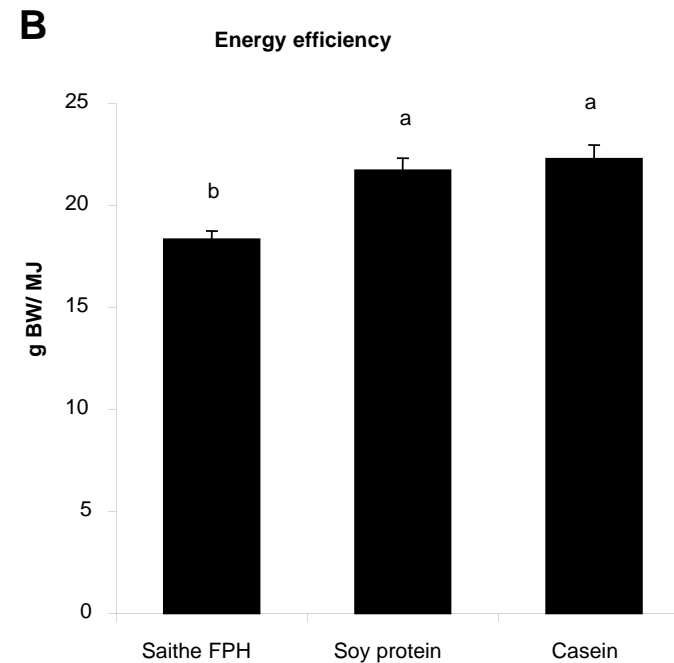
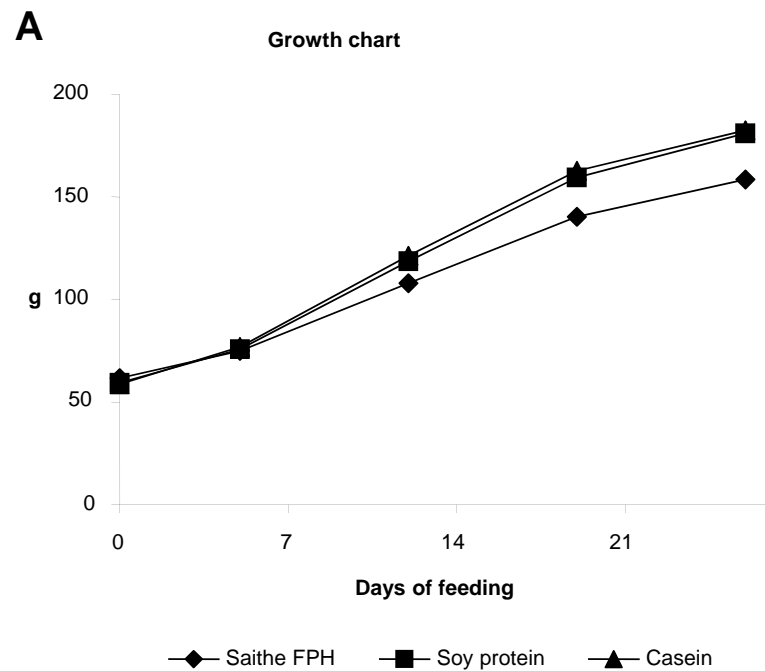
Tørt fiske protein hydrolysat (FPH)

Rotteforsøk med FPH frå sei

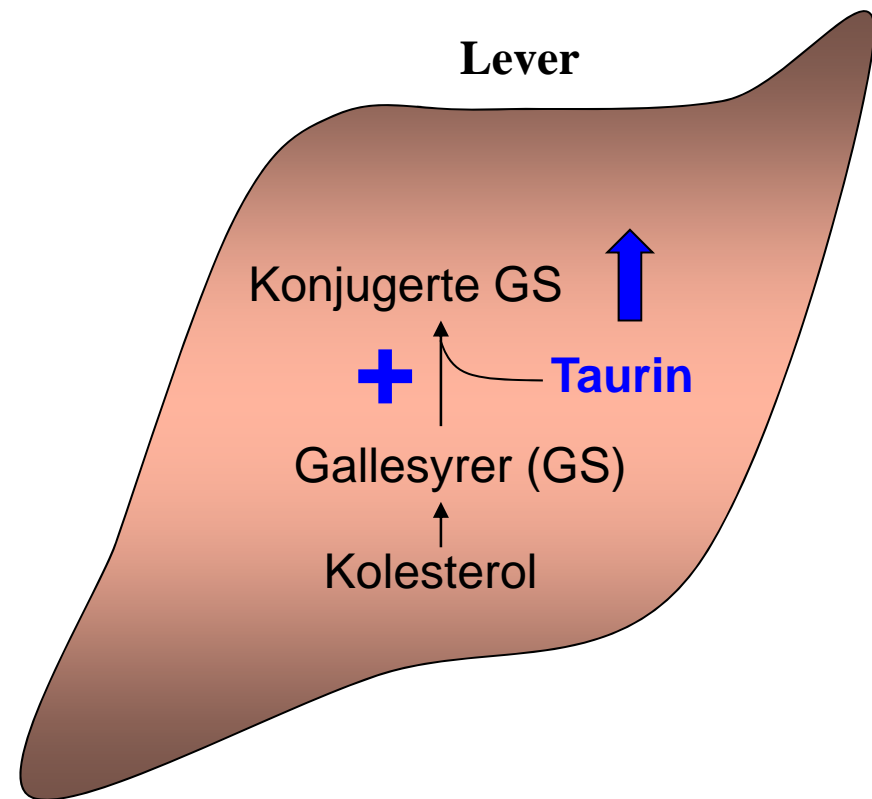
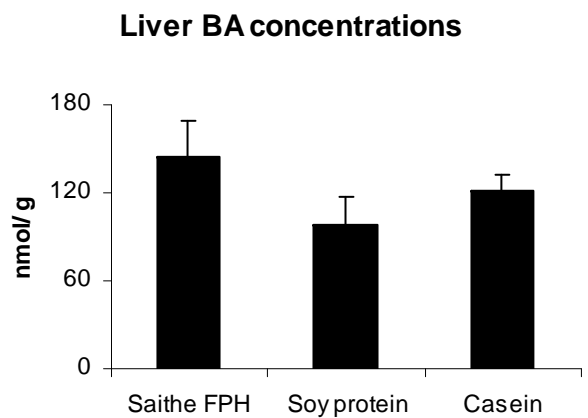
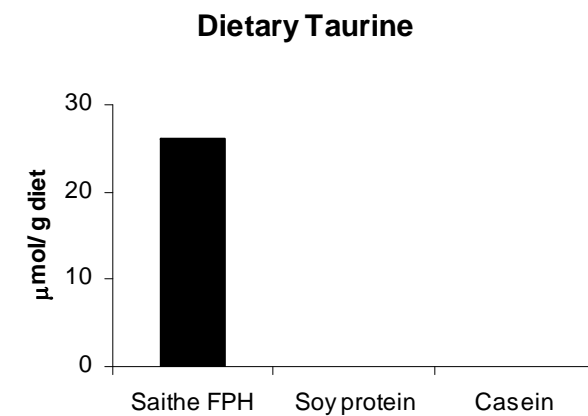
- Samanlikna sei FPH med effekt av soyaprotein og kasein

Component, g/kg	Saithe FPH	Soy protein	Casein
Saithe FPH	239	-	-
Soy protein isolate	-	230	-
Casein	-	-	227
KCl	-	23	26
Salt mix AIN-93 G*	35	35	35
Vitamin mix AIN-93G*	10	10	10
Cellulose	50	50	50
Sucrose	90	90	90
Supplement AIN-95G*	10	10	10
L-Cystine	3	3	3
Choline Bitartrate	2,5	2,5	2,5
Soy bean oil	100	100	100
Potato starch, dextrinized	461	447	446

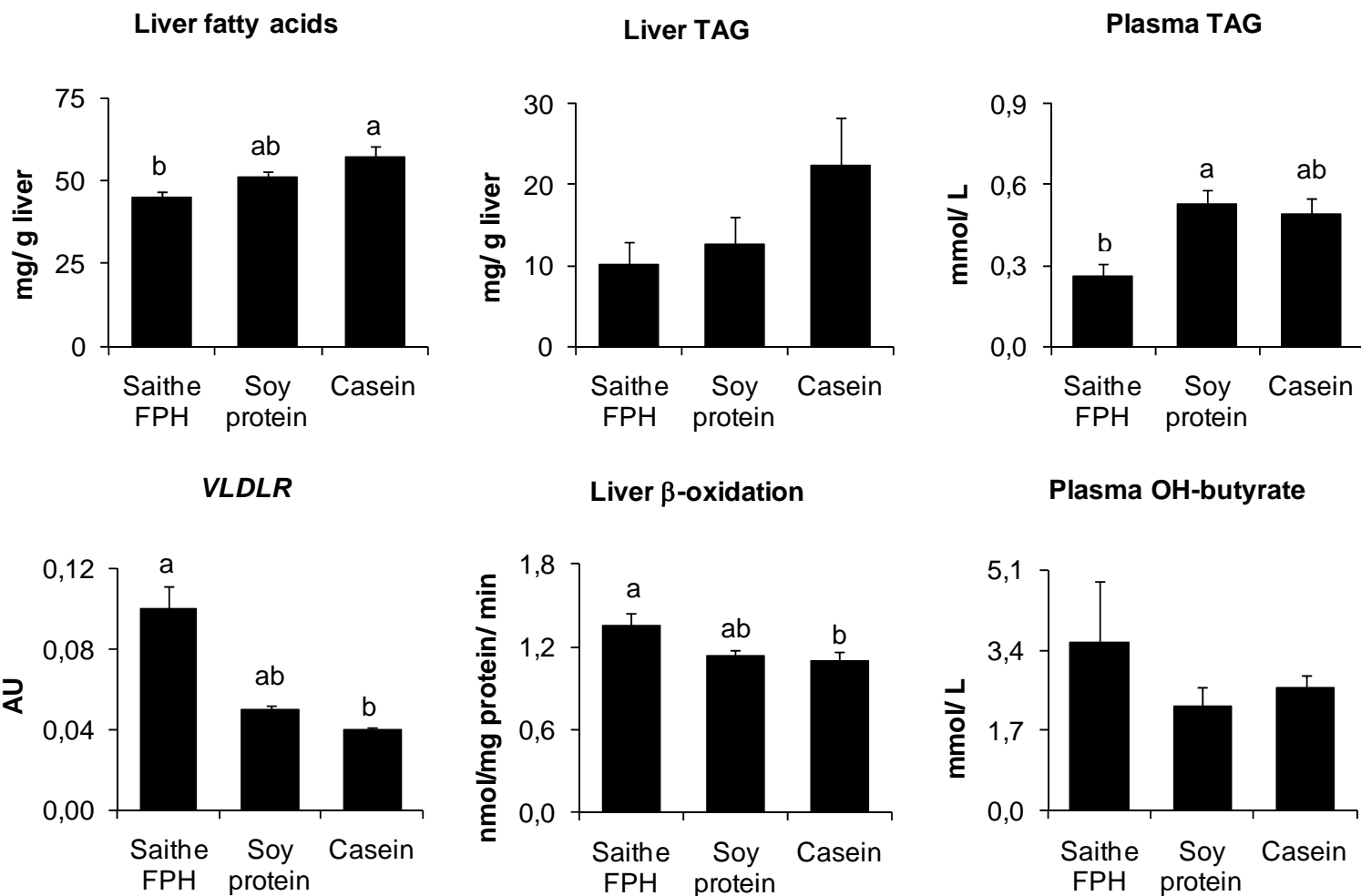
Sei FPH reduserer energi-effektivitet



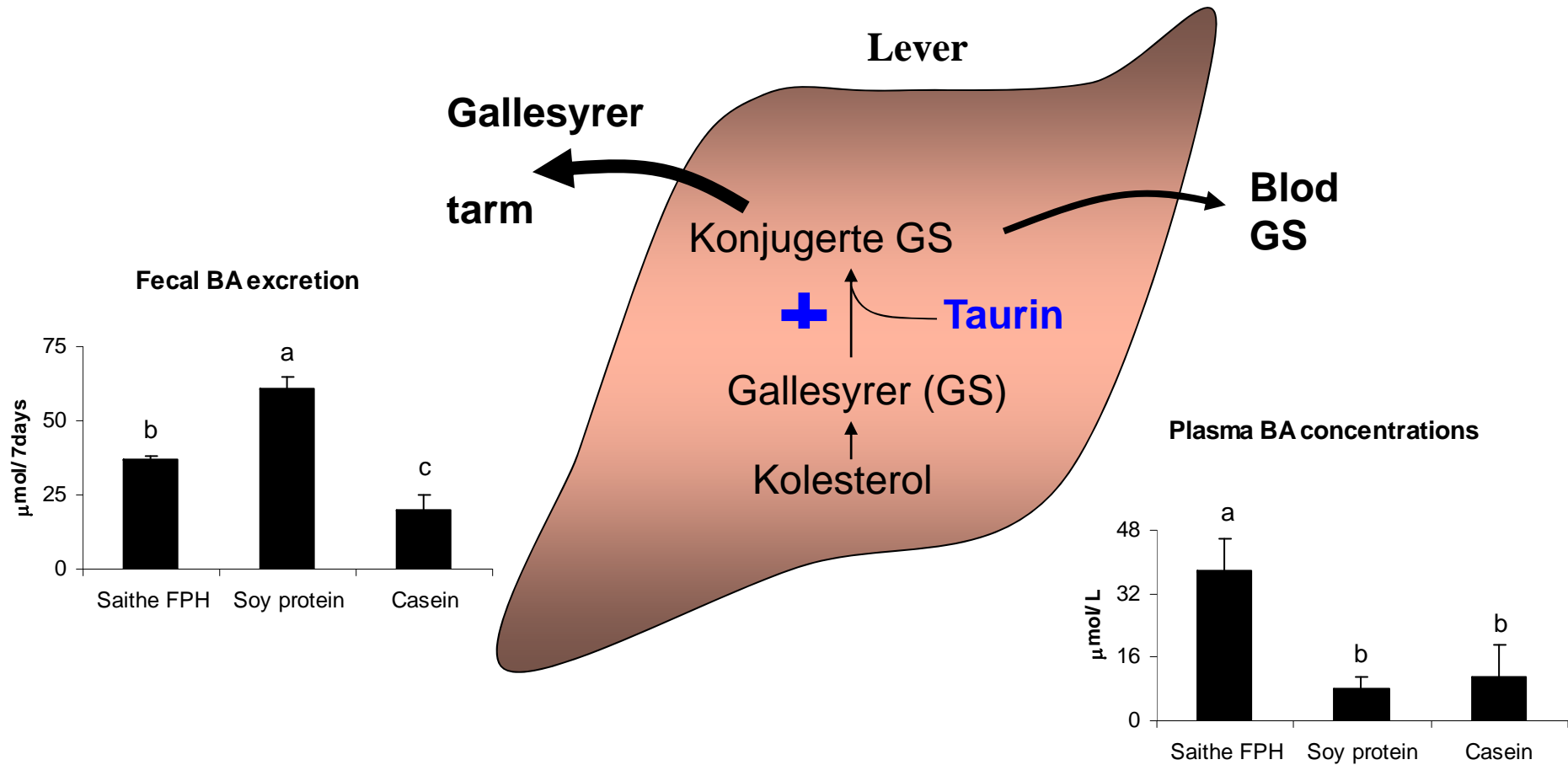
Sei FPH er rikt på taurin – og taurin er involvert i galle syre-produksjon



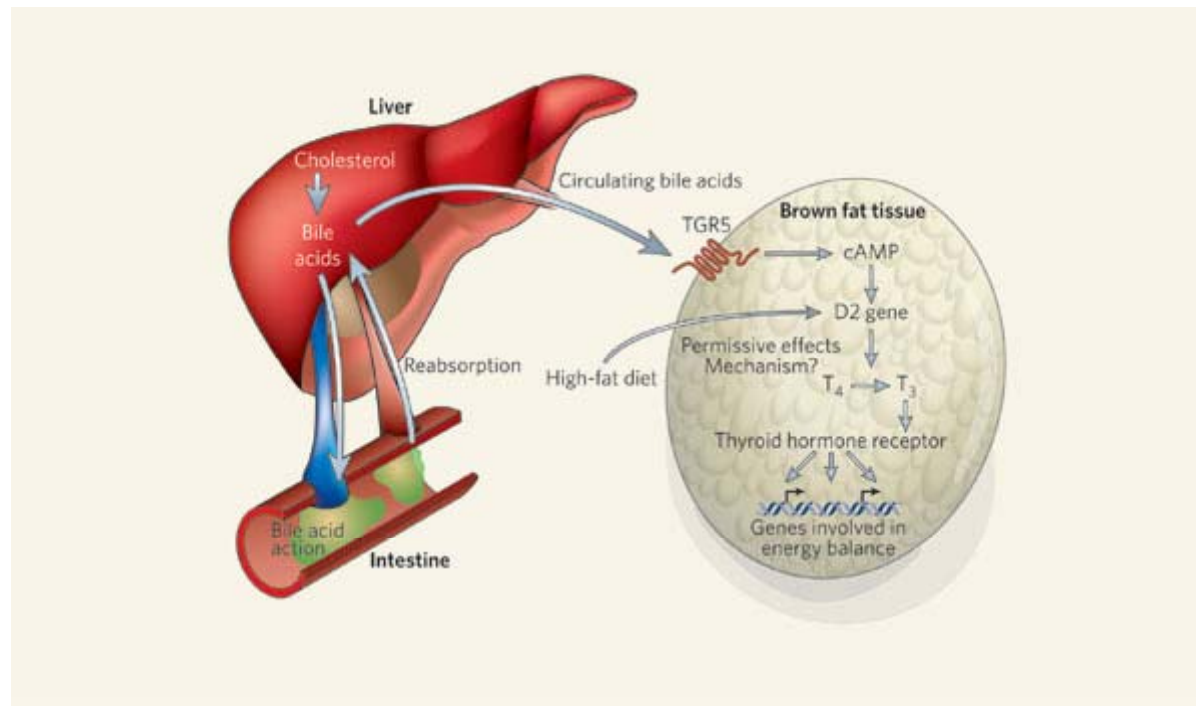
Sei FPH reduserer TAG i lever og blod



FPH aukar plasma konsentrasjon av gallesyrer

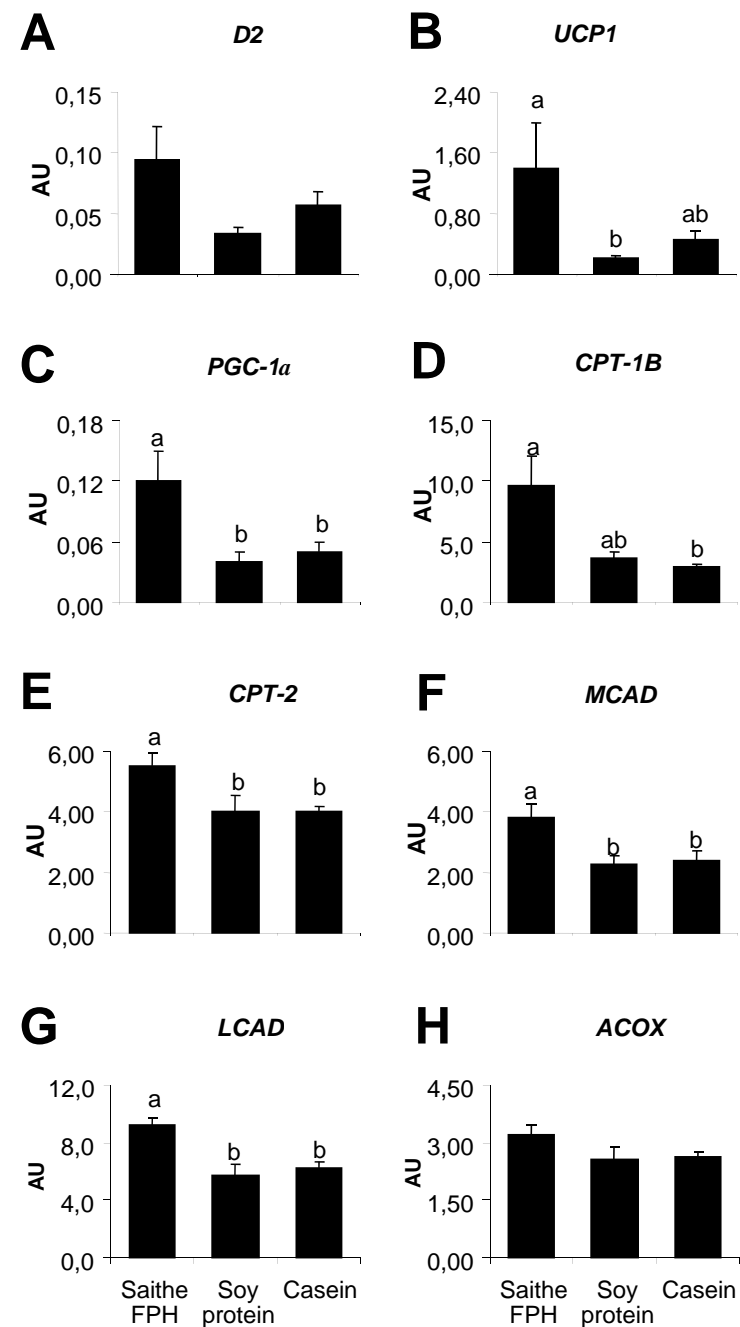
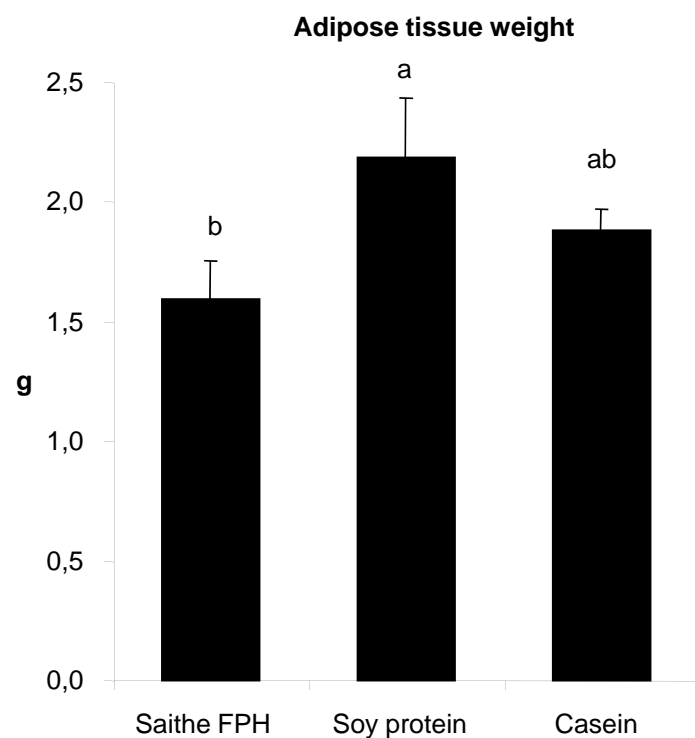


Gallesyrer aukar energiomsetnaden fettvev

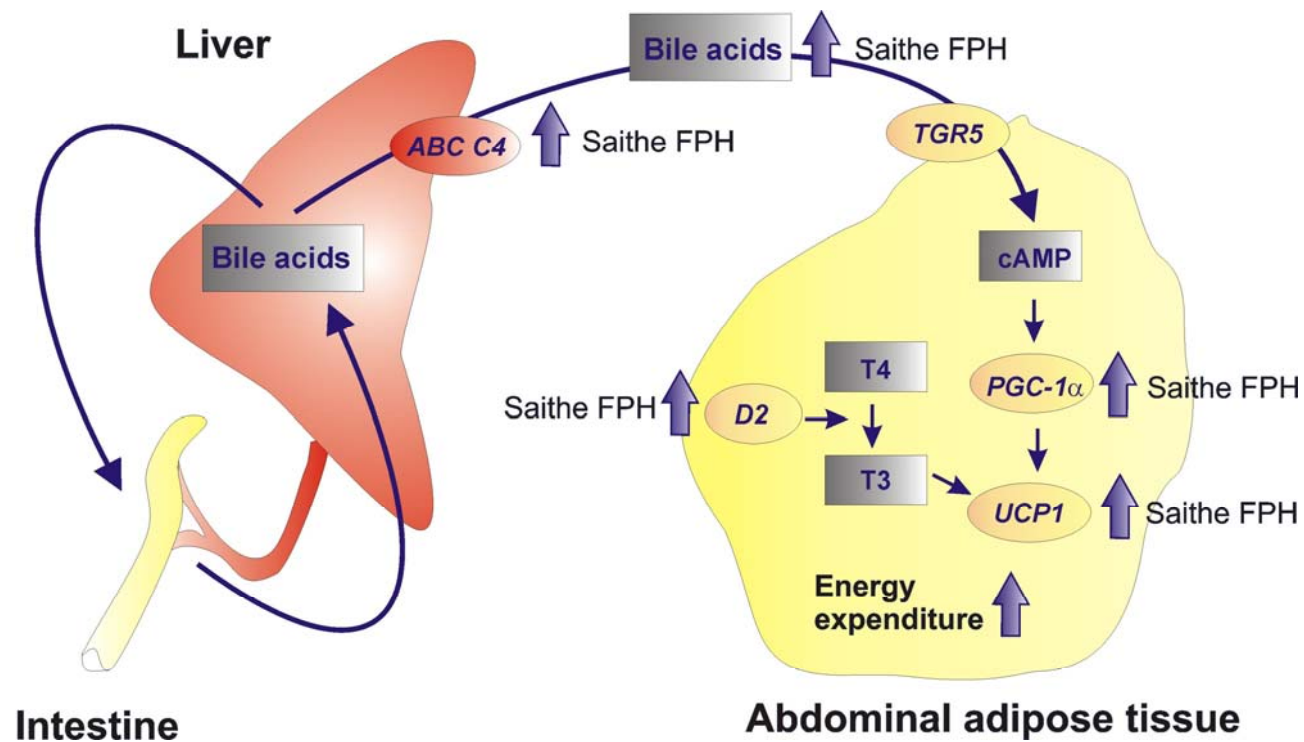


From Baxter, J.D. and Webb, P. (2006) *Nature* **439**: 402-403

FPH reduserer mengde buk fett og endrar genuttrykk i buk fett



Oppsummering FPH og redusert fedme



Konklusjonar:

- Ved likt energi-inntak har rotter som får FPH i dietten:
 - **Redusert mengde buk fett**
 - **Lavare TAG i blod**
 - **Mindre fett i lever**
- FPH kan motvirke utvikling av metabolsk syndrom i rotter, samanlikna med soyaprotein og kasein

FPH mot metabolsk syndrom

Definitions for the Metabolic Syndrome

WHO 1999

- Dysglycemia (DM, IFG, IGT, IR) + 2 of:
 - BMI > 30 or ↑WHR (>0.90 males/>0.85 females)
 - Dyslipidemia (Trig ≥ 1.7 mmol / low HDL (>0.9 males/<1.0 females))
 - BP ≥ 140/90 mmHg
 - Micro alb (alb excm > 20 µg/min)

ATP III

- 3 or more of:
 - ↑ waist (>102 cm in males/>88 females)
 - Dyslipidemia (Trig ≥ 1.7 mmol/low HDL (<1.0 mmol/<1.3 mmol))
 - BP ≥ 135/85 mmHg
 - FPG ≥ 6.1 mmol/L

Medarbejdere:

- Københavns Universitet
 - Qin Hao
 - Karsten Kristiansen
- Syddanske Universitet
 - Philip Hallenborg
- Universitetet i Bergen
 - Gunnar Mellgren
- Karolinska Universitetet
 - Hanns-Ulrich Marschall
- NIFES
 - Lise Madsen
 - Marit Espe
 - Gabriel Criaes
 - Åse Heltveit
 - Jacob Wessels
 - Livar Frøyland

Takk for økonomisk støtte frå:

- Rubin/ FHF
- Innovasjon Norge
- Danish Natural Science Research Council
(Danish Obesity Research Centre)
- Programstyret for Ernæring, UiB

Takk for merksemda!



1dak.com/people/biggest-beer-belly-in-the-world/