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Insufficient vitamin D intakes amongst pregnant women in Ireland

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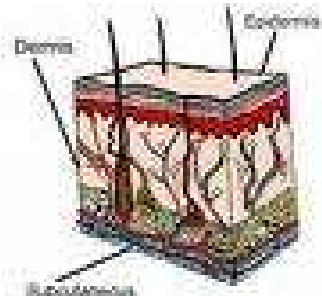
Vitamin D



UVB sunlight



Skin



Vitamin D₃

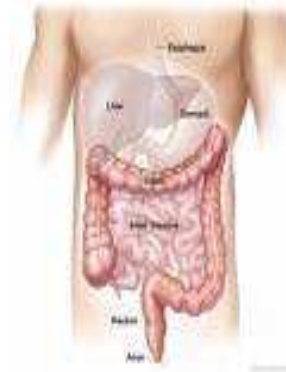


25 (OH) D - Liver



1, 25 (OH)₂ D - Kidney

Intestine



Oily Fish



Adapted from Mulligan et al., 2009



Vitamin D in pregnancy



Role in Pregnancy

- Enhances calcium absorption
- Prevents maternal bone loss
- Reduces risk of pre eclampsia, GDM, IR



Role in Children

- Bone mineralisation, prevent Rickets
- Reduces risk of small-gestational-age
- Reduces neonatal hypocalcaemia



Problem in Ireland!



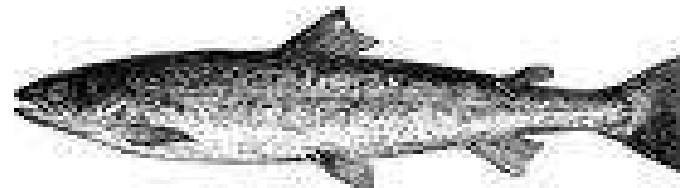
- Northern Latitude (51-55°N)



- Not enough



- Poor dietary intake



Typical Irish Summers!





Background

Study	N	Design	Findings
Bodnar et al 2007 Pittsburgh USA 40°N	200 White + 200 Black Pregnant women	Obs	At delivery: <ul style="list-style-type: none">•42% white women and 56% white neonates insufficient•54% black women and 47% black neonates insufficient•> 90% used prenatal vitamins
Bowyer et al 2008 Sydney Australia 33.5°S	971 pregnant women 901 neonates	Obs	In 3 rd Trimester & cord blood: <ul style="list-style-type: none">•15% women and 11% neonates were vitamin D deficient•Maternal serum levels were 52nmol/l•Lower infant birthweight



Background

Study	N	Design	Findings
Holmes <i>et al.</i> 2009 Belfast 54°-55°N	99 Caucasian pregnant women	Obs	35%, 44% and 16% pregnant women were vit D deficient 96%, 96%, and 75% were vit D insufficient at 12, 20 and 35 weeks
O'Riordan <i>et al</i> 2008 Cork 51°N	43 Caucasian pregnant women	Obs	Daily intake of vit D was 3.6µg/d 14-24% women were vit D deficient 34-53% women were vit D insufficient



Aim



The aim of this study was to determine dietary vitamin D intakes of pregnant women in Ireland:

- Prior to pregnancy
- During each trimester of pregnancy



Methods



- 65 Caucasian pregnant women recruited in early pregnancy between 10 and 18 weeks

Inclusion Criteria:

- Healthy pregnant women >18 years of age
- **NOT** taking any form of vitamin D supplement



Methods



- All women completed a Food Frequency Questionnaire in early pregnancy
- 3-day food diary completed each trimester
- Data entered in to QBuilder and NetWISP and exported into SPSS version 15.0 for analysis
- Nutrition Analysis Packages - well established method of determining nutrient intakes from food intakes
(McCance and Widdowson's *Composition of Foods*, 6th Edition)



Results – Characteristics



N = 65	Mean (SD)	Range
Age (years)	31.6 (4.1)	22 - 41
Gestation at booking (weeks)	12.3 (2.1)	10 - 18
Booking Weight (kg)	74.2 (13.4)	53 – 107.3
Height (m)	1.65 (0.7)	1.52 – 1.83
BMI (kg/m ²)	27.2 (4.6)	20.4 – 40.1



Results – FFQ Year Preceding Pregnancy

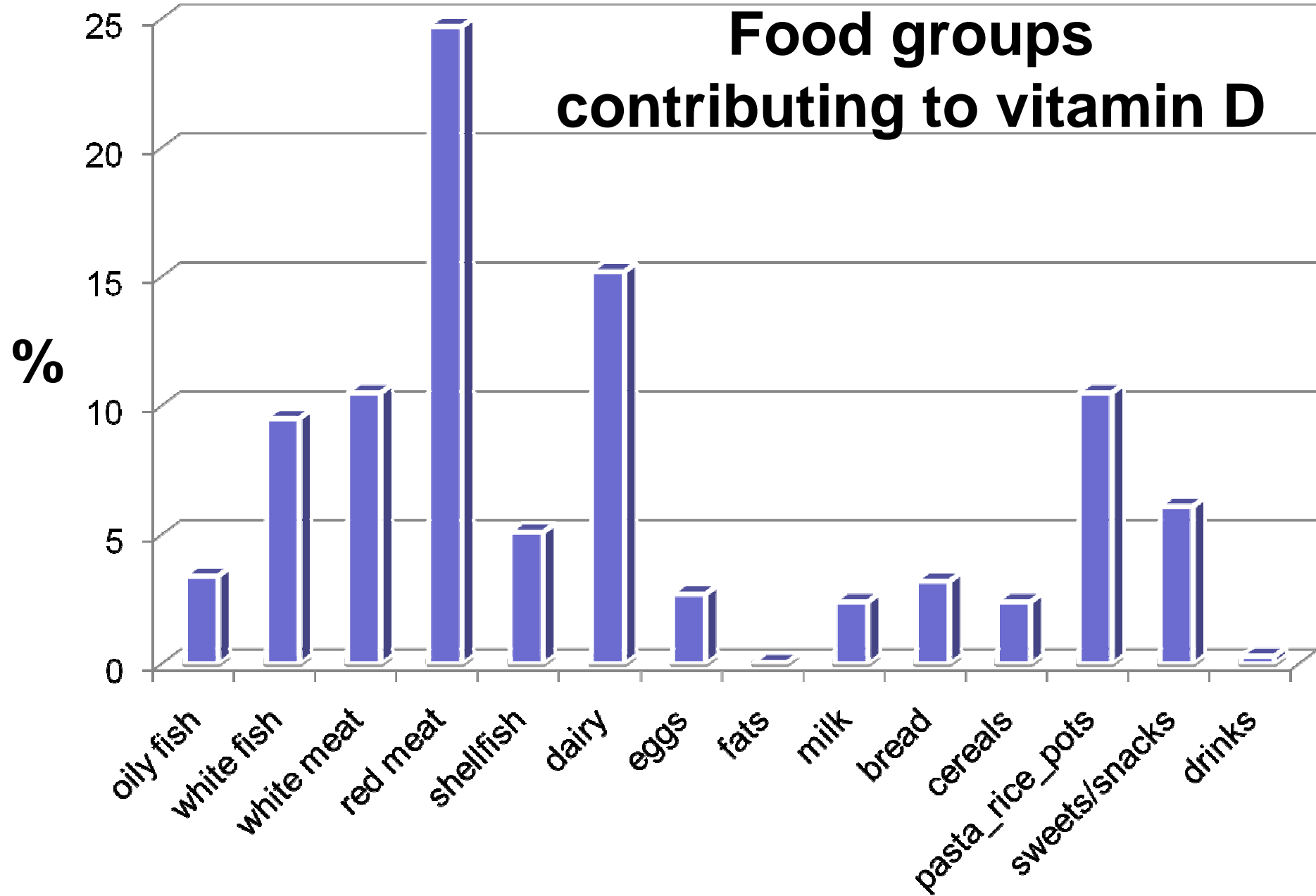


	Median	IQR
Vitamin D (μg)	2.6	1.7, 3.7

Recommendations:

- FAO/WHO 5 $\mu\text{g}/\text{d}$
- USA & UK 5 $\mu\text{g}/\text{d}$
- Ireland 0-10 $\mu\text{g}/\text{d}$

Food groups contributing to vitamin D





Results – FD During Pregnancy



Vitamin D (μg)		
	Median	IQR
Trimester 1	2.0	1.1, 3.0
Trimester 2	1.9	1.3, 3.6
Trimester 3	2.1	1.1, 3.6

Recommendations:

- USA & Canada $5\mu\text{g}$, Australia & New Zealand $5\mu\text{g}$,
 - UK & Ireland $10\mu\text{g}$
- Netherlands $7.5-10\mu\text{g/d}$



Conclusion



- Dietary intakes of vitamin D insufficient both
 - prior to and;
 - during each stage of pregnancy

- Public health interventions needed to educate pregnant women of the dietary sources of vitamin D particularly oily fish



Conclusion



- Implications for the long term health of both mothers and infants
 - bone health of mother and infant
 - autoimmune diseases in later life
- Should supplementation be advised during Pregnancy ?



Acknowledgements

