



Food for Thought

The link between Nutrition and Learning

**By
Dr Aaron Lett
Dr Aygul Dagbasi**

IMPERIAL

Pre-session Check-in Exercise

Imperial students -

To support you to get the most from the Learning Well Programme, please take a moment to complete this short exercise about your current understanding and expectations of this session:

- Your responses will be submitted anonymously.
- There are no right or wrong answers – feel free to share your thoughts.
- This activity should take no more than 2-3mins.

Learning Well Programme: Pre-session Check-in Exercise

(THURSDAY)



About us

- Dr Aaron M. Lett

Nutrition Scientist

PhD in Food Structure and Metabolism

Senior Teaching Fellow



- Dr Aygul Dagbasi

Dietitian

PhD in Appetite Regulation

Research Associate and Dietitian



Is there a link between nutrition and learning ?

Nutrition can impact



ENERGY LEVELS



ATTENTION



MEMORY FORMING
/ LEARNING



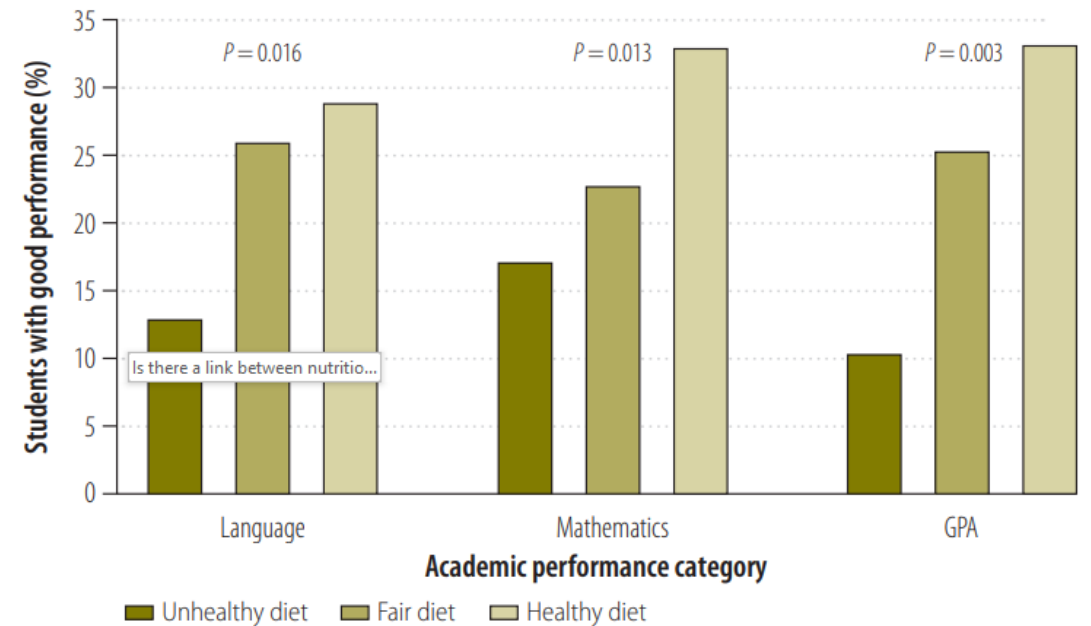
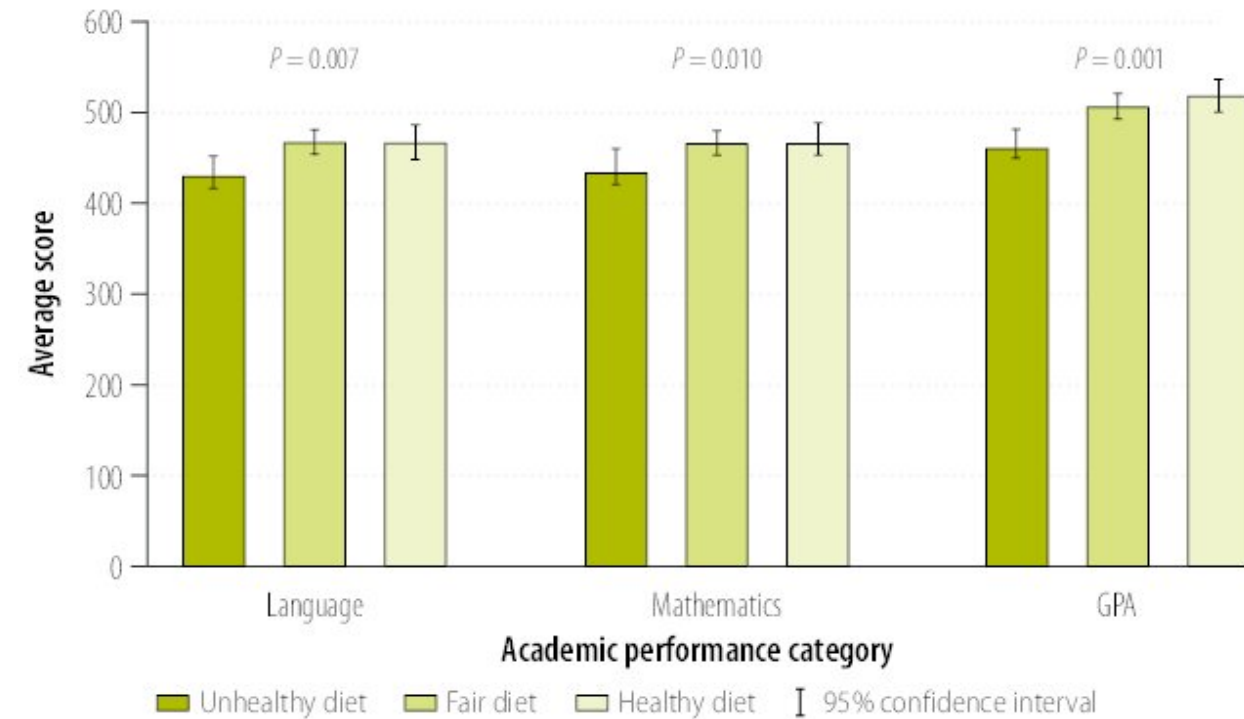
MOOD

Is there a link between nutrition and learning ?

Research

Nutritional quality of diet and academic performance in Chilean students

Paulina Correa-Burrows,^a Raquel Burrows,^a Estela Blanco,^b Marcela Reyes^a & Sheila Gahagan^b



Is there a link between nutrition and learning ?

British Journal of Nutrition (2017), 117, 1587–1595
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Diet quality and attention capacity in European adolescents: the Healthy Lifestyle in Europe by Nutrition in Adolescence (HELENA) study

N=384

Pontus Henriksson^{1*}, Magdalena Cuenca-García^{2,3}, Idoia Labayen⁴, Irene Esteban-Cornejo¹, Hanna Henriksson¹, Mathilde Kersting⁵, Jeremy Vanhelst^{6,7}, Kurt Widhalm^{8,9}, Frederic Gottrand^{6,7}, Luis A. Moreno¹⁰ and Francisco B. Ortega^{1,11} on behalf of the HELENA study group†

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Diet and attention capacity in adolescence

1593

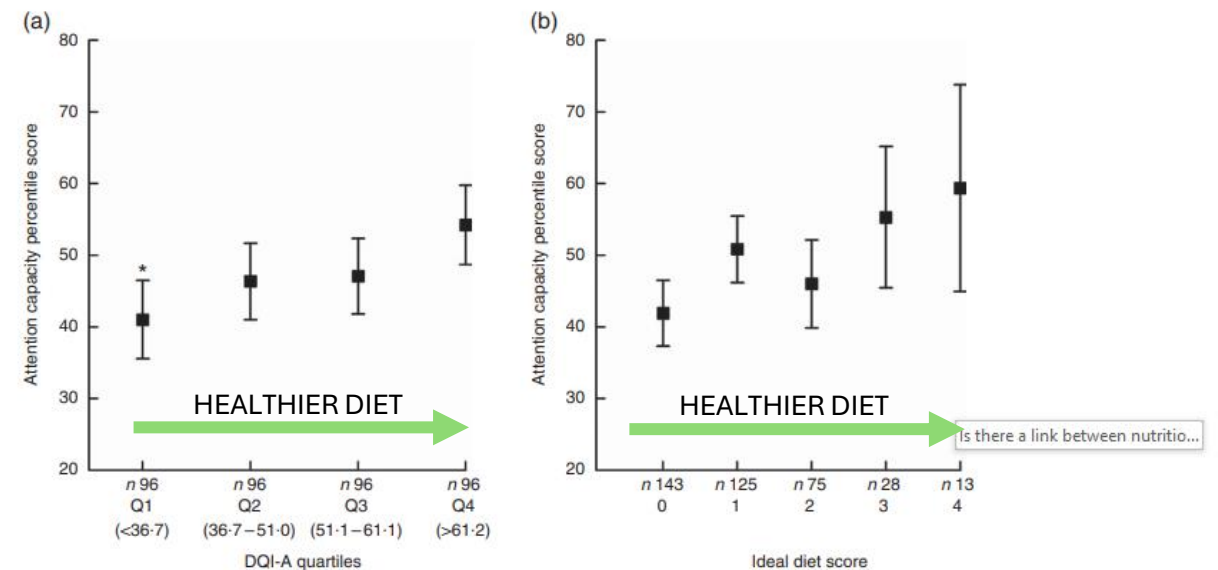


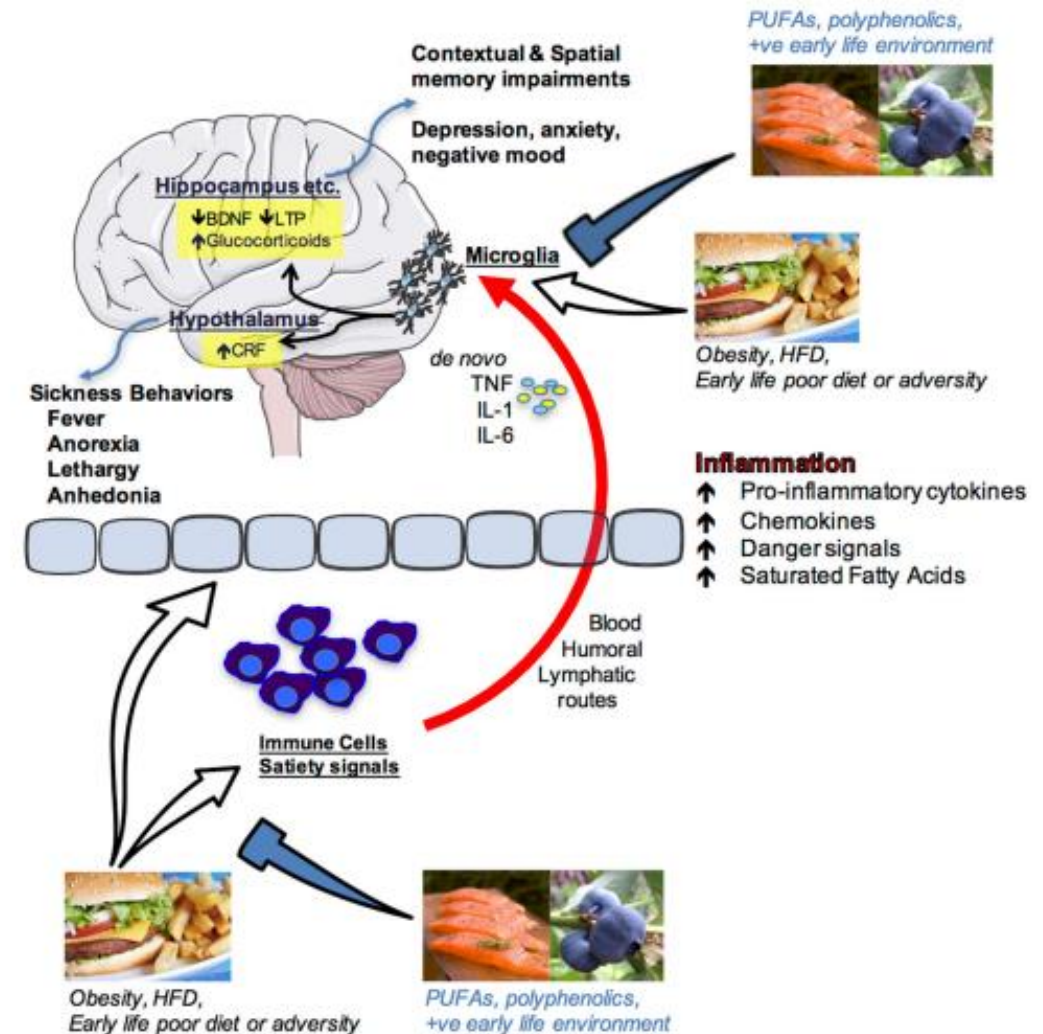
Fig. 1. Differences in attention capacity score according to (a) Diet Quality Index for adolescents (DQI-A) and (b) ideal diet score in European adolescents using ANCOVA adjusting for age, sex, BMI, maternal educational attainment, family affluence scale and study centre. Estimated marginal means with their 95% CI are presented. * Difference between quartiles (Q) 1 and 4 in DQI-A was statistically significant ($P=0.009$).

Is there a link between nutrition and learning ?

REVIEW ARTICLE **OPEN**

Food for thought: how nutrition impacts cognition and emotion

Sarah J. Spencer¹, Aniko Korosi², Sophie Layé³, Barbara Shukitt-Hale⁴ and Ruth M. Barrientos⁵





Would you say your
diet is good ?

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What makes a Healthy
Diet?

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Eatwell Guide

Check the label on packaged foods

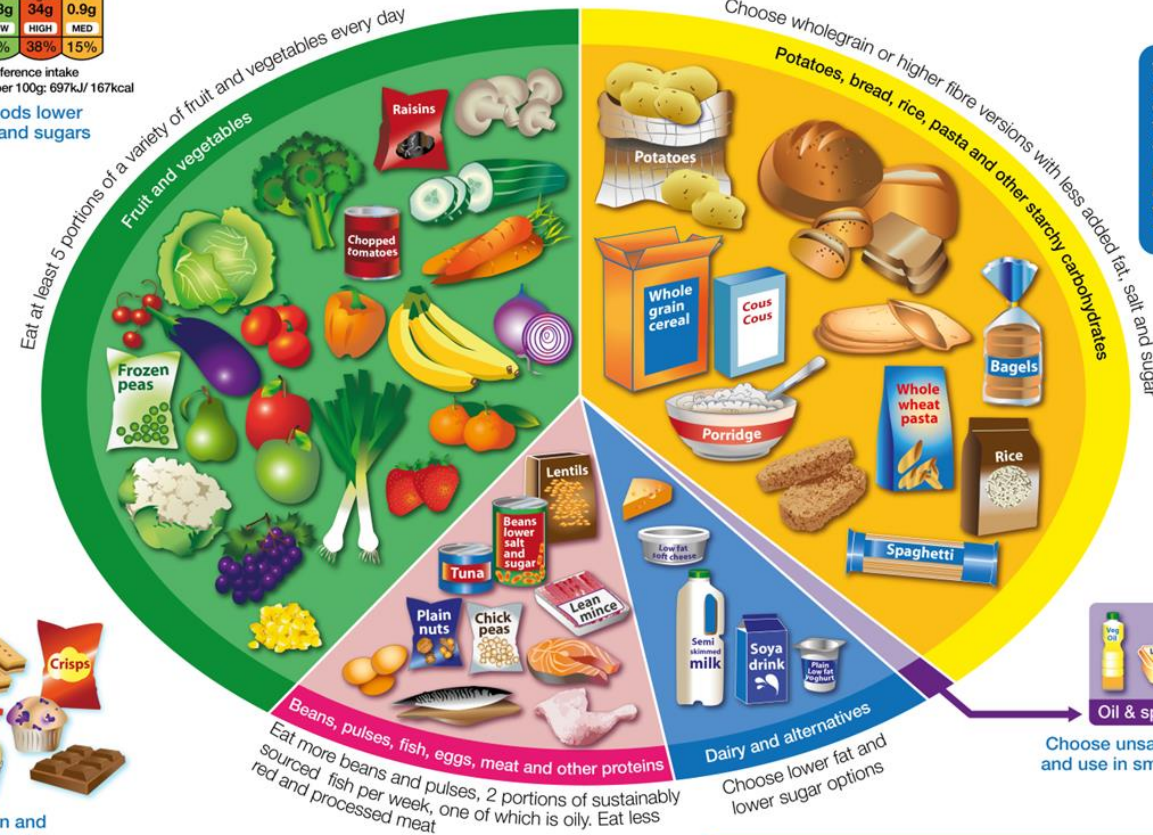
Each serving (150g) contains

Energy	Fat	Saturated	Sugars	Salt
1046kJ 250kcal	3.0g	1.3g	34g	0.9g
	LOW	LOW	HIGH	MED
13%	4%	7%	38%	15%

of an adult's reference intake
Typical values (as sold) per 100g: 697kJ/ 167kcal

Choose foods lower
in fat, salt and sugars

Use the Eatwell Guide to help you get a balance of healthier and more sustainable food. It shows how much of what you eat overall should come from each food group.



Water, lower fat milk, sugar-free drinks including tea and coffee all count.

Limit fruit juice and/or smoothies to a total of 150ml a day.



Eat less often and
in small amounts



Choose unsaturated oils
and use in small amounts

Per day 2000kcal 2500kcal = ALL FOOD + ALL DRINKS



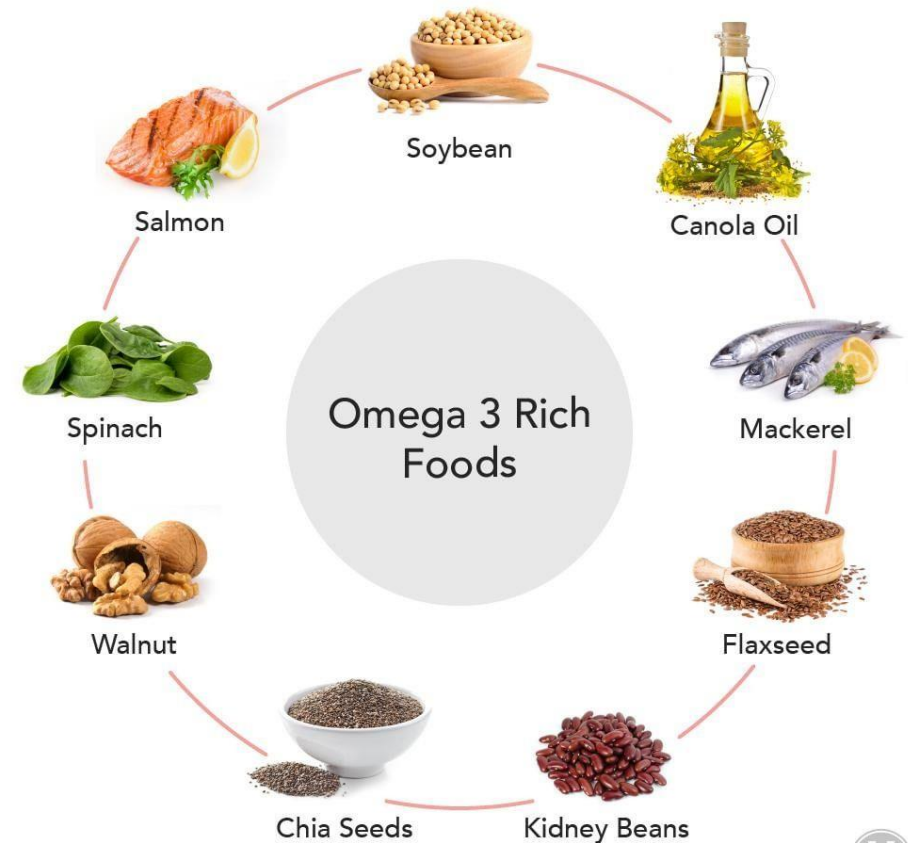
What particular **foods** and **nutrients**, have an effect on brain function?

Omega 3

- The brain is 50-60% lipid of which 35% is Omega 3

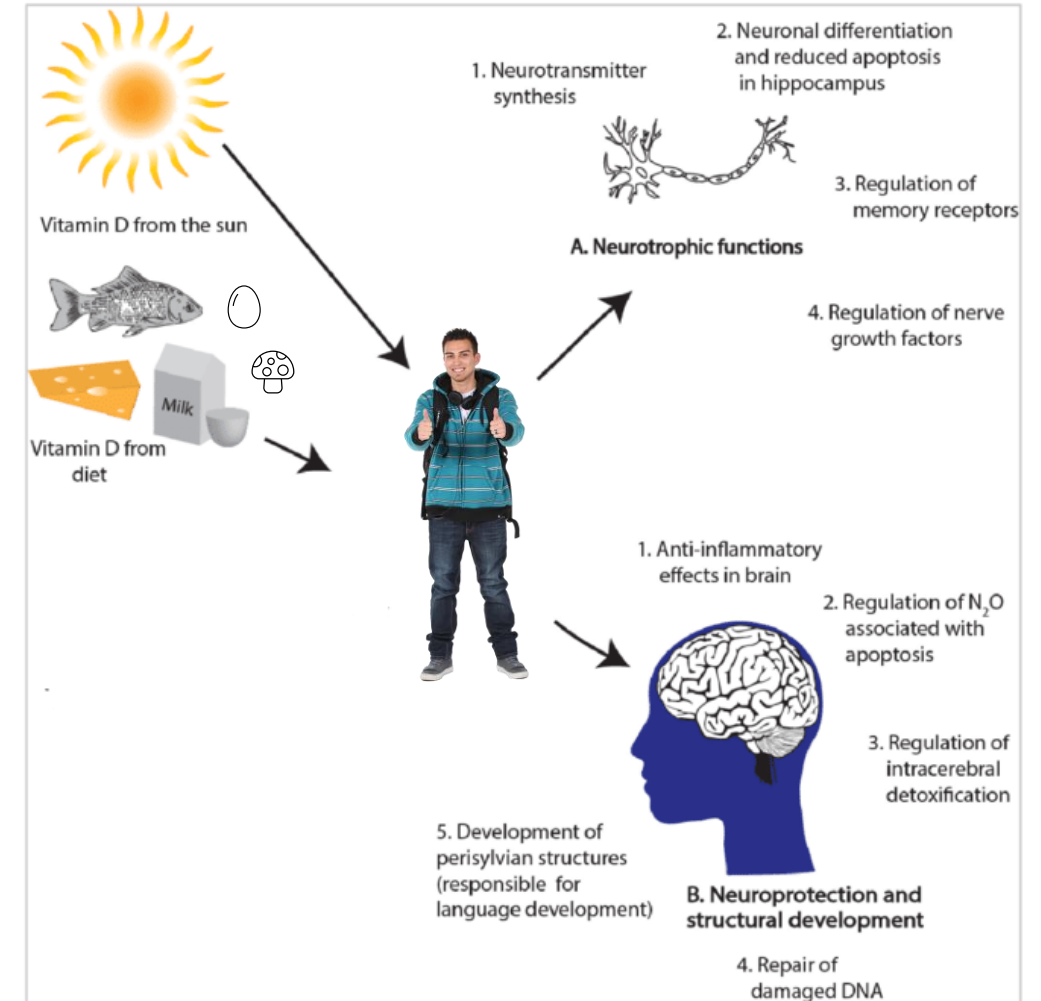
3 types of Omega 3 Fatty Acids:

- Docosahexaenoic acid (DHA) = 40% of brain fatty acids
 - Alpha-linolenic acid (ALA)
 - Eicosapentaenoic acid (EPA)
-
- Omega-3 promotes:
 - Cognition
 - Neuronal preservation
 - Protection against neurodegeneration



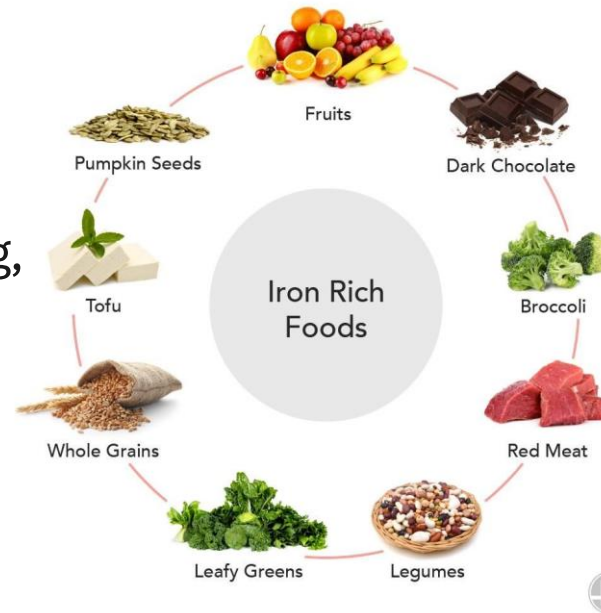
Vitamin D

- Vitamin D aids in the function of neuronal and glial tissue and is neuroprotective
- Recommend intake: 10mg per day
- Vitamin D deficiency is common during autumn and winter



Zinc and Iron

- Zinc and iron, are the most concentrated metal in the brain.
- Zinc plays a role in axonal and synaptic transmission, DNA, RNA, and protein synthesis during brain development.
- The amount of zinc you need is:
 - 9.5mg a day for men
 - 7mg a day for women
- Iron deficiency effects speed of brain processing, learning and memory.
- The amount of iron you need is:
 - 8.7mg a day for men aged 19 and over.
 - 14.8mg a day for women aged 19 to 49.
 - 8.7mg a day for women aged 50 and over.



ZINC-RICH FOODS

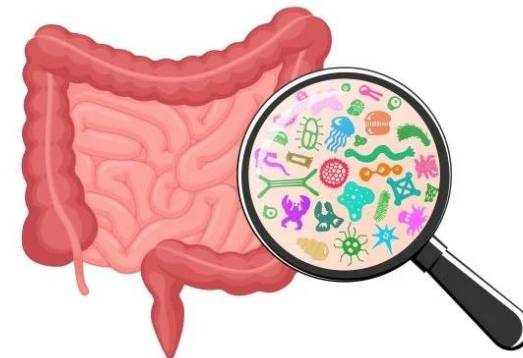
 oyster 410 g/2000 cal	 ribeye filet 120 g/2000 cal	 ground beef 75 g/2000 cal	 spinach 65 g/2000 cal
 sirloin steak 55 g/2000 cal	 asparagus 55 g/2000 cal	 lamb roast 50 g/2000 cal	 chicken liver 50 g/2000 cal
 zucchini 45 g/2000 cal	 beef jerky 40 g/2000 cal	 chicken drumstick 40 g/2000 cal	 lamb chops 40 g/2000 cal



optimal nutrient intake = 20 mg/2000 cal
bliss point (minimum) = 9 mg/2000 cal

Fibre

- Fibre supports a healthy gut microbiome
- Gut microbiome has been linked with:
 - Cognitive function
 - Mood
- Recommendation for fibre is 30g per day
- In the UK, on average we only eat 18g per day
- **How much fibre have you had today?**



Top High Fiber Foods

Fruits



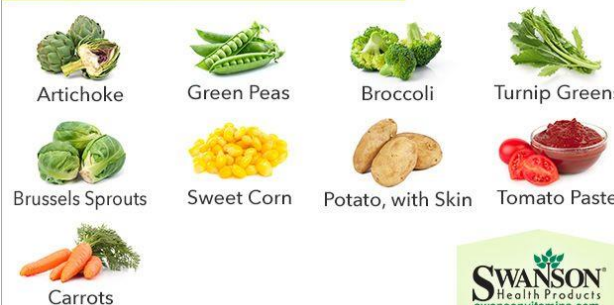
Grains, Cereal and Pasta



Legumes, Nuts and Seeds



Vegetables



How many servings of these foods have you eaten today?

Food	Portion	Number Of Portions	Grams Of Fibre	Total
Bran cereal (Bran flakes, Shreddies)	1 bowl (30 g)		x3	
Other cereal (Cornflakes, Rice Krispies)	1 bowl (30 g)		x1	
Whole grain bread	1 slice		x2	
White bread	1 slice		x1	
Brown rice/pasta	1 serving (125 g cooked)		X4	
White rice/pasta	1 serving (125 g cooked)		x2	
Beans, lentils, peas	1 serving (1/2 can)		X4	
Potatoes (boiled)	1 serving (200 g cooked)		X3	
Vegetables	1 serving (1/2 cup)		x2	
Fruit (whole, not juice)	1 whole		x2	
Nuts/seeds (peanuts, almonds, sunflower seeds)	1 serving (1/4 cup)		x3	
DAILY TOTAL				grams

TRUE



FALSE

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Top tips

- Plan your meals
- Eat mostly fresh food
- Aim to fill at least 1/3 of your plate with vegetables
- Eat varied fruits and vegetables
- Eat legumes at least twice a week
- Eat OILY fish once a week
- Drink plenty of water (not just coffee !)
- Consider taking Vitamin D supplements



Thank You
Questions?

a.lett@imperial.ac.uk

IMPERIAL

Post-session Reflection

Imperial students -

To help you maximise this learning opportunity, this activity is designed to support you to reflect on what you've learnt and to consider what you can personally take away from this session.

- Your responses will be submitted anonymously.
- There are no right or wrong answers.
- This exercise should take no more than 3mins.
- We hope you find this activity helpful.

Learning Well Programme: Post-session Reflection Activity
(THURSDAY)

