

May 16, 2022

Admiral Rachel L. Levine, MD
Assistant Secretary for Health, U.S. Public Health Service
Office of the Assistant Secretary for Health
US Department of Health and Human Services

Janet de Jesus, MS, RD
Nutrition Advisor
Office of Disease Prevention and Health Promotion
US Department of Health and Human Services

Re: Federal Register # 2022-08043; Request for Comments on Scientific Questions to be Examined to Support the Development of the Dietary Guidelines for Americans, 2025-2030

Dear Assistant Secretary Levine and Ms. de Jesus,

Thank you for the opportunity to provide input into the formative process of the next edition of the Dietary Guidelines for Americans (DGA). We applaud the decisions of HHS and USDA to address the following elements:

- Focus on food-based strategies that can be used to help individuals implement the DGAs and prevent or manage overweight and obesity.
- Assess the role of ultra-processed foods (UPF) and relationship to growth, size, body composition, risk of overweight/obesity, weight loss, and maintenance.
- Application of a health equity lens to the scientific questions to ensure the DGAs are relevant to people with diverse racial, ethnic, socioeconomic, and cultural backgrounds.
- Examination of the relationships between:
 - Food sources of added sugars to overweight/obesity and type 2 diabetes, and saturated fat and cardiovascular disease.
 - Timing of eating (address diet trends such as intermittent fasting) and overweight/obesity and alignment with healthy dietary patterns.
 - “Specific food-based strategies” and overweight/obesity.
- Sustainability and the complex interrelationships between agriculture production, nutrition, and climate change.

In addition, to strengthen the process and achieve the critical goals of the DGA, we strongly urge HHS and USDA to take the following actions as they embark on these critical discussions (bibliographies are included at the end):

1. Add to the current list of scientific questions to be reviewed by the DGAC (see bibliography):

<p>Refined Grains and Starches</p> <p><i>What is the relationship between food sources of refined grains and starches consumed and:</i></p> <ul style="list-style-type: none"> • <i>growth, size, body composition, risk of overweight and obesity, and weight loss and maintenance?</i> • <i>risk of type 2 diabetes?</i> • <i>risk of cardiovascular diseases?</i>
--

<p>Dairy Fat</p> <p><i>What is the relationship between consumption of whole fat, reduced fat, and non-fat dairy foods – both separately and jointly considering milk, cheese, and yogurt – and:</i></p> <ul style="list-style-type: none"> • <i>growth, size, body composition, risk of overweight and obesity, and weight loss and maintenance?</i> • <i>risk of type 2 diabetes?</i> • <i>risk of cardiovascular diseases?</i>

2. Establish a Clear Classification System for Ultra-Processed Foods (UPF)

While we support HHS and USDA in addressing the relationship between consumption of dietary patterns with varying amounts of UPF and growth, size, body composition, risk of overweight and obesity, and weight loss and maintenance for the next edition of the DGAs, we strongly encourage the agencies to work closely with FDA to first establish a clear taxonomy of processed and ultra-processed foods. A taxonomy of the spectrum of food processing, such as NOVA or EPIC, is essential before conducting systematic reviews, food pattern modeling, or data analyses. Food-based dietary guidance in Brazil and Canada currently address UPF.

In response to the increase in scientific studies that link the consumption of UPF with greater risk of diet-related non-communicable diseases, we recommend expanding the scientific question to include:

<p>Ultra-Processed Foods</p> <p><i>What is the relationship between consumption of dietary patterns with varying classifications and amounts of ultra-processed foods and:</i></p> <ul style="list-style-type: none"> • <i>meeting recommended nutrient and food targets?</i> • <i>risk of type 2 diabetes?</i> • <i>risk of cardiovascular disease?</i> • <i>risk of certain types of cancer (breast, colorectal, lung, and prostate)?</i>
--

3. Address Sustainability, Climate-Smart Dietary Patterns, and National Nutrition Security as a Parallel Convergent Process

We also support the commitment to establish a parallel, yet separate, process for developing recommendations on how to achieve climate-smart dietary patterns that support household, community, and population nutrition security. There is a tremendous urgency for the U.S. to address the profound impacts of climate on the food supply and nutrition security and to advance strategic research and policy solutions that ensure:

- All individuals have consistent access, availability, and affordability of foods and beverages that promote well-being and prevent disease.
- Greater resilience of agricultural and food systems.
- Long-term capacity of natural resources (i.e., soil, water, energy, biodiversity) that supports a nutritious food supply.

As we have learned from current events - wildfires in the west, droughts in the Midwest, the global COVID-19 pandemic, and with the war in Ukraine - the U.S. needs a national strategy to ensure stability and resilience of domestic agriculture and food systems that support healthy dietary patterns, both now and in the future. This includes applying a systems approach to predicting how mitigation and adaptation measures to address climate change impact agriculture and food systems, their agility and resilience to chronic disruptions, and impact on access and consumption of foods that support healthy eating patterns.

Other countries such as Brazil, Canada, Denmark, France, Germany, Iceland, Sweden, and others have introduced environmental aspects into their food-based dietary guidance systems. The U.S. has an opportunity to lead the dialog, science, and policy recommendations on climate-smart dietary patterns and nutrition security. The time for having a robust, multidimensional national strategy that advances healthy dietary patterns, sustainable food systems, and adaptive climate change is now. These efforts would not only inform the 2025 and future editions of the DGAs but will inform food and nutrition assistance programs, chronic disease prevention efforts, energy and natural resource conservation, public health preparedness, and even national defense. The multifold gains will be significant steps toward establishing a state of nutrition security and resilience.

We recommend the following process for HHS and USDA to establish climate-smart dietary patterns that support national nutrition security:

- 1) Assemble an interdisciplinary team comprised of Federal staff from HHS, USDA, EPA, NOAA, USAID, Interior, DOD, and others to develop the process for developing research and policy recommendations on climate-smart dietary patterns to support national nutrition security. Three co-executive secretaries should be appointed. This intergovernmental team will:
 - a) Develop a project management plan that aligns with the process designed by HHS and USDA to revise the DGAs (<https://www.dietaryguidelines.gov/work-under-way/learn-about-process>).

- i) The plan shall include a formal crosswalk between these concurrent efforts and in which the results of the climate-smart dietary patterns advisory committee are published and informs the work of the 2025 DGAC.
- b) Determine the methods and protocol for conducting rigorous systematic reviews of the scientific literature, data and predictive analyses, and system modeling and identify the scientific team to oversee the multi-prong analyses.
- c) Establish a charter for a Climate-Smart Dietary Patterns and National Nutrition Security Federal Advisory Committee (FAC).
- d) Launch a website to serve as a repository of the work of the FAC.
- e) Solicit nominations and appoint a FAC that includes individuals who are respected and have demonstrated research and scientific publication experience. This includes agronomists, horticulturalists and seed scientists; climatologist, ecologists, and environmental scientists; animal scientists, entomologists, and marine scientists; registered dietitian nutritionists, nutrition scientists, public health practitioners, and physicians; food scientists and microbiologists; environmental engineers; and health informatic analysts, data scientists, and systems modelers. The FAC would:
 - i) Work collaboratively with the Federal advisory team to develop the scientific research questions which would be made available for public comment. These questions would encompass a health equity lens.
 - ii) Review, deliberate, and summarize the scientific evidence, data, and models.
 - iii) Submit a scientific report with research and policy recommendations to the coordinating Federal agencies and to the 2025 DGAC. The scientific report would be made available to the public for review and comment for a minimum of 90 days.

Thank you for this opportunity to provide comments to these critical issues. We look forward to the work of the 2025 Dietary Guidelines Advisory Committee and the next edition of the DGAs.

Sincerely,

Angie Tagtow, MS, RD, LD
Founder & Chief Strategist, Äkta Strategies, LLC
Doctoral Student, University of Illinois, School of Public Health
Fellow National Leadership Academy for the Public's Health
Former Executive Director, USDA Center for Nutrition Policy and Promotion
Senior Fellow and Endowed Chair, Minnesota Institute for Sustainable Agriculture, University of Minnesota College of Food, Agriculture, and Natural Resource Sciences

Dariush Mozaffarian, MD, DrPH
Dean
Jean Mayer Professor of Nutrition, Friedman School of Nutrition Sciences & Policy
Tufts University
Professor of Medicine
Tufts School of Medicine and Division of Cardiology
Tufts Medical Center

Bibliography

Refined Grains and Starches

[Changes in diet and lifestyle and long-term weight gain in women and men.](#) Mozaffarian D, Hao T, Rimm EB, Willett WC, Hu FB. *N Engl J Med.* 2011 Jun 23;364(25):2392-404.

[A Systematic Review and Meta-Analysis of Randomized Controlled Trials on the Effects of Oats and Oat Processing on Postprandial Blood Glucose and Insulin Responses.](#) Musa-Veloso K, Noori D, Venditti C, Poon T, Johnson J, Harkness LS, O'Shea M, Chu Y. *J Nutr.* 2021 Feb 1;151(2):341-351

[Associations of Whole Grain and Refined Grain Consumption With Metabolic Syndrome. A Meta-Analysis of Observational Studies.](#) Guo H, Ding J, Liang J, Zhang Y. *Front Nutr.* 2021 Jul 1;8:695620

[Effects of Whole Grain Intake, Compared with Refined Grain, on Appetite and Energy Intake: A Systematic Review and Meta-Analysis.](#) Sanders LM, Zhu Y, Wilcox ML, Koecher K, Maki KC. *Adv Nutr.* 2021 Jul 30;12(4):1177-1195

[Whole Grains, Refined Grains, and Cancer Risk: A Systematic Review of Meta-Analyses of Observational Studies.](#) Gaesser GA. *Nutrients.* 2020 Dec 7;12(12):3756.

[The Effect of Replacing Refined Grains with Whole Grains on Cardiovascular Risk Factors: A Systematic Review and Meta-Analysis of Randomized Controlled Trials with GRADE Clinical Recommendation.](#) Marshall S, Petocz P, Duve E, Abbott K, Cassettari T, Blumfield M, Fayet-Moore F. *J Acad Nutr Diet.* 2020 Nov;120(11):1859-1883.e31

[Grain consumption and risk of gastric cancer: a meta-analysis.](#) Wang T, Zhan R, Lu J, Zhong L, Peng X, Wang M, Tang S. *Int J Food Sci Nutr.* 2020 Mar;71(2):164-175.

[Food Groups and Risk of Overweight, Obesity, and Weight Gain: A Systematic Review and Dose-Response Meta-Analysis of Prospective Studies.](#) Schlesinger S, Neuenschwander M, Schwedhelm C, Hoffmann G, Bechthold A, Boeing H, Schwingshackl L. *Adv Nutr.* 2019 Mar 1;10(2):205-218

[The effects of whole-grain compared with refined wheat, rice, and rye on the postprandial blood glucose response: a systematic review and meta-analysis of randomized controlled trials.](#) Musa-Veloso K, Poon T, Harkness LS, O'Shea M, Chu Y. *Am J Clin Nutr.* 2018 Oct 1;108(4):759-774

[Meta-Analysis of the Association Between Whole and Refined Grain Consumption and Stroke Risk Based on Prospective Cohort Studies.](#) Chen J, Huang Q, Shi W, Yang L, Chen J, Lan Q. *Asia Pac J Public Health.* 2016 Oct;28(7):563-575

[Dietary potato intake and risks of type 2 diabetes and gestational diabetes mellitus.](#) Guo F, Zhang Q, Jiang H, He Y, Li M, Ran J, Lin J, Tian L, Ma L. *Clin Nutr.* 2021 Jun;40(6):3754-3764

[Potato Consumption and Risk of Site-Specific Cancers in Adults: A Systematic Review and Dose-Response Meta-Analysis of Observational Studies.](#) Darooghegi Mofrad M, Mozaffari H, Askari MR, Amini MR, Jafari A, Surkan PJ, Azadbakht L. *Adv Nutr.* 2021 Oct 1;12(5):1705-1722

[Processed potatoes intake and risk of type 2 diabetes: a systematic review and meta-analysis of nine prospective cohort studies.](#) Quan W, Jiao Y, Xue C, Li Y, Wang Z, Zeng M, Qin F, He Z, Chen J. *Crit Rev Food Sci Nutr.* 2022;62(5):1417-1425

Dairy Fat

[Association of dairy consumption with metabolic syndrome, hypertension and diabetes in 147 812 individuals from 21 countries.](#) Bhavadharini B, Dehghan M, Mente A, Rangarajan S, Sheridan P, Mohan V, Iqbal R, Gupta R, Lear S, Wentzel-Viljoen E, Avezum A, Lopez-Jaramillo P, Mony P, Varma RP, Kumar R, Chifamba J, Alhabib KF, Mohammadifard N, Oguz A, Lanas F, Rozanska D, Bengtsson Bostrom K, Yusoff K, Tsolkile LP, Dans A, Yusufali A, Orlandini A, Poirier P, Khatib R, Hu B, Wei L, Yin L, Deeraili A, Yeates K, Yusuf R, Ismail N, Mozaffarian D, Teo K, Anand SS, Yusuf S. *BMJ Open Diabetes Res Care.* 2020 Apr;8(1):e000826. doi: 10.1136/bmjdr-2019-000826.PMID: 32423962

[Dairy Consumption and Total Cancer and Cancer-Specific Mortality: A Meta-Analysis of Prospective Cohort Studies.](#) Jin S, Je Y. *Adv Nutr.* 2021 Nov 11:nmab135. doi: 10.1093/advances/nmab135. Online ahead of print.PMID: 34788365

[Dairy Foods, Obesity, and Metabolic Health: The Role of the Food Matrix Compared with Single Nutrients.](#) Mozaffarian D. *Adv Nutr.* 2019 Sep 1;10(5):917S-923S. doi: 10.1093/advances/nmz053.PMID: 31518410

[Fatty acid biomarkers of dairy fat consumption and incidence of type 2 diabetes: A pooled analysis of prospective cohort studies.](#) Imamura F, Fretts A, Marklund M, Ardisson Korat AV, Yang WS, Lankinen M, Qureshi W, Helmer C, Chen TA, Wong K, Bassett JK, Murphy R, Tintle N, Yu CI, Brouwer IA, Chien KL, Frazier-Wood AC, Del Gobbo LC, Djoussé L, Geleijnse JM, Giles GG, de Goede J, Gudnason V, Harris WS, Hodge A, Hu F; InterAct Consortium, Koulman A, Laakso M, Lind L, Lin HJ, McKnight B, Rajaobelina K, Risérus U, Robinson JG, Samieri C, Siscovick DS, Soedamah-Muthu SS, Sotoodehnia N, Sun Q, Tsai MY, Uusitupa M, Wagenknecht LE, Wareham NJ, Wu JH, Micha R, Forouhi NG, Lemaitre RN, Mozaffarian D; Fatty Acids and Outcomes Research Consortium (FORCE). *PLoS Med.* 2018 Oct 10;15(10):e1002670. doi: 10.1371/journal.pmed.1002670. eCollection 2018 Oct.PMID: 30303968

[Biomarkers of dairy fat intake, incident cardiovascular disease, and all-cause mortality: A cohort study, systematic review, and meta-analysis.](#) Trieu K, Bhat S, Dai Z, Leander K, Gigante B, Qian F, Korat AVA, Sun Q, Pan XF, Laguzzi F, Cederholm T, de Faire U, Hellénus ML, Wu JHY, Risérus U, Marklund M. *PLoS Med.* 2021 Sep 21;18(9):e1003763.

[Food sources of fat may clarify the inconsistent role of dietary fat intake for incidence of type 2 diabetes.](#) Ericson U, Hellstrand S, Brunkwall L, Schulz CA, Sonestedt E, Wallström P, Gullberg B, Wirfält E, Orho-Melander M. *Am J Clin Nutr.* 2015 May;101(5):1065-80

[Association of dairy intake with cardiovascular disease and mortality in 21 countries from five continents \(PURE\): a prospective cohort study.](#) Dehghan M, Mente A, Rangarajan S, Sheridan P, Mohan V, Iqbal R, Gupta R, Lear S, Wentzel-Viljoen E, Avezum A, Lopez-Jaramillo P, Mony P, Varma RP, Kumar R, Chifamba J, Alhabib KF, Mohammadifard N, Oguz A, Lanan F, Rozanska D, Bostrom KB, Yusoff K, Tsolkile LP, Dans A, Yusufali A, Orlandini A, Poirier P, Khatib R, Hu B, Wei L, Yin L, Deereaili A, Yeates K, Yusuf R, Ismail N, Mozaffarian D, Teo K, Anand SS, Yusuf S; Prospective Urban Rural Epidemiology (PURE) study investigators. *Lancet.* 2018 Nov 24;392(10161):2288-2297. doi: 10.1016/S0140-6736(18)31812-9. Epub 2018 Sep 11. PMID: 30217460

[Serial measures of circulating biomarkers of dairy fat and total and cause-specific mortality in older adults: the Cardiovascular Health Study.](#) de Oliveira Otto MC, Lemaitre RN, Song X, King IB, Siscovick DS, Mozaffarian D. *Am J Clin Nutr.* 2018 Sep 1;108(3):476-484. doi: 10.1093/ajcn/nqy117.

[Associations of dairy product consumption with mortality in the European Prospective Investigation into Cancer and Nutrition \(EPIC\)-Italy cohort.](#) Pala V, Sieri S, Chiodini P, Masala G, Palli D, Mattiello A, Panico S, Tumino R, Frasca G, Fasanelli F, Ricceri F, Agnoli C, Grioni S, Krogh V. *Am J Clin Nutr.* 2019 Nov 1;110(5):1220-1230

[Dairy Product Consumption and Cardiovascular Health: a Systematic Review and Meta-Analysis of Prospective Cohort Studies.](#) Chen Z, Ahmed M, Ha V, Jefferson K, Malik V, Ribeiro PAB, Zuchinali P, Drouin-Chartier JP. *Adv Nutr.* 2021 Sep 22;13(2):439-54.

[Changes in diet and lifestyle and long-term weight gain in women and men.](#) Mozaffarian D, Hao T, Rimm EB, Willett WC, Hu FB. *N Engl J Med.* 2011 Jun 23;364(25):2392-404.

[Is Butter Back? A Systematic Review and Meta-Analysis of Butter Consumption and Risk of Cardiovascular Disease, Diabetes, and Total Mortality.](#) Pimpin L, Wu JH, Haskelberg H, Del Gobbo L, Mozaffarian D. *PLoS One.* 2016 Jun 29;11(6):e0158118. doi: 10.1371/journal.pone.0158118. eCollection 2016. PMID: 27355649

[Natural trans fat, dairy fat, partially hydrogenated oils, and cardiometabolic health: the Ludwigshafen Risk and Cardiovascular Health Study.](#) Mozaffarian D. *Eur Heart J.* 2016 Apr 1;37(13):1079-81. doi: 10.1093/eurheartj/ehv595. Epub 2015 Nov 17.

[Dairy foods, dairy fat, diabetes, and death: what can be learned from 3 large new investigations?](#) Mozaffarian D. *Am J Clin Nutr.* 2019 Nov 1;110(5):1053-1054. doi: 10.1093/ajcn/nqz250.

[Dairy consumption and risk of type 2 diabetes: 3 cohorts of US adults and an updated meta-analysis.](#) Chen M, Sun Q, Giovannucci E, Mozaffarian D, Manson JE, Willett WC, Hu FB. *BMC Med.* 2014 Nov 25;12:215. doi: 10.1186/s12916-014-0215-1.

[Circulating biomarkers of dairy fat and risk of incident stroke in U.S. men and women in 2 large prospective cohorts.](#) Yakoob MY, Shi P, Hu FB, Campos H, Rexrode KM, Orav EJ, Willett WC, Mozaffarian D. *Am J Clin Nutr.* 2014 Dec;100(6):1437-47. doi: 10.3945/ajcn.114.083097. Epub 2014 Sep 24.

Ultra-Processed Foods

Baraldi, L. G., Martinez Steele, E., Canella, D. S., & Monteiro, C. A. (2018). Consumption of ultra-processed foods and associated sociodemographic factors in the USA between 2007 and 2012: evidence from a nationally representative cross-sectional study. *BMJ Open*, 8(3), e020574.

De Amicis R, Mambrini SP, Pellizzari M, et al. Ultra-processed foods and obesity and adiposity parameters among children and adolescents: a systematic review [published online ahead of print, 2022 Mar 24]. *Eur J Nutr.* 2022;1-15. doi:10.1007/s00394-022-02873-4

Elizabeth L, Machado P, Zinöcker M, Baker P, Lawrence M. Ultra-Processed Foods and Health Outcomes: A Narrative Review. *Nutrients.* 2020;12(7):1955. Published 2020 Jun 30. doi:10.3390/nu12071955

Garzillo JMF, Poli VFS, Leite FHM, Martinez-Steele E, Machado PP, Louzada MLC, et al. Ultra-processed food intake and diet carbon and water footprints: a national study in Brazil. *Rev Saude Publica.* 2022;56:6. <https://doi.org/10.11606/s1518-8787.2022056004551>

Gramza-Michałowska A. The Effects of Ultra-Processed Food Consumption-Is There Any Action Needed?. *Nutrients.* 2020;12(9):2556. Published 2020 Aug 24. doi:10.3390/nu12092556

Livingston AS, Cudhea F, Wang L, et al. Effect of reducing ultraprocessed food consumption on obesity among US children and adolescents aged 7-18 years: evidence from a simulation model. *BMJ Nutr Prev Health.* 2021;4(2):397-404. Published 2021 Jul 7. doi:10.1136/bmjnp-2021-000303

Louzada ML, Baraldi LG, Steele EM, Martins AP, Canella DS, Moubarac JC, Levy RB, Cannon G, Afshin A, Imamura F, Mozaffarian D, Monteiro CA. [Consumption of ultra-processed foods and obesity in Brazilian adolescents and adults.](#) *Prev Med.* 2015 Dec;81:9-15. doi: 10.1016/j.ypmed.2015.07.018. Epub 2015 Jul 29. PMID: 26231112

Machado PP, Steele EM, Levy RB, et al. Ultra-processed food consumption and obesity in the Australian adult population. *Nutr Diabetes.* 2020;10(1):39. Published 2020 Dec 5. doi:10.1038/s41387-020-00141-0

Martínez Steele E, Baraldi LG, Louzada ML, Moubarac JC, Mozaffarian D, Monteiro CA. Ultra-processed foods and added sugars in the US diet: evidence from a nationally representative cross-sectional study. *BMJ Open.* 2016;6(3):e009892. Published 2016 Mar 9. doi:10.1136/bmjopen-2015-009892

Martínez Steele E, Popkin BM, Swinburn B, Monteiro CA. The share of ultra-processed foods and the overall nutritional quality of diets in the US: evidence from a nationally representative cross-sectional study. *Popul Health Metr.* 2017;15(1):6. Published 2017 Feb 14. doi:10.1186/s12963-017-0119-3

Monteiro CA, Moubarac JC, Levy RB, Canella DS, Louzada MLDC, Cannon G. Household availability of ultra-processed foods and obesity in nineteen European countries. *Public Health Nutr.* 2018;21(1):18-26. doi:10.1017/S1368980017001379

Monteiro, C.A., Cannon, G., Lawrence, M., Costa Louzada, M.L. and Pereira Machado, P. 2019. Ultra-processed foods, diet quality, and health using the NOVA classification system. Rome, FAO.

Monteiro, C.A.; Cannon, G.; Lawrence, M.; Costa Louzada, M.L.; Pereira Machado, P. Ultra-Processed Foods, Diet Quality, and Health Using the NOVA Classification System; Food and Agriculture Organization of the United Nations (FAO): Rome, Italy, 2019.

Moubarac JC, Parra DC, Cannon G, Monteiro CA. Food Classification Systems Based on Food Processing: Significance and Implications for Policies and Actions: A Systematic Literature Review and Assessment. *Curr Obes Rep.* 2014;3(2):256-272. doi:10.1007/s13679-014-0092-0

Musa-Veloso K, Noori D, Venditti C, Poon T, Johnson J, Harkness LS, O'Shea M, Chu Y. [A Systematic Review and Meta-Analysis of Randomized Controlled Trials on the Effects of Oats and Oat Processing on Postprandial Blood Glucose and Insulin Responses.](#) *J Nutr.* 2021 Feb 1;151(2):341-351

Neri D, Martinez-Steele E, Monteiro CA, Levy RB. Consumption of ultra-processed foods and its association with added sugar content in the diets of US children, NHANES 2009-2014. *Pediatr Obes.* 2019;14(12):e12563. doi:10.1111/ijpo.12563

Poti JM, Mendez MA, Ng SW, Popkin BM. Is the degree of food processing and convenience linked with the nutritional quality of foods purchased by US households?. *Am J Clin Nutr.* 2015;101(6):1251-1262. doi:10.3945/ajcn.114.100925

Quan W, Jiao Y, Xue C, Li Y, Wang Z, Zeng M, Qin F, He Z, Chen J. Processed potatoes intake and risk of type 2 diabetes: a systematic review and meta-analysis of nine prospective cohort studies. *Crit Rev Food Sci Nutr.* 2022;62(5):1417-1425.

Spreadbury I. Comparison with ancestral diets suggests dense acellular carbohydrates promote an inflammatory microbiota, and may be the primary dietary cause of leptin resistance and obesity. *Diabetes Metab Syndr Obes.* 2012;5:175-89. doi: 10.2147/DMSO.S33473.