

**Gut health feature:**

**Jenny Logan:**

- (1) Magnusson KR, Hauck L, Jeffrey BM, et al. Relationships between diet-related changes in the gut microbiome and cognitive flexibility. *Neuroscience*. 2015;300:128-140. doi:10.1016/j.neuroscience.2015.05.016
- (2) Lawrence A David et al; Diet rapidly and reproducibly alters the human gut microbiome; *Nature*. 2014 Jan 23; 505(7484): 559–563.
- (3) Kim MS, Hwang SS, Park EJ, Bae JW. Strict vegetarian diet improves the risk factors associated with metabolic diseases by modulating gut microbiota and reducing intestinal inflammation. *Environ Microbiol Rep*. 2013;5(5):765-775. doi:10.1111/1758-2229.12079
- (4) Paulina Markowiak and Katarzyna Ślizewska; Effects of Probiotics, Prebiotics, and Synbiotics on Human Health; *Nutrients*. 2017 Sep; 9(9): 1021.
- (5) Eamonn M M Quigley; *Gastrointestinal Hepatol*; 2013; Sept; 9(9):560-569
- (6) Synbalance LP a super performing probiotic; *NutraCos Nov/Dec 2012*
- (7) Valerio Mezzasalma et al; A Randomized, Double-Blind, Placebo-Controlled Trial: The Efficacy of Multispecies Probiotic Supplementation in Alleviating Symptoms of Irritable Bowel Syndrome Associated with Constipation; *BioMed Research International Volume 2016, Article ID 4740907*
- (8) Efficacy and safety of the probiotic *Saccharomyces boulardii* for the prevention and therapy of gastrointestinal disorders; *Therap Adv Gastroenterol*. 2012 Mar; 5(2): 111–125.
- (9) Colonization of Intestinal Mucosa by *L. casei* & *rhamnosus* Juor. *Clin. Micro*, March 2003
- (10) Saavedra JM et al Feeding *Streptococcus Thermophilus*...for the prevention of diarrhoea *Lancet* 344 (8929)
- (11) Veronica Lazar et al; Aspects of Gut Microbiota and Immune System Interactions in Infectious Diseases, *Front Immunol*. 2018; 9: 1830.
- (12) [nutraingredients.com/Article/2020/05/18/Scientists-urge-UK-gov-to-look-at-gut-s-role-in-coronavirus](https://nutraingredients.com/Article/2020/05/18/Scientists-urge-UK-gov-to-look-at-gut-s-role-in-coronavirus)

**Patrick Holford:**

<https://www.medicalnewstoday.com/articles/covid-19-digestive-symptoms-are-common>

[https://journals.lww.com/ajg/Documents/COVID\\_Digestive\\_Symptoms\\_AJG\\_Preproof.pdf](https://journals.lww.com/ajg/Documents/COVID_Digestive_Symptoms_AJG_Preproof.pdf)

**Ask the experts:**

**Karen Jones:**

Akiba, S. et al. (2000) Involvement of Lipxygenase Pathway in Docosapentaenoic Acid-Induced Inhibition of Platelet Aggregation. *Biological & Pharmaceutical Bulletin*. 23 (11), 1293-1297.

Drouin, G. et al. (2019) Comparative effects of dietary n-3 docosapentaenoic acid (DPA), DHA and EPA on plasma lipid parameters, oxidative status and fatty acid tissue composition. *The Journal of Nutritional Biochemistry*. 63186-196.

Drouin, G. et al. (2019) The n-3 docosapentaenoic acid (DPA): A new player in the n-3 long chain polyunsaturated fatty acid family. *Biochimie*. 15936-48.

Kaur, G. et al. (2011) Docosapentaenoic acid (22:5n-3) down-regulates the expression of genes involved in fat synthesis in liver cells. *Prostaglandins, Leukotrienes and Essential Fatty Acids*. 85 (3-4), 155-161.

Koletzko, B. et al. (1988) Fatty acid composition of mature human milk in Germany. *The American Journal of Clinical Nutrition*. 47 (6), 954-959.

Leng, G. et al. (1994) Plasma essential fatty acids, cigarette smoking, and dietary antioxidants in peripheral arterial disease. A population-based case-control study. *Arteriosclerosis and Thrombosis: A Journal of Vascular Biology*. 14 (3), 471-478.

Leng, X. et al. (2018) All n-3 PUFA are not the same: MD simulations reveal differences in membrane organization for EPA, DHA and DPA. *Biochimica et Biophysica Acta (BBA) - Biomembranes*. 1860 (5), 1125-1134.

Mozaffarian, D. et al. (2013) Plasma Phospholipid Long-Chain  $\omega$ -3 Fatty Acids and Total and Cause-Specific Mortality in Older Adults. *Annals of Internal Medicine*. 158 (7), 515.

Pinto, T. et al. (2016) Serum n-3 polyunsaturated fatty acids are inversely associated with longitudinal changes in depressive symptoms during pregnancy. *Epidemiology and Psychiatric Sciences*. 26 (2), 157-168.

Skulas-Ray, A. et al. (2015) Red Blood Cell Docosapentaenoic Acid (DPA n-3) is Inversely Associated with Triglycerides and C-reactive Protein (CRP) in Healthy Adults and Dose-Dependently Increases Following n-3 Fatty Acid Supplementation. *Nutrients*. 7 (8), 6390-6404.

Weylandt, K. (2016) Docosapentaenoic acid derived metabolites and mediators – The new world of lipid mediator medicine in a nutshell. *European Journal of Pharmacology*. 785108-115.

### Joint health feature:

1. Lyle, B. "Nutritional Strategies to Promote Muscle and Joint Health", Kerry Health and Nutrition Institute. <https://khni.kerry.com/wp-content/uploads/2017/02/11318-KHNI-White-Paper-Muscle-Joint-Health.pdf>
2. World Health Organization. "Falls." Fact sheet #344. October 2012
3. Sozen, T., Ozisik, L., & Calik Basaran, N. (2016). An overview and management of osteoporosis. *European Journal of Rheumatology*, 4(1), 46–56. <https://doi.org/10.5152/eurjrheum.2016.048>
4. Kuo, T. R., & Chen, C. H. (2017). Bone biomarker for the clinical assessment of osteoporosis: Recent developments and future perspectives. *Biomarker Research*, 5(1), 5–13. <https://doi.org/10.1186/S40364-017-0097-4>
5. Sozen, T., Ozisik, L., & Calik Basaran, N. (2016). An overview and management of osteoporosis. *European Journal of Rheumatology*, 4(1), 46–56. <https://doi.org/10.5152/eurjrheum.2016.048>
6. Klein-Nulend, J., van Oers, R. F. M., Bakker, A. D., & Bacabac, R. G. (2015). Bone cell mechanosensitivity, estrogen deficiency, and osteoporosis. *Journal of Biomechanics*, 48(5), 855–865. <https://doi.org/10.1016/j.jbiomech.2014.12.007>

7. Iannone, F and G Lapadula. "Obesity and inflammation--targets for OA therapy." *Curr Drug Targets*. 2010 May;11(5):586-98.
8. Arthritis Research UK, Prevalence of osteoarthritis in England and local authorities: Birmingham, Public Health England, <https://www.versusarthritis.org/media/13374/birmingham-oa-1.pdf>
9. Guh DP, Zhang W, Bansback N, Amarsi Z, Birmingham CL, Anis AH. The incidence of co-morbidities related to obesity and overweight: a systematic review and meta-analysis. *BMC Public Health*. 2009 Mar 25;9:88. doi: 10.1186/1471-2458-9-88. PMID: 19320986; PMCID: PMC2667420.
10. Morgan, O. J., Hillstrom, H. J., Ellis, S. J., Golightly, Y. M., Russell, R., Hannan, M. T., Deland, J. T., 3rd, & Hillstrom, R. (2019). Osteoarthritis in England: Incidence Trends From National Health Service Hospital Episode Statistics. *ACR open rheumatology*, 1(8), 493–498. <https://doi.org/10.1002/acr2.11071>
11. Bruyère, O., Burlet, N., Delmas, P. D., Rizzoli, R., Cooper, C., & Reginster, J. Y. (2008). Evaluation of symptomatic slow-acting drugs in osteoarthritis using the GRADE system. *BMC musculoskeletal disorders*, 9, 165. <https://doi.org/10.1186/1471-2474-9-165>
12. National Health Service, (2020), "Vitamin C" <https://www.nhs.uk/conditions/vitamins-and-minerals/vitamin-c/>
13. Cashman, K. D., van den Heuvel, E. G., Schoemaker, R. J., Prévéraud, D. P., Macdonald, H. M., & Arcot, J. (2018). 25-Hydroxyvitamin D as a Biomarker of Vitamin D Status and Its Modeling to Inform Strategies for Prevention of Vitamin D Deficiency within the Population. *Advances in Nutrition: An International Review Journal*, 8(6), 947–957. <https://doi.org/10.3945/an.117.015578>
14. B Laurence Riggs, Sundeep Khosla and L. Joesph Melton (2002). Sex Steroids and the Construction and Conservation of. *Endocrine Reviews*, 23(3), 279–302. <https://doi.org/10.1210/er.23.3.279>
15. Institute of Medicine. "Dietary reference intakes for vitamin C, vitamin E, selenium and carotenoids." Washington, DC: The National Academies Press 2000
16. Krasnokutsky S, Samuels J, Abramson SB. Osteoarthritis in 2007. *Bull NYU Hosp Jt Dis*. 2007;65(3):222-8. PMID: 17922674.