ΤΜΗΜΑ ΒΙΟΧΗΜΕΙΑΣ & ΒΙΟΤΕΧΝΟΛΟΓΙΑΣ
ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
25 ΧΡΟΝΙΑ

Καταρρίπτοντας τους μύθους σε σχέση με την διατροφική πρωτεΐνη

Δρ. Μαρία Κοντού
Επ. Καθηγήτρια Πρωτεϊνικής Χημείας
Τμήμα Βιοχημείας και Βιοτεχνολογίας
Πανεπιστήμιο Θεσσαλίας

2ο Ιατρικό Συνέδριο για τη Φυτική Διατροφή: Διατροφή, Φλεγμονή και Καρκινογένεση
8-9 Μαρτίου 2025, Εθνική Πινακοθήκη

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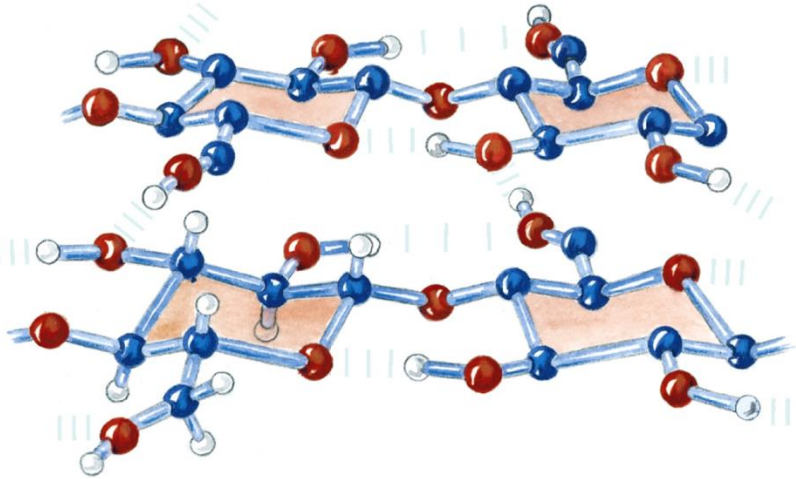
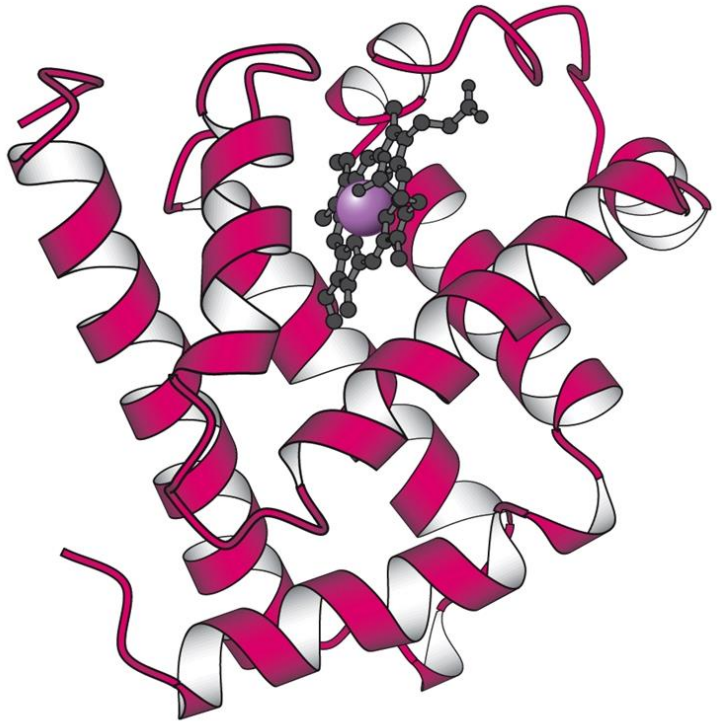
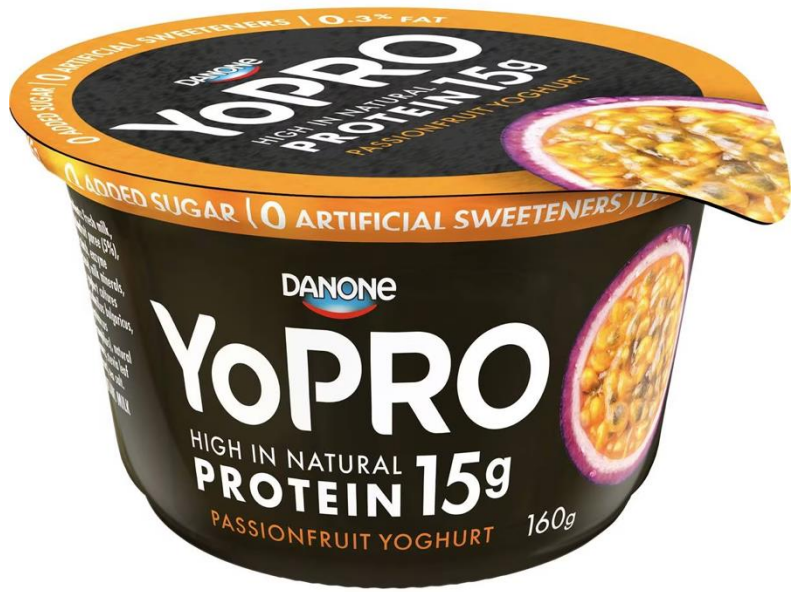


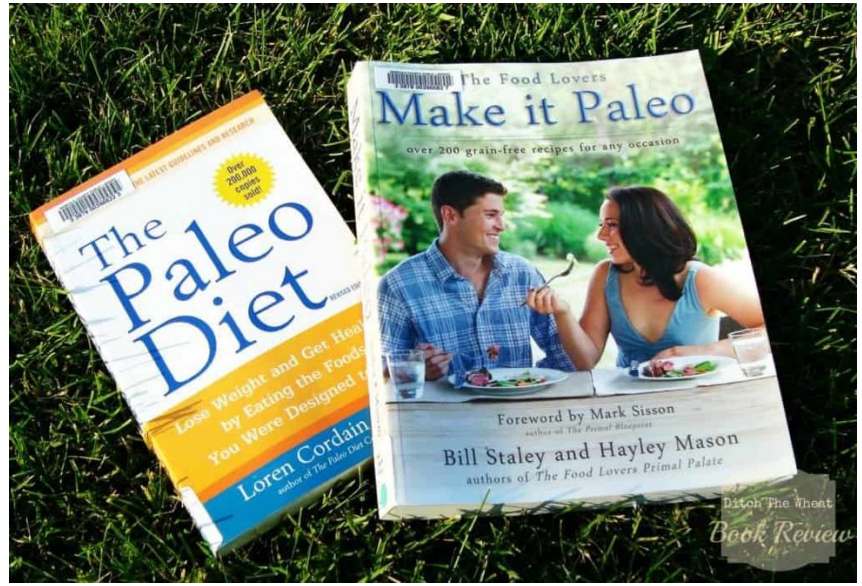


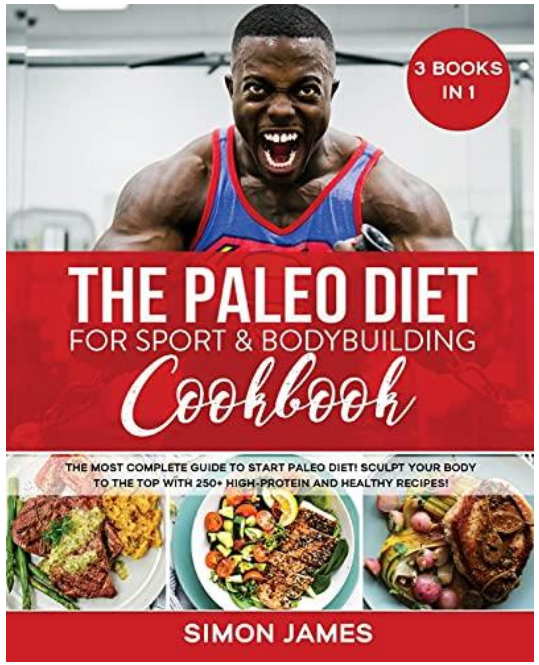

#1 SOURCE WHEY PROTEIN ISOLATE
#1 SOURCE WHEY PROTEIN ISOLATE
360°CUT
PERFORMANCE SUPPLEMENTS
360PRO WHEY
PREMIUM WHEY PROTEIN
PERFORMANCE BLEND*
24 PROTEIN
2 NET CARBS
1 SUGAR
30 SERVINGS
CHOCOLATE SILK
NATURALLY AND ARTIFICIALLY FLAVORED
GLUTEN FREE PROTEIN POWDER | NET WT. 2.1 LBS (951 G)

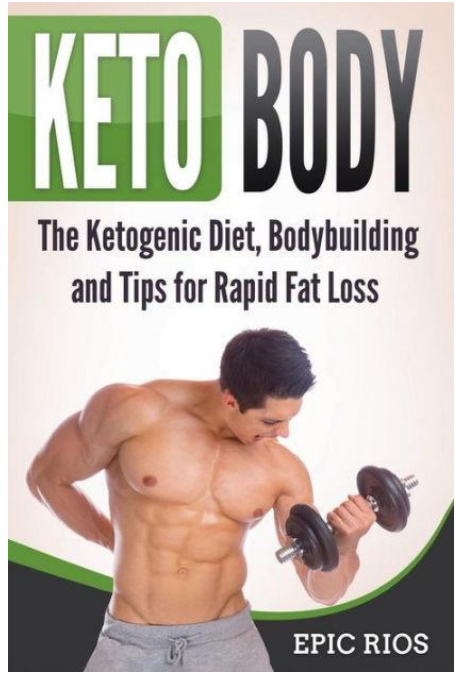

0 ADDED SUGAR | 0 ARTIFICIAL SWEETENERS | 0.3% FAT
DANONE
YoPRO
HIGH IN NATURAL PROTEIN 15g
PASSIONFRUIT YOGHURT
160g

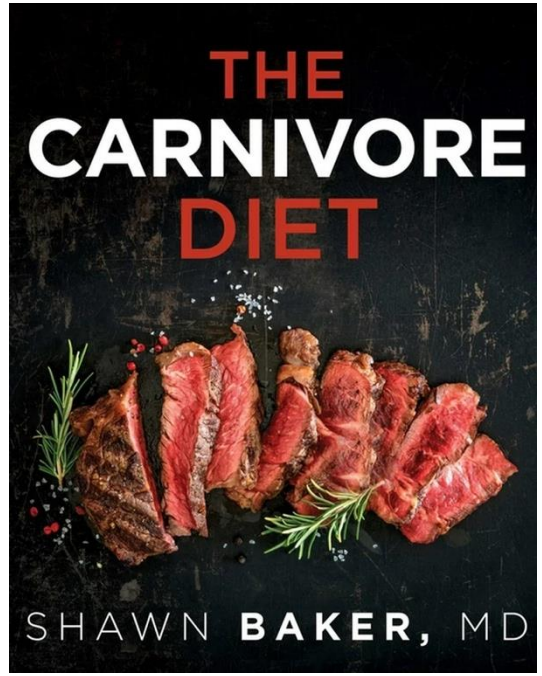

THE PASTA TASTE YOU LOVE
PROTEIN+
ROTINI
DAL 1877
Barilla
14.5 oz


117
Paleo foods you can eat
7-day
beginner plan
PALEO FOR BEGINNERS
Essentials to get started
#1 Amazon BEST SELLER
ROCKRIDGE PRESS
99
easy
recipes

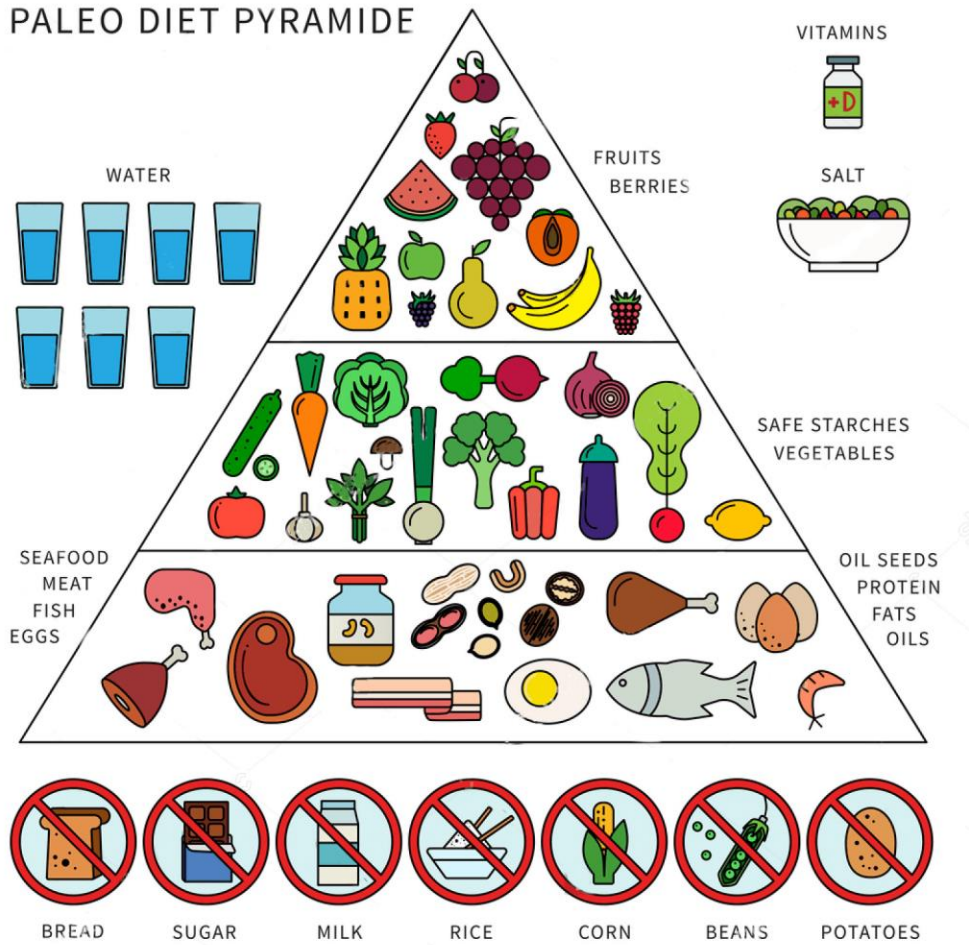

The Paleo Diet
Lose Weight and Get Healthy by Eating the Foods You Were Designed to Eat
Loren Cordain
The Food Lovers
Make it Paleo
over 200 grain-free recipes for any occasion
Foreword by Mark Sisson
Bill Staley and Hayley Mason
authors of The Food Lovers Primal Palate
Ditch The Wheat
Book Review


3 BOOKS IN 1
THE PALEO DIET
FOR SPORT & BODYBUILDING
Cookbook
THE MOST COMPLETE GUIDE TO START PALEO DIET! SCULPT YOUR BODY TO THE TOP WITH 250+ HIGH-PROTEIN AND HEALTHY RECIPES!
SIMON JAMES


KETO BODY
The Ketogenic Diet, Bodybuilding and Tips for Rapid Fat Loss
EPIC RIOS


THE CARNIVORE DIET
SHAWN BAKER, MD

MEDITERRANEAN DIET



- Βασίζεται η εξέλιξη του Homo Sapiens στην κατανάλωση κρέατος?
- Πόση πρωτεΐνη πρέπει να λαμβάνουμε με την διατροφή?
- Μπορούμε να λάβουμε επαρκή πρωτεΐνη με μια φυτική διατροφή?
- Πλήρης και μη πλήρης πρωτεΐνη
- Τα BCAA και η ανάπτυξη μυϊκής μάζας
- Η βιοδιαθεσιμότητα της φυτικής πρωτεΐνης
- Αίσθημα κορεσμού και πρωτεΐνη

ΤΜΗΜΑ
ΒΙΟΧΗΜΕΙΑΣ &
ΒΙΟΤΕΧΝΟΛΟΓΙΑΣ
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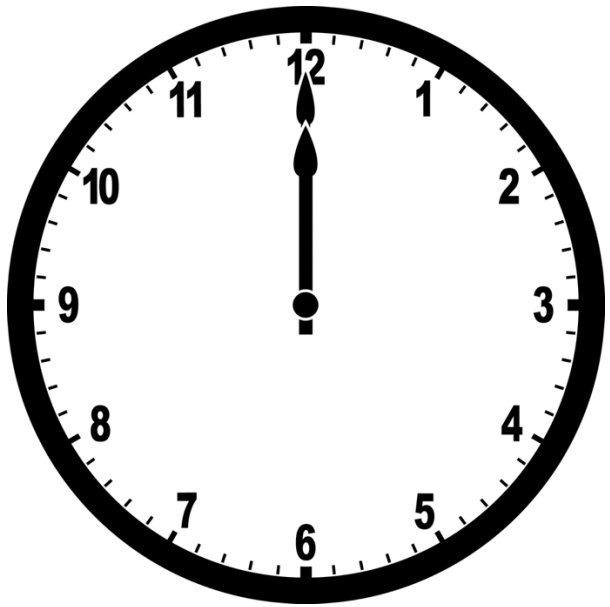
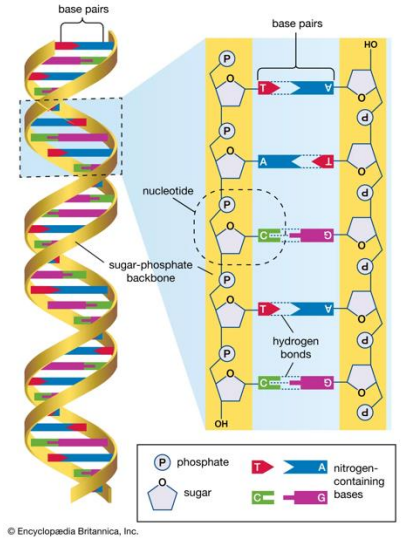
Βασίζεται η εξέλιξη του Homo Sapiens στην κατανάλωση κρέατος?

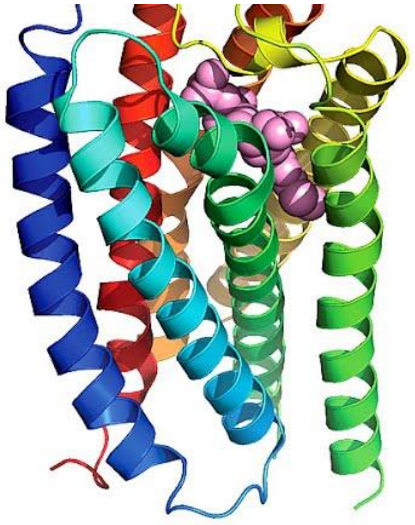


1st Agricultural Revolution

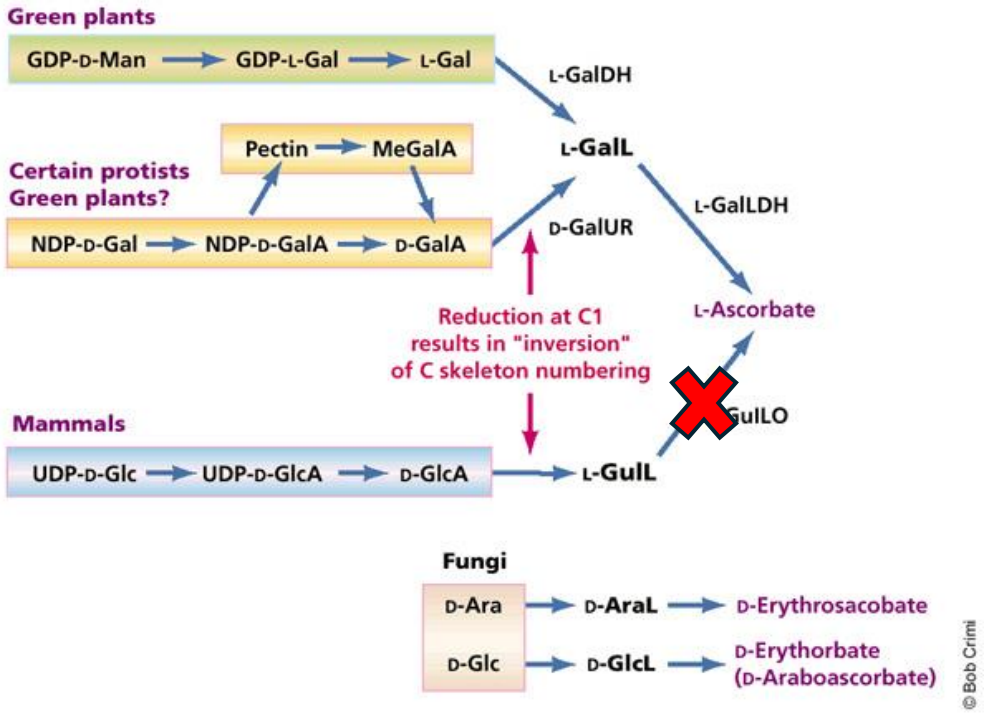
To

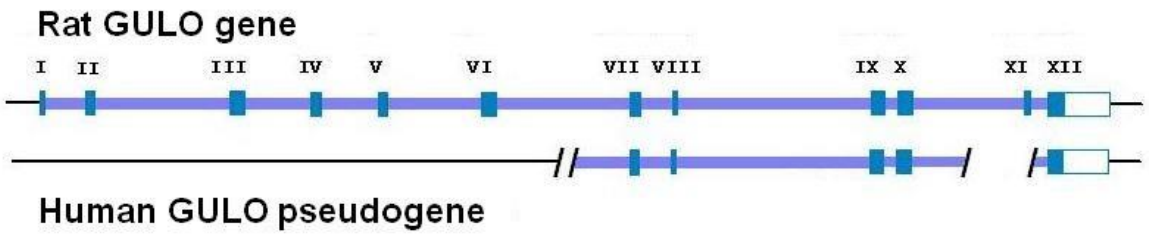
- **Η μεγάλη πλειοψηφία των βιοχημικών και γενετικών εξελικτικών προσαρμογών του ανθρώπινου είδους έγιναν για την κατανάλωση φυτικών τροφών**





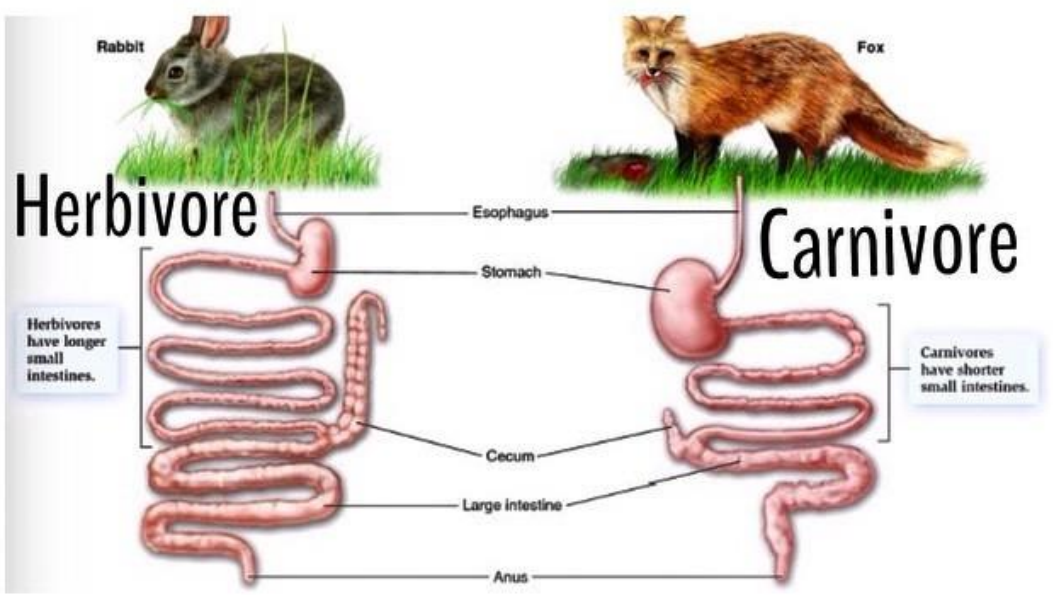
Βιταμίνη C

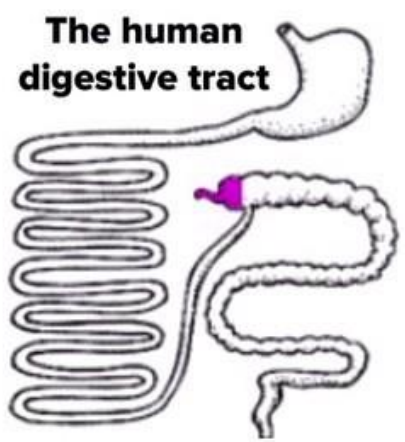




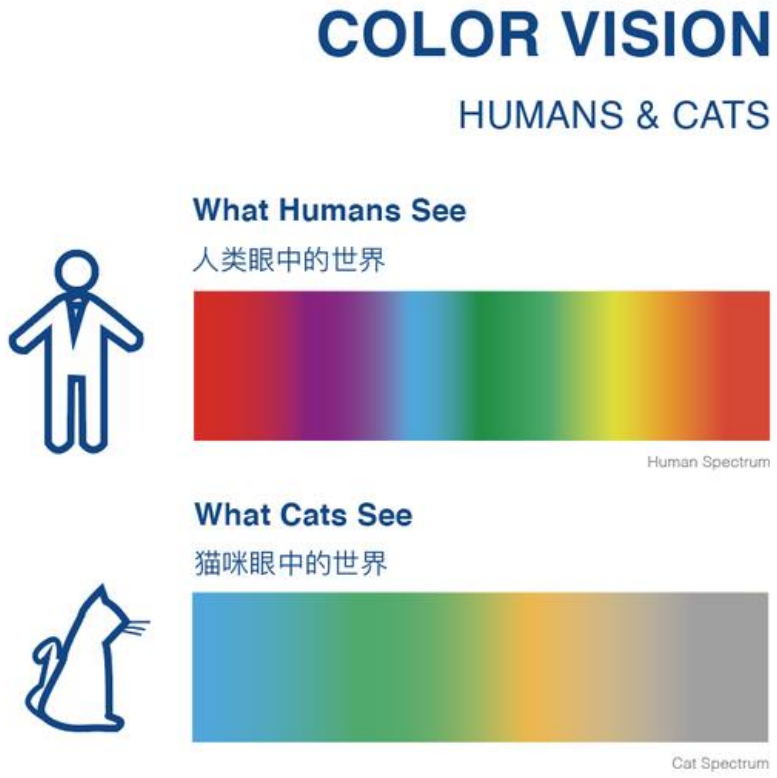
Yuriko Ohta, Morimitsu Nishikimi, Random nucleotide substitutions in primate nonfunctional gene for l-gulono-γ-lactone oxidase, the missing enzyme in l-ascorbic acid biosynthesis,
Biochimica et Biophysica Acta (BBA) - General Subjects, Volume 1472, Issues 1–2,1999, Pages 408-411, ISSN 0304-4165,

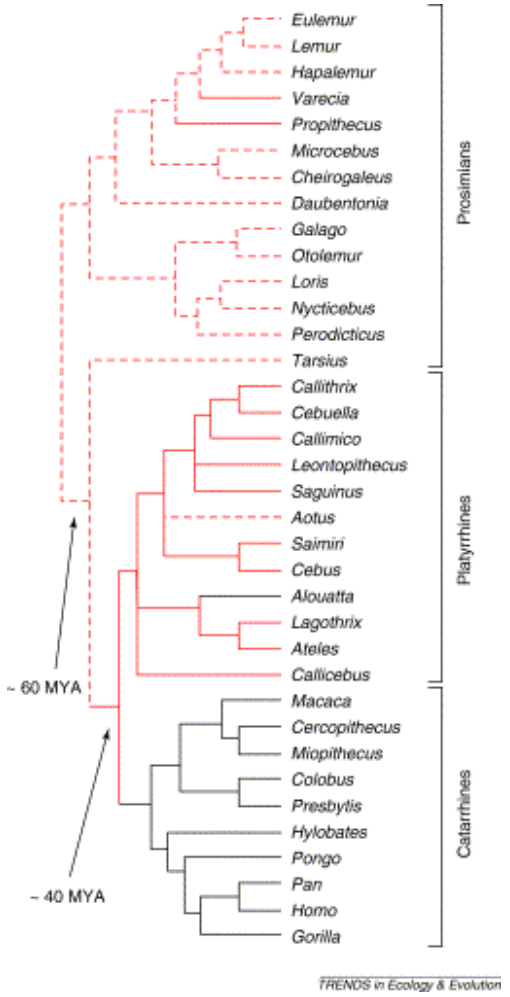
Γαστρεντερικός σωλήνας





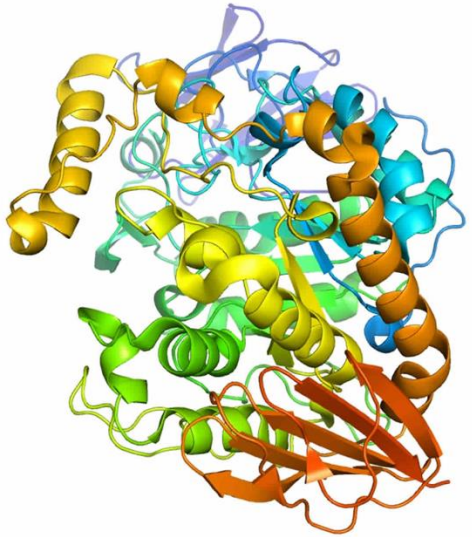
Τριχωματική όραση

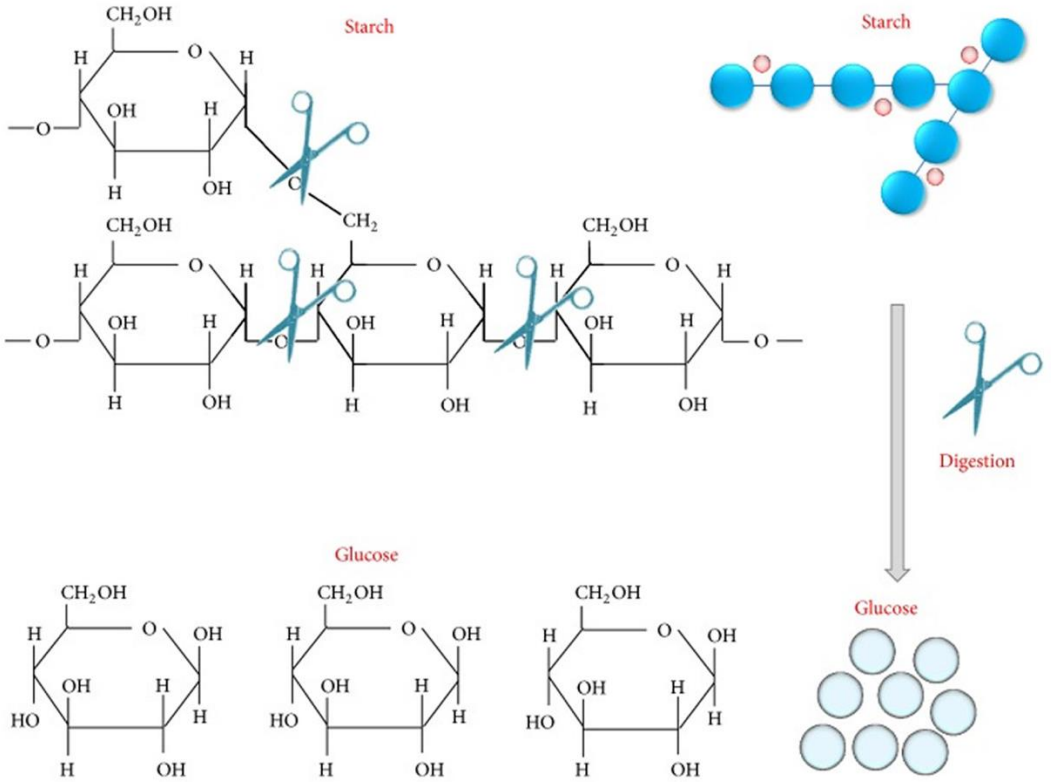


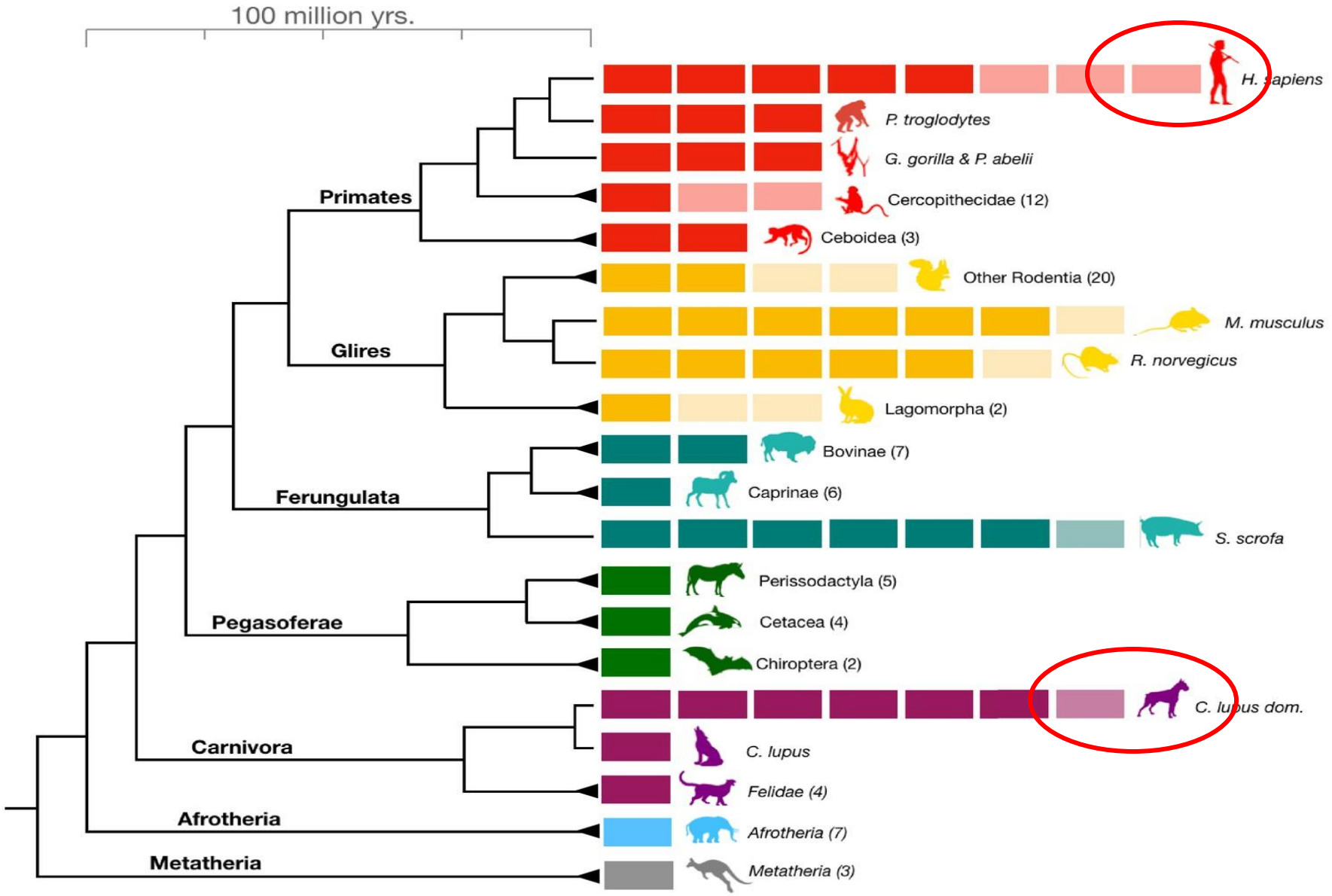


Alison K. Surridge, Daniel Osorio, Nicholas I. Mundy,
Evolution and selection of trichromatic vision in primates,
Trends in Ecology & Evolution, Volume 18, Issue 4, 2003, Pages 198-205,ISSN 0169-5347

Γονίδιο αμυλάσης







Petar Pajic, Pavlos Pavlidis, Kirsten Dean, Lubov Neznanova, Rose-Anne Romano, Danielle Garneau, Erin Daugherity, Anja Globig, Stefan Ruhl, Omer Gokcumen (2019) Independent amylase gene copy number bursts correlate with dietary preferences in mammal

ΤΜΗΜΑ ΒΙΟΧΗΜΕΙΑΣ & ΒΙΟΤΕΧΝΟΛΟΓΙΑΣ
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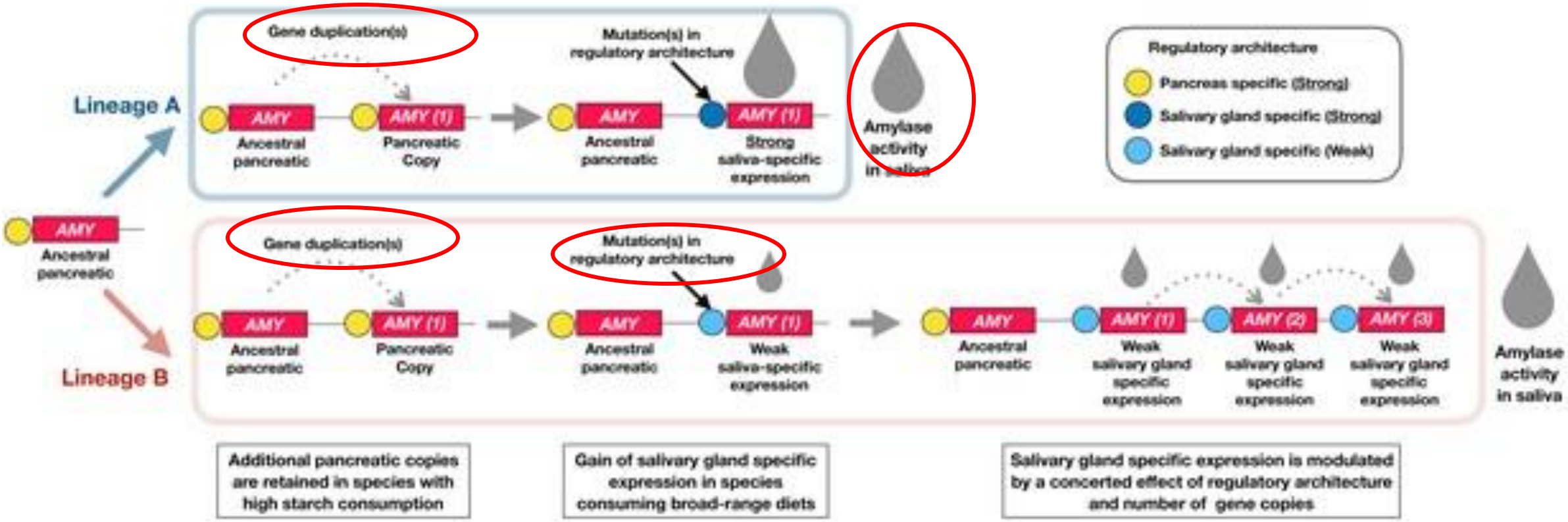
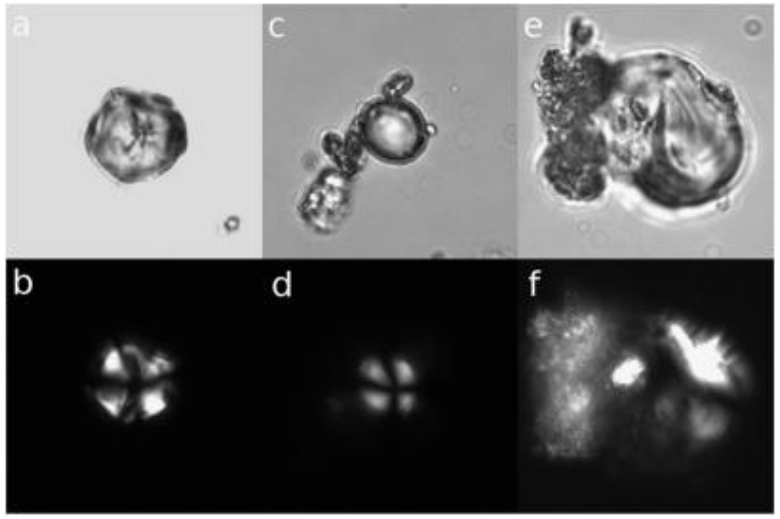
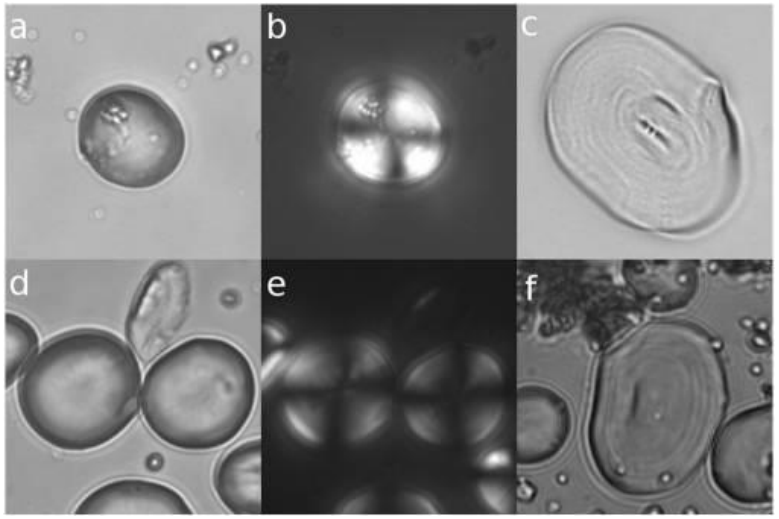
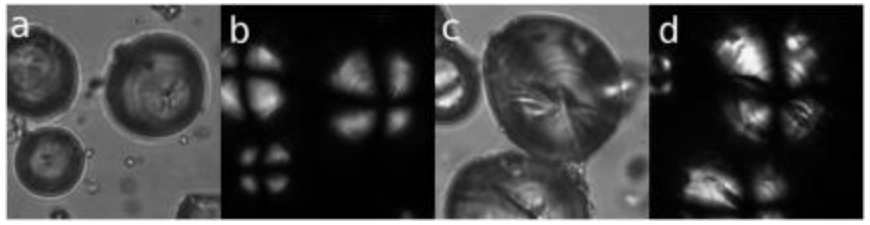
Τουλάχιστον 3 φορές στην εξέλιξη μας επεκτείναμε την ικανότητα μας να μεταβολίζουμε άμυλο

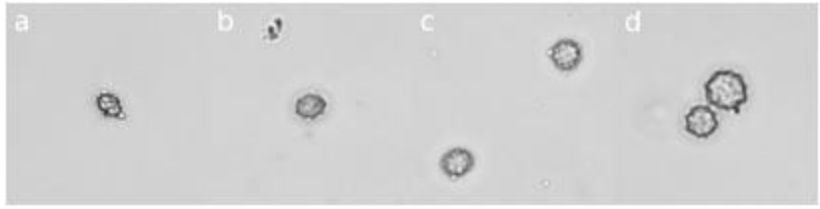


Perry GH, Dominy NJ, Claw KG, Lee AS, Fiegler H, Redon R, Werner J, Villanea FA, Mountain JL, Misra R, Carter NP, Lee C, Stone AC. Diet and the evolution of human amylase gene copy number variation. Nat Genet. 2007 Oct;39(10):1256-60. doi: 10.1038/ng2123. Epub 2007 Sep 9. PMID: 17828263; PMCID: PMC2377015.





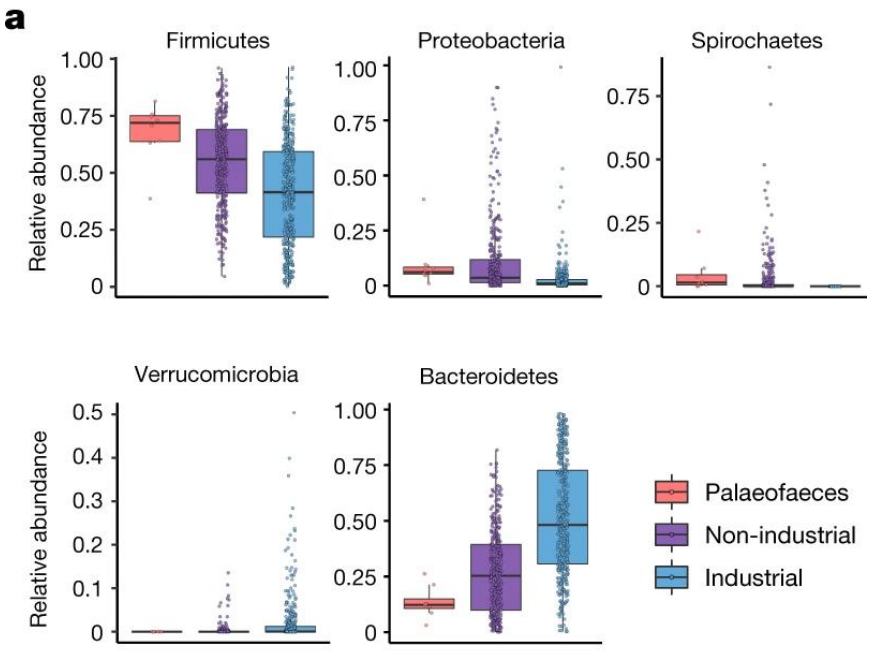


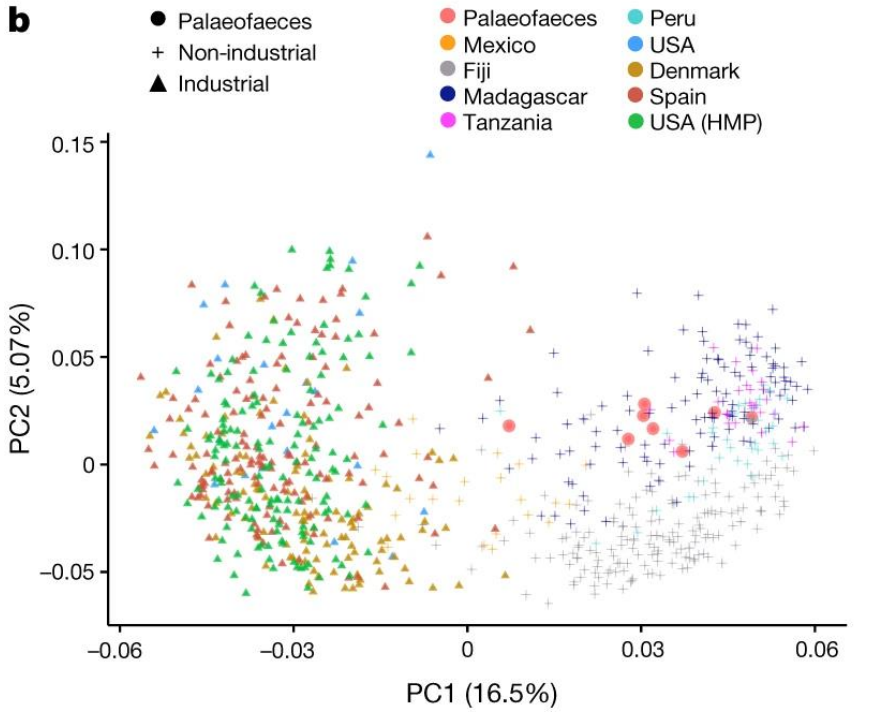


Henry AG, Brooks AS, Piperno DR. Microfossils in calculus demonstrate consumption of plants and cooked foods in Neanderthal diets (Shanidar III, Iraq; Spy I and II, Belgium). Proc Natl Acad Sci U S A. 2011 Jan 11;108(2):486-91. doi: 10.1073/pnas.1016868108. Epub 2010 Dec 27. PMID: 21187393; PMCID: PMC3021051.

Κοπρόλιθοι

Εμπλουτισμένα με CAZymes που αποικοδομούν το άμυλο, λόγω της υψηλότερης κατανάλωσης σύνθετων υδατανθράκων





Wibowo, M.C., Yang, Z., Borry, M. et al. Reconstruction of ancient microbial genomes from the human gut. Nature 594, 234–239 (2021).

ΤΜΗΜΑ
ΒΙΟΧΗΜΕΙΑΣ &
ΒΙΟΤΕΧΝΟΛΟΓΙΑΣ
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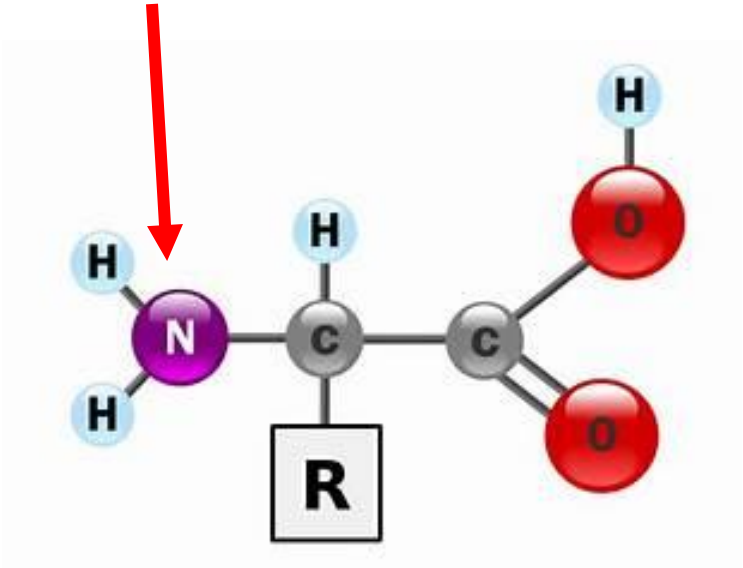
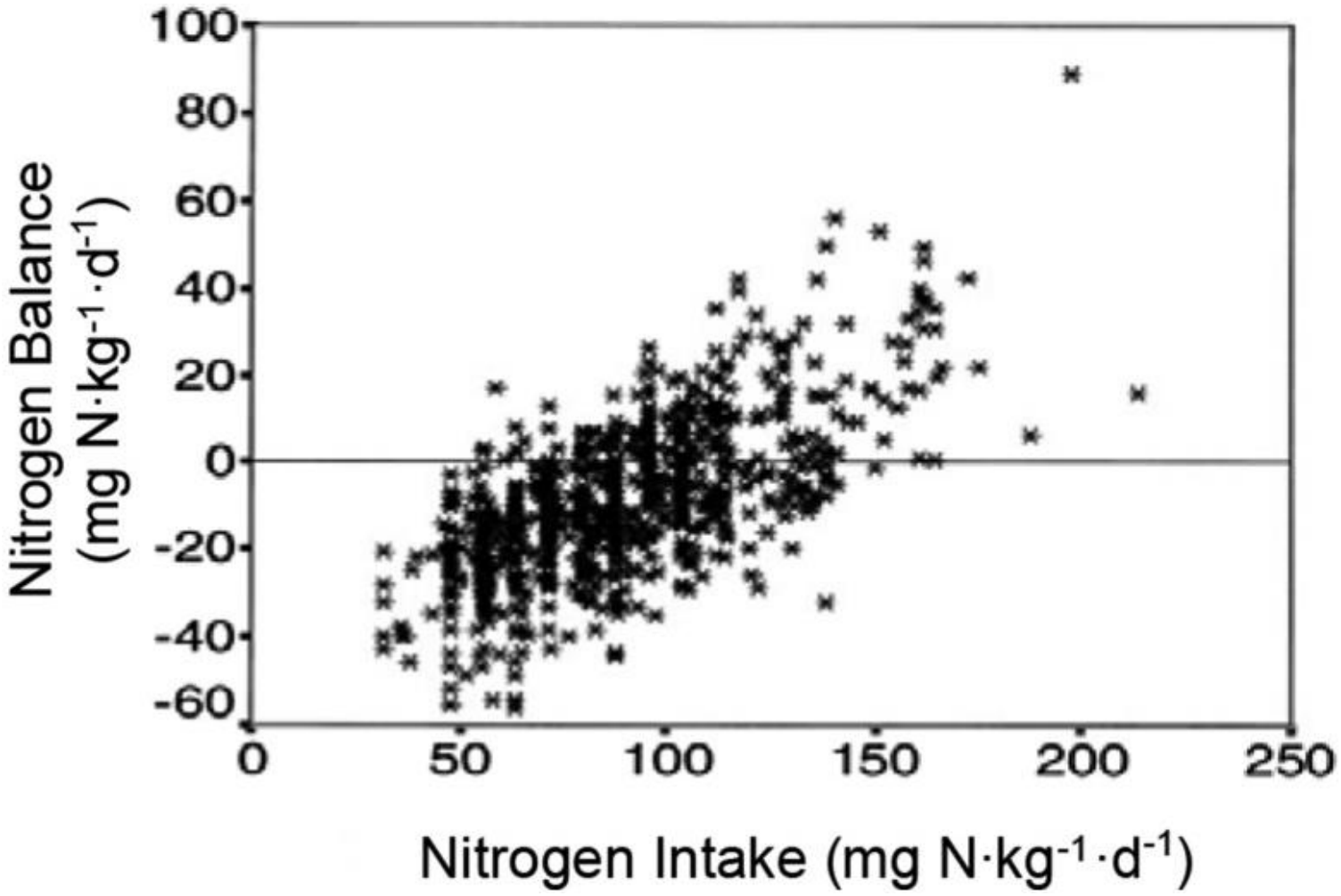
Πόση πρωτεΐνη πρέπει να λαμβάνουμε με την διατροφή?

Πόση πρωτείνη χρειαζόμαστε??

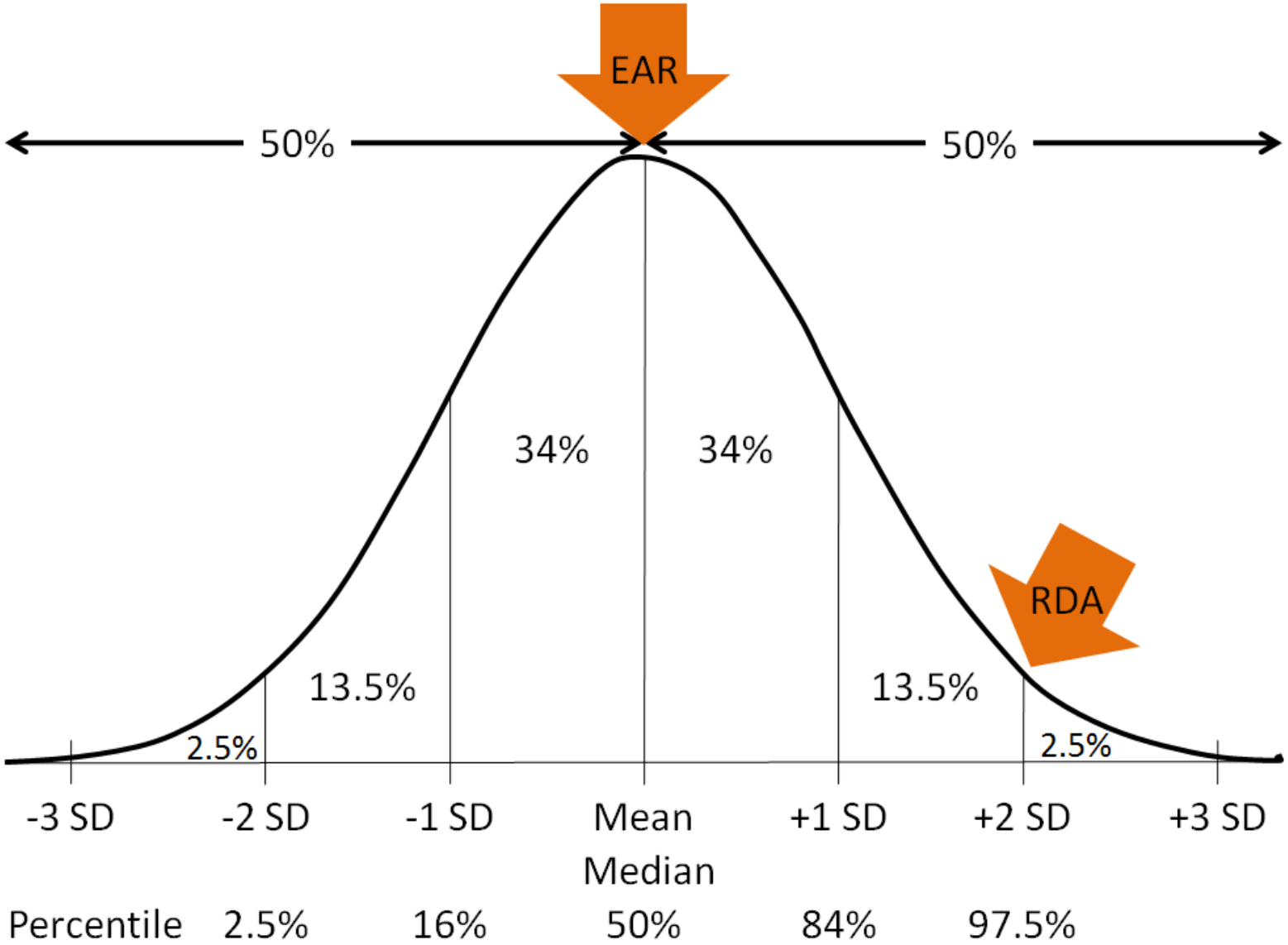
- Μελέτες ισοζυγίου αζώτου





Rand WM, Pellett PL, Young VR. Meta-analysis of nitrogen balance studies for estimating protein requirements in healthy adults. Am J Clin Nutr 2003;77:109–27.

FAO/WHO/UNU (2007). "Protein and Amino Acid Requirements in Human Nutrition."



EAR = Estimated Average Requirement
RDA = Recommended Dietary Allowance

ΤΜΗΜΑ ΒΙΟΧΗΜΕΙΑΣ & ΒΙΟΤΕΧΝΟΛΟΓΙΑΣ
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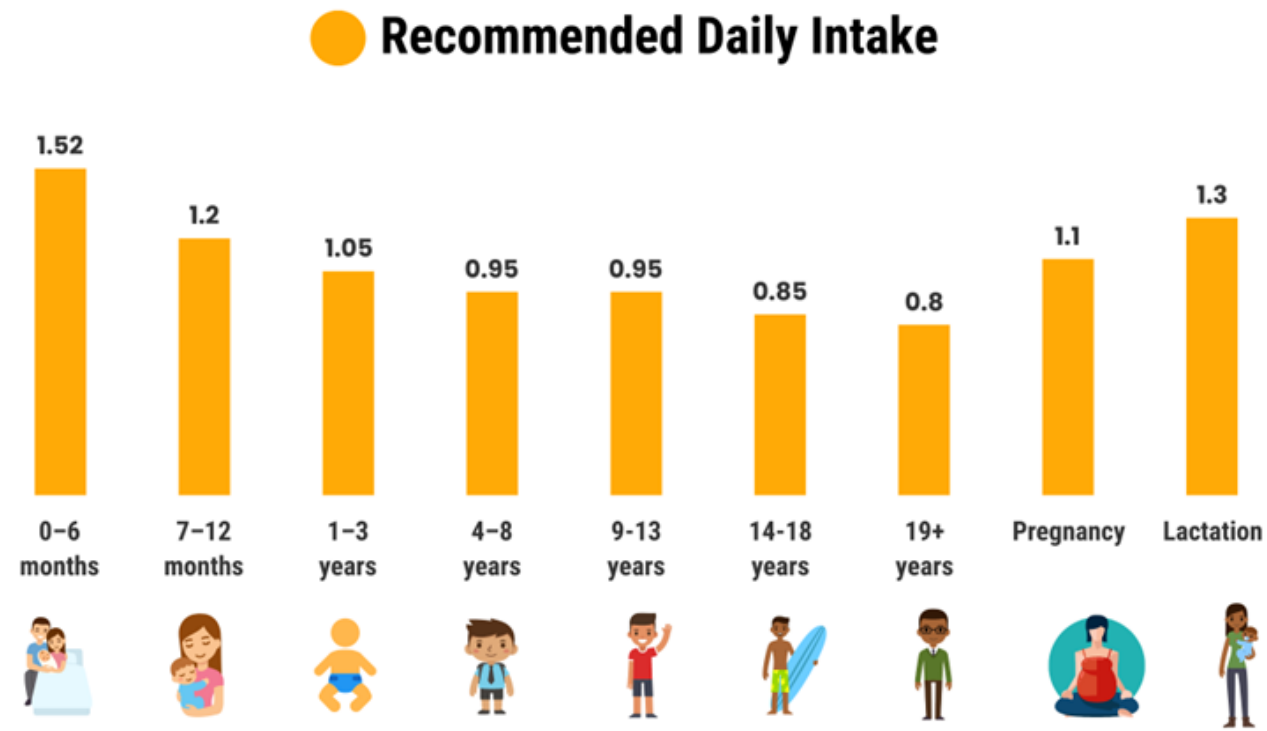
PROTEIN INTAKE

RECOMMENDED INTAKE LEVELS FOR ALL AGE GROUPS (g/kg/d)

FromGreens



Source: Institute of Medicine (2005) - Dietary reference intake guide (NAP.edu)

Geirsdottir O.G., Arnarson A., Ramel A., Jonsson P.V., Thorsdottir I. Dietary protein intake is associated with lean body mass in community-dwelling older adults. Nutr. Res. 2013;33:608–612. doi: 10.1016/j.nutres.2013.05.014.

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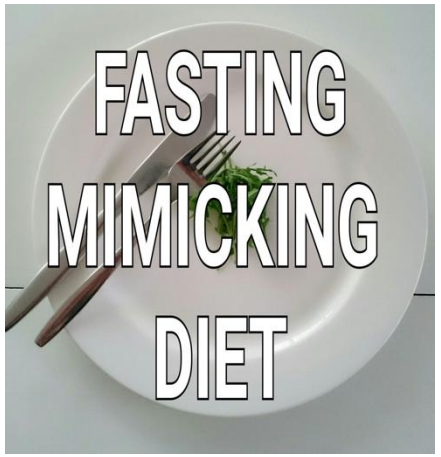

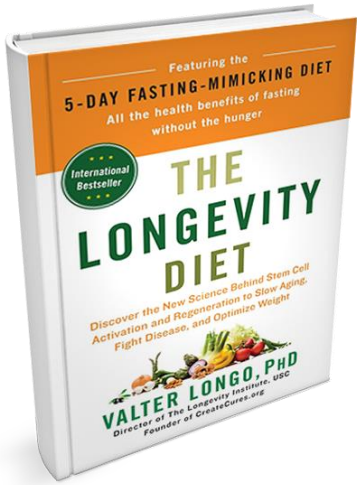

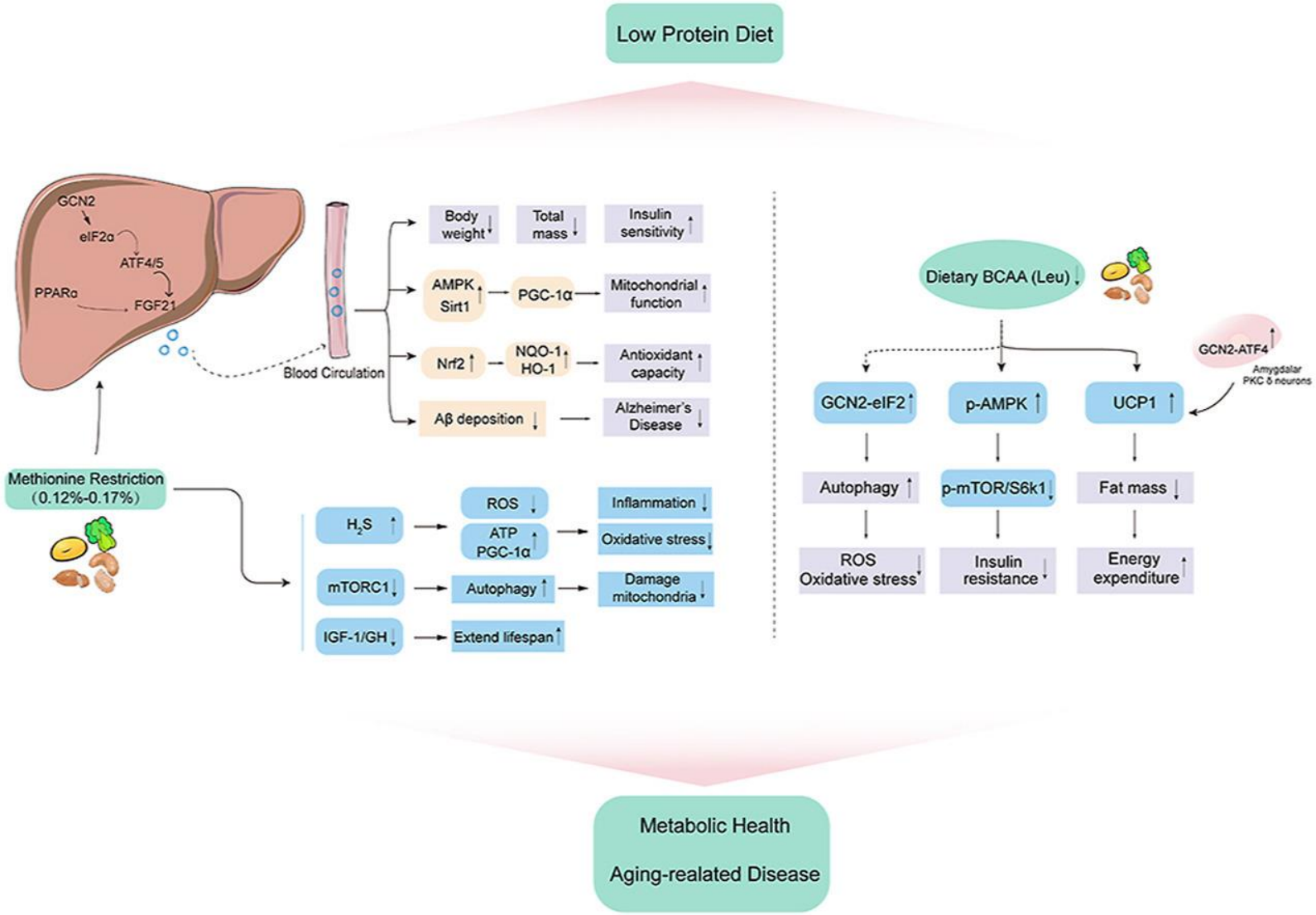

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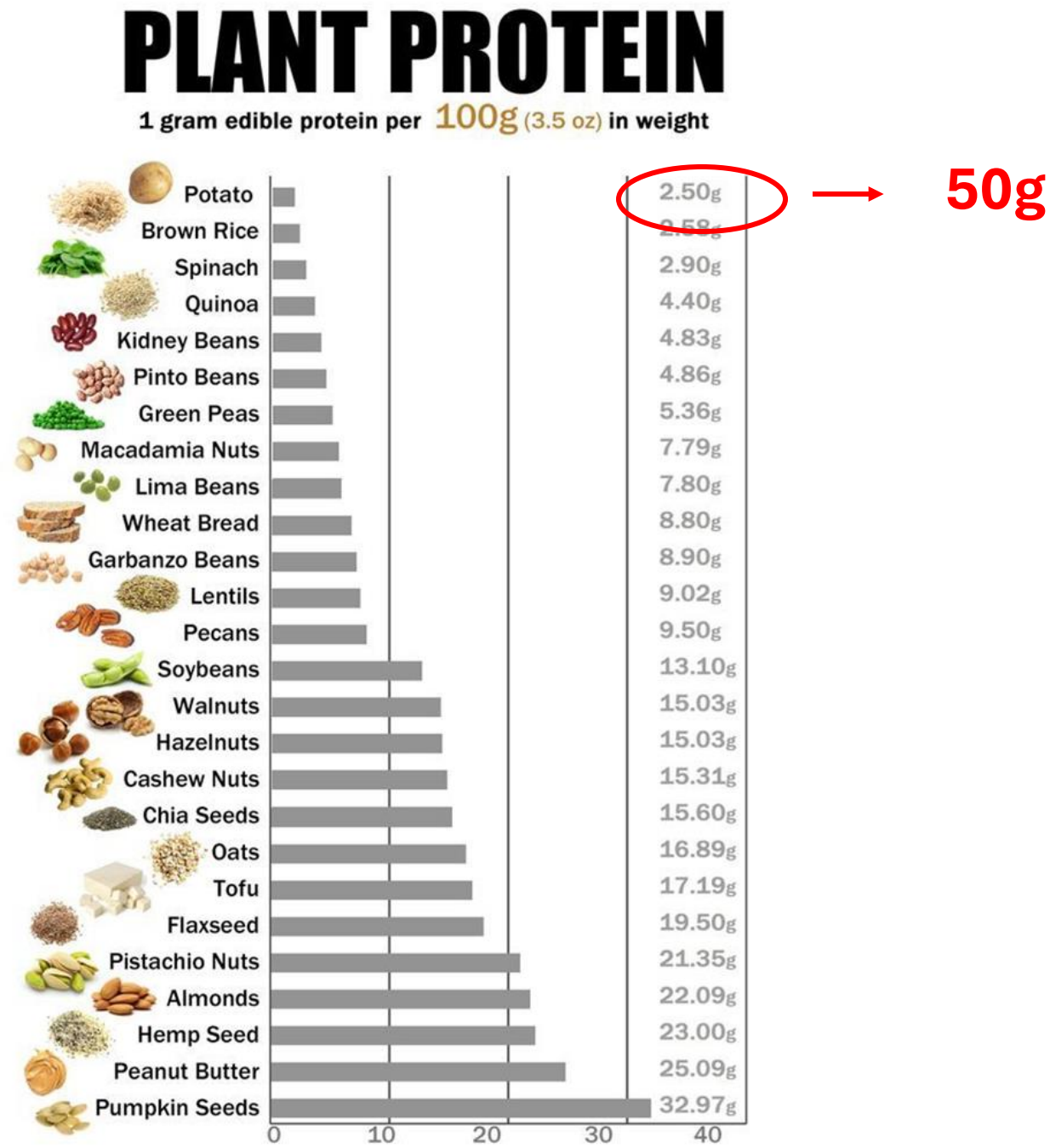
Μπορούμε να λάβουμε επαρκή πρωτεΐνη από φυτικά τρόφιμα?

0,8 g/kg σωματικού βάρους/ημέρα

70Kg- -> 56g



→ **50g**

	Meat-Eaters	Fish-Eaters	Lacto-ovo-Vegetarians	Vegans
n (%)	18,244 (60)	4531 (15)	6673 (22)	803 (3)
Energy (kcal)	2091	2030	2002	1944
% Energy from protein	17.2	15.5	14.0	13.1
Protein (g/kg of body weight) [1]	1.28	1.17	1.04	0.99
Protein (g) [2]	90	79	70	64
Body weight (kg) [2]	70	67	67	64

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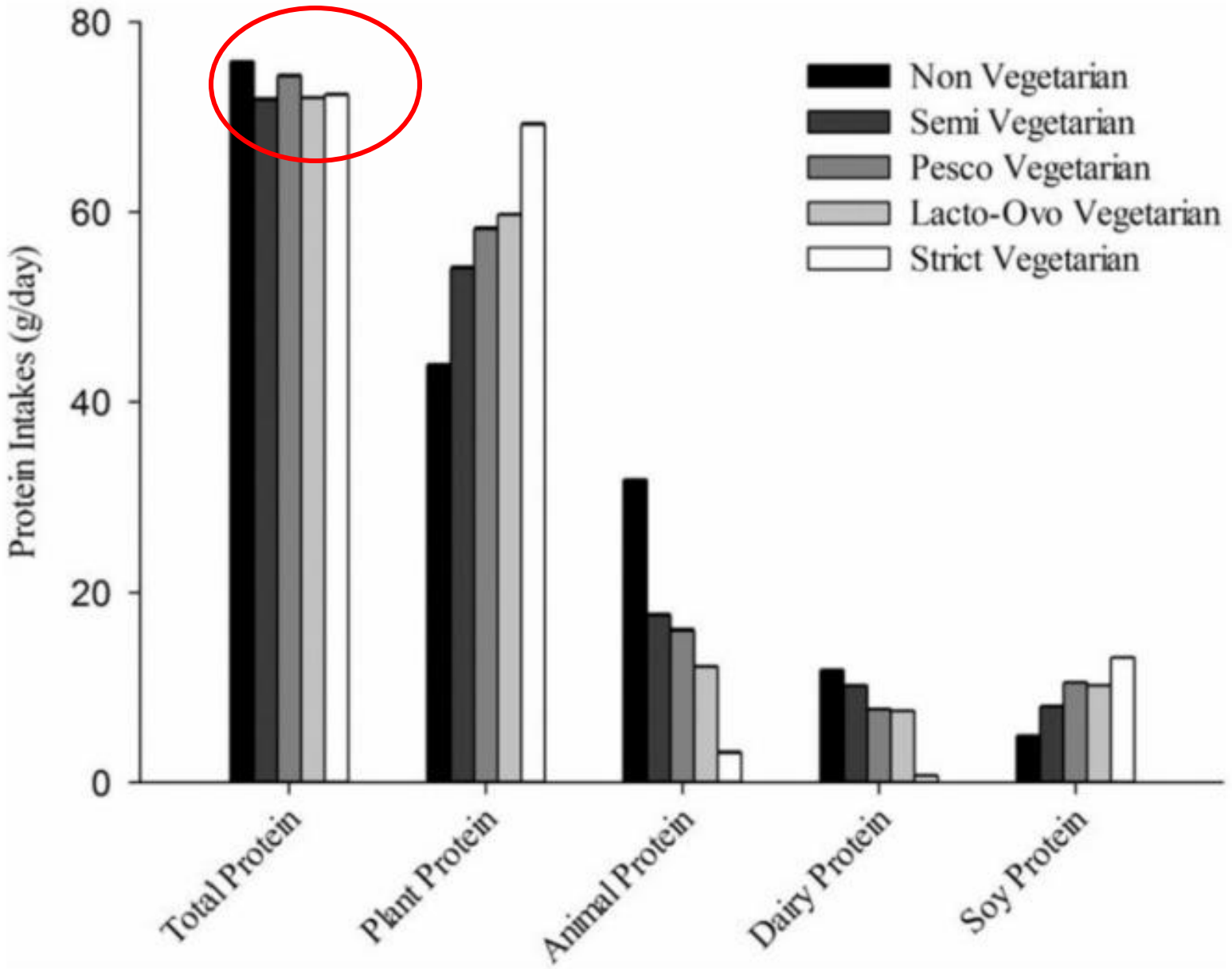
ΤΜΗΜΑ ΒΙΟΧΗΜΕΙΑΣ & ΒΙΟΤΕΧΝΟΛΟΓΙΑΣ
ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
25 ΧΡΟΝΙΑ

Protein intake (g/day) in the Adventist Health Study 2



Rizzo N.S., Jaceldo-Siegl K., Sabate J., Fraser G.E. Nutrient profiles of vegetarian and nonvegetarian dietary patterns. J. Acad. Nutr. Diet. 2013;113:1610–1619. doi: 10.1016/j.jand.2013.06.349.

Average protein intake of vegans based on different samples in the literature.

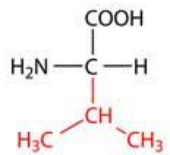
Study	Protein Intake			Vegans (*n*)	Method
	%E	g	g/kg bw		
EPIC-Oxford (UK)	13.1	64 [1]	0.99	803	FFQ [2]
Nutrinet (France)	12.8	62		789	Multiple 24-h R
AHS-2 (North America)	14.1	71		5694	FFQ
A Belgian study	14	82		102	FFQ
A Danish Survey	11.1 [1]	67		70	4-d weighted Record
Recommended Dietary Allowance (RDA)	>10 (approx.)	50 (approx.)	0.83 (exactly)		

Mariotti F, Gardner CD. Dietary Protein and Amino Acids in Vegetarian Diets-A Review. Nutrients. 2019 Nov 4;11(11):2661. doi: 10.3390/nu11112661

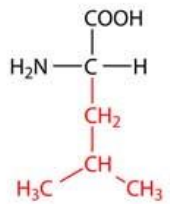
ΤΜΗΜΑ
ΒΙΟΧΗΜΕΙΑΣ &
ΒΙΟΤΕΧΝΟΛΟΓΙΑΣ
ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
25 ΧΡΟΝΙΑ

Ο μύθος (?) της "πλήρους πρωτείνης"

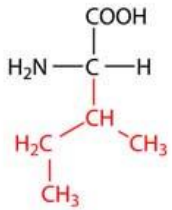
Essential Amino Acids



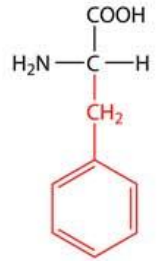
Valine



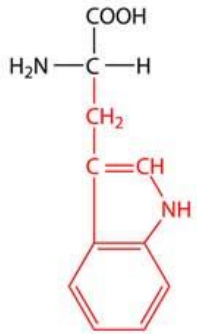
Leucine



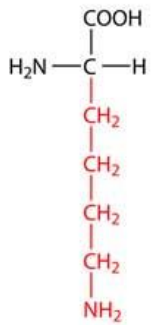
Isoleucine



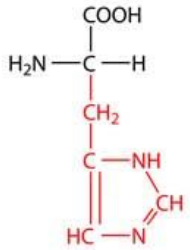
Phenylalanine



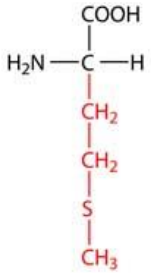
Tryptophan



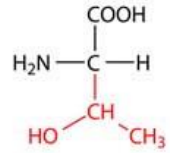
Lysine



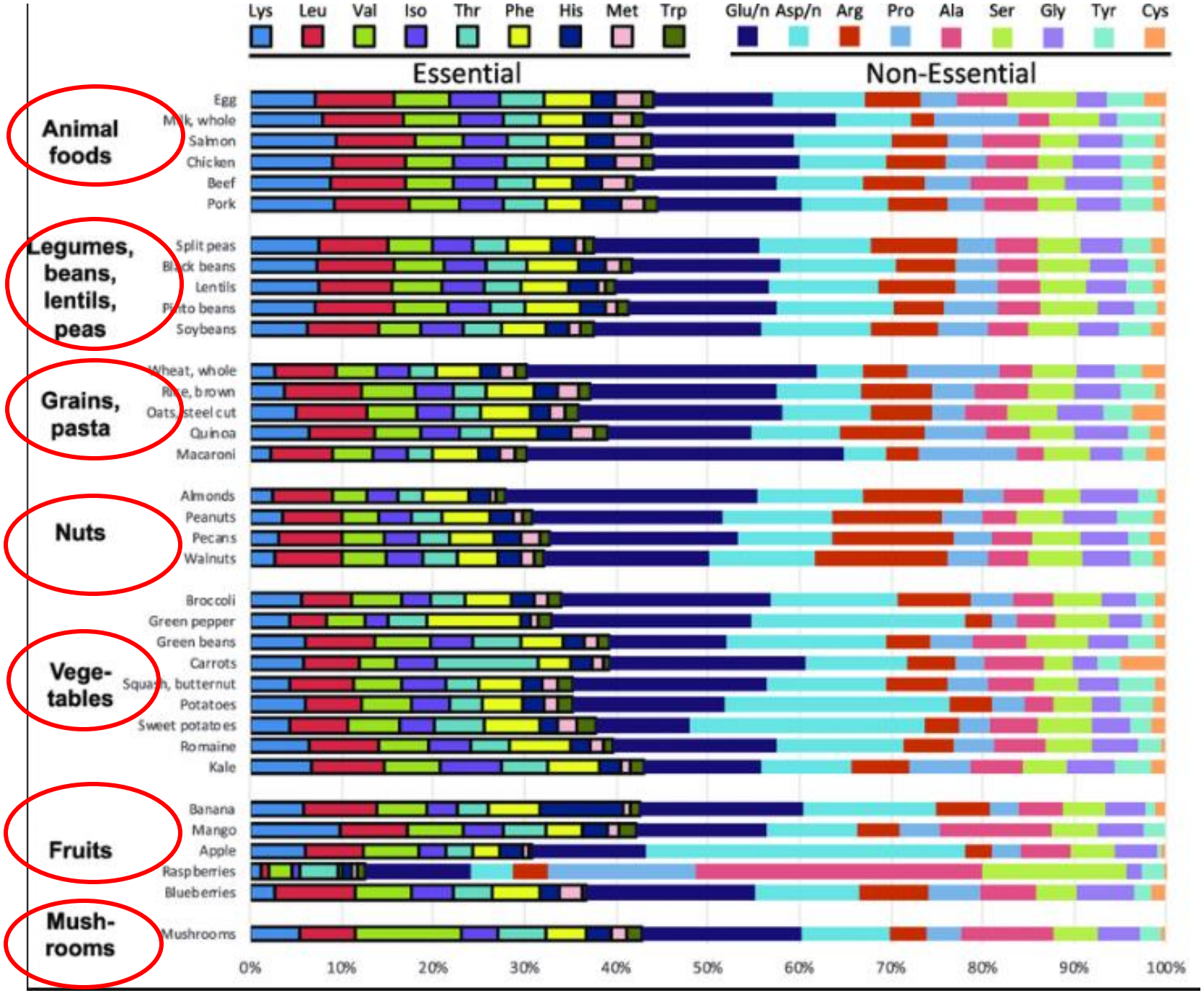
Histidine



Methionine



Threonine


Lys
Leu
Val
Iso
Thr
Phe
His
Met
Trp
Glu/n
Asp/n
Arg
Pro
Ala
Ser
Gly
Tyr
Cys
Essential
Non-Essential
Animal foods
Egg
Milk, whole
Salmon
Chicken
Beef
Pork
Legumes, beans, lentils, peas
Split peas
Black beans
Lentils
Pinto beans
Soybeans
Grains, pasta
Wheat, whole
Rice, brown
Oats, steel cut
Quinoa
Macaroni
Nuts
Almonds
Peanuts
Pecans
Walnuts
Vege-tables
Broccoli
Green pepper
Green beans
Carrots
Squash, butternut
Potatoes
Sweet potatoes
Romaine
Kale
Fruits
Banana
Mango
Apple
Raspberries
Blueberries
Mush-rooms
Mushrooms
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Essential amino acids in some common foods*

	chicken egg, boiled, 1 large (50 g)	ground beef, lean, broiled, 100 g (3.5 oz)	cow's milk, lowfat, 2%, 246 g (8 fl oz)	soybeans, dry roasted, 86 g (1/2 cup)	cornmeal, whole grain, 122 g (1 cup)	flour, whole wheat, 120 g (1 cup)	pinto beans, boiled, 171 g (1 cup)	sunflower seeds, dry roasted, 28 g (1 oz)
tryptophan	77	277	115	494	70 **	254	166	84
threonine	302	1,080	366	1,478	372	474	592	223
isoleucine	343	1,111	490	1,651	355	610	621	274
leucine	538	1,954	795	2,772	1,215	1,111	1,122	399
lysine	452	2,057	644	2,265	278	454	964	225
methionine	196	633	205	459	207	254	212	119
phenylalanine	334	965	393	1,777	487	775	759	281
valine	384	1,202	544	1,699	501	742	735	316
histidine	149	846	220	918	303	380	392	152

*In milligrams.
**Underscored number indicates limiting amino acid.
Source: Jean A.T. Pennington, *Bowes and Church's Food Values of Portions Commonly Used*, 17th ed. (1998).

Table 5 Amounts of sample foods required to provide [B] a total amount of EAAs equal to the recommended daily sum of total EAAs (i.e., ~12.9 g) or [C] the RDA for each individual EAA.

From: Essential amino acids: master regulators of nutrition and environmental footprint?

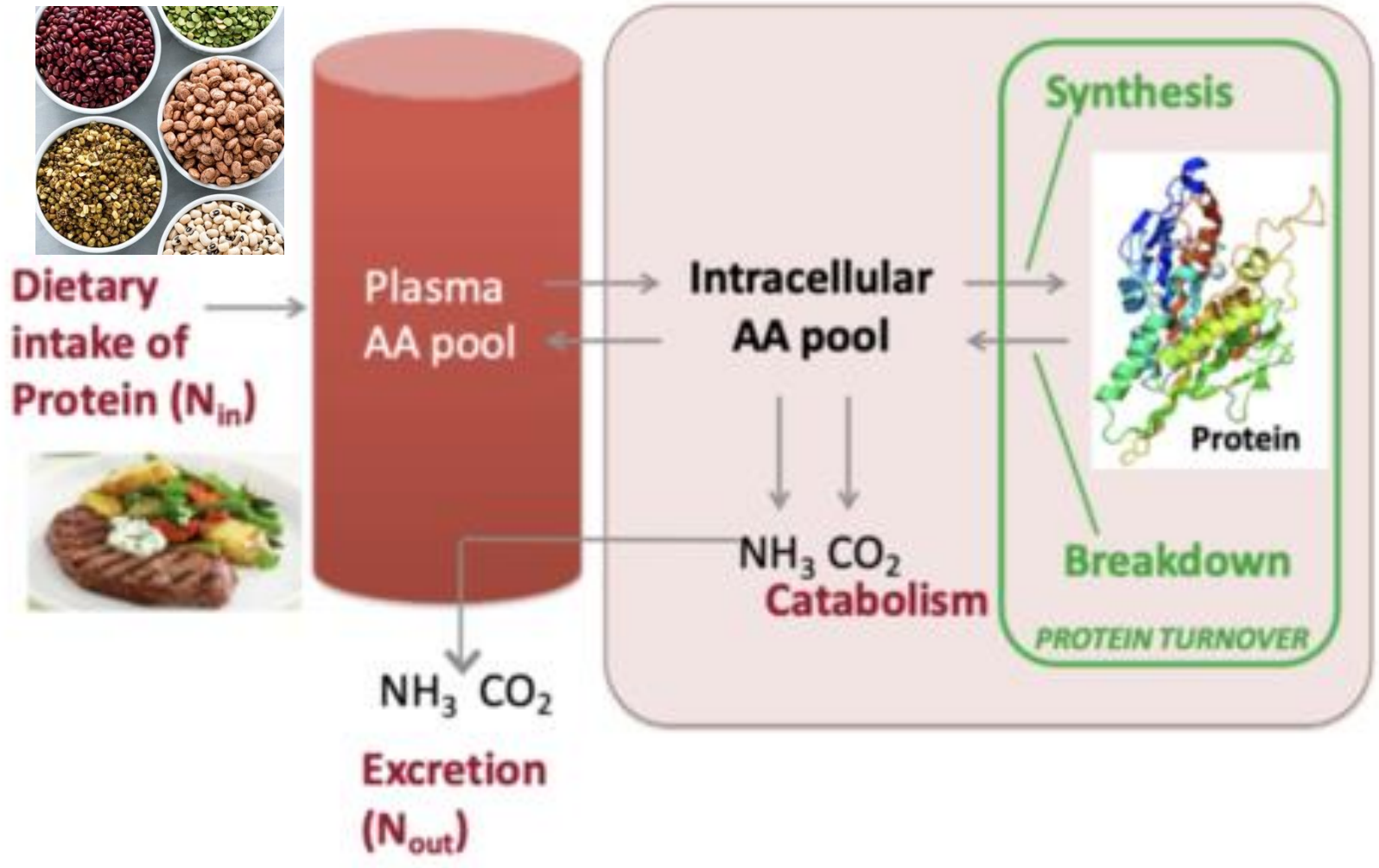
	Egg	Milk	Beef	Pig	Chicken	Sea bass	Soybeans	Beans	Peas	Wheat	Maize	Rice	Potato	Cauliflower	Quinoa
B	206 [1]	718	123	137	109	131	65	267	642	339	337	439	2063	1775	154
C	295 [2]	890	171	168	140	174	89	478	1105	879	814	817	2856	2169	205

Recommended daily allowances (RDA, referred to a 70-kg man) (see Table 2 for references). Data are expressed in grams (g) of edible parts, with the exception of milk (ml).

[1]Corresponding to 3.74 eggs.

[2]Corresponding to 5 eggs.

Amino Acid Pools & Protein Turnover



Modified from Shils et al. 2006
Modern Nutrition in Health and Disease

FROM THE ACADEMY
Position Paper

Position of the Academy of Nutrition and Dietetics: Vegetarian Diets

ABSTRACT

It is the position of the Academy of Nutrition and Dietetics that appropriately planned vegetarian, including vegan, diets are healthful, nutritionally adequate, and may provide health benefits for the prevention and treatment of certain diseases. These diets are appropriate for all stages of the life cycle, including pregnancy, lactation, infancy, childhood, adolescence, older adulthood, and for athletes. Plant-based diets are more environmentally sustainable than diets rich in animal products because they use fewer natural resources and are associated with much less environmental damage. Vegetarians and vegans are at reduced risk of certain health conditions, including ischemic heart disease, type 2 diabetes, hypertension, certain types of cancer, and obesity. Low intake of saturated fat and high intakes of vegetables, fruits, whole grains, legumes, soy products, nuts, and seeds (all rich in fiber and phytochemicals) are characteristics of vegetarian and vegan diets that produce lower total and low-density lipoprotein cholesterol levels and better serum glucose control. These factors contribute to reduction of chronic disease. Vegans need reliable sources of vitamin B-12, such as fortified foods or supplements.

J Acad Nutr Diet. 2016;116:1970-1980.

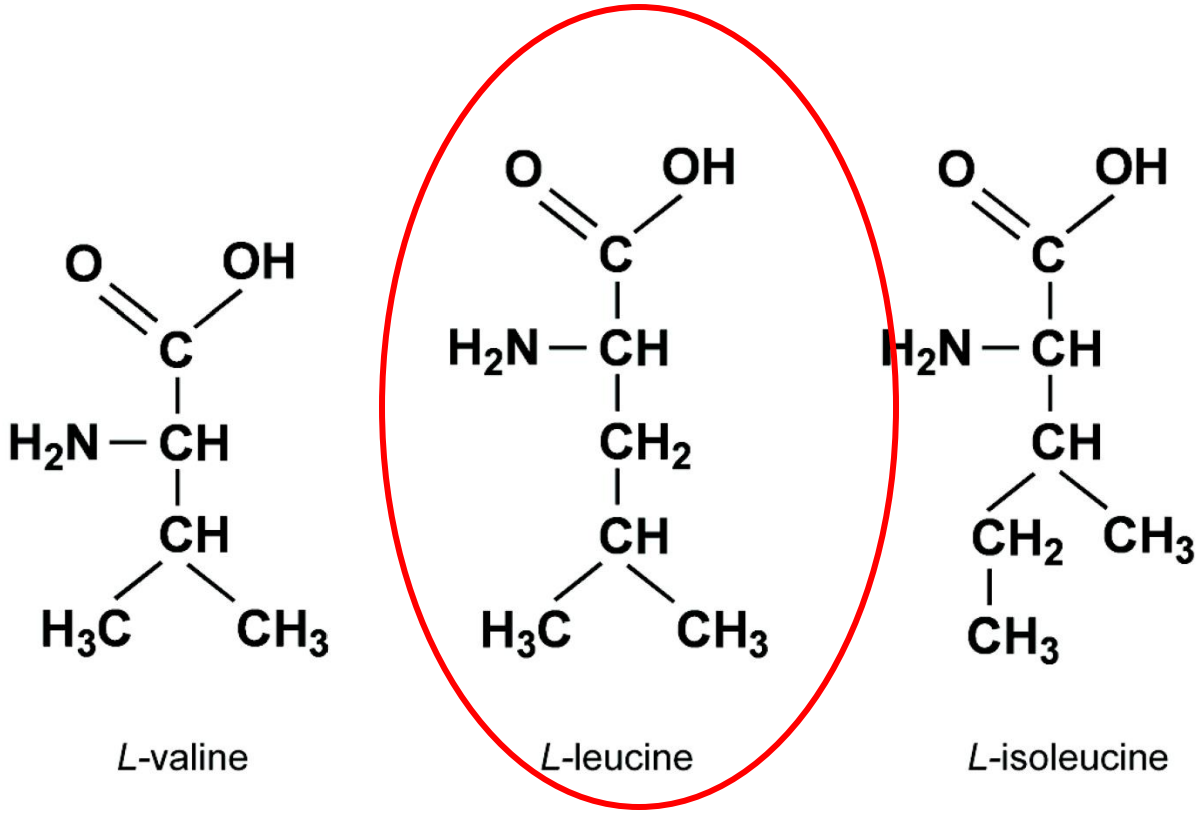
POSITION STATEMENT

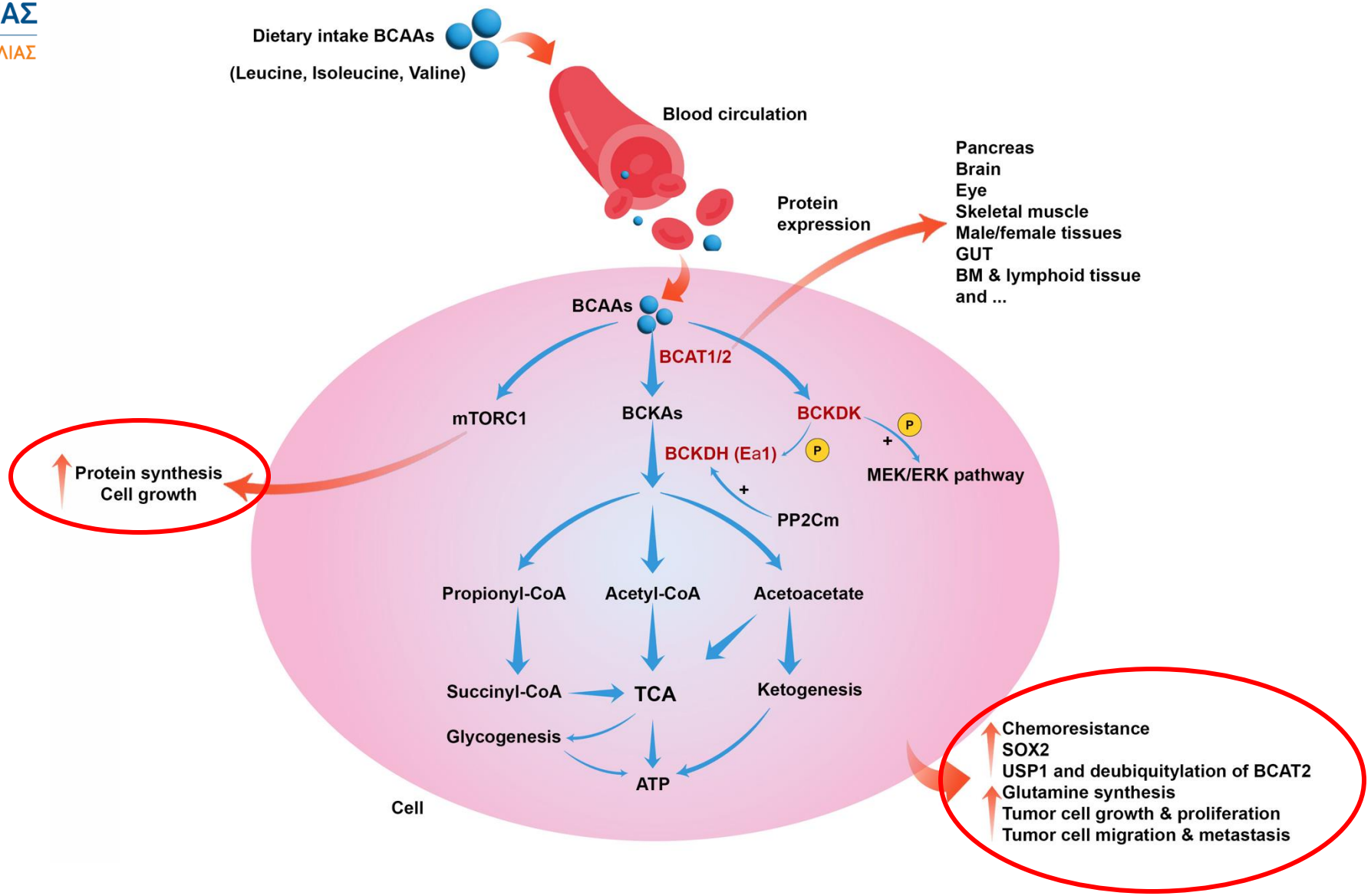
It is the position of the Academy of Nutrition and Dietetics that appropriately planned vegetarian, including vegan, diets are healthful, nutritionally adequate, and may provide health benefits in the prevention and treatment of certain diseases. These diets are appropriate for all stages of the life cycle, including pregnancy, lactation, infancy, childhood, adolescence, older adulthood, and for athletes. Plant-based diets are more environmentally sustainable than diets rich in animal products because they use fewer natural resources and are associated with much less environmental damage.

protein intakes, when caloric intakes are adequate.[6-8] The terms *complete* and *incomplete* are misleading in relation to plant protein. Protein from a variety of plant foods, eaten during the course of a day, supplies enough of all indispensable (essential) amino acids when caloric requirements are met.[7] The regular use of legumes and soy products will ensure an adequate protein intake for the vegetarian, as well as providing other essential nutrients.[9]

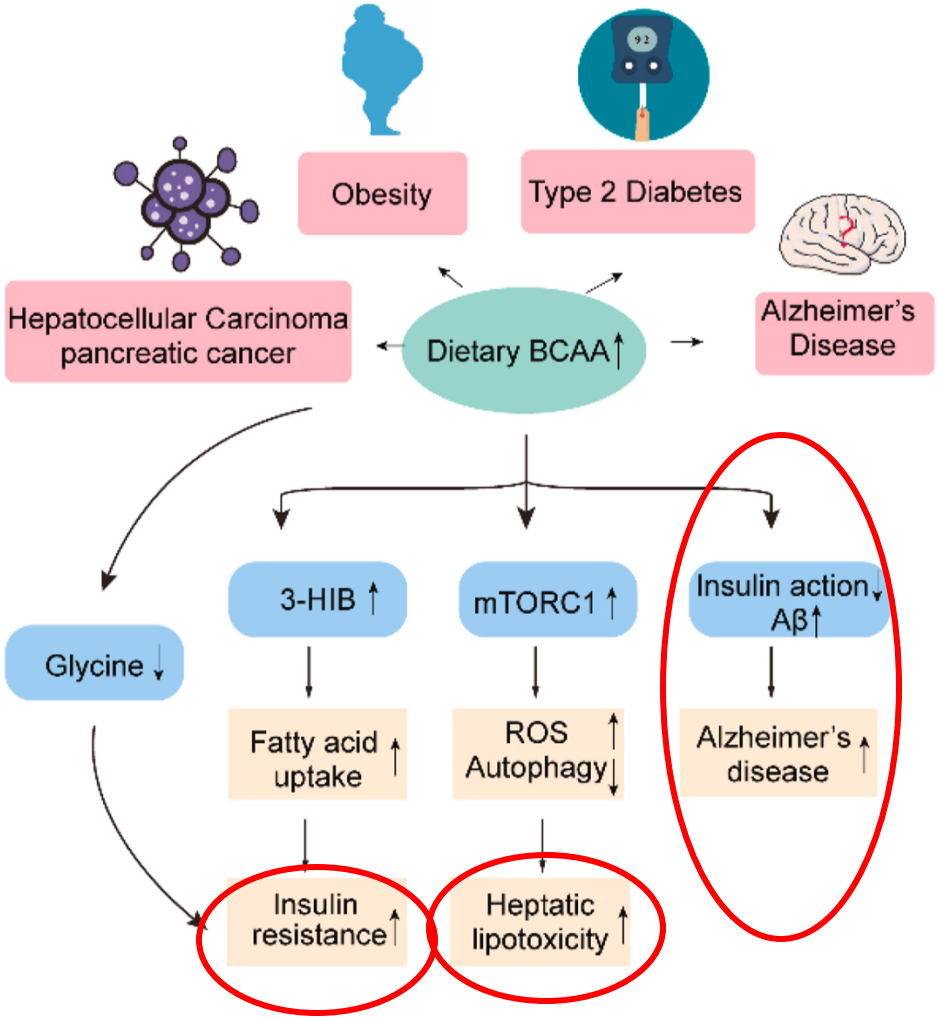
ΤΜΗΜΑ ΒΙΟΧΗΜΕΙΑΣ & ΒΙΟΤΕΧΝΟΛΟΓΙΑΣ
ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
25 ΧΡΟΝΙΑ

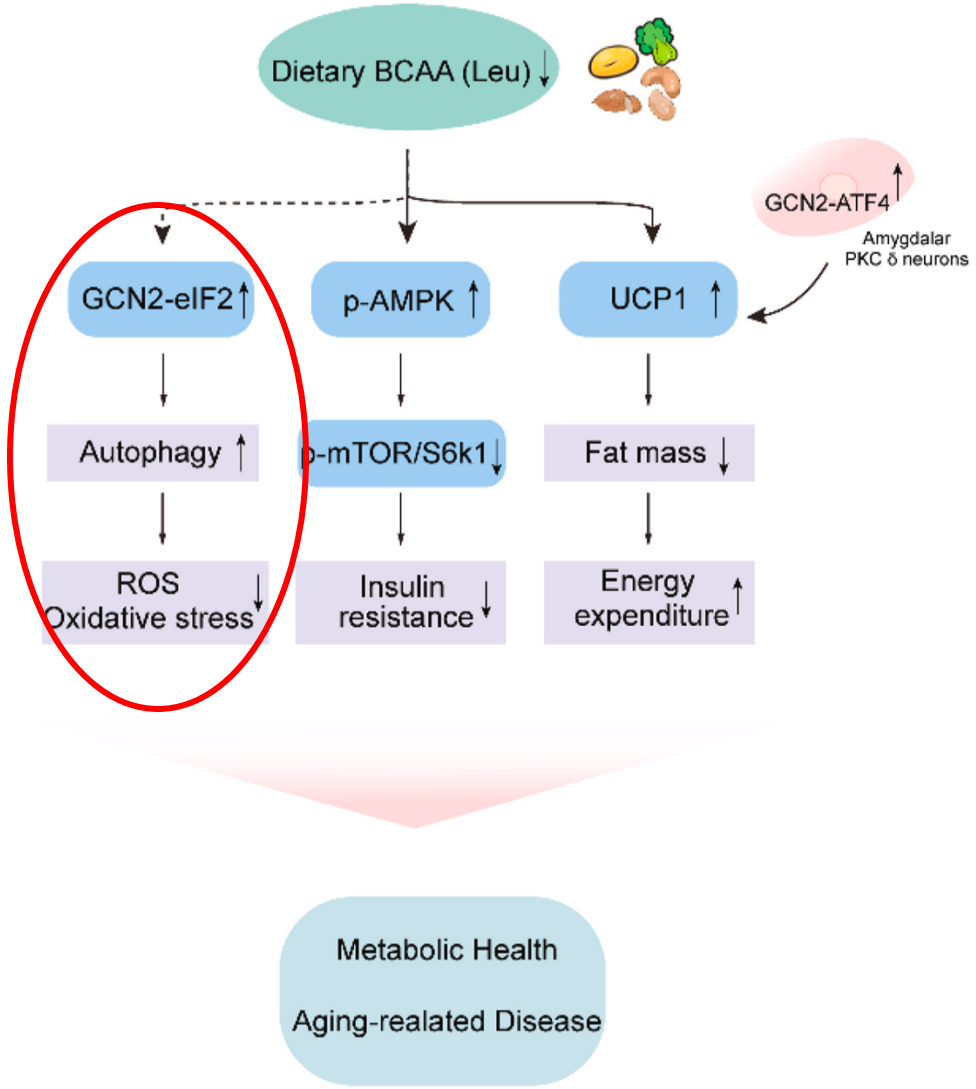
Τα BCAA και η ανάπτυξη μυϊκής μάζας



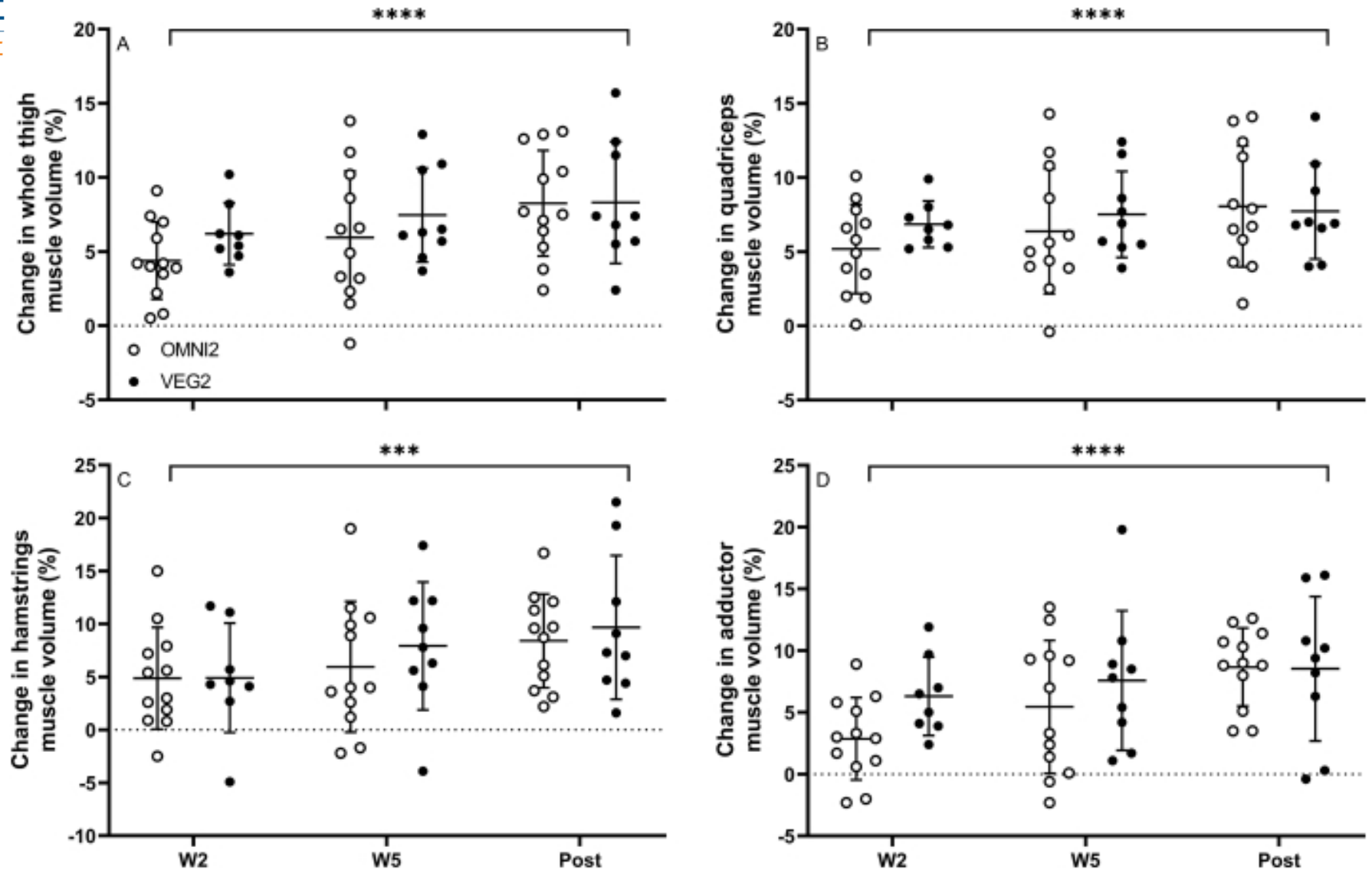


Er Xu, Bangju Ji, Bangju Ji, Ketao Jin,Yefeng Chen. Branched-chain amino acids catabolism and cancer progression: focus on therapeutic interventions. Front. Oncol. , Volume 13 - 2023 | https://doi.org/10.3389/fonc.2023.1220638





Danna Wang, Jin Ye, Renjie Shi, Beita Zhao, Zhigang Liu, Wei Lin, Xuebo Liu, Dietary protein and amino acid restriction: Roles in metabolic health and aging-related diseases, Free Radical Biology and Medicine, Volume 178, 2022, Pages 226-242, ISSN 0891-5849, https://doi.org/10.1016/j.freeradbiomed.2021.12.009.



Monteyne AJ, Coelho MOC, Murton AJ, Abdelrahman DR, Blackwell JR, Koscien CP, Knapp KM, Fulford J, Finnigan TJA, Dirks ML, Stephens FB, Wall BT. Vegan and Omnivorous High Protein Diets Support Comparable Daily Myofibrillar Protein Synthesis Rates and Skeletal Muscle Hypertrophy in Young Adults. J Nutr. 2023 Jun;153(6):1680-1695. doi: 10.1016/j.tjnut.2023.02.023.

ΤΜΗΜΑ
ΒΙΟΧΗΜΕΙΑΣ &
ΒΙΟΤΕΧΝΟΛΟΓΙΑΣ
ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
25 ΧΡΟΝΙΑ

Βιοδιαθεσιμότητα - Αντιθρεπτικά

Protein digestibility-corrected amino acid score (PDCAAS)

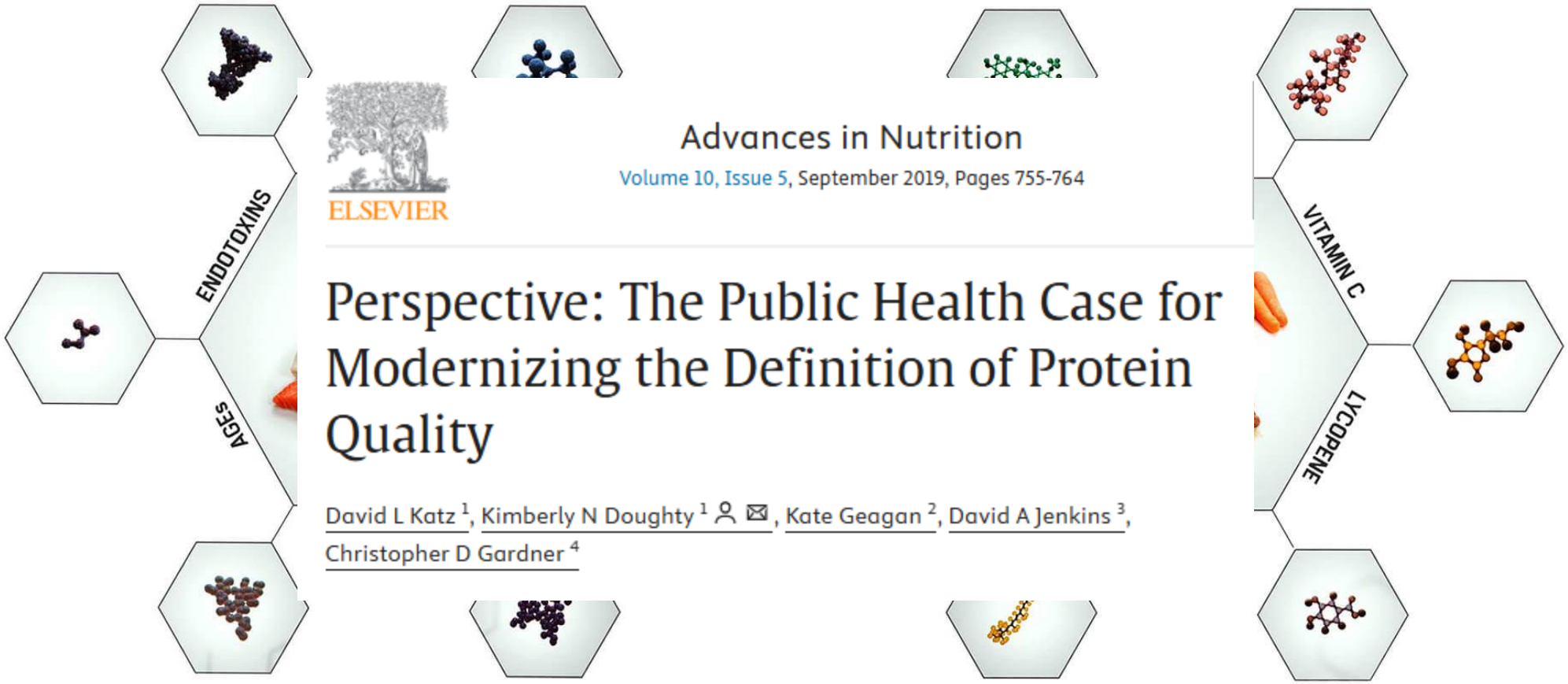
Digestible Indispensable Amino Acid Score (DIAAS)

$$\frac{\text{Amino Acid in protein}}{\text{Amino Acid requirement}} \times \text{Protein digestibility} = \text{PDCAAS score truncated to max.1.0}$$

$$\frac{\text{Amino Acid in protein}}{\text{Amino Acid requirement}} \times \text{Amino Acid digestibility} = \text{DIAAS score (no truncation)}$$

Protein Sources	PDCAAS	DIAAS
Animal proteins		
Skimmed milk powder	100 *	123
Milk protein concentrate	100 *	141
Casein		117
Whey protein isolate	100 *	125
Whey		85
Whey protein concentrate	100 *	133
Pork		117
Beef		112
Chicken	100	108
Egg	100	101
Insect protein		75
Plant proteins		
Wheat	51	54
Oats	64	57
Oat protein concentrate	69	67
Soy		91
Soy flour	100 *	105
Soy protein isolate	100 *	98
Pea	64	70
Pea protein concentrate	84	73
Fava beans		55
Rapeseed		67
Lupin	40–80	68
Canola		72
Corn		36
Potato	100	100
Gelatine		2
Red kidney beans		51
Chickpeas		85
Split red lentils		50
Split yellow peas		73

Ajomiwe N, Boland M, Phongthai S, Bagiyal M, Singh J, Kaur L. Protein Nutrition: Understanding Structure, Digestibility, and Bioavailability for Optimal Health. Foods. 2024 Jun 5;13(11):1771. doi: 10.3390/foods13111771. PMID: 38890999; PMCID: PMC11171741.



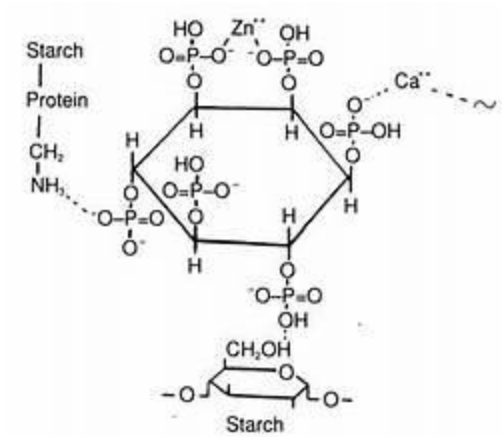
ELSEVIER

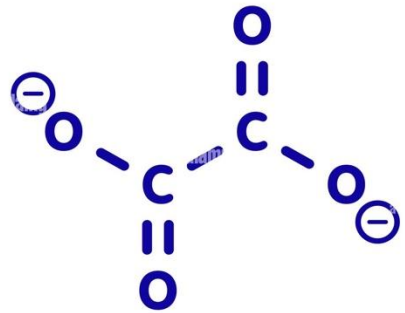
Advances in Nutrition

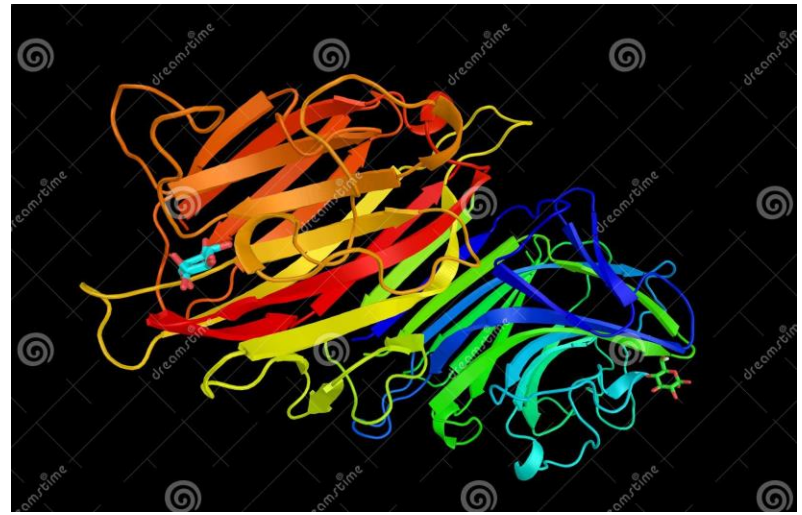
Volume 10, Issue 5, September 2019, Pages 755-764

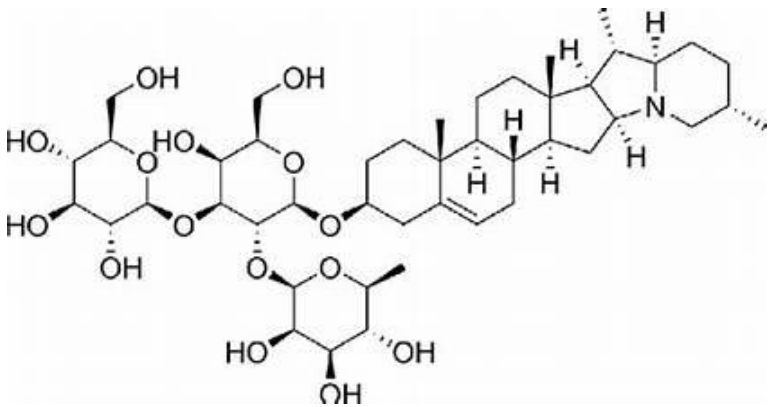
Perspective: The Public Health Case for Modernizing the Definition of Protein Quality

David L Katz [1], Kimberly N Doughty [1], Kate Geagan [2], David A Jenkins [3], Christopher D Gardner [4]


Starch
Protein
Starch

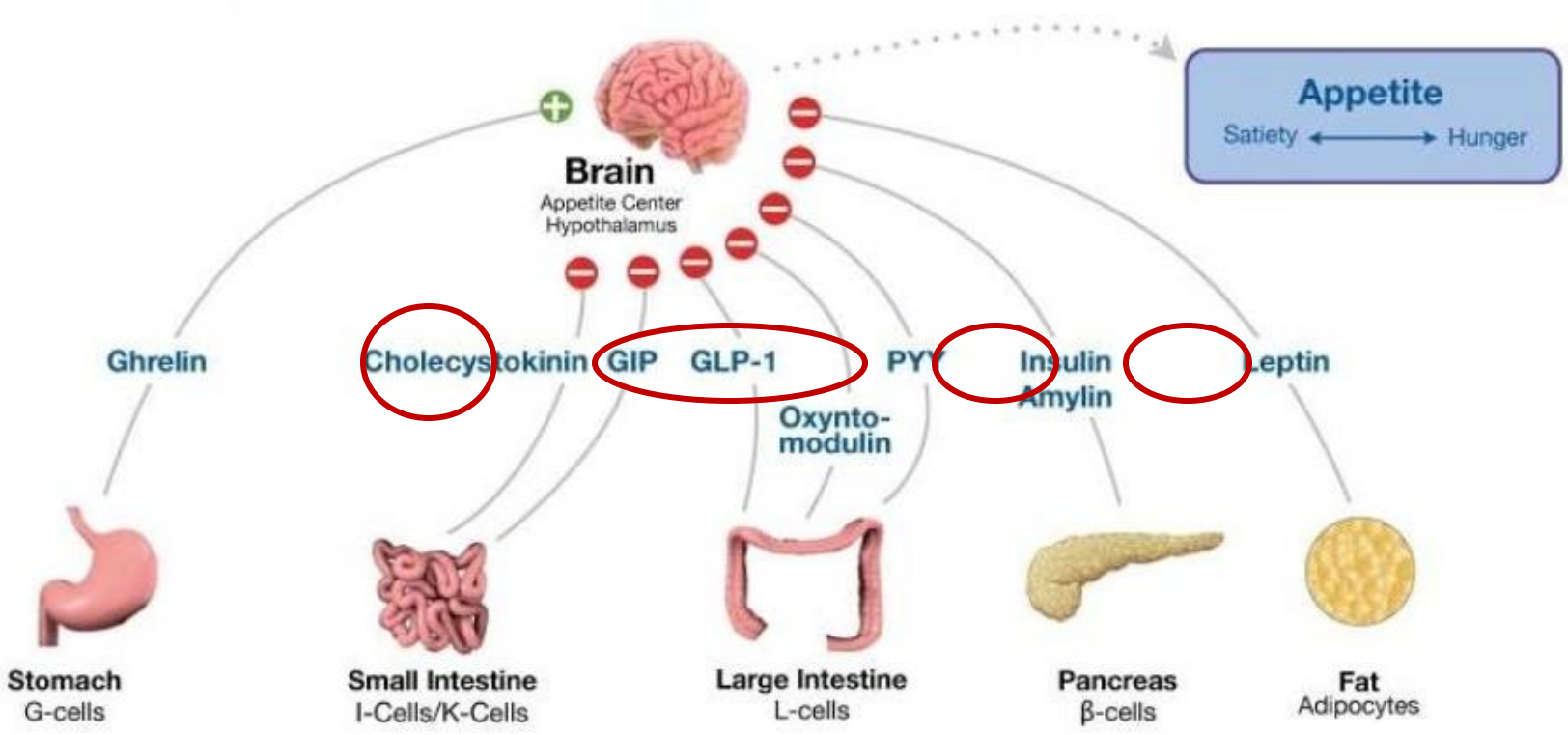







PLANTS ARE
POISONING YOU

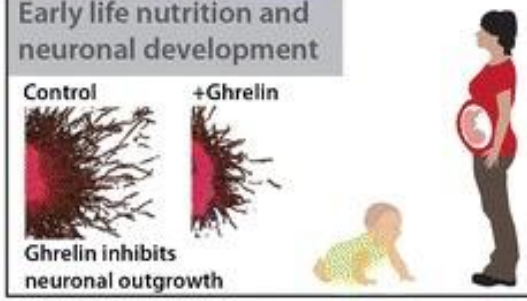
Αίσθηση κορεσμού



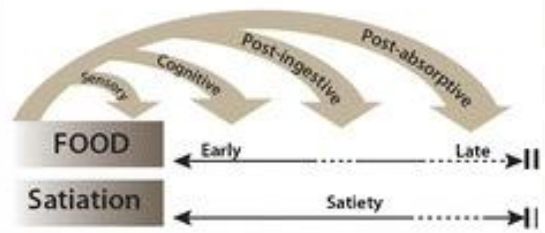
OVERALL MECHANISMS

Responses to food across the lifecourse

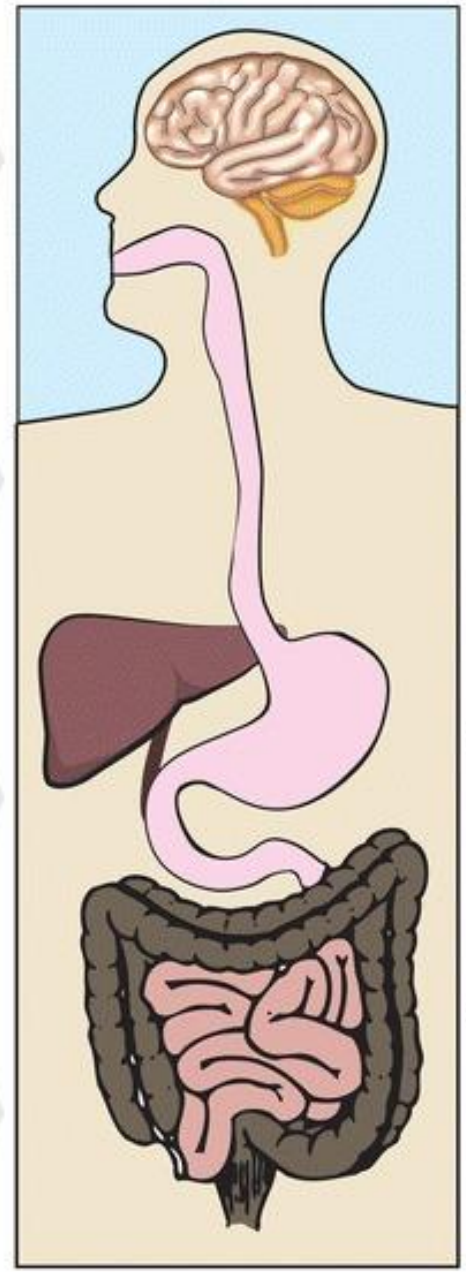
Early life nutrition and neuronal development



Satiety cascade



Exercise-induced compensatory eating

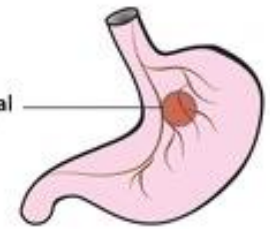


SPECIFIC TARGETS

Energy balance and reward pathways

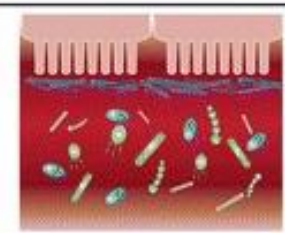
Brainstem solid/ liquid calories

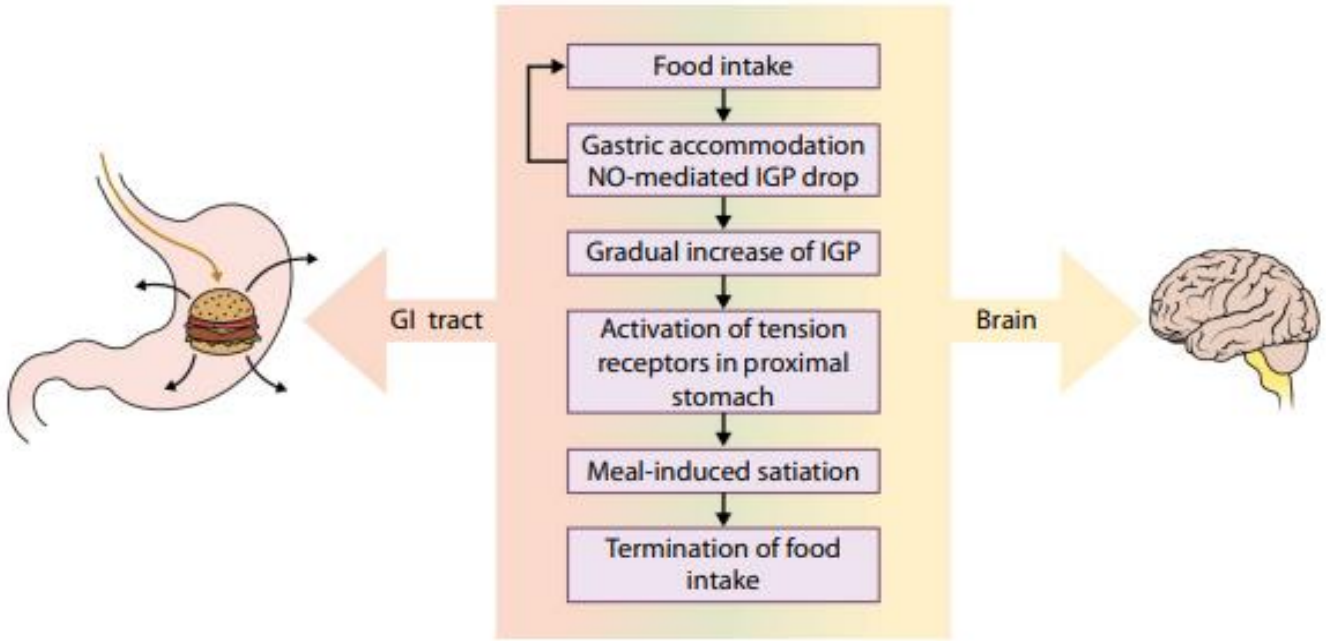
Targeting vagal nerves

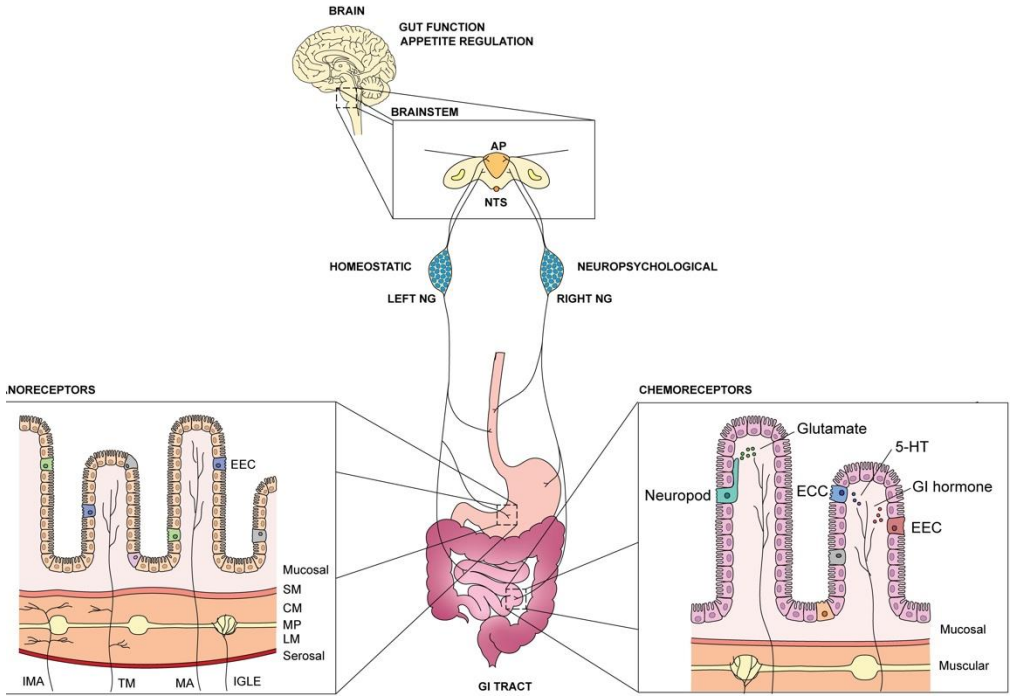


Nutrient-induced hormone release

Gut microbiota

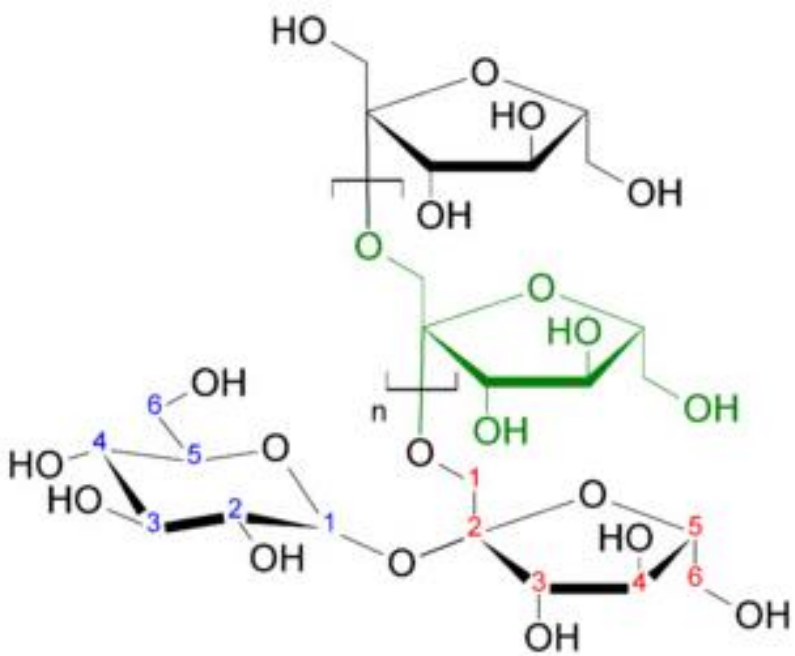






Tack J, Verbeure W, Mori H, Schol J, Van den Houte K, Huang IH, Balsiger L, Broeders B, Colomier E, Scarpellini E, Carbone F. The gastrointestinal tract in hunger and satiety signalling. United European Gastroenterol J. 2021 Jul;9(6):727-734. doi: 10.1002/ueg2.12097. Epub 2021 Jun 21. PMID: 34153172; PMCID: PMC8280794.

Front. Physiol. , 11 June 2020, Sec. Gastrointestinal Sciences Volume 11 - 2020 | https://doi.org/10.3389/fphys.2020.00643



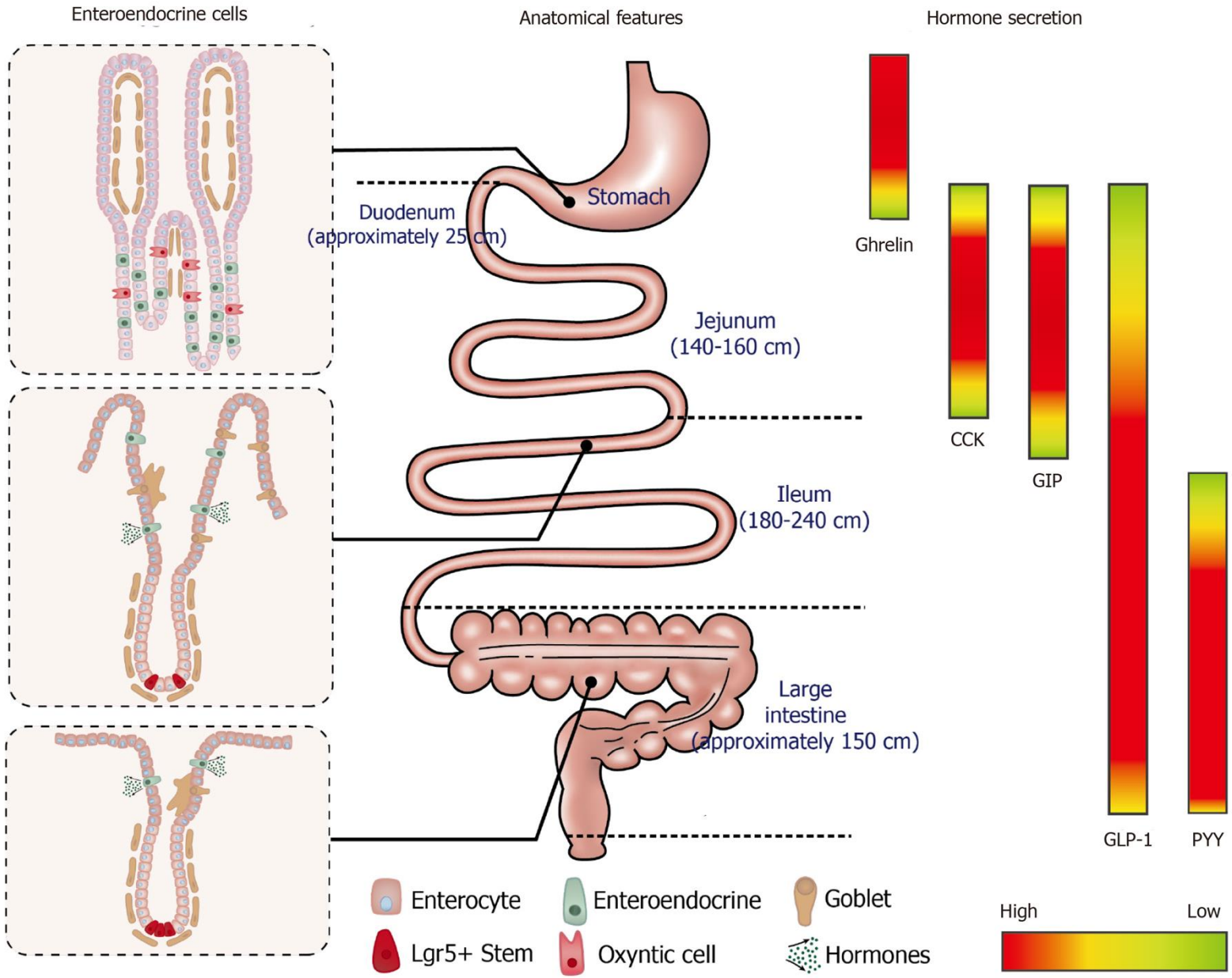
Οι φυτικές ίνες, ιδιαίτερα οι **διαλυτές ίνες**, **ζυμώνονται στο έντερο** και παράγουν **βραχείας αλυσίδας λιπαρά οξέα (SCFAs)**, τα οποία ενισχύουν περαιτέρω το **PYY και το GLP-1**, ενισχύοντας το αίσθημα πληρότητας.

Οι φυτικές ίνες, ειδικά οι διαλυτές (όπως στη βρώμη, τα φασόλια και ο λιναρόσπορος), σχηματίζουν μια **πηκτή ουσία** στο στομάχι, αυξάνοντας το **ιξώδες** της τροφής και καθυστερώντας την έξοδό της.

Οι φυτικές ίνες μειώνουν επιπλέον την απορρόφηση της γλυκόζης, διατηρώντας τα **επίπεδα ενέργειας σταθερά και μειώνοντας τις λιγούρες**.

Οι φυτικές ίνες θρέφουν τα ωφέλιμα βακτήρια του εντέρου, που παράγουν **SCFAs (όπως το βουτυρικό και το προπιονικό οξύ)**, τα οποία αυξάνουν την παραγωγή ορμονών κορεσμού και επηρεάζουν τον **υποθάλαμο** μειώνοντας την πείνα.

Οι **τροφές με φυτικές ίνες** (όπως τα λαχανικά, τα όσπρια και τα δημητριακά ολικής αλέσεως) **αυξάνουν τον όγκο των γευμάτων** χωρίς πολλές θερμίδες, **διατείνοντας το στομάχι** και ενεργοποιώντας **μηχανικούς υποδοχείς κορεσμού**.


Enteroendocrine cells
Anatomical features
Hormone secretion
Duodenum
(approximately 25 cm)
Stomach
Jejunum
(140-160 cm)
Ileum
(180-240 cm)
Large
intestine
(approximately 150 cm)
Ghrelin
CCK
GIP
GLP-1
PYY
Enterocyte
Enteroendocrine
Goblet
Lgr5+ Stem
Oxyntic cell
Hormones
High
Low

ΤΜΗΜΑ ΒΙΟΧΗΜΕΙΑΣ & ΒΙΟΤΕΧΝΟΛΟΓΙΑΣ
ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
25 ΧΡΟΝΙΑ

ΣΥΝΟΨΗ

- **Η μεγάλη πλειοψηφία των βιοχημικών και γενετικών εξελικτικών προσαρμογών του ανθρώπινου είδους έγιναν για την κατανάλωση φυτικών τροφών**
- **Σε μια διατροφή με ποικιλία τροφών λαμβάνουμε την απαραίτητη ποσότητα και ποιότητα πρωτεΐνης**
- **Η ζωική πρωτείνη δεν είναι απαραίτητη για την ανάπτυξη μυικής μάζας**
- **Η διαφορά βιοδιαθεσιμότητας μεταξύ ζωικών και φυτικών πρωτεινών είναι μικρή**
- **Οι φυτικές πηγές πρωτείνης μπορούν να προκαλέσουν μεγαλύτερη αίσθηση κορεσμού**

ΤΜΗΜΑ
ΒΙΟΧΗΜΕΙΑΣ &
ΒΙΟΤΕΧΝΟΛΟΓΙΑΣ
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