NUTC 0285: Current Controversies in Nutrition Science
Summer 2021

Class Meetings: Online, primarily via Canvas

Instructor(s): Nicole Schultz, PhD, MPH
Email: nicole.schultz@tufts.edu

Pre-recorded lectures are presented by Dr. Adela Hruby.

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:


**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+ though F) for the course will be assigned based on the following criteria (rounded up):

<table>
<thead>
<tr>
<th>Grade Range</th>
<th>Grade Description</th>
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<tbody>
<tr>
<td>90–100</td>
<td>A range (90–&lt;93 = A-, 93+ = A, A+ given for superlative work)</td>
</tr>
<tr>
<td>80–89</td>
<td>B range (80–&lt;83 = B-, 83–&lt;87 = B, 87–&lt;90 = B+)</td>
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<tr>
<td>70–79</td>
<td>C range (70–&lt;73 = C-, 73–&lt;77 = C, 77–&lt;80 = C+)</td>
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<tr>
<td>60–69</td>
<td>D range (60–&lt;63 = D-, 63–&lt;67 = D, 67–&lt;70 = D+)</td>
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<tr>
<td>&lt;60</td>
<td>F</td>
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**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 me 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 26 and continues through “Final Exam Week” (August 23–29). 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.

<table>
<thead>
<tr>
<th>WEEK NO.</th>
<th>WEEK BEGINNING</th>
<th>COURSE TOPIC</th>
<th>ASSIGNMENTS DUE BY END OF WEEK (11:59PM ET SUNDAY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>May 26</td>
<td>Course Introduction</td>
<td>Getting to Know You Survey Discussion: Class Introductions</td>
</tr>
<tr>
<td>2</td>
<td>May 31</td>
<td>Personal Biases and Reading Nutrition News</td>
<td>A1. My World View</td>
</tr>
<tr>
<td>3</td>
<td>June 7</td>
<td>Casting a Critical Eye on Nutrition Information</td>
<td>A2. Is This Legit?</td>
</tr>
<tr>
<td>4</td>
<td>June 14</td>
<td>Topic 1: Saturated Fat, Part 1</td>
<td>3-2-1 Reflection 1</td>
</tr>
<tr>
<td>5</td>
<td>June 21</td>
<td>Topic 1: Saturated Fat, Part 2</td>
<td>3-2-1 Reflection 2</td>
</tr>
<tr>
<td>6</td>
<td>June 28</td>
<td>Topic 1: Saturated Fat, Part 3</td>
<td>3-2-1 Reflection 3 A3. What Topics Do You Think Are Controversial? Canvas Discussion #1</td>
</tr>
<tr>
<td>7</td>
<td>July 5</td>
<td>Topic 2: Grains, Gluten, and Celiac, Part 1</td>
<td>3-2-1 Reflection 4</td>
</tr>
<tr>
<td>8</td>
<td>July 12</td>
<td>Topic 2: Grains, Gluten, and Celiac, Part 2</td>
<td>3-2-1 Reflection 5 A4. How Has Your Thinking Evolved? Canvas Discussion #2</td>
</tr>
<tr>
<td>9</td>
<td>July 19</td>
<td>Topic 3: Carb-phobia and Associated Diets, Part 1</td>
<td>3-2-1 Reflection 6 Zoom Discussion #3 (tentative)</td>
</tr>
<tr>
<td>10</td>
<td>July 26</td>
<td>Topic 3: Carb-phobia and Associated Diets, Part 2</td>
<td>3-2-1 Reflection 7 A5. Identify a Final Project Topic Zoom Discussion #3 (tentative)</td>
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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 26-30 (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.

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**Week 2: May 31-June 6**

**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*.
  Accessible at [http://www.onlinejacc.org/content/69/9/1172](http://www.onlinejacc.org/content/69/9/1172)

**Assignments Due:**
A1. My World View

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**Week 3: June 7-13**

**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*.

**Assignments Due:**
A2. Is This Legit?

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**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 14-20**

**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:


**Assignments Due:**

3-2-1 Reflection

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**Week 5: June 21-27**

**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:

**Assignments Due:**
3-2-1 Reflection

Week 6: June 28-July 4

**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 2 lectures:
- Saturated Fat: A Closer Look at the Timeline of Evidence, Part 2
- Saturated Fat: Whence the Confusion

Read:
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 5-12

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:

**Assignments Due:**
3-2-1 Reflection

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**Week 8: July 12-18**

**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:

**Assignments Due:**
A4. How Has Your Thinking Evolved?
3-2-1 Reflection
Canvas Discussion #2

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**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 19-25**

**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:

**Assignments Due:**
3-2-1 Reflection
Zoom Discussion #3 (tentative)

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**Week 10: July 26-August 1**

**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:
- Taubes, Gary. The Case Against Sugar excerpt. 2017. Available at: [https://aeon.co/essays/sugar-is-a-toxic-agent-that-creates-conditions-for-disease](https://aeon.co/essays/sugar-is-a-toxic-agent-that-creates-conditions-for-disease)

**A5. Identify a Final Project Topic**

**3-2-1 Reflection**

**Zoom Discussion #3 (tentative)**

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**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 2-8**

**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
- Understanding the Evidence around the Supplement Debate: Foods vs. Supplements

Read:

**Assignments Due:**
A6. Supplement Claims
3-2-1 Reflection
Continue working on your Final Project (Outline is due next week).

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**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: Supplements as Health vs. Disease-Promoters
- Identifying Quality Supplements and Combating Supplement Quackery

Read:

• 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


**Assignments Due:**
A7. Outline of Final Project
3-2-1 Reflection
Canvas Discussion #4

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**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 16-22**

**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:
• Taylor, Asley P. “Insects Are Increasingly Evolving Resistance to Genetically Modified Crops.” *The Scientist*. October 13, 2017. Accessible at https://www.the-
Assignments Due:
A8. Video Presentation of Final Project
3-2-1 Reflection

Week 14: August 23-29

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:


**Assignments Due:**
A9. Final Project Essay  
Canvas Discussion #5  
Please complete the Course Evaluation.