



Jod og stoffskiftið

Vitan úr Føroyum

Herborg Líggjasardóttir Johannesen, Sjúkrahúsverkið

23. september 2022



NORTH DENMARK REGION

FRÓÐSKAPARSETUR
FØROYA
University of the Faroe Islands



Jod og stoffskiftið

- › Jod
 - Søga og týdning fyrir heilsuna
- › Jod og Stoffskiftið
 - Sjúkumynstrið
 - øðrvísi enn í DK, Íslandi og Grønlandi
- › Úrslit av kanningunum
 - Jod í
 - Kranavatni
 - Føroyeskum kosti
 - Fólki



Jod

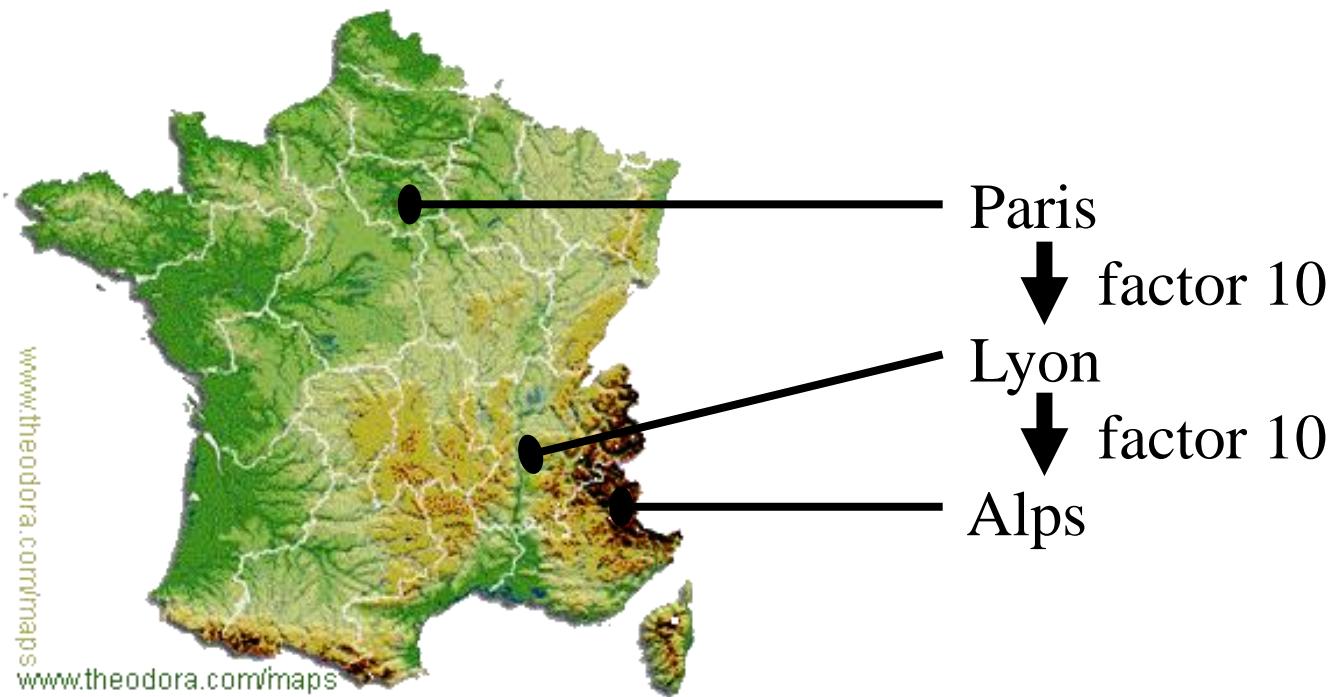
- Iodine
 - Element nummar 53
 - Atommassi 127
 - Metal-líknandi eginleikar
 - Halogen. Sublimes
 - Micronutrient (føðsluevni)
- Funnið í 1811

Tá man framleiddi salpetur til krút til herin hjá Napoleon

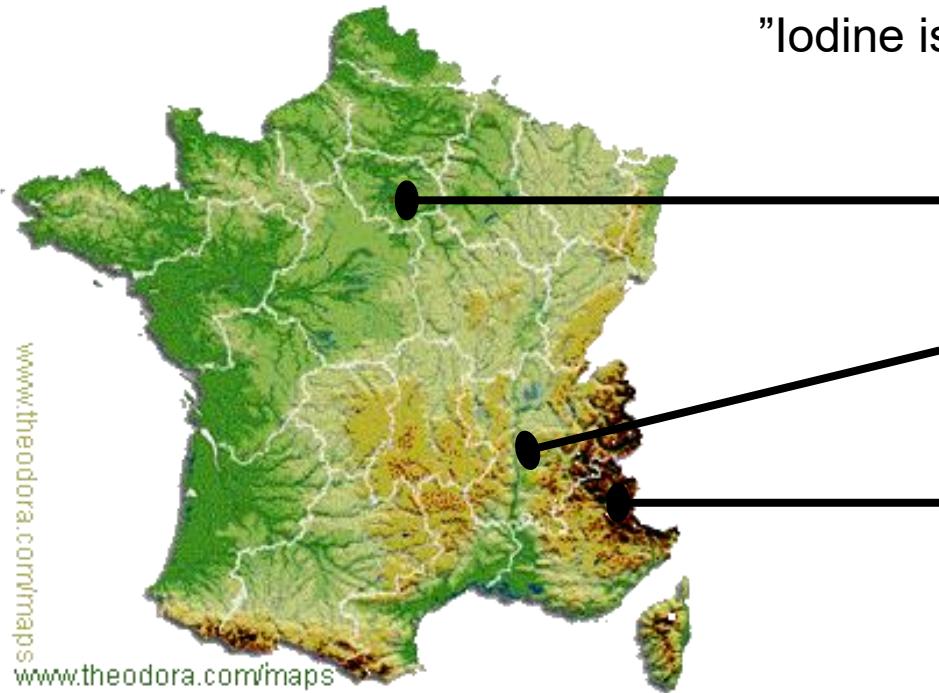


PERIODIC TABLE OF THE ELEMENTS																			
18																			
1	H	Hydrogen	1.0078	2	Li	Lithium	6.938	3	Na	Sodium	22.989	4	Be	Beryllium	9.012	5	B	Boron	10.806
2	Li	Lithium	6.938	3	Mg	Magnesium	24.312	4	Sc	Scandium	44.956	5	V	Titanium	47.867	6	Cr	Vanadium	50.942
3	Na	Sodium	22.989	4	Ti	Titanium	47.867	5	Cr	Chromium	51.996	6	Mn	Manganese	54.938	7	Fe	Iron	55.845
4	K	Potassium	39.098	5	Ca	Calcium	40.078	6	Tc	Rhenium	91.224	7	Co	Coalt	58.933	8	Ni	Nickel	58.693
5	Rb	Rubidium	85.468	6	Sr	Stronctium	87.62	7	Y	Yttrium	88.905	8	Cu	Copper	63.546	9	Zn	Zinc	65.38
6	Cs	Ceasium	132.91	7	Fr	Francium	223	8	Sc	Scandium	57.71	9	Ga	Gallium	69.723	10	Ge	Germanium	72.63
7	Fr	Francium	223	8	Ra	Rutherfordium	265	9	Db	Dubnium	242	10	As	Arsenic	74.922	11	In	Inium	78.96
				9	Rf	Rutherfordium	261	10	Sg	Seaborgium	266	11	Sb	Selenium	74.922	12	Te	Tellurium	78.96
				10		SEE BELOW		11	Bh	Bhaskerium	264	12	At	Xenon	83.798	13	I	Iodine	126.90
				11		SEE BELOW		12	Gs	Gesamium	264	13	Po	Polonium	127.60	14	Fr	Flerovium	126.90
				12		SEE BELOW		13	Mt	Mendelevium	268	14	Bi	Bismuth	126.90	15	Lv	Liversium	126.90
				13		SEE BELOW		14	Rg	Rutherfordium	268	15	Uup	Ununpentium	268	16	Uus	Ununhexium	268
				14		SEE BELOW		15	Ds	Darmstadtium	268	16	Fl	Flerovium	268	17	Tm	Thulium	173.04
				15		SEE BELOW		16	Hs	Hassium	269	17	Cf	Californium	269	18	Lu	Lutetium	174.97
				16		SEE BELOW		17	Mt	Mendelevium	269	18	Fm	Fermium	259	19	Yb	Ytterbium	173.04
				17		SEE BELOW		18	Rg	Rutherfordium	268	19	Md	Mendeleevium	259	20	Lu	Lutetium	174.97
				18		SEE BELOW		19	Eu	Europium	157.25	20	Y	Yttrium	173.04				
						GUIDE			20	Gd	Gadolinium	159.36							
						ATOMIC NUMBER			21	Tb	Terbium	162.50							
						ELEMENT SYMBOL			22	Dy	Dysprosium	164.93							
						ELEMENT NAME			23	Ho	Holmium	167.26							
						ATOMIC WEIGHT			24	Tm	Thulium	168.93							
									25	Er	Erbium	169.93							
									26	Y	Ytterbium	170.93							
									27	Lu	Lutetium	171.97							

Týdningurin av jod



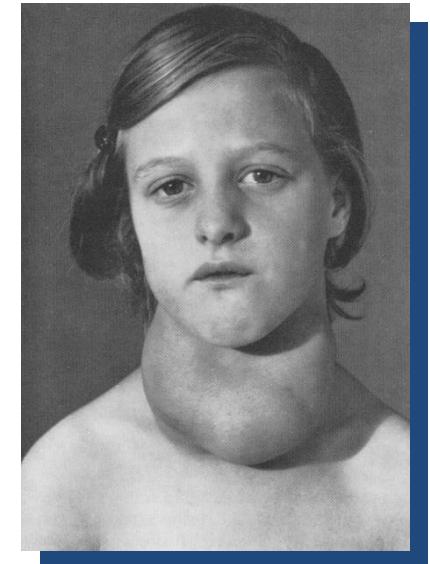
Týdningurin av jod



Chartin hypothesis 1851:
"Iodine is the cause of goitre"

Paris
↓ factor 10
Lyon
↓ factor 10
Alps

Goitre:
No
Yes
Yes



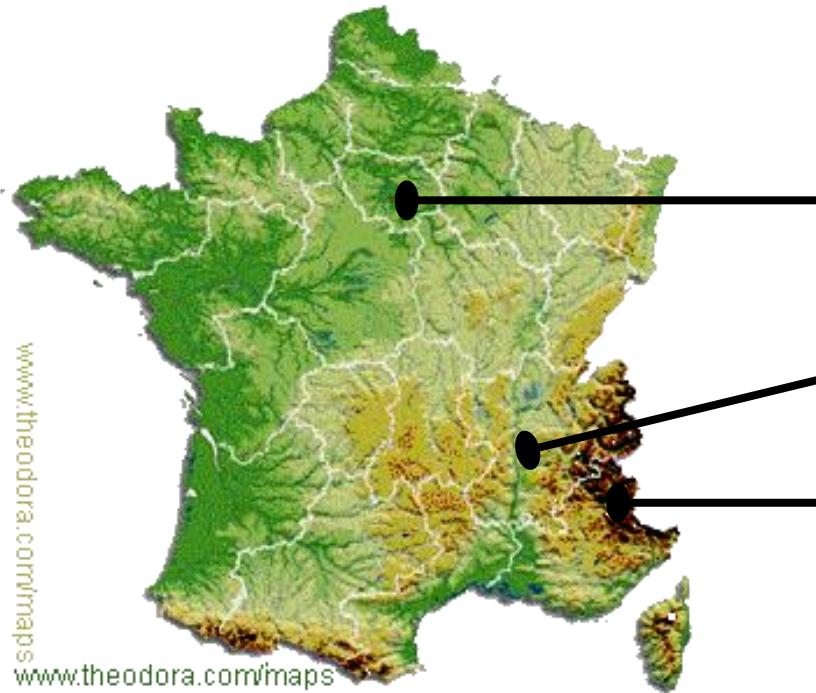
Týdningurin av jod



www.theodora.com/maps

	Goitre:	Cretinisme:
Paris	No	No
↓ factor 10		
Lyon	Yes	No
↓ factor 10		
Alps	Yes	Yes

Týdningurin av jod



Cretinisme:
No

No

Yes

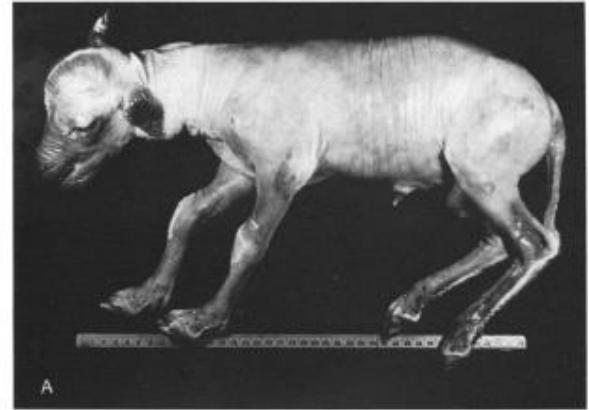
ris (1851) 31:280–3

Frá epidemiology til vísindi

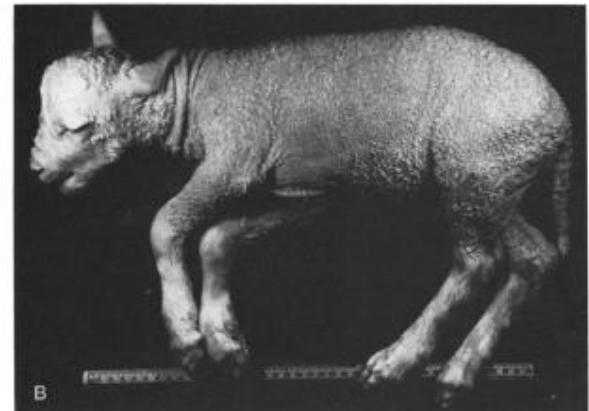
Seyður

Tørvur var á djóramodel
fyri at vísa samanhangin
millum jod og cretinism

No iodine



+ iodine

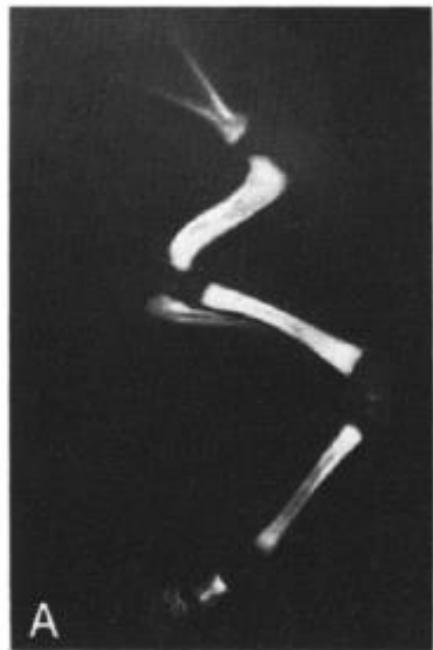


Potter & Hetzel, 1982

Týdningurin av jod

Frá epidemiologi til prógv

ID



Control



ID+iodine suppl

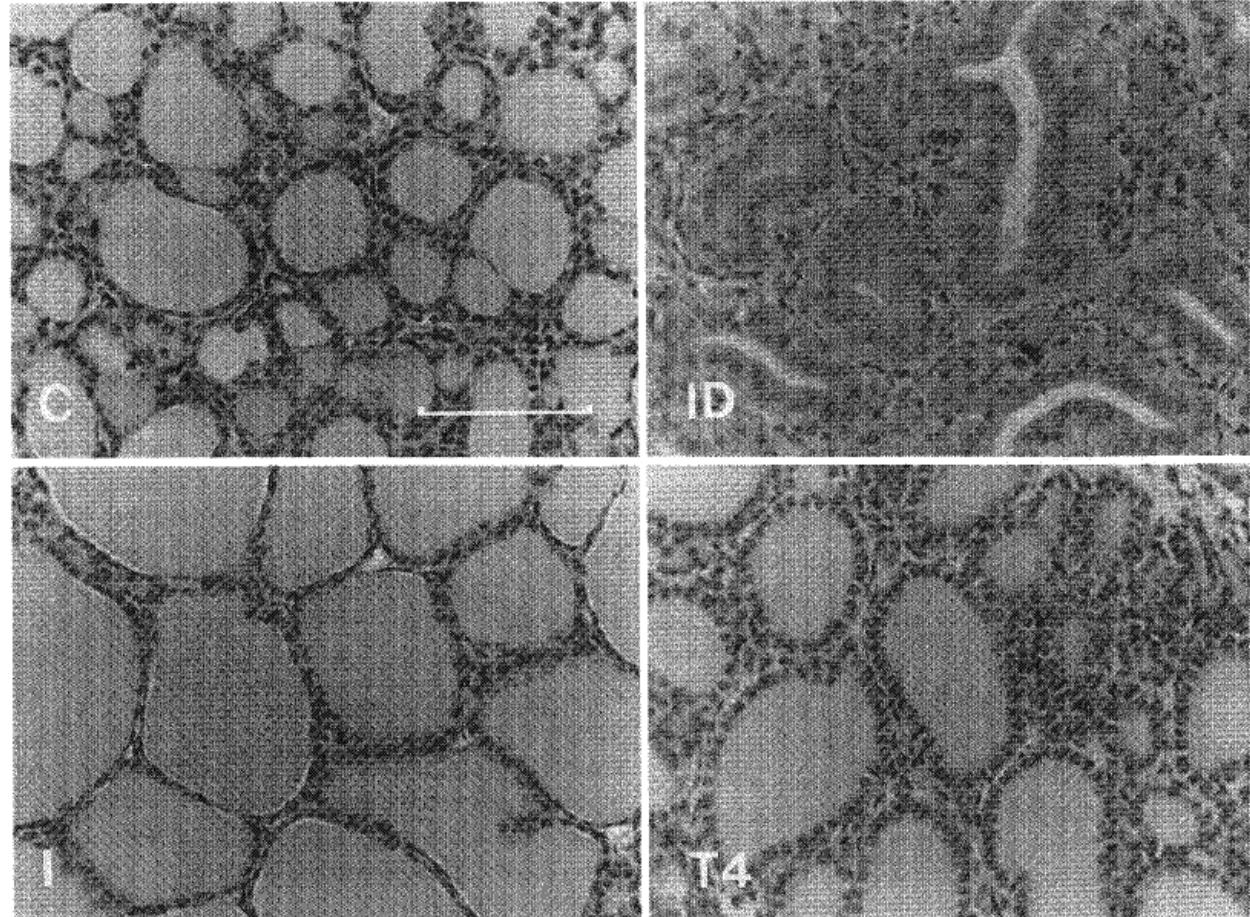


Fig. 2. Lateral radiographs of the right forelimbs of fetuses delivered at 140 days gestation from ewes that were (A) iodine-deficient, (B) controls and (C) injected with iodized oil at 100 days.

Týdningurin av jod

Frá epidemiologi til vísindi

Nøktandi Jod



Jod Mangul

Tilsett Jod

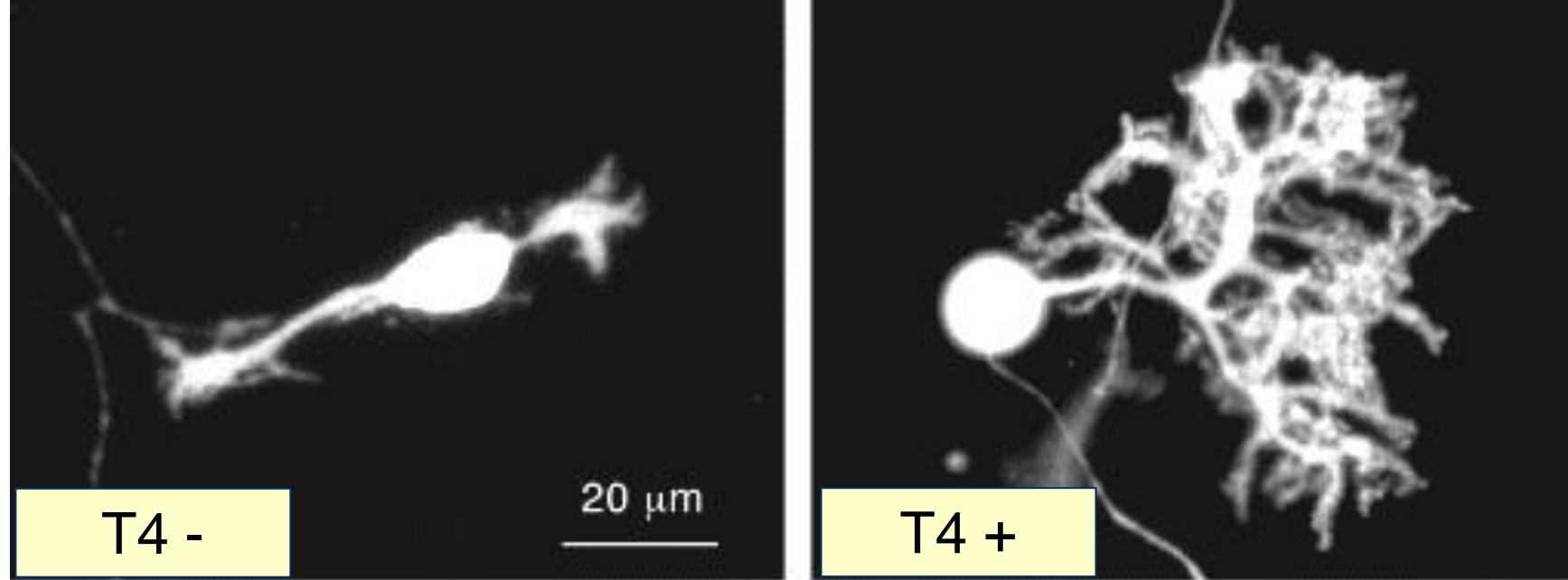
Stoffskiftisvevnaður 1:100

Tilsett
stoffskiftishormon T4

Mano & Hetzel, 1989

Týdningurin av stoffskiftishormoni T4

Frá epidemiologi til prógv
**T4-tegd útvikling av heilakykum Dendrites
á 20inda degi í Vitro**



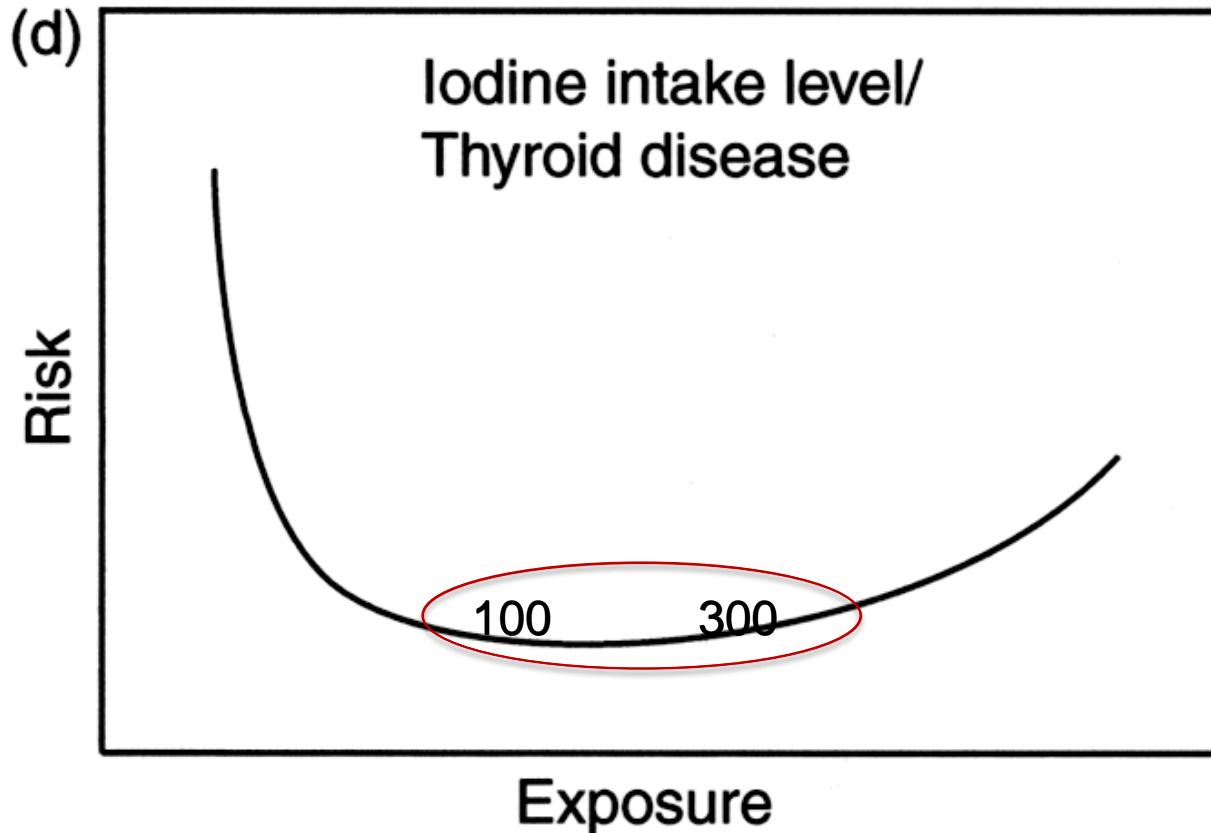
Kimura-Kuroda J et al 2005

Jod - føðsluevni er neyðugt fyrir heilsuna



Cretinism

Photo by
F. Merke



Laurberg et al 2002



Jod
yvirskot
struma
Suzuki, 1980

Granskingsspurningar (Research questions)

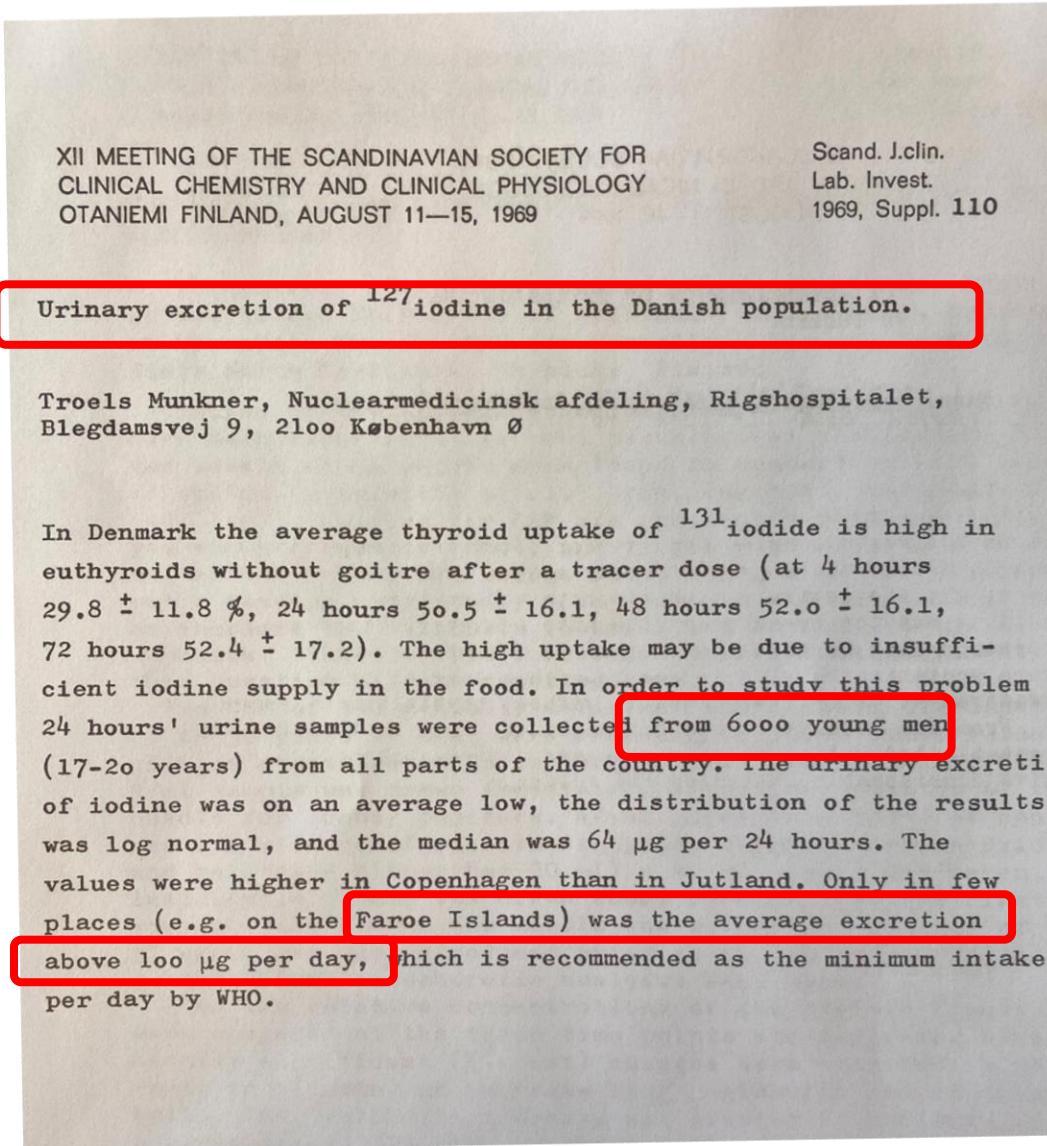
- › Hvussu er jod-støðan í Føroyum?
- › Er samanhangur millum stoffskiftissjúkur og jod hjá føroyingum?
 - Varierar
 - Jod inntøkan?
 - Stoffskiftissjúkur?
 - Aldursbólkar?
 - Kyn?
- › Hvørji tilmæli kann betra um jod-støðuna og stoffskiftissjúkur í Føroyum?

Dagblaðið 1935

Háðan 5. ágúst 1935

<p>DAGBLAÐID Læsir til óvinnar, stýring, tilgang og lykking.</p> <p>TELEFONI: Blaðabílinn 305 Argrikáðin 201 Præstebílinn 201</p> <p>PALDARSKJÓLI: XO. 276. Þóðargildi mið. þann 1. Febrúar og Þorsdagur. I myndu til syc. umskot.</p> <p>LÝSINGARPRÍSIR: A. 4. síða 8. ócr. 10. 1935 A. 5. og 2. síða 12. - A. meira, pláðir 15. - Þarf líköt meira og tilgang: Mið apr. hvarf 10%</p> <p>Radioprogram. Købmænni: Radio, 1130 Km. 025 m/og Købmænni: Radio, 238 Km. (120 m). (Fransk Tid).</p> <p>Torsdag 5. August</p> <ul style="list-style-type: none"> 13.00 Margarín 13.00 Margarín for Færøren 16.00 Fjørðurssanger 20.00 Hymnsangur og Þorsdagssongur 20.00 Træning 21.00 Koncert 21.30 Læsir Margarín gánum Tíðens 22.00 Tíðensmægur Hjörðingur <p>FREDAG 6. August</p> <ul style="list-style-type: none"> 13.00 Margarín 13.00 Væringur, se Færøren 16.00 Fjørðurssanger 18.00 Margarín og Þorsdagssongur 18.00 Koncert 18.30 Læsir Margarín gánum Tíðens 22.00 Tíðensmægur Hjörðingur <p>4.000 — Nr. 87</p>	<p>DAGLAHM</p> <p>FDR Clothing Ltd. Ltd. / Spalding Vestermælumark FDR Clothing, Købmænni MGR Pressurbladid TDR Ólafur Saksunar — Edward Gray</p> <p>FREDAG 6. AUGUST</p> <p>13.00 Margarín</p> <p>13.00 Væringur, se Færøren</p> <p>16.00 Fjørðurssanger</p> <p>18.00 Margarín og Þorsdagssongur</p> <p>18.00 Koncert</p> <p>18.30 Læsir Margarín gánum Tíðens</p> <p>22.00 Tíðensmægur Hjörðingur</p> <p>6.000 — Nr. 88</p> <p>FØROYA BANKI FORENDOKTOR: THORSHAVN AFDELING: TRANDBAEG ARTIKELKAPITAL OG RESERVER CA. KR. 500.000</p> <p>Bankforretninger af enhver Art udføres.</p> <p>Kontakt: Hverdag 11—3. Lørdag 11—2.</p> <p>PRENTSMÍDJA „DAGBLADSINS“ RÓKA, BLSD. OG ACCIDENTSPRENTSMÍDIA SJØRDARGÖTU TØRSHAVN TELEFON 237</p> <p>AU: arnategenerál vortur, gott og kligt — i viðum alla taðri item ■ Stóri Greal er stykksu pappi og konkotum till billigstu prisir.</p> <p>Brug kun færisk Margarine VITA NR 1 VITAMINISERET</p> <p>DAGLIGSTOVU -MØBLAR- Fæderstof vortur og bort, al mæd, dísasæppi, mæðaði, segði og mæði í matvæntakastan í Hans P. Poulsen, Tórshavn. Tel. 238</p> <p>Eggkvæði og Áta Vind Argrikáðin. 10. Húsau. 20.— 24.— 120.— Kostau. 16.— 17.— 120.— Fæðau. 16.— 17.— 120.— Smør. 15.— 16.— 60.—</p> <p>Dýrðar til fiskvændar, til þessar meðaldeildar leggur, til vældige Strafar, með Kaffi, Fosli og Jóns, i særlig Grøn fiskur Pískur. El Falur, el Þritur Síður, vændeð til dross. Læs klæði, en langt være endi. Fis hæði, en kaffi. Þritur, el Þritur „Færø Islands Fishing industry of today“.</p>
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Hvussu er jod-støðan í Føroyum?



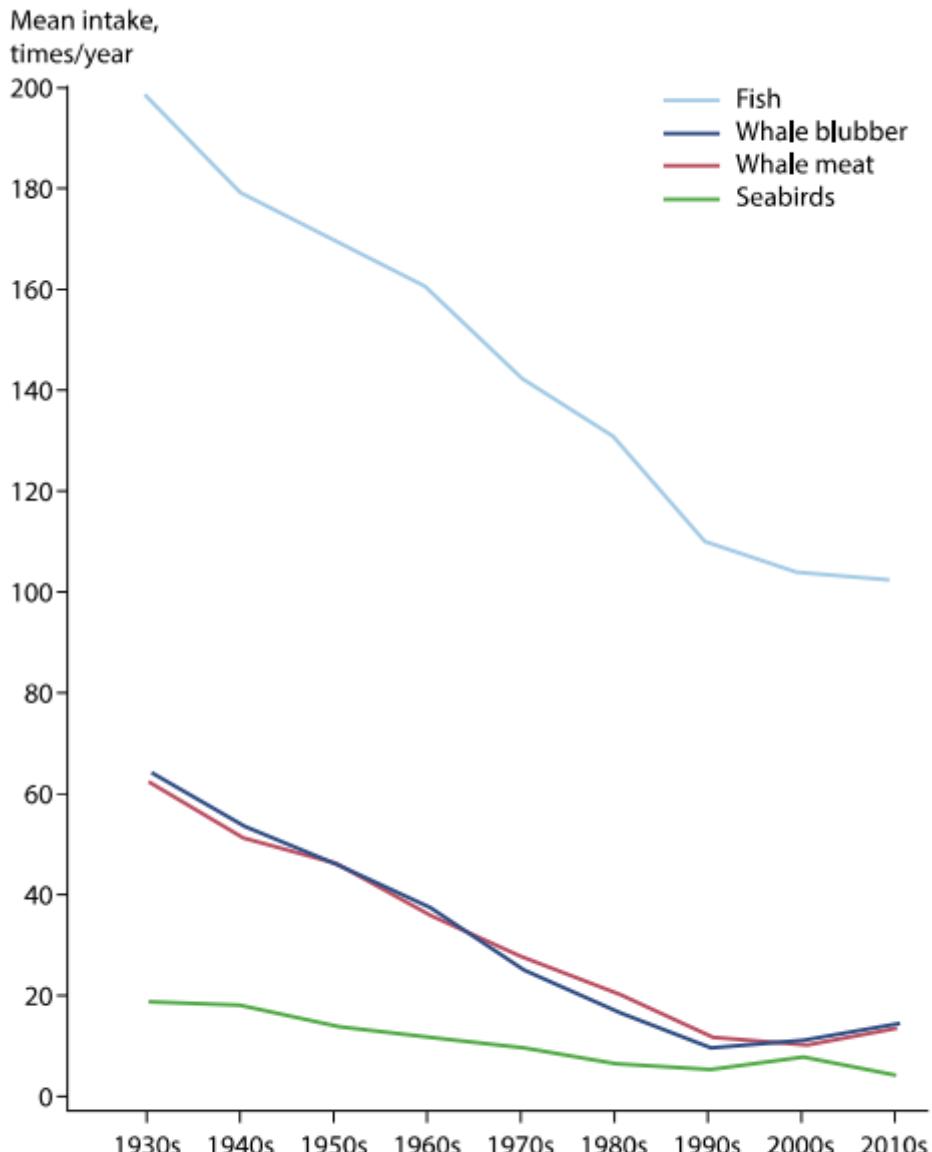
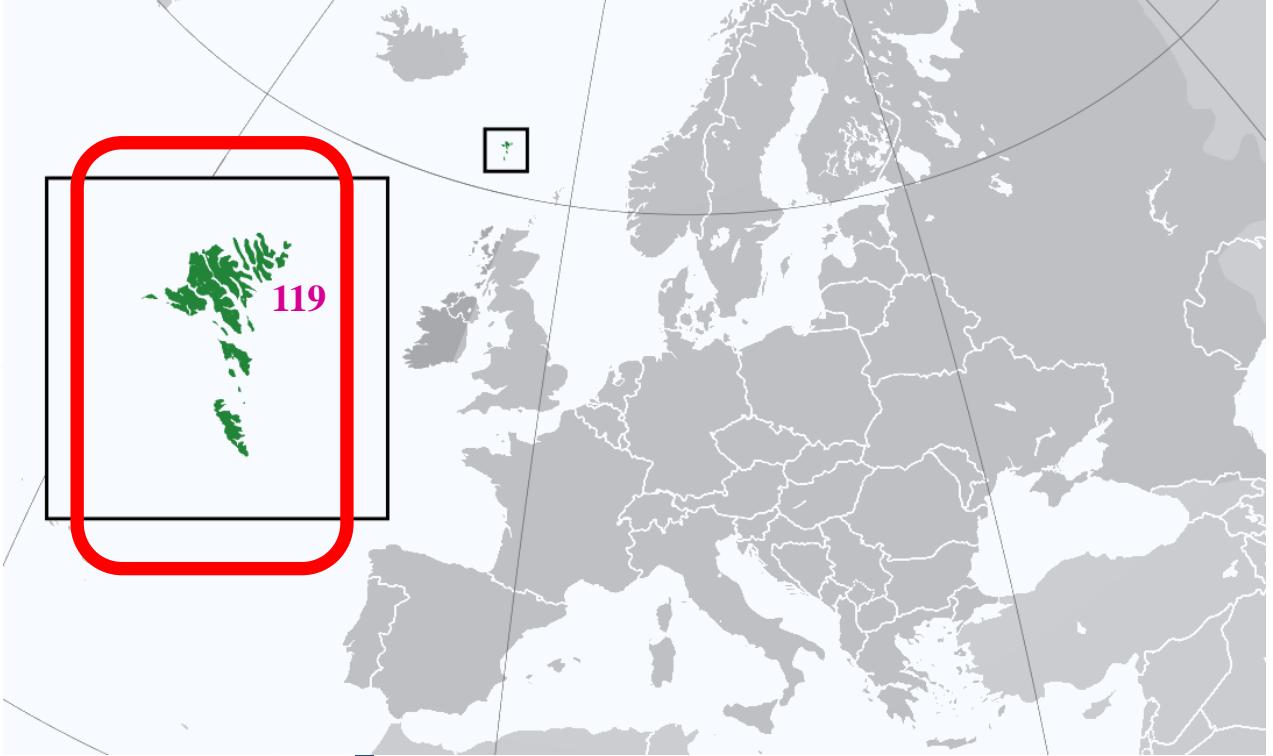
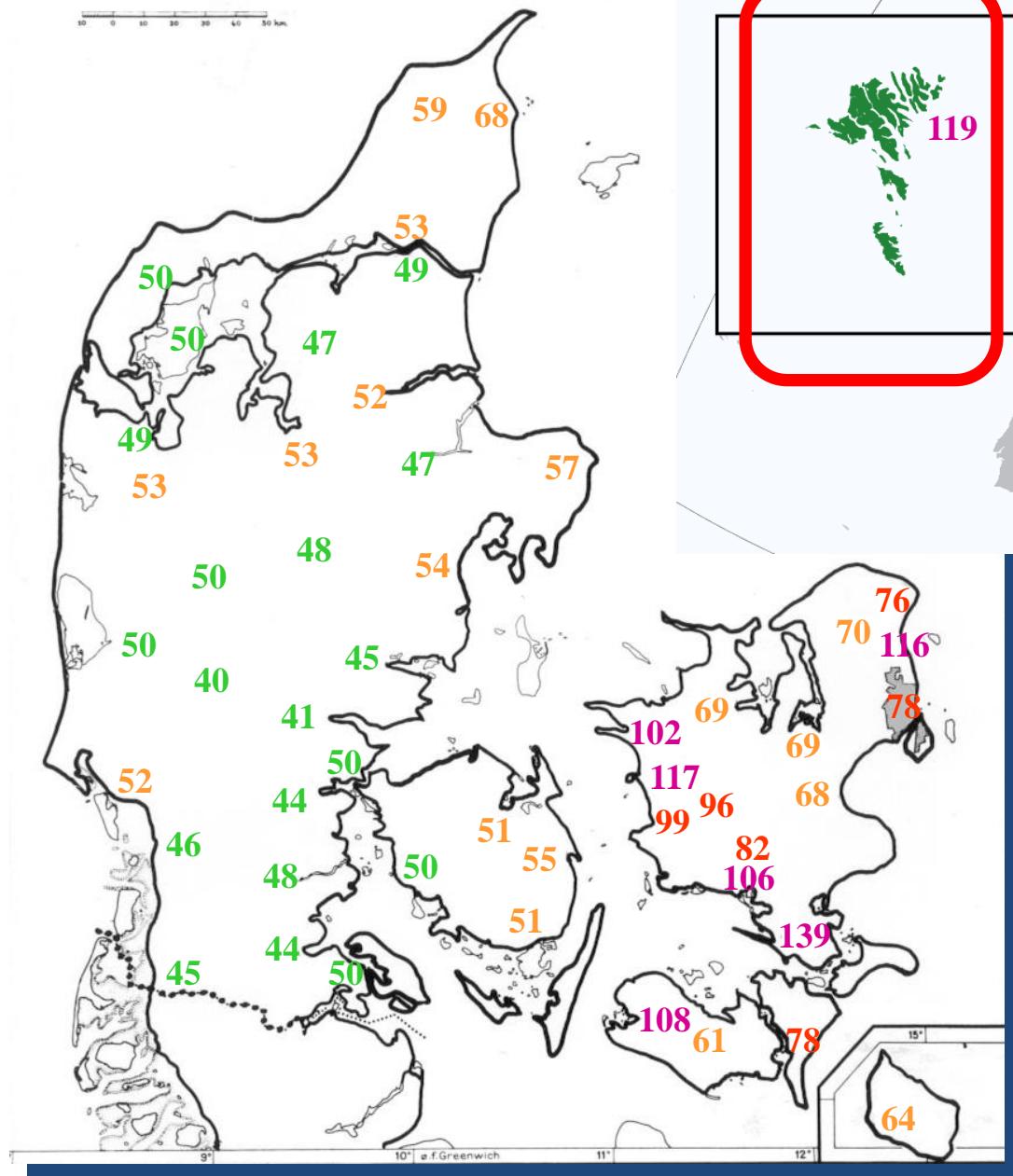
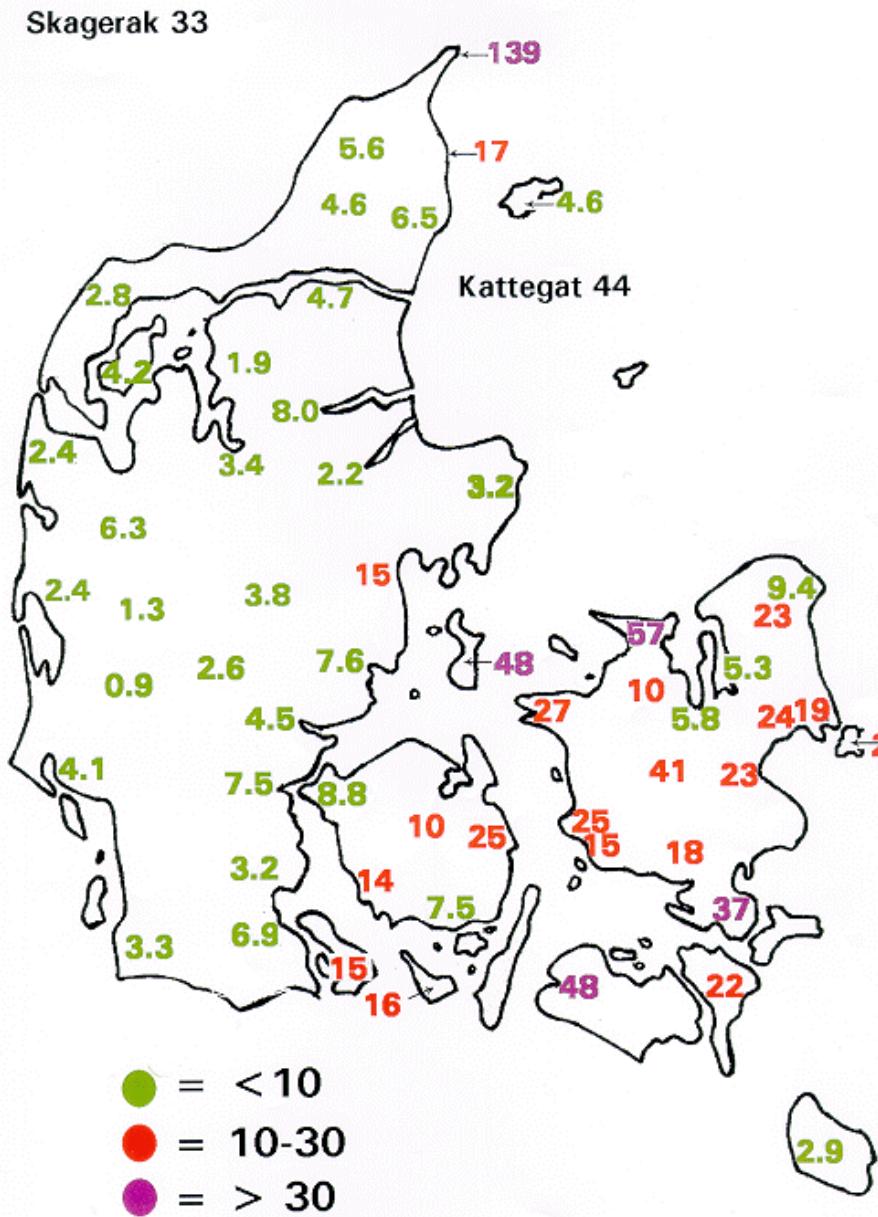


Figure 2.4 Estimated mean annual intake of four important food groups in the Faroe Islands since the 1930s.

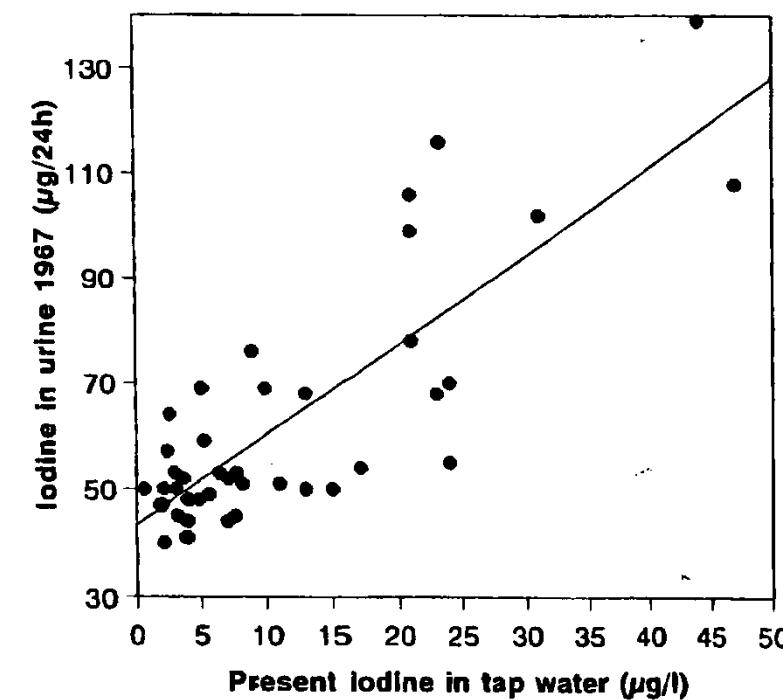
amap, 2021



Iodine in Danish Water ($\mu\text{g/l}$)



Samanhangur millum jod í
- kranavatni
- urin



Kanningarháttur

Kanna jod í kostinum og drykkivørum

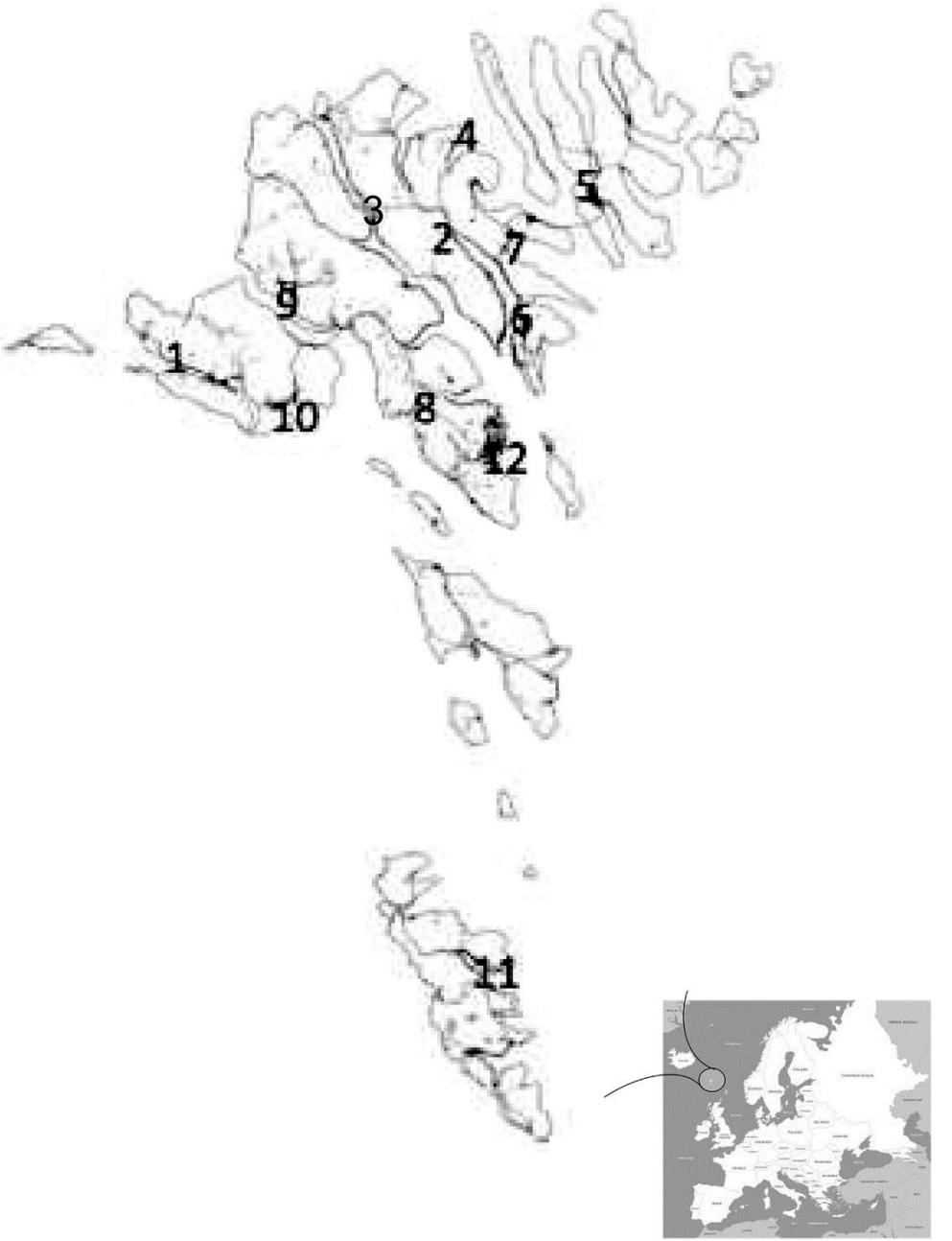
Jod í individi kann ikki nýtast,
skal vera bólkar >120 fólk

- 3 kanningar av fólki
40-75 ára gomlum
14 ára gomlum
Barnakonum

- Stílaðu eftir 90-95% precision av jodúrskiljanini
- Jod var mátað í urin
- Metoda: ceri/arsen after alkaline ashing

FAROE ISLANDS

<2mcg/ml



RESEARCH ARTICLE

 OPEN ACCESS 

The iodine content of Faroese food items to support iodine nutrition in the North Atlantic

Herborg Líggjasardóttir Johannessen ^{id^{a,b}}, Stig Andersen^{c,d,e}, Pál Weihe^{b,f,g}, Maria Skaalum Petersen^{b,f,g}, Marin Strøm^{b,f} and Anna Sofía Veyhe^{b,f,g}

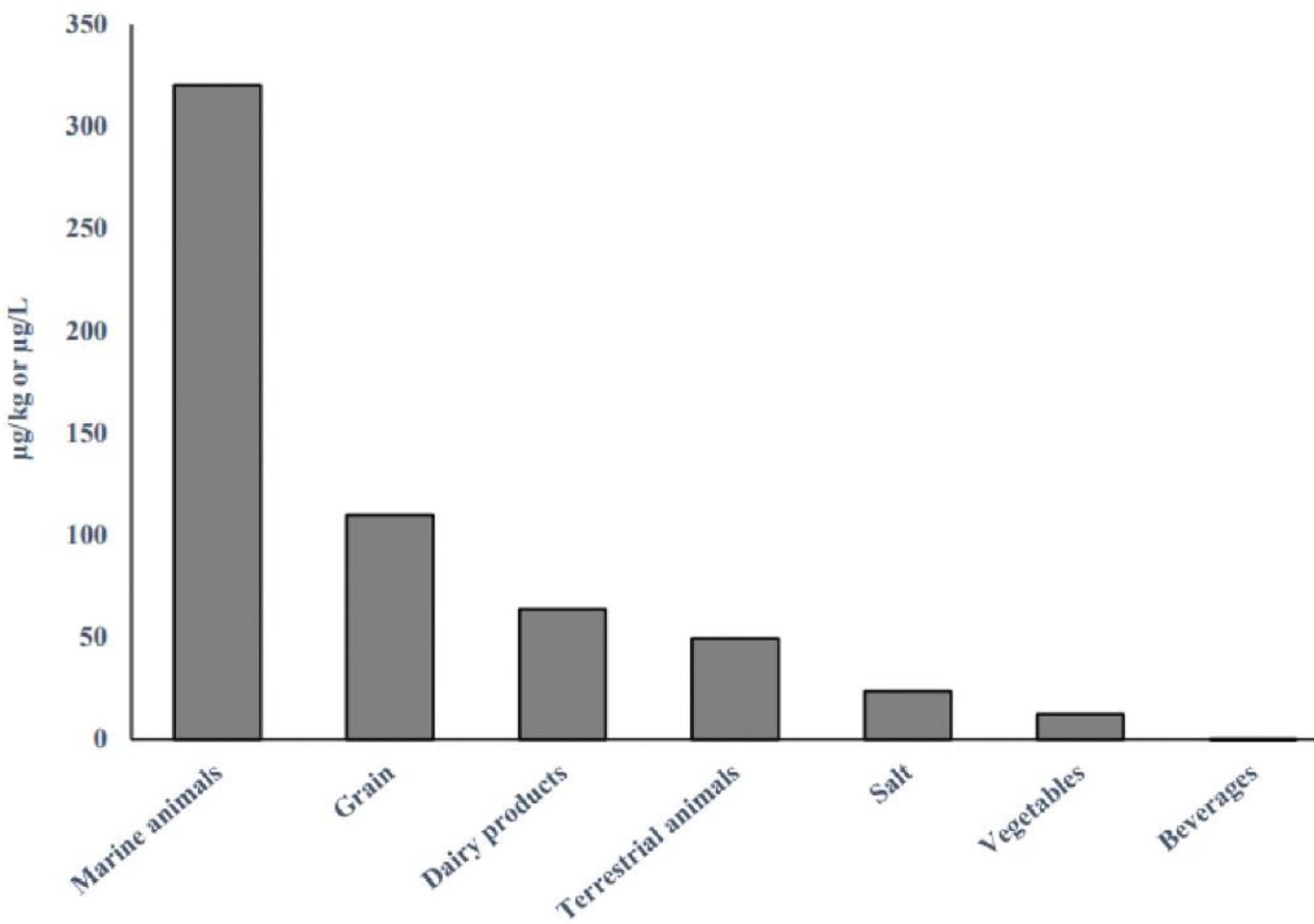


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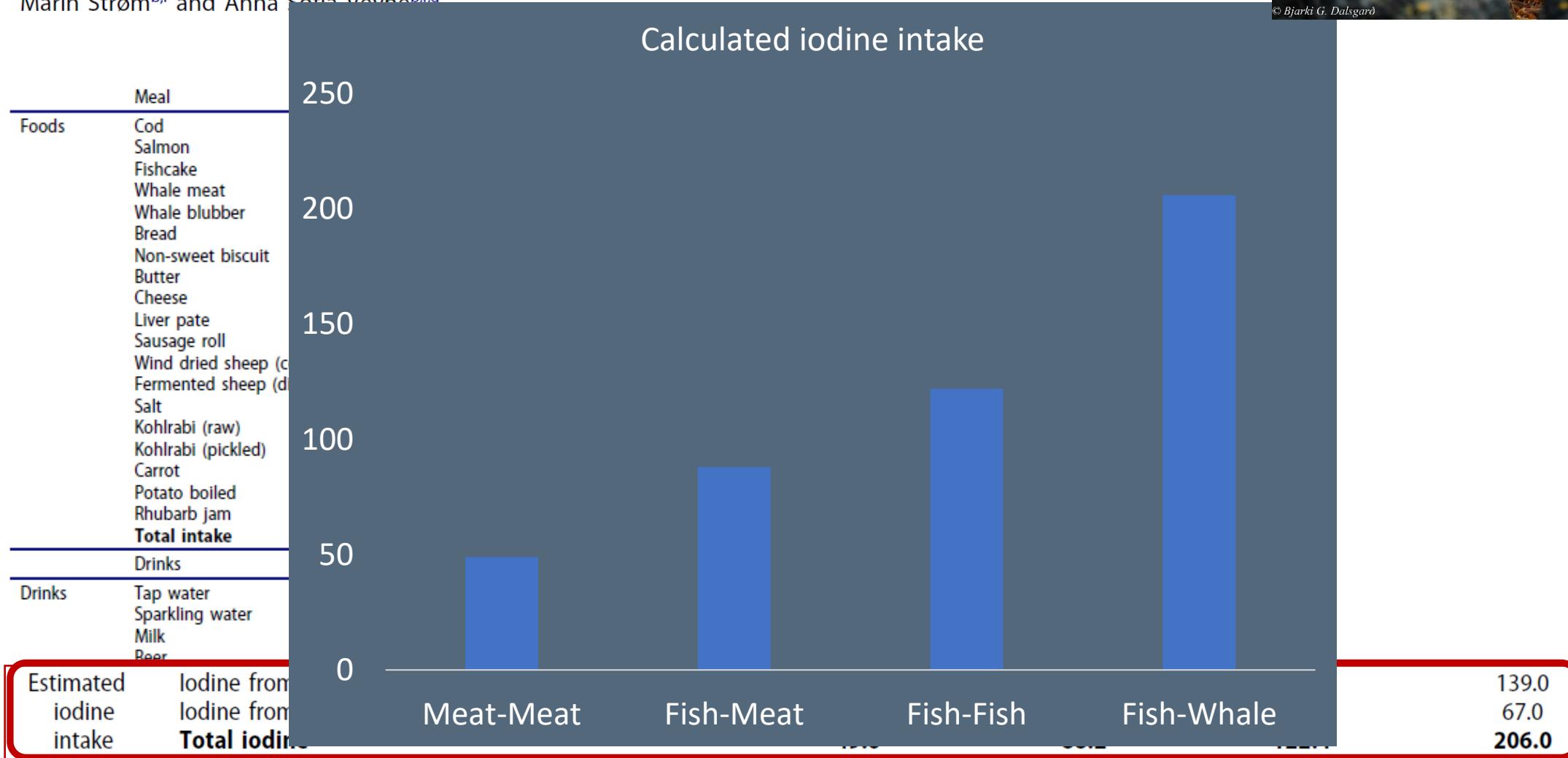


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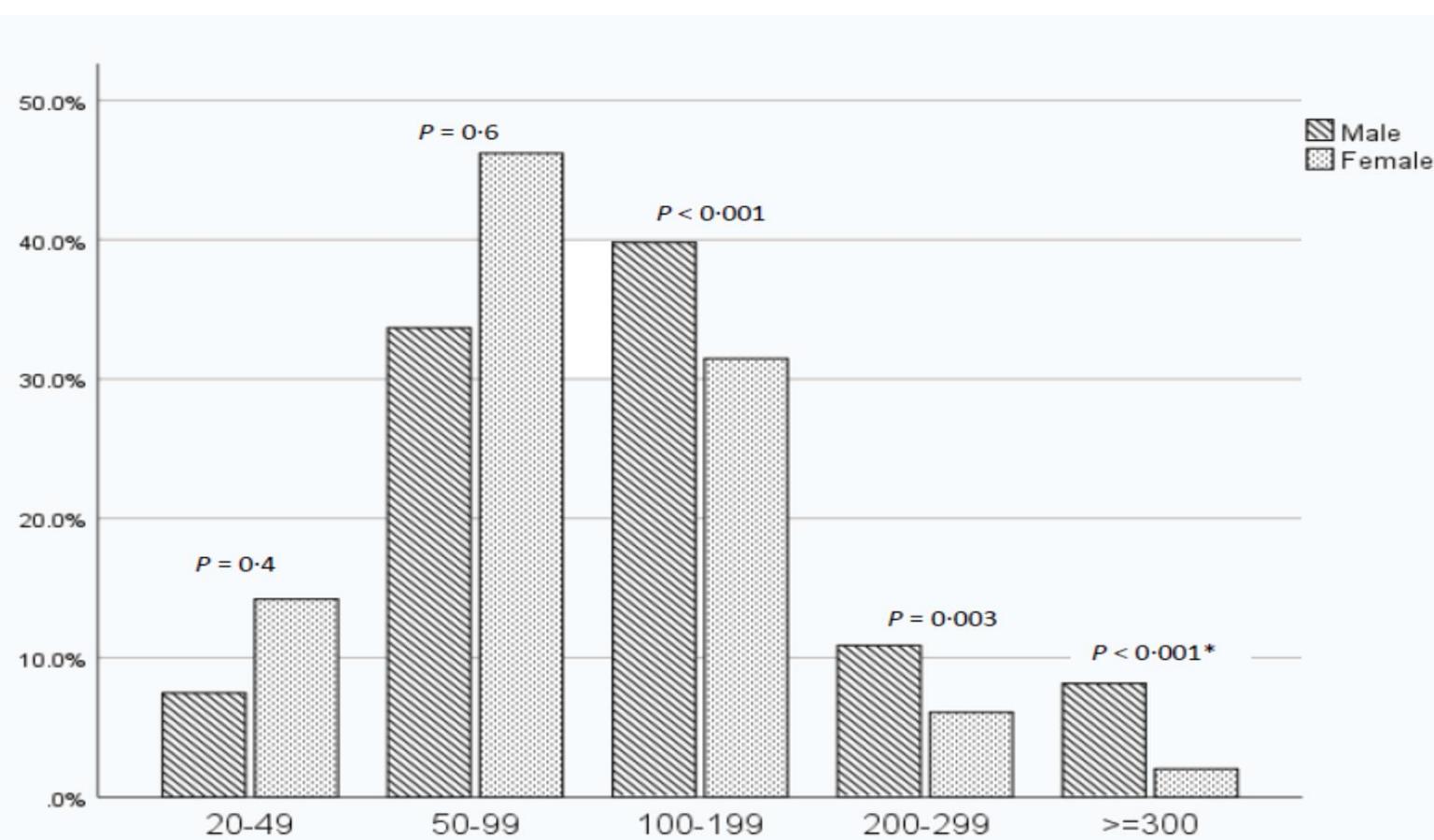
Iodine nutrition among the adult population of the Faroe Islands: a population-based study



Herborg Líggjasardóttir Johannesen^{1,2*}, Gunnar Sjúrðarson Knudsen³, Stig Andersen^{4,5,6}, Pál Weihe¹
Anna Sofía Veyhe^{2,7,8}

British Journal of Nutrition (2022), 127, 1190–1197

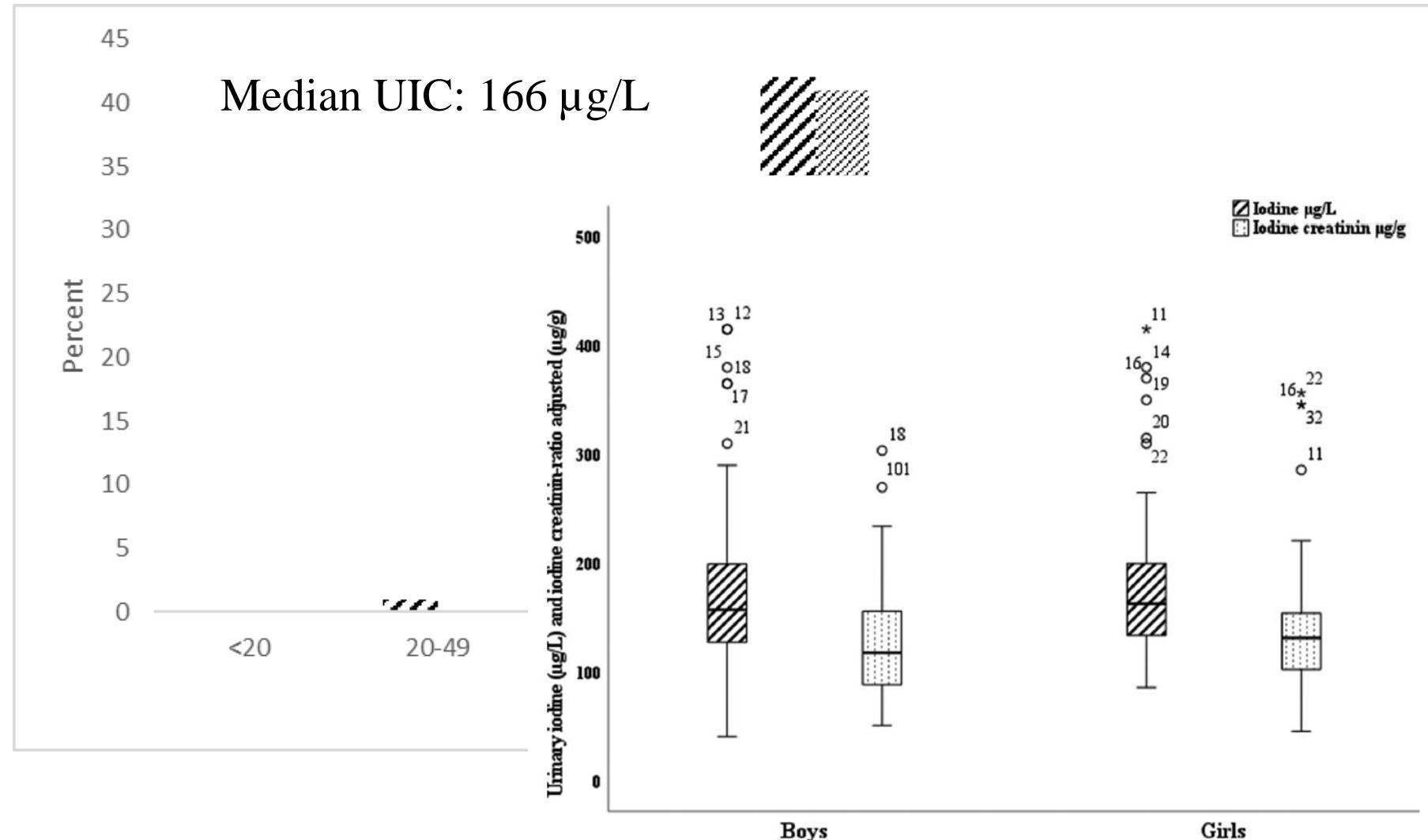
National Institute for Health and Care Research
British Journal of Nutrition



Iodine nutrition with North Atlantic living: the Faroese adolescents



Herborg Líggjasardóttir Johannessen^{1,2,*} , Stig Andersen^{3,4,5}, Stine Linding Andersen^{3,6}, Kári Rubek Nielsen^{2,7}, Pál Weihe^{2,8}, Maria Skaalum Petersen^{2,8} and Anna Sofía Veyhe^{2,8}

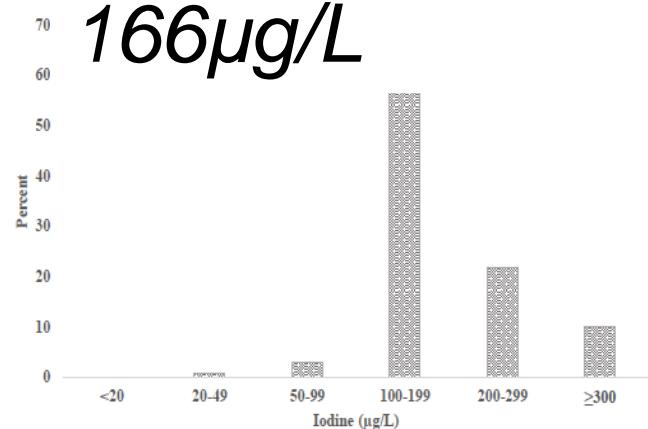




JOD STØÐAN Í FØROYUM



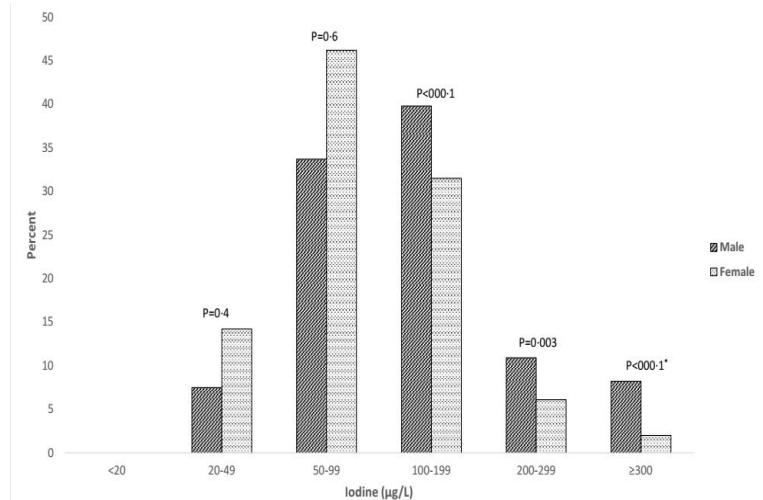
*Teenagers,
median
 $166\mu\text{g}/\text{L}$*



Johannesen et al (2023)
Journal of Nutritional Science



*Adults,
median $101\mu\text{g}/\text{L}$*



Johannesen et al (2022)
British Journal of Nutrition



DECREASING IODINE INTAKE AMONG PREGNANT WOMEN IN THE FAROE ISLANDS

Anna Sofía Veyhe^{1,2,3}, Herborg Johannessen^{1,4}, Solrunn Hansen⁵, Jóhanna Petursdóttir², Pál Weihe^{1,2,3}, Marin Strøm^{1,3}, Stine Linding Andersen⁶, Stig Andersen^{6,7}.

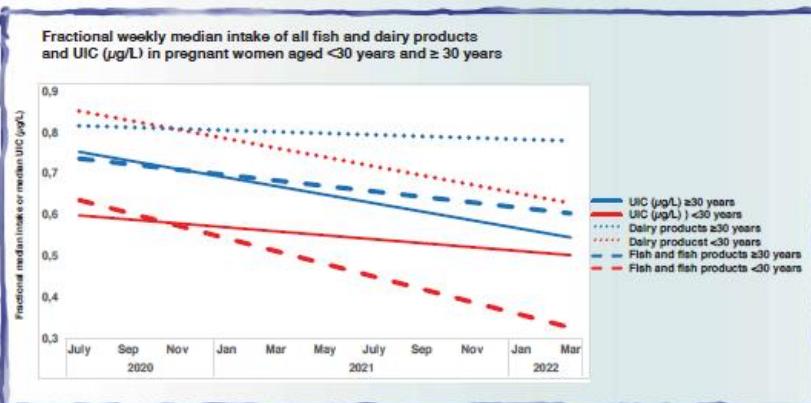
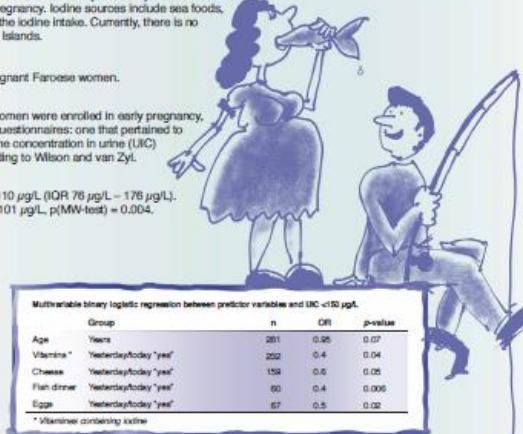
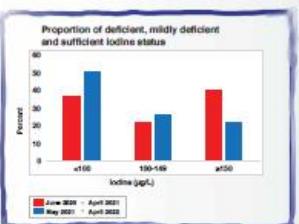


Background: Iodine is essential for thyroid function and severe deficiency adversely affects the developing brain. A sufficient intake is particularly important during the pregnancy. Iodine sources include sea foods, of which the intake is decreasing with at likely parallel influence on the iodine intake. Currently, there is no knowledge about the iodine status of pregnant women in the Faroe Islands.

Aim: We thus aimed to determine the iodine intake among pregnant Faroese women.

Method: From June 2020 through April 2022, 672 eligible women were enrolled in early pregnancy, and 647 donated a morning spot urine sample and answered two questionnaires: one that pertained to demographic information and an iodine-specific questionnaire. Iodine concentration in urine (UIC) was determined using the Sandell-Kolthoff reaction modified according to Wilson and van Zyl.

Results: The participation rate was 63%. Median UIC was 110 µg/L (IQR 76 µg/L – 176 µg/L). UIC decreased over the sampling period, from median 117 µg/L to 101 µg/L, p (M-W-test) = 0.004.

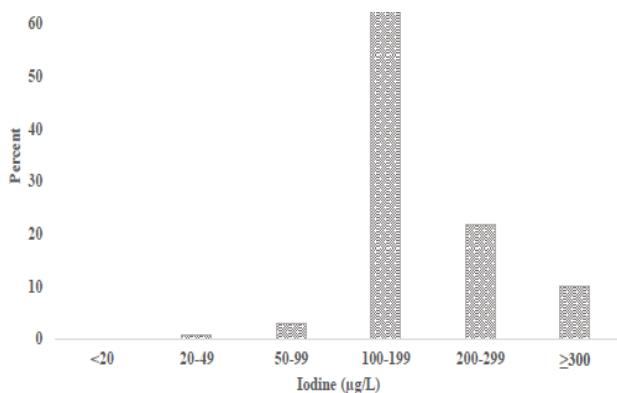


Conclusion: In summary, iodine intake is decreasing among pregnant women. Tackling the iodine challenge requires a comprehensive approach. Local public health authorities should prioritize iodine awareness campaigns, promote iodine-rich food sources, and monitor iodine intake among pregnant women to safeguard the health of the population and protect the developing fetus.

Funding: The Research Council of the Faroe Islands

Iodine Status in the Faroe Islands

*Tannáringar,
median
166 μ g/L*



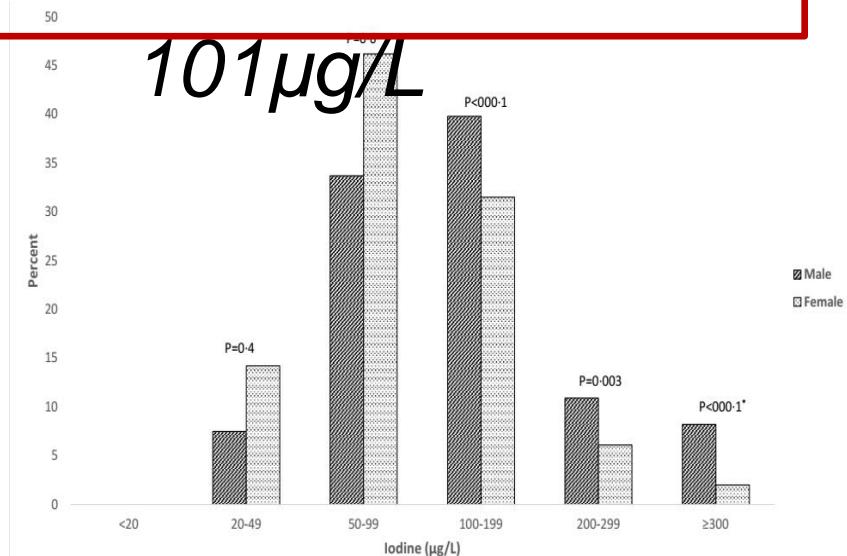
Johannesen et al (2023)
Journal of Nutritional Science

*Barnakonur,
median 96 μ g/L*



Johannesen et al (2023)
European Congres of Endocrinology

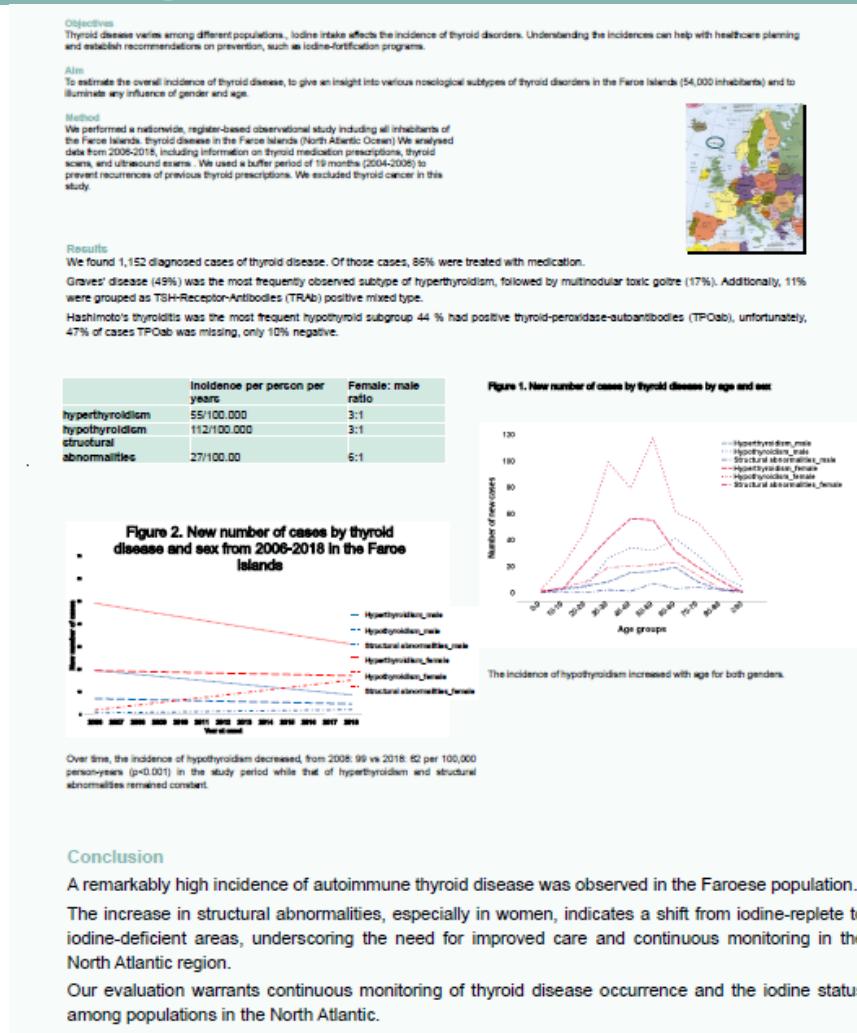
*vaksin,
median
101 μ g/L*



Johannesen et al (2021)
British Journal of Nutrition

THYROID DISORDERS IN THE FAROE ISLANDS: INCIDENCE OF HYPERTHYROIDISM, HYPOTHYROIDISM, AND STRUCTURAL ABNORMALITIES

Herborg Líggjasardóttir Johannessen¹, Stig Andersen^{3,4,5}, Pál Weihe^{2,6}, Maria Skaalum Petersen^{2,6}, Anna Sofía Veyhe^{2,6}



Niðurstøða

- 1) Fiskur og sjógæti innhalda nógv jod, meðan mjólk og mjólkaúrdráttir og kjøt hava eitt sindur
- 2) Føroyska vatnið inniheldur einki jod
- 3) Føroysku tannáringarnir høvdu passandi jod-innihald í landroyndunum um aldarskifti
- 4) Hjá vaksnum var median land-jod-innihaldið í lægra lagi
- 5) Barnakonur í lægra lagi
- 6) Føroyingar hava verið vanir við at eta nógvan fisk og sjógæti
 - 1) men okkara kanningar geva eisini ábendingar um, at føroyingar eta minni fisk og sjógæti

Hvat kanst tú gera?

- 1) Et fisk/havúrdrátt minst 2 ferðir um vikuna til høvuðsmáltíð
- 2) Nýt jod-ríkað húsarhaldssalt
- 3) Barnakonur vitaminískoyti við jodi
- 4) Kunning og fokus á jodstøðuna í Føroyum, so til ber at taka støðu til heilsuráð





#BecauseHormoneMatters
#WorldHormoneDay

Takk fyri áhugan



NORTH DENMARK REGION



betri



SJÚKRAHÚS
VERKIÐ

