

**NUTC 0285: Current Controversies in Nutrition Science
Summer 2022**

Class Meetings: Online, via Canvas

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Pre-recorded lectures are presented by Dr. Adela Hruby and Dr. Nicole Schultz.

Office Hours: Email: Anytime (nicole.schultz@tufts.edu); will respond within 48 hours
Zoom: By appointment; email to schedule

Semester Hour Units: 3

Prerequisites: None

Course Description: Virtually no discipline attracts more public attention or generates more controversies than nutrition. The reasons for this vary. Food and nutrition can be viewed through multiple lenses: the personal, familial, communal, cultural, political, historical, and scientific. This course explores the scientific underpinnings of several hot topics and controversies, which will be examined from the perspectives of scientists and consumers (of food and media), with an undercurrent fostering self-understanding of implicit biases. The class will engage in debates and discussions designed to illuminate different perspectives. Students will have the opportunity to research, evaluate, and present their findings on a nutrition-related topic that is of concern to them.

Course Goals: By the end of the course, you will:

- Be able to identify your own biases in approaching current hot topics/controversies, in approaching sources of information about these topics, and where such biases originated
- Develop skills to critically evaluate sources of non-scientific nutrition information and misinformation, including traditional and “new” media, as well as the nutrition information itself, to become more informed consumers
- Learn how to summarize the state of scientific evidence and the gaps in knowledge of a given topic
- Understand the scientific, cultural, media, and/or political origins of nutrition controversies

Texts or Materials: With the exception of the book (below), all assigned readings listed on the schedule will be available for the duration of the semester on Canvas (<https://canvas.tufts.edu>), or via the Hirsch Health Sciences Library access system, in cases where finding the literature is part of the assignment. In this course, we rely primarily on popular media and similar readings, supplemented with peer-reviewed articles published in major medical and nutrition journals for those hoping to gain more depth of understanding (these are marked as “**Optional**”). Reading studies will be new to most of you, and you are not expected to approach these articles as scientists, or to understand every part of them.

You will be briefly introduced to how to scan a paper and how to approach it for the purposes of this course.

The required book, available on Amazon or from your favorite bookseller:

Levinovitz, Alan. *The Gluten Lie: And Other Myths About What You Eat*. Regan Arts, New York, NY. 2015. ISBN-10: 1941393063. ISBN-13: 978-1941393062.

Academic Conduct: Each student is responsible for upholding the highest standards of academic integrity, as specified in the [Friedman School's Policies and Procedures Handbook](#) and [Tufts University policies](#). It is the responsibility of each student to understand and comply with these standards, as violations will be sanctioned by penalties ranging from failure on an assignment and the course to dismissal from the school.

In addition, all documents used in preparing your work must be properly referenced, or else risk being identified as plagiarized work. Instructors and other university personnel may request that students submit written assignments to plagiarism prevention resources, websites, or other authoritative databanks, such as (but not limited to) "turnitin.com," or a similar site. These services compare student-produced documents with web content, newspapers, journals, magazines, books, student essays, and other data to determine the originality of student work.

Assessment and Grading: The assignments and discussions for this course are designed to allow you to practice and demonstrate that you understand the course and module objectives. They are both reflective and evaluative. Your Final Project will allow you to explore a controversy that is of interest to you. Please refer to the schedule of Lectures, Readings, and Assignments later in this document for details.

Contributing to your final grade are:

Reflections (10 total, 2.5 points each)	25%
Discussions (6 total, 5 points each)	30%
Assignments (9 total, 5 points each)	45%

Grading Range: The passing grade at the Friedman School is a B- or better. Also, at Friedman an A+ grade and A grade are both calculated as 4.00 grade points in a student's grade point average.

Final letter grades (A+ through F) for the course will be assigned based on the following criteria (rounded up):

90–100	A range (90–<93 = A-, 93+ = A, A+ given for superlative work)
80–89	B range (80–<83 = B-, 83–<87 = B, 87–<90 = B+)
70–79	C range (70–<73 = C-, 73–<77 = C, 77–<80 = C+)
60–69	D range (60–<63 = D-, 63–<67 = D, 67–<70 = D+)
<60	F

Instructions for Submission of Assignments and Exams: Written assignments, except for discussion transcripts/videos, should be submitted in Word, 1-inch margins, 11-point font, single-spaced, on the Canvas site. All assignments, quizzes, discussion postings, etc., must be submitted by Sunday the week they are assigned, no later than 11:59PM EST/EDT or your local time, whichever is later, unless otherwise specified. Please let your instructor know if you are taking the course in a time zone other than the east coast of the U.S. Late assignments will be accepted; however, 10% will be deducted for every day late. That said, if you have extenuating circumstances, please notify the instructor.

Accommodation of Disabilities: Tufts University is committed to providing equal access and support to all students through the provision of reasonable accommodations so that each student may access their curricula

and achieve their personal and academic potential. If you have a disability that requires reasonable accommodations, please contact the Friedman School Assistant Dean of Student Affairs at 617-636-6719 to make arrangements for determination of appropriate accommodations. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

Diversity Statement: We believe that the diversity of student experiences and perspectives is essential to the deepening of knowledge in this course. We consider it part of our responsibility as instructors to address the learning needs of all of the students in this course. We will present materials that are respectful of diversity: race, color, ethnicity, gender, age, disability, religious beliefs, political preference, sexual orientation, gender identity, socioeconomic status, citizenship, language, or national origin among other personal characteristics.

Course Topics and Assignment Schedule at a Glance: The course begins on May 25 and continues through “Final Exam Week” (August 22–28). This 14-week course is primarily organized around a handful of current hot topics/controversies, presented as case studies supported primarily by popular media pieces, accompanied by relevant research for those willing to explore and learn at a deeper level. These topics are organized in a way to allow each student to acquire greater skill in understanding the origins of putative controversies, how media often drives controversies, and how nutrition scientists understand and approach these topics.

WEEK NO.	WEEK BEGINNING	COURSE TOPIC	ASSIGNMENTS DUE BY <u>END OF WEEK</u> (11:59PM ET SUNDAY)
1	May 25	Course Introduction	Getting to Know You Survey Discussion: Class Introductions
2	May 30	Personal Biases and Reading Nutrition News	<i>A1. My World View</i>
3	June 6	Casting a Critical Eye on Nutrition Information	<i>A2. Is This Legit?</i>
4	June 13	Topic 1: Saturated Fat, Part 1	3-2-1 Reflection 1
5	June 20	Topic 1: Saturated Fat, Part 2	3-2-1 Reflection 2
6	June 27	Topic 1: Saturated Fat, Part 3	3-2-1 Reflection 3 <i>A3. What Topics Do You Think Are Controversial?</i> Canvas Discussion #1
7	July 4	Topic 2: Grains, Gluten, and Celiac, Part 1	3-2-1 Reflection 4
8	July 11	Topic 2: Grains, Gluten, and Celiac, Part 2	3-2-1 Reflection 5 <i>A4. How Has Your Thinking Evolved?</i> Canvas Discussion #2
9	July 18	Topic 3: Carb-phobia and Associated Diets, Part 1	3-2-1 Reflection 6
10	July 25	Topic 3: Carb-phobia and Associated Diets, Part 2	3-2-1 Reflection 7 <i>A5. Identify a Final Project Topic</i> Canvas Discussion #3
11	August 1	Topic 4: Dietary Supplements, Part 1	3-2-1 Reflection 8 <i>A6. Supplement Claims</i>

12	August 8	Topic 4: Dietary Supplements, Part 2	3-2-1 Reflection 9 A7. Outline of Final Project Topic Canvas Discussion #4
13	August 15	Topic 5: Organic vs. Conventional Foods, Part 1	3-2-1 Reflection 10 A8. Video Presentation of Final Project
14	August 22	Topic 5: Organic vs. Conventional Foods, Part 2	A9. Final Project due Canvas Discussion #5 Please complete the Course Evaluation

This schedule is subject to modification at the instructor's discretion.

Detailed Description of Course Topics, Assignment Schedule, and the Learning Objectives for Each Class Session:

Weeks 1 through 3

In this first part of the course, we cover the introduction to the course and the course's theoretical approach, and, moreover, begin to explore the world view with which you enter this exploration of hot topics and controversies. Your own beliefs and biases will predispose you to accepting or arguing against contradictory evidence, information, or sources. Therefore, becoming aware of these is key to your understanding how you approach the topics that follow.

Week 1: May 25-29 (half-week)

Course Topic: Course Introduction

Required Lectures/Materials:

Watch 1 lecture:

- Course Introduction

Read:

- Introduction in *The Gluten Lie*.

Assignments Due:

Review the syllabus. Organize your schedule. Get familiar with the work ahead.

Complete the "Getting to Know You" survey.

Participate in the Class Introductions Discussion.

Week 2: May 30-June 5

Course Topic: Personal Biases and Reading Nutrition News

Learning Objectives:

- Identify and describe your own personal beliefs about specific topics in food/nutrition.

- Investigate some of the origins of these beliefs and recognize how these beliefs affect your daily dietary practices.
- Explore the rigidity or fluidity of these beliefs in the face of supporting or contradictory evidence.

Required Lectures/Materials:

Watch 2 lectures:

- Understanding Your Nutrition and Media World Views
- Wheat from Chaff: How to Read Nutrition News with a Critical Eye and Identify Nutrition Experts and Imposters

Read:

- Chapters 1, 2, and 3 in *The Gluten Lie*.
- Freeman, Andrew M., et al. Trending Cardiovascular Nutrition Controversies. *JACC*. 2017; 69(9). Accessible at <http://www.onlinejacc.org/content/69/9/1172>

Assignments Due:

A1. My World View

Week 3: June 6-12

Course Topic: Casting a Critical Eye on Nutrition Information

Learning Objectives:

- Identify signatures of nutrition quackery versus nutrition expertise.
- Review and practice strategies to identify misleading nutrition information in popular and social media, blogs, infomercials, etc.

Required Lectures/Materials:

Watch 2 lectures:

- Whom Do We Trust and Why?
- Casting a Critical Eye on Nutrition Information

Read:

- Chapters 4, 5, and 6, and the “Unpacked Diet” sections in *The Gluten Lie*.
- “Improving Public Understanding: Guidelines for Communicating Emerging Science on Nutrition, Food Safety, and Health”. *Journal of National Cancer Institute*. 1998, 90(3).

Assignments Due:

A2. Is This Legit?

Weeks 4 through 6

During these weeks we begin investigating our first topic: saturated fat and specifically its role in heart health. We begin with a high-level overview of how nutrition science is conducted, how scientists accrue evidence in a given field, and how they rank different kinds of evidence. We then move into an exploration of evidence and

arguments for/against the role of saturated fat in human health, including a brief review of basic lipid-related physiology.

Week 4: June 13-19

Course Topic: Saturated Fat, Part 1

Learning Objectives:

- Explain the basics of the scientific method/approach.
- Distinguish the major types of research studies and describe the hierarchy of scientific evidence.
- Describe how nutrition scientists tend to view research and accruing evidence.
- List the different types of dietary fat and their dietary sources.
- Broadly summarize the current view of the physiological role of dietary fats in human heart health.

Required Lectures/Materials:

Watch 3 lectures:

- How Does “Science” Work?
- Getting the Gist of Nutrition Research When You’re Not a Nutrition Scientist
- The Physiology of Saturated Fat and Heart Health, in Brief

Read:

- [Read through the Executive Summary, at least] *Scientific Report of the 2020 Dietary Guidelines Advisory Committee*. 2020. U.S. Department of Agriculture (USDA). <https://www.dietaryguidelines.gov/2020-advisory-committee-report>
- [Review of latest understanding/evidence] Chapter 65: Nutrition in the Prevention of Coronary Heart Disease and the Management of Lipoprotein Disorders. Ed: Ernst J. Schaefer, in Ross, A. Catharine. (2014). *Modern nutrition in health and disease*. (11th ed. / editors, A. Catharine Ross [and others]. ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins. Accessible for free online via Tufts Hirsh Health Sciences Library.
- [**Optional** in-depth biology review] Chapter 4: Lipids, Sterols, and Their Metabolites. Ed: Peter J. H. Jones and Todd Rideout, in Ross, A. Catharine. (2014). *Modern nutrition in health and disease*. (11th ed. / editors, A. Catharine Ross [and others]. ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins. Accessible for free online via Tufts Hirsh Health Sciences Library.

Assignments Due:

3-2-1 Reflection

Week 5: June 20-26

Course Topic: Saturated Fat, Part 2

Learning Objectives:

- Summarize the readings from the nutrition science literature.
- Outline the history of dietary fat recommendations in the US, including the general timeline of evidence and the current state of the evidence on saturated fat.

Required Lectures/Materials:

Watch 2 lectures:

- Dietary Fat: A Brief History of Guidelines and Recommendations
- Saturated Fat: A Closer Look at the Timeline of Evidence, Part 1

Read:

- [Optional original research] Chowdhury, R, et al. Association of dietary, circulating, and supplement fatty acids with coronary risk: a systematic review and meta-analysis. *Ann Intern Med.* 2014; 160(6): 398-406.
- [Response to Chowdhury, et al.] Bittman, M. "Butter is back." *The New York Times.* March 25, 2014. Accessible at <http://www.nytimes.com/2014/03/26/opinion/bittman-butter-is-back.html>
- [Optional original research] Li, Y, et al. Saturated fat as compared to unsaturated fats and sources of carbohydrates in relation to risk of coronary heart disease: A prospective cohort study. *JACC.* 2015; 66(14): 1538-1548.
- [Response to Li, et al.] Boodman, E. "Replace bad fats with good foods for heart health, study says." STAT. Posted September 28, 2015. Accessible at: <http://www.bostonglobe.com/metro/2015/09/28/replace-bad-fats-with-good-foods-for-healthy-heart-study-shows/PKczKjreFQHfxSdyZ0H1xJ/story.html>

Assignments Due:

3-2-1 Reflection

Week 6: June 27-July 3

Course Topic: Saturated Fat, Part 3 (Conclusion)

Learning Objectives:

- Examine methods used in the nutrition science literature.
- Outline meta-analytic methods, their uses and their limitations.
- Identify the central arguments for/against current guidelines on saturated fat in human health.

Required Lectures/Materials:

Watch 1 lecture:

- Saturated Fat: A Closer Look at the Timeline of Evidence, Part 2

Read:

- [Optional original research] Pimpin L, et al. Is Butter Back? A Systematic Review and Meta-Analysis of Butter Consumption and Risk of Cardiovascular Disease, Diabetes, and Total Mortality. 2016. *PLoS ONE* 11(6): e0158118.
- [Response to Pimpin, et al.] Wessel, L. "Butter doesn't increase risk of heart disease after all." STAT. Posted June 29, 2016. Accessible at <https://www.statnews.com/2016/06/29/butter-cardiovascular-saturated-fat/>
- [Optional original research] Dehghan, Mahshid, et al. Associations of fats and carbohydrate intake with cardiovascular disease and mortality in 18 countries from five continents (PURE): a prospective cohort study. *The Lancet.* 2017; 390(10107): 2050–2062. Accessible at [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(17\)32252-3/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(17)32252-3/abstract)

- [Response to Dehghan, et al.] “PURE study makes headlines, but the conclusions are misleading.” The Nutrition Source. Harvard T.H. Chan School of Public Health. September 8, 2017. Accessible at <https://www.hsph.harvard.edu/nutritionsource/2017/09/08/pure-study-makes-headlines-but-the-conclusions-are-misleading/>
- [Response to Dehghan, et al.] Kahleova, Hana. “PURE Study: Killer Carbs or Poor Living Conditions?” Physicians Committee For Responsible Medicine. September 8, 2017. Accessible at <https://www.pcrm.org/news/news-releases/pure-study-killer-carbs-or-poor-living-conditions>

Assignments Due:

A3. What Topics Do You Think Are Controversial?

3-2-1 Reflection

Canvas Discussion #1

Weeks 7 and 8

Our second topic is the healthfulness of grains, with the related topics of celiac disease and gluten sensitivity.

As students are undoubtedly aware, most healthy diet recommendations include avoiding refined grains (white flour, pastries, white bread, etc.). But there are several popular dietary movements that go further and shun grains altogether, whether wheat, oats, rye, etc. The arguments underlying the grain-free approach vary but primarily focus on the evolution of humans and their diets. We explore this literature and some of the popular diets to assess the evidence about the healthfulness of grains.

Week 7: July 4-11

Course Topic: Grains, Gluten, and Celiac, Part 1

Learning Objectives:

- Distinguish grains from non-grains (i.e., other seeds), including their refining processes, and list what makes a grain a whole grain.
- Describe celiac disease and contrast it with “gluten sensitivity” and related gastrointestinal conditions.

Required Lectures/Materials:

Watch 1 lecture:

- Grains, Gluten, Celiac: Understanding the Basics

Read:

- “What’s a Whole Grain? A Refined Grain?” Oldways Whole Grains Council. Accessible at <https://wholegrainscouncil.org/whole-grains-101/whats-whole-grain-refined-grain>
- “Celiac Disease. Overview.” NIH NIDDK. Accessible at <https://www.niddk.nih.gov/health-information/digestive-diseases/celiac-disease>
- [Optional original research] Biesiekierski, Jessica R., et al. Gluten Causes Gastrointestinal Symptoms in Subjects Without Celiac Disease: A Double-Blind Randomized Placebo-Controlled Trial. American Journal of Gastroenterology. 2011; 106: 501-514. Accessible at: <https://wellspringofhealth.com/wp-content/uploads/2015/08/Gluten-Causes-Gastrointestinal-Symptoms-in-Subjects-Without-Celiac-Disease-2011.pdf>

- [Optional original research] Biesiekierski, Jessica R., et al. No effects of gluten in patients with self-reported non-celiac gluten sensitivity after dietary reduction of fermentable, poorly absorbed, short-chain carbohydrates. *Gastroenterology*. 2013; 145(2): 320-328. Accessible at: <https://www.ncbi.nlm.nih.gov/pubmed/23648697>

Assignments Due:

3-2-1 Reflection

Week 8: July 11-17

Course Topic: Grains, Gluten, and Celiac, Part 2 (Conclusion)

Learning Objectives:

- Discuss evidence regarding the healthfulness and potential unhealthfulness of grains
- Assess the validity of some of the arguments for/against including grains in the diet

Required Lectures/Materials:

Watch 1 lecture:

- Gluten: Hypotheses vs. Hysteria?

Read:

- Specter, Michael. "Against the Grain: Should you go gluten-free?" *The New Yorker*. November 3, 2014. Accessible at: <https://www.newyorker.com/magazine/2014/11/03/grain>
- Fasano, Alessio, et al. Nonceliac Gluten Sensitivity. *Gastroenterology*. 2015; 148(6): 1195-1204. Accessible at <http://www.sciencedirect.com/science/article/pii/S0016508515000293>
- [Optional original research] Kim, Hyun-seok, et al. Time Trends in the Prevalence of Celiac Disease and Gluten-Free Diet in the US Population: Results From the National Health and Nutrition Examination Surveys 2009-2014. *JAMA Intern Med*. 2016; 176(11): 1716-1717. Accessible at <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2547202>
- Talley, Nicholas J., et al. Celiac Disease and Nonceliac Gluten or Wheat Sensitivity: The Risks and Benefits of Diagnosis. *JAMA Intern Med*. 2017; 177(5): 615-616. Accessible at <https://jamanetwork.com/journals/jamainternalmedicine/article-abstract/2611959>

Assignments Due:

A4. How Has Your Thinking Evolved?

3-2-1 Reflection

Canvas Discussion #2

Weeks 9 and 10

Now that you have a deep understanding of the controversies surrounding saturated fat and grains, we will explore carbohydrates as a whole, beyond just grains. While clinical applications of the ketogenic diet have been around since the 1920s, the low-carbohydrate craze emerged in the 1980s, with Dr. Robert Atkins' *Diet Revolution* books. Given his success, many quickly followed suit, such as the Zone Diet, South Beach Diet and nowadays, the Paleo and Whole30 Diets. We will begin this section by reviewing carbohydrate sources, function, physiology and health implications. Then we will explore "carb-phobia," from past to present,

analyze the state of the evidence, and determine whether or not low carbohydrate diets are the panacea for good health and longevity.

Week 9: July 18-24

Course Topic: Carb-phobia and Associated Diets, Part 1

Learning Objectives:

- List the different types of carbohydrates and their sources.
- Describe the key functions of carbohydrates.
- Broadly summarize the digestion, absorption and metabolism of carbohydrates.
- Explain the relationship between carbohydrates and human health.

Required Lectures/Materials:

Watch 3 lectures:

- What are Carbohydrates?
- Carbohydrate Metabolism
- Carbohydrates and Health

Read:

- Ludwig DS, Hu FB, Tappy L, Brand-Miller J. Dietary carbohydrates: role of quality and quantity in chronic disease. *BMJ*. 2018;361:k2340. Published 2018 Jun 13. doi:10.1136/bmj.k2340. Accessible at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5996878/>
- Seidelmann, Sara B et al. Dietary carbohydrate intake and mortality: a prospective cohort study and meta-analysis. *The Lancet Public Health*. 2018;3(9): e419 - e428. Accessible at: [https://www.thelancet.com/article/S2468-2667\(18\)30135-X/fulltext](https://www.thelancet.com/article/S2468-2667(18)30135-X/fulltext)
- Jefferson, RS. 'Most Comprehensive Study of Carb Intake' Seems to Confirm And-Old Idea of Everything in Moderation. *Forbes*. August 22, 2018. Accessible at: <https://www.forbes.com/sites/robinseatonjefferson/2018/08/22/most-comprehensive-study-of-carb-intake-seems-to-confirm-age-old-idea-of-everything-in-moderation/?sh=30bb14b549e7>

Assignments Due:

3-2-1 Reflection

Week 10: July 25-July 31

Course Topic: Carb-phobia and Associated Diets, Part 2

Learning Objectives:

- Describe the origin of the low carbohydrate diet and how it has evolved.
- Compare and contrast trending low carbohydrate diets.
- Discuss the challenges of evaluating the efficacy of low carbohydrate diets with scientific rigor.
- Assess the validity of the arguments for/against low carbohydrate diets, including consideration of the population of interest.
- Interpret the evidence and develop an informed recommendation about whether or not one should follow a low carbohydrate diet.

Required Lectures/Materials:

Watch 2 lectures:

- Carb-phobia and Low Carbohydrate Diets: Past to Present
- Weight Loss versus Health Promotion: A Review of the Evidence

Read:

- Oh R, Gilani B, Uppaluri KR. Low Carbohydrate Diet. [Updated 2020 Jul 9]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK537084/>
- Paoli A, Rubini A, Volek JS, Grimaldi KA. Beyond weight loss: a review of the therapeutic uses of very-low-carbohydrate (ketogenic) diets [published correction appears in Eur J Clin Nutr. 2014 May;68(5):641]. *Eur J Clin Nutr.* 2013;67(8):789-796. doi:10.1038/ejcn.2013.116. Accessible at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3826507/>
- Mazidi M, Katsiki N, Mikhailidis DP, Sattar N, Banach M. Lower carbohydrate diets and all-cause and cause-specific mortality: a population-based cohort study and pooling of prospective studies. *Eur Heart J.* 2019 Sep 7;40(34):2870-2879. doi: 10.1093/eurheartj/ehz174. PMID: 31004146. Accessible at: <https://academic.oup.com/eurheartj/article/40/34/2870/5475490>
- Taubes, Gary. The Case Against Sugar excerpt. 2017. Available at: <https://aeon.co/essays/sugar-is-a-toxic-agent-that-creates-conditions-for-disease>
- **Optional:** Branco AF, Ferreira A, Simões RF, Magalhães-Novais S, Zehowski C, Cope E, Silva AM, Pereira D, Sardão VA, Cunha-Oliveira T. Ketogenic diets: from cancer to mitochondrial diseases and beyond. *Eur J Clin Invest.* 2016 Mar;46(3):285-98. doi: 10.1111/eci.12591. PMID: 26782788. Accessible at: <https://onlinelibrary.wiley.com/doi/full/10.1111/eci.12591>

A5. Identify a Final Project Topic

3-2-1 Reflection

Canvas Discussion #3

Weeks 11 through 12

In these two weeks, our attention turns to multivitamins in an attempt to answer the seemingly simple question: should I take one? Perhaps unsurprisingly, the evidence isn't clear cut, particularly when it comes to potentially elevated risk of certain cancers due to select dietary supplements. On the other hand, in certain populations that are at risk of being undernourished, multivitamins are likely beneficial... But can they optimize health or promote longevity in generally healthy people? That's a multibillion-dollar question the supplement industry wants to answer in the affirmative.

Week 11: August 1-7

Course Topic: Dietary Supplements, Part 1

Learning Objectives:

- Describe the supplement market, its major players, and other vested interests.
- Use labels and key online resources to identify quality supplements.
- Identify instances when supplements may be helpful in health and disease.

Required Lectures/Materials:

Watch 2 lectures:

- A Glimpse of What Is at Stake in Supplements
- Identifying Quality Supplements and Combating Supplement Quackery

Read:

- Liu, Rui Hai. Health-Promoting Components of Fruits and Vegetables in the Diet. *Advances in Nutrition*. 2013; 4: 384S–392S. Accessible at <https://academic.oup.com/advances/article/4/3/384S/4591619>
- Rautiainen, S., et al. Dietary supplements and disease prevention - a global overview. *Nat Rev Endocrinol*. 2016; 12(7): 407-20. Accessible at <https://www.nature.com/articles/nrendo.2016.54>
- [Optional original research] Al-Khudairy, L., et al. Vitamin C supplementation for the primary prevention of cardiovascular disease. *Cochrane Database Syst Rev*. 2017 Mar 16;3:CD011114. Accessible at <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD011114.pub2/abstract>
- Biesalski, HK, and Tinz, J. Multivitamin/mineral supplements: Rationale and safety. *Nutrition*. 2017; 36: 60-66. Accessible at [http://www.nutritionjrn.com/article/S0899-9007\(16\)30092-2/fulltext](http://www.nutritionjrn.com/article/S0899-9007(16)30092-2/fulltext)
- [Optional original research] Rangel-Huerta, Oscar D. and Gil, Angel. Effect of omega-3 fatty acids on cognition: an updated systematic review of randomized clinical trials. *Nutrition Reviews*, 2018; 76(1): 1–20. Accessible at <https://academic.oup.com/nutritionreviews/article-abstract/76/1/1/4732611?redirectedFrom=fulltext>

Assignments Due:

A6. Supplement Claims

3-2-1 Reflection

Continue working on your Final Project (Outline is due next week).

Week 12: August 8-14

Course Topic: Dietary Supplements, Part 2

Learning Objectives:

- Debate for and against taking multivitamin/mineral and/or other dietary supplements.
- Critique nutrition quackery regarding supplements.

Required Lectures/Materials:

Watch 2 lectures:

- Understanding the Evidence around the Supplement Debate: Foods vs. Supplements
- Understanding the Evidence around the Supplement Debate: Supplements as Health vs. Disease-Promoters

Read:

- [Optional original research] Issa, O.M. et al. Effect of high-dose oral multivitamins and minerals in participants not treated with statins in the randomized Trial to Assess Chelation Therapy (TACT). *Am Heart J*. 2018; 195: 70-77. Accessible at [http://www.ahjonline.com/article/S0002-8703\(17\)30273-9/fulltext](http://www.ahjonline.com/article/S0002-8703(17)30273-9/fulltext)
- [Optional original research] Zhao, Jia-Guo, et al. Association Between Calcium or Vitamin D Supplementation and Fracture Incidence in Community-Dwelling Older Adults: A Systematic Review

and Meta-analysis. *JAMA*. 2017; 318(24): 2466-2482. Accessible at

<https://jamanetwork.com/journals/jama/article-abstract/2667071?redirect=true>

- Raymond, Joan. "Is it OK to take vitamin supplements every day?" *TODAY*. March 24, 2017. Accessible at <https://www.today.com/health/it-ok-take-vitamin-supplements-every-day-t1376>
- "Is It a Good Idea for Adults to Take a Daily Multivitamin?" *The Wall Street Journal*. April 11, 2017. Accessible at <https://www.wsj.com/articles/is-it-a-good-idea-for-adults-to-take-a-daily-multivitamin-1491962581>
- Levine, Hallie. "3 Science-Backed Reasons Not To Take A Multivitamin." *Prevention*. April 19, 2017. Accessible at <https://www.prevention.com/health/reasons-not-to-take-multivitamin>

Assignments Due:

A7. Outline of Final Project

3-2-1 Reflection

Canvas Discussion #4

Weeks 13 and 14

We will spend these two weeks learning about the health and related effects of organic versus conventional foods, with a slight tangent into the GMO debate. You may be surprised about what the science has to say about differences so far, and this may be one area where personal beliefs and socioeconomic status play bigger roles in food choices than does science.

Week 13: August 15-21

Course Topic: Organic vs. Conventional Foods, Part 1

Learning Objectives:

- Define the "organic" label.
- Identify characteristics of "organic" foods and food production.
- Summarize the current state of the evidence of organically vs. conventionally farmed foods with respect to the domain of nutritional quality/content.

Required Lectures/Materials:

Watch 3 lectures:

- What Does "Organic" Mean?
- Understanding GMOs and "Frankenfoods"
- Evidence on Organic vs. Conventional Foods: Food Quality

Read:

- Greenbaum, Dov, and Gerstein, Mark. "Opinion: GMOs Are Not 'Frankenfoods'." *The Scientist*. August 30, 2016. Accessible at <https://www.the-scientist.com/?articles.view/articleNo/46908/title/Opinion--GMOs-Are-Not--Frankenfoods-/>
- Taylor, Ashley P. "Insects Are Increasingly Evolving Resistance to Genetically Modified Crops." *The Scientist*. October 13, 2017. Accessible at <https://www.the-scientist.com/?articles.view/articleNo/50640/title/Insects-Are-Increasingly-Evolving-Resistance-to-Genetically-Modified-Crops/>

- Barański, Marcin, et al. Higher antioxidant and lower cadmium concentrations and lower incidence of pesticide residues in organically grown crops: a systematic literature review and meta-analyses. *British Journal of Nutrition*. 2014; 112(5): 794-811. Accessible at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4141693/>
- Średnicka-Tober, Dominika, et al. Composition differences between organic and conventional meat: a systematic literature review and meta-analysis. *British Journal of Nutrition*. 2016; 115(6): 994-1011. Accessible at <https://www.cambridge.org/core/journals/british-journal-of-nutrition/article/composition-differences-between-organic-and-conventional-meat-a-systematic-literature-review-and-metaanalysis/B333BC0DD4B23193DDFA2273649AE0EE>
- [Optional original research] Średnicka-Tober, Dominika, et al. Higher PUFA and n-3 PUFA, conjugated linoleic acid, α-tocopherol and iron, but lower iodine and selenium concentrations in organic milk: a systematic literature review and meta- and redundancy analyses. *British Journal of Nutrition*. 2016; 115: 1043–1060. Accessible at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4838834/>
- [Optional original research] Koh, Eunmi, et al. Effect of Organic and Conventional Cropping Systems on Ascorbic Acid, Vitamin C, Flavonoids, Nitrate, and Oxalate in 27 Varieties of Spinach (*Spinacia oleracea* L.). *J. Agric. Food Chem.*, 2012; 60(12): 3144–3150. Accessible at <http://pubs.acs.org/doi/abs/10.1021/jf300051f>

Assignments Due:

A8. Video Presentation of Final Project

3-2-1 Reflection

Week 14: August 22-28

Course Topic: Organic vs. Conventional Foods, Part 2

Learning Objectives:

- Summarize the current state of the evidence of organically vs. conventionally farmed foods with respect to the domains of environmental impact and human health.
- Appraise GMO foods and labels and debate the merit of the arguments for/against the use of GMO and respective labeling.

Required Lectures/Materials:

Watch 2 lectures:

- Evidence on Organic vs. Conventional Foods: Environmental Impact
- Evidence on Organic vs. Conventional Foods: Human Health

Read:

- Tuomisto, H.L., et al. Does organic farming reduce environmental impacts? – A meta-analysis of European research. *Journal of Environmental Management*. 2012; 112: 309-320. Accessible at <http://www.sciencedirect.com/science/article/pii/S0301479712004264>
- Seufert, Verena, et al. Comparing the yields of organic and conventional agriculture. *Nature*. 2012; 485: 229–232. Accessible at <https://www.nature.com/articles/nature11069>.
- Reganold, John P. and Wachter, Jonathan M. Organic agriculture in the twenty-first century. *Nature Plants*. 2016; 2: 15221. Accessible at <https://www.nature.com/articles/nplants2015221>

- Oates, Liza, et al. Reduction in urinary organophosphate pesticide metabolites in adults after a week-long organic diet. *Environmental Research*. 2014; 132: 105-111. Accessible at <http://www.sciencedirect.com/science/article/pii/S001393511400067X>
- [Optional original research] Baudry, Julia, et al. Association between organic food consumption and metabolic syndrome: cross-sectional results from the NutriNet-Santé study. *European Journal of Nutrition*. 2017. Accessible at <https://link.springer.com/article/10.1007%2Fs00394-017-1520-1>
- Barański, Marcin, et al. Effects of organic food consumption on human health; the jury is still out! *Food & Nutrition Research*. 2017; 61(1). Accessible at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5345585/>
- Mie, Axel, et al. Human health implications of organic food and organic agriculture: a comprehensive review. *Environmental Health*. 2017; 16(1). Accessible at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5658984/>

Assignments Due:

A9. Final Project Essay

Canvas Discussion #5

Please complete the Course Evaluation.