



LIFESCI 2N03: Human Nutrition for Life Science

Shelley Vanderhout, RD, PhD

Week 1

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Land Acknowledgement

We recognize and acknowledge that McMaster University meets and learns on the traditional territories of the Mississauga and Haudenosaunee nations, and within the lands protected by the “Dish With One Spoon” wampum, an agreement amongst all allied Nations to peaceably share and care for the resources around the Great Lakes.

The “dish” represents the land that is to be shared peacefully and the “spoon” represents the individuals living on and using the resources of the land in a spirit of mutual co-operation.

Wampum belts (shown here) are often made to show agreements between people.



<https://www.thecanadianencyclopedia.ca/en/article/a-dish-with-one-spoon>

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3

After a decade in university...

- Manage your time wisely
- Reach out to people you admire or whose work you are interested in
- Use the resources available to you
- Know your own work style
- Explore!



TLDR: Take action

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About LifeSci 2N03

- We'll cover:
 - How nutrition is studied (research) and assessed (individual health)
 - Basics of macro- and micronutrients
 - Nutrition recommendations (Canada's Food Guide)
 - Dietary patterns (vegetarianism, fad diets)
 - "Superfoods," antioxidants, and the microbiome



=> Different types of research, different methods strength and limitations of studies, how the results are interpreted

=> How does diet tie into risk of disease and measure of overall health?

=> Macronutrients are carbohydrates, protein, and fat

=> Micronutrients are vitamins and minerals, generally

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How will this course run?

Mondays 9:30-10:20	Tuesdays 10:30-11:20	Thursdays 9:30-10:20
Virtual drop-in office hours (MS Teams)	Synchronous LIVE class (Echo 360) Will go 'LIVE' about 5min before class starts	Synchronous LIVE class (Echo 360) Will go 'LIVE' about 5min before class starts

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FAQ

How do the virtual office hours work?

LIFESCI 2N03 C01 FAL 2021 Human N... ...

General

Virtual Office Hours

SV

Shelley Vanderhout · 10:45 a.m.
Drop in to ask questions about course content, assignments, readings, the exam, and more.

Virtual Office Hours
Occurs every Monday @ 9:30 a.m.

e/ Reply

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FAQ

How will the synchronous classes run?

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Tips for students

- If you don't see "LIVE" at time of synchronous class, refresh webpage
- Click "LIVE" to join the class
- Click "Show Live Stream" on bottom left
- Choice of 3 views (slides, my desktop with PPT and my camera). Double click preferred view to make it larger and close camera if you don't want it on, or delay
- Can follow along using slide advancer in Echo360 and make notes as you go in Echo360

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=> Chrome & Firefox are the best browsers for accessing Echo360

=> Echo360 generates a transcript, which can be very useful for skimming through lectures

FAQ		Week 1 (Sept 7-10)	Week 2 (Sept 13-17)	Week 3 (Sept 20-24)	Week 4 (Sept 27-Oct 1)	Week 5 (Oct 4-8)
Topic	Intro to nutrition	What is a healthy diet?	Carbohydrates	Fat	Protein	
Module Due	Sept 10 11:59 PM	Sept 17 11:59 PM	Sept 24 11:59 PM	Oct 1 11:59 PM		
Week 6 (Oct 18-22)		Week 7 (Oct 25-29)	Week 8 (Nov 1-5)	Week 9 (Nov 8-12)	Week 10 (Nov 15-19)	
Topic	Vegetarian & vegan diets		Hydration	Antioxidants	Weight loss & fat diets	Fad diets
Module Due	Oct 22 11:59 PM					Nov 19 11:59 PM
Week 11 (Nov 22-26)		Week 12 (Nov 29-Dec 3)	Week 13 (Dec 6-10)			
Topic	Superfoods		Gut health	Wrap up		
Module Due	Nov 26 11:59 PM					

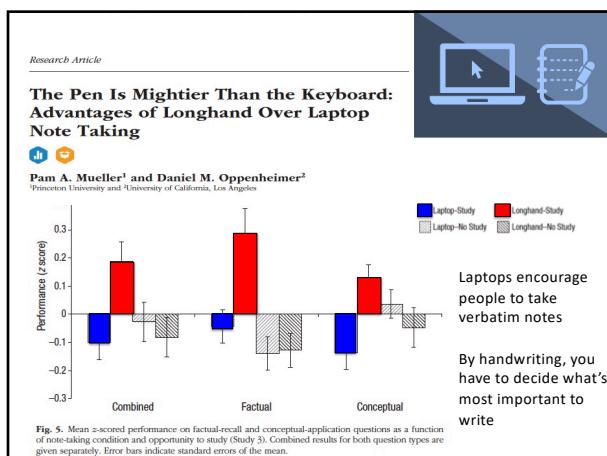
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Where are the course resources kept and how should I take notes?

- Skeleton notes uploaded to Avenue on Mondays
 - Come to class on Tues and Thurs and complete your notes, or watch recordings
 - Just like in-person classes, completing notes in class encourages you to stay engaged or awake!
 - I recommend printing notes and hand writing in notes as we go through class
- Skeleton notes also uploaded to Echo360 (if you want to take notes using Echo360)

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=> Slides are posted every Monday

=> Only skeleton notes are posted; you must come to class to fill them in, or watch the recording afterwards

=> Print out notes and hand write the information

=> This study compares students that took notes by hand vs. students that took notes on a laptop

=> Longhand-study is hand writing notes

=> Positive scores are better performance

=> Students that took notes by hand did way better than students that took notes on a laptop

=> Handwriting requires you to carefully select what to write; on a laptop you can type much faster



How will I be assessed?

1) Assignment 1	25%
2) Assignment 2	25%
3) Online quizzes in Modules	10%
4) Participation	5%
5) Cumulative final exam	35%

=> Final exam will be online; multiple choice; and administered at the end

=> Participation is polls on Echo360

=> Quizzes are embedded in the module

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What is Assignment #1 (25%)

- Objective: Refine science communication skills**
- Critique a mainstream news article about a food or beverage by comparing the news article to the scientific article that the news piece is based on
 - Create an infographic about the food or beverage
 - Due Oct 8th, 2021
 - 3 day grace period if needed
 - Detailed guidelines on Avenue
 - More details on creating infographics next week

=> Compare news article to scientific article; did they get the study design properly, did they report the relationship properly; did they miss anything?

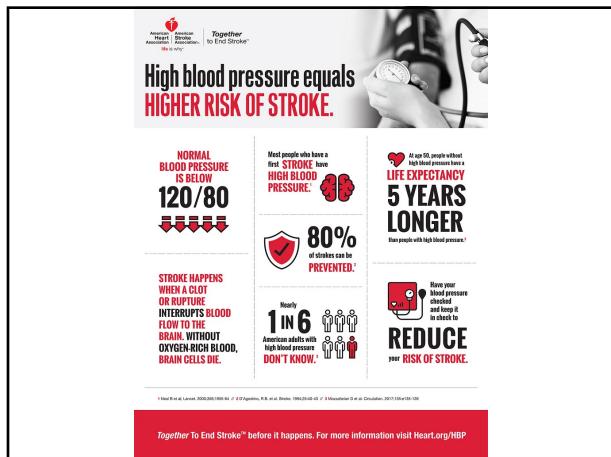
=> Infographic is based on article

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=> Infographics capture attention with pictures, color, myths, etc.

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FAQ What is Assignment #2 (25%)

Objective: Improve food literacy

- Log your diet for 5 days, enter everything you ate and drank into Diet and Wellness Plus software, generate analysis and compare your diet to recommendations
- Find misleading food products and discuss what is misleading about them

- Due Nov 8th, 2021
- 3 day grace period if needed
- Detailed guidelines on Avenue
- More information about this assignment in next few weeks

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FAQ Diet Wellness +

- Online diet analysis software which provides nutrient breakdown of foods and beverages
- Necessary to complete Assignment #2
- Accessible via link found in syllabus
- Discount code: DIGITALB2S1479 (in syllabus)
- Resources for using Diet Wellness + available on Avenue

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=> Log diet for 5 days and then log it into the Diet Wellness software

=> Compile all foods into a report to see average macro/micronutrient intake

=> Find misleading food from your diet and discuss why it's misleading

=> Necessary to complete assignment 2

=> Use the discount code; also found in syllabus

=> Easy to use software

FAQ What if I need help with the assignments?

- Drop-in virtual office hours every week with me (Mondays at 9:30-10:20am) on Teams



- Danial, one of your TAs, can answer questions about Diet and Wellness + software (aminaeid@mcmaster.ca)

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=> Danial can only answer questions specific to Diet Wellness software

FAQ Teams

Welcome to LIFESCI 2N03 C01 FAL 2021 Human Nutrition for Life Sciences
Choose where you want to start



- You may use this space to ask your peers questions or post helpful websites, articles or resources you find
- It will not be actively monitored by me or TAs
- I may post announcements here, which I will also post on Avenue (and vice versa)

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FAQ What is TopHat?

TOP HAT

- Platform to house our e-text
- 7 modules
- Each module has:
 - Learning objectives
 - Text to read
 - Questions throughout (marks for answering)
 - 1-2 videos to watch
- Completion in 30min-1 hour

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=> TopHat is a platform that hosts electronic versions of textbooks

=> Easy to use

=> Only used for textbook and modules

=> Must purchase access to TopHat for the term, and purchase the textbook; total is \$46

=> Modules are worth 10%

=> Questions are embedded throughout the textbook



What is TopHat?

- You will receive an email invite to access the textbook from TopHat
 - Join code: 997578
- The McMaster Bookstore also has information on this virtual textbook online

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Our textbook

Welcome to your journey through the world of food and nutrition!

About the author

Thanks for choosing this e-book to guide you on your journey through the (sometimes confusing) world of nutrition! I'm Dr. Janet Pritchard, an Assistant Professor at McMaster University in the School of Interdisciplinary Science and Kinesiology. I have had a passion for nutrition and exercise science since my first year of university as an



=> Textbook is all online

=> Textbook author is the usual teacher for 2N03

=> Textbook was written specifically for this class

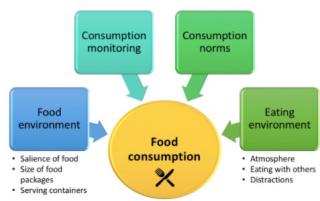
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Our textbook

1.1 Why do we eat what we eat?

Did you know that undergraduate students make over 200 decisions about what to eat or drink each day (Wansink & Sobal, 2007)? If you think about it, that's a lot of opportunities to make good and bad choices. Obviously, our knowledge of nutrition influences what we choose to put in our bodies, but many other factors play a role. Overconsumption and underconsumption of food can lead to health issues down the road as there may be nutrient excess or deficiencies. Let's take a minute to look at some factors that influence our food choices.



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FAQ

Our textbook

Homework
Due September 10, 2022 Details

Nutrition Applications for Optimal Health
Section 1: What is a healthy diet?
Contains 5 Items • Worth 5 points • Adjust Points

Knowledge check: Centenarian diet

Match the dietary features to the Blue Zone.

Premise	Response
1 Greece	→ A bitter melon
2 Japan	→ B sheep's cheese
3 Italy	→ C avocados
4 California	→ D eggs
5 Costa Rica	→ E potatoes

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FAQ

Readings & Modules



- Designed to create a foundation for the material covered in class
- Allow for discussion and application of concepts during lectures instead of covering more basic principles
- Modules are embedded to check understanding as you read
 - Will be made available at least 2 weeks before due date

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=> Readings/modules should be done before class

FAQ

How do I gain access to it and how do I get marks?

- Can purchase through TopHat website or Bookstore
 - \$30 through TopHat or \$37.95 through bookstore plus \$16 subscription to TopHat to access book = \$46
- 10% of final grade from completing questions throughout the modules
 - Each module has ~10 questions
 - For each question: $\frac{1}{2}$ mark for attempting the question + $\frac{1}{2}$ mark for getting it correct (and you have 2 attempts to get it correct!)

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Will I be tested on content from the modules?



- Yes, the content complements, adds to or overlaps with the content we cover in class
- Content in class *builds* on modules

=> Questions won't be pulled straight from the modules and put on the exam

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How can I get the participation marks?

- Polls will occur in Echo360
 - I will open each question for about 2 mins to allow for internet delays
- Can answer polls as we are going through class together
- Polls can also be answered AFTER class if you watch recordings back if you miss LIVE class
 - Please wait until LIVE class is finished before trying to access recordings and polls

=> Polls can still be accessed and completed after Live class

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Why polls throughout class?

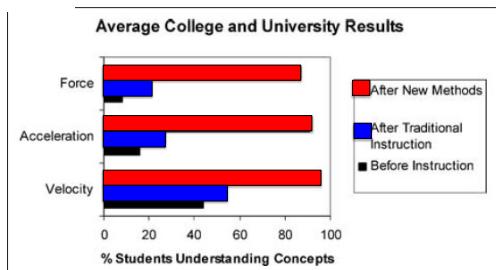


Figure 1. Active-engagement vs. traditional instruction for improving students' conceptual understanding of basic physics concepts (taken from Laws et al., 1999)

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How will participation be calculated?

90-100% of questions answered = 5%
 80-89% of questions answered = 4%
 65-79% of questions answered = 3%
 50-64% of questions answered = 2%
 35-49% of questions answered = 1%
 <35% of questions answered = 0%

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Grace period folder

Friday, October 8, 2021	Assignment #1 - Due	11:59 PM
	Assignment #1	
	Due October 8 at 11:59 PM	
Monday, October 11, 2021	Assignment #1 Grace Period Folder - Due	11:59 PM
	Assignment #1 Grace Period Folder	
	Due October 11 at 11:59 PM	

=> For both assignments, if you need to submit one assignment late, up to 3 days late, you can submit to the grace period folder. Submitting both assignments late will result in a penalty.

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MSAF (McMaster Student Absence Form)

mcmaster.ca/msaf

The University recognizes that students periodically require relief from academic work for medical or other personal situations. This Policy aims to manage these requests by taking into account the needs and obligations of students, instructors and administrators. It is the prerogative of the instructor of the course to determine the appropriate relief for missed term work in their course. Any concerns regarding the granting of relief should be directed to the respective [Faculty/Program Office](#).

Requests for relief should be made with a commitment to academic integrity in mind. Requests that deviate from this commitment will be handled under the [Academic Integrity Policy](#) and/or [Code of Student Rights and Responsibilities](#), where appropriate.

=> MSAF can only be used on assignments/tests worth less than 25%

=> It's not really useful in this course

=> Can be used for module quizzes

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Final Exam

- Hosted on Avenue
- Multiple choice
- To be scheduled by registrar
- More details later!



https://peanuts.fandom.com/wiki/Christmas_Time_Is_Here

=> Exam will be hosted on Avenue, and it will be multiple choice

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Email etiquette



- Email is for brief communication
 - “1 sentence issues” (missed test, appointment outside of office hrs.)
- No... screenshots of slides from class (i.e., slide 13 of week 9 and slide 6 of week 10...)
 - “Can you explain how protein is metabolized? What happens on a low carb diet? I also don’t understand dehydration...”

=> Only email about personal issues

=> Course content should be asked in virtual office hours

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What about netiquette?

Before you send a comment or post, ask yourself:

- Could anything in this message come off as rude, insensitive or disrespectful?
- Is this something I would keep to myself if I were communicating in person?
- Was I upset, frustrated or angry when I wrote this message?

If you answered “yes” to any of these questions, you should review and edit your message before you send it

Understanding changes when communicating online.

- Consider how others might interpret your words or actions.
- It’s harder to convey tone online, so avoid using sarcasm or humour that could be misinterpreted.
- To avoid further confusion, ask for clarification if you need help understanding a message or comment.

You may encounter people with opposing opinions. In these situations:

- When responding:
- Be respectful.
 - Don’t insult the other person or make personal remarks.
 - If you feel angry or upset about an interaction, take a break to calm down and respond at a later time.
 - Ask about the person’s intent, and allow them to explain their perspective.

<https://sscm.mcmaster.ca/the-code/netiquette>

=> Read the email before sending it

=> Find the answer yourself before asking the professor

=> Be professional in your email; no short forms, add a proper greeting, etc.

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Introduction to the field of nutrition

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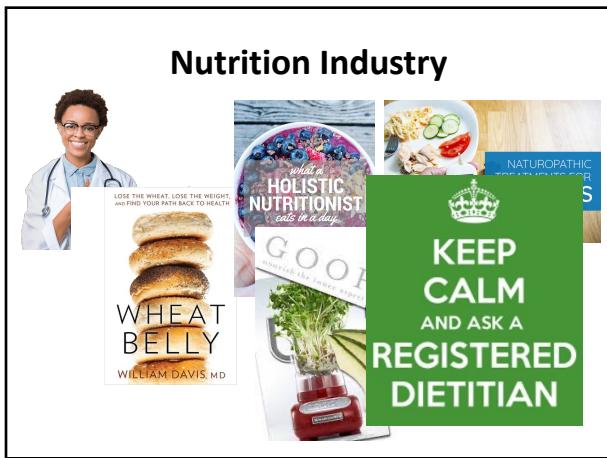


=> Nutrition plays a role for how different economies survive and thrive over time

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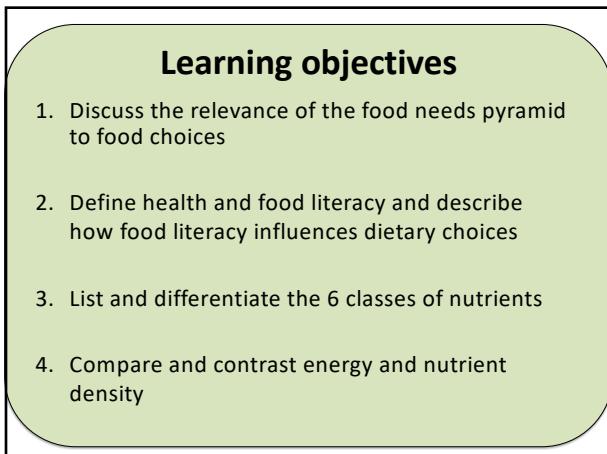
=> Doctors can provide nutrition advice

=> Holistic nutritionists

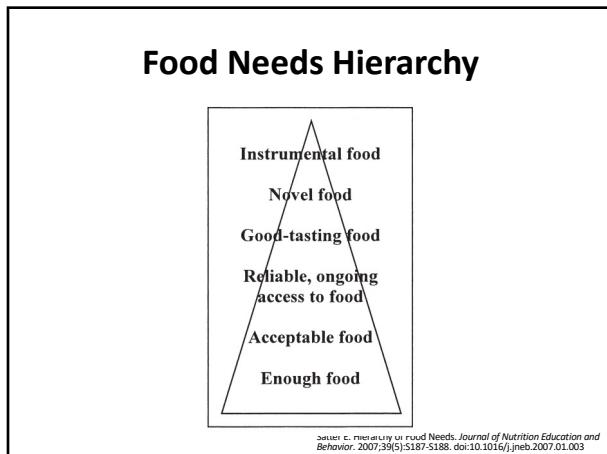
=> Celebs think they're nutritionists

=> Nutritionists are an unregulated professional; anyone can become a nutritionist by taking a 2-day course

=> Registered dietitian is considered the gold standard of care



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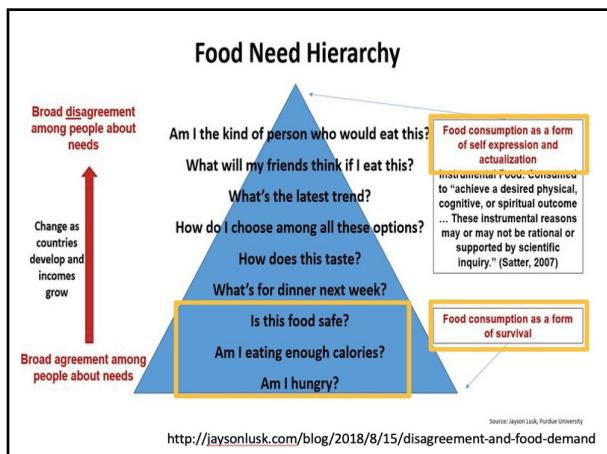
=> This diagram is an adaptation of Mazlo's hierarchy of needs

=> The diagram shows different levels of human growth

=> Instrumental food is seen as food that helps a person achieve a certain outcome (i.e. Performance, dietary choice, etc.)

=> Novel food is new food

=> Have a positive relationship with the food you eat



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=> This is Jason Lusk's societal approach to nutrition

=> The bottom of the pyramid is where there is broad agreement among people

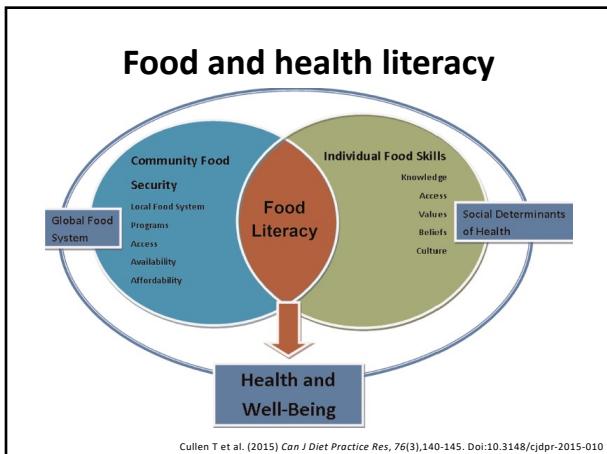
=> The top of the pyramid is has broad disagreement

=> As we move up the pyramid, the reliance on science falters



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=> Food literacy means being able to adapt to the environment, physical changes, cultural expectations



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=> Each factor deeply affects nutrition; how much you can afford, the quality you can afford, etc.

=> Higher education and income are associated with being food literate

=> Skills and knowledge are about planning food diets

How do food literacy and health literacy influence your diet?

- Choice of foods influenced by knowledge of disease or health effects
 - Influence ability to understand food labels, guidelines, recommendations
 - Influence ability to access information about healthy eating

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=> This figure examines health literacy, food label use, dietary quality, etc. among young adults in USA

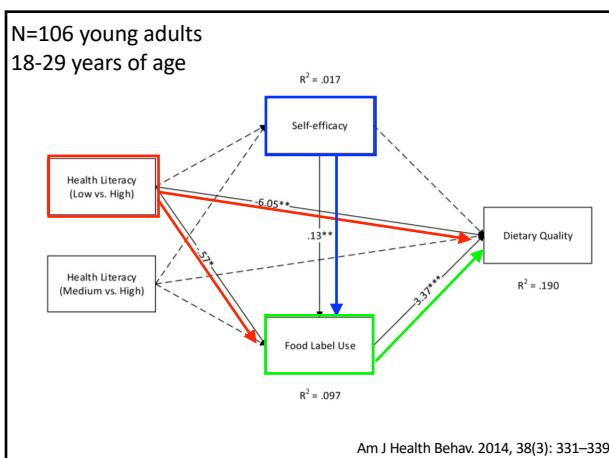
=> The researchers found that self-efficacy and health literacy were predictors of food label use

=> Health literacy is predictive of dietary quality and food label use

=> Food label use is predictive of dietary quality; it is sort of a mediator

=> Self efficacy is related to food label use

=> As self efficacy increases (i.e. Education), individuals are able to use food labels more effectively, and follow a healthier diet



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Recap

- Health literacy plays a role in diet quality
 - Lower health literacy → Less likely to use food labels
- Knowledge isn't the only thing
 - Lower self efficacy → Less likely to use food labels

=> Lower self efficacy is low confidence

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Food Advertising Literacy Training Reduces the Importance of Taste in Children's Food Decision-Making: A Pilot Study

Oh-Ryong He¹, Haley Killian¹, Jared M. Bruce^{1,2}, Seung-Lark Lim¹ and Amanda S. Bruce^{1,*†}

N=39 children, 8-13 years of age

Commercial → narratives

TABLE 1 | Factual and evaluative narratives for food advertising literacy training.

Factual narratives	Evaluative narratives
(1) Foods look and taste differently in reality.	(1) These foods don't make you have fun.
(2) The advertisers want you to go and eat these foods.	(2) Those foods are disgusting.
(3) These commercials are intended to sell.	(3) People in these commercials aren't cool.
(4) The advertisers are trying to trick you.	(4) These foods don't make you happy.
(5) These commercials aren't telling the truth.	(5) These foods are bad for you.
	(6) Those foods are not delicious.
	(7) Those foods are so unhealthy.

[Front Psychol.](#) 2018 Jul 27;9:1293

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=> A child's taste for food drives their food choices and exposure to food commercials can increase the importance of taste when children make food decisions

=> This study explored whether literacy training about food advertising would influence children's food choices

=> The findings showed that taste attributes in children's food choices significantly decreased and children's critical thoughts towards commercials increased after completing the training, and the children in the control group who didn't receive the training, didn't experience any change in the variables

=> Suggests that improving food advertising literacy could be helpful for reducing the influence of food/advertisements targeted at children

=> Children's food choices are largely driven by taste, not health

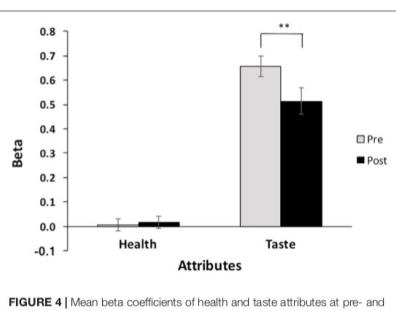


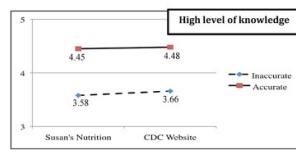
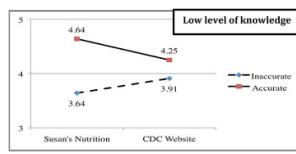
FIGURE 4 | Mean beta coefficients of health and taste attributes at pre- and post-training. ** $p < 0.01$.

- Food choices predicted by taste more than health effects
- But, after training, taste played less of a role
- More critical thinking about food commercials

[Front Psychol.](#) 2018 Jul 27;9:1293

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How does food literacy predict interpretation of nutrition information?



Jung EH, Walsh-Childers K, Kim H-S. Factors influencing the perceived credibility of diet-nutrition information web sites. *Computers in Human Behavior*. 2016;58:37-47. doi:10.1016/j.chb.2015.11.044

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=> On the top is participants with a lower level of food literacy

=> On the bottom is participants with a higher level of food literacy

=> People with a lower level of knowledge were unable to filter out inaccurate information

How much of what is online agrees with Canada's food guide?

Table IV. Number of articles congruent and incongruent with advice from the Canada food guide by website

	All	About	CHN	Doccissimo	iVillage	MSN	ServiceVie	WebMD	Yahoo
Pure congruent advice	858 (31.0)	71 (22.1)	131 (37.4)	94 (26.9)	115 (32.9)	117 (33.4)	124 (35.4)	106 (30.4)	100 (28.6)
Pure incongruent advice	284 (10.3)	53 (16.5)	9 (2.6)	35 (10.0)	43 (12.3)	47 (13.4)	23 (6.6)	39 (11.2)	35 (10.0)
Mixed advice	688 (25.8)	99 (30.8)	104 (29.7)	36 (10.3)	100 (28.6)	83 (23.7)	82 (23.4)	120 (34.4)	64 (18.3)
No advice	940 (33.9)	98 (30.5)	106 (30.3)	185 (52.9)	92 (26.3)	103 (29.4)	121 (34.6)	84 (24.1)	151 (43.1)
Ratio of pure congruent to incongruent advice	3.02	1.34	14.56	2.69	2.67	2.49	5.39	2.72	2.86
Total	2770	321	350	350	350	350	350	349	350
Chi-squared = 247.2156, df = 24, P-value = 0.000.									

On average, only 1/3 of sources were consistent with Canada's Food Guide
Ostry et al. Health Educ Res. 2008;23(4):648-55.

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=> Commercial websites (not government) accounted for 80% of time spent on seeking nutrition information

=> Commercial websites are run by companies trying to sell products

=> The study found uneven messages about fruit and vegetable intake, and consistent messages about we should be eating a variety of foods

=> Advice about salt, coffee, and alcohol was generally consistent with CFG

Why is the field of nutrition so complicated?

- Young field of science
- Observational research misinterpreted as causal
- Selective reporting in nutrition
- Confounding variables (SDOH, age, health)
- Non-food aspects of nutrition (additives, pesticides)
- Small trials with surrogate outcomes (i.e. Blood pressure is a surrogate of risk of CVD)

Ioannidis, J. JAMA. Published online August 23, 2018

=> Vitamins were only discovered ~100 years ago

=> Media is guilty of sensationalizing some studies

=> Some studies don't even get published

=> i.e. Some studies say coffee is good, others say it is bad

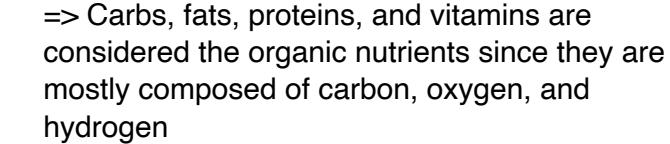
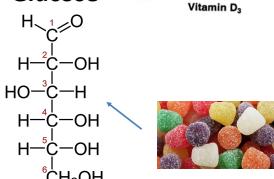
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6 classes of nutrients

- Carbohydrates, fat, protein, vitamins
4 kcal/g
9 kcal/g
 - Minerals
 - Water

Glucose

O=C=O



=> Carbs and protein provide 4 kcal/g

=> Fat provides 9 kcal/g

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Try it...

- Calculate the energy available from a bean burrito with cheese:
 - 55 grams carbohydrate
 - 15 grams protein
 - 2 grams fat
 - Determine the % of kcalories from each of the energy nutrients.

Chipotle



Carbs: 55 g x 4 = 220 kcal

Protein: 15g x 4 = 60 kcal

Fat: 2g x 9 = 18 kcal

$$\text{Total} = 220 + 60 + 18 = 298 \text{ kcal}$$

$$220/298 = 0.738255033557047$$

~74% of energy is provided from carbs in the burrito

~20% of energy from protein

~6% of energy from fat

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Energy and nutrient density

Energy density: the energy content/unit weight of food
Nutrient density: the nutrient content/unit weight or kcal of food

Lower energy density
- This 450g breakfast delivers 500 kcal, for an energy density of 1.1 (500 kcal/450g = 1.1kcal/g)

Higher energy density
- This 144g breakfast delivers 500 kcal, for an energy density of 3.5 (500 kcal/144g = 3.5 kcal/g)

=> Energy density is purely concerned with calories provided per weight of food; it doesn't take into consideration where that energy comes from - which nutrients its spread across

=> Nutrient density takes the nutrient content into account; the more nutrients per weight of food, the more nutrient dense

=> Foods high in salt are considered less nutrient dense

=> Two different meals can deliver the same amount of energy, the nutrient density can be different

Try it!

Calculate the energy density per serving of this Uncle Ben's Fast & Fancy Broccoli and Cheddar side dish.



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- 42 grams per serving

- 160 calories

Energy density =

$$\# \text{ of kcal in a serving} / \text{weight of serving}$$

$$160 / 42 = 3.80952381 \sim 3.81 \text{ kcal/g}$$

The energy density per serving is: 3.81 kcal/g

Energy density classifications

- **Very low** energy density foods = less than 0.6 cal/g
- **Low** energy density foods = 0.6 to 1.5 cal/g
- **Medium** energy density foods = 1.5 to 4 cal/g
- **High** energy density foods = more than 4 cal/g

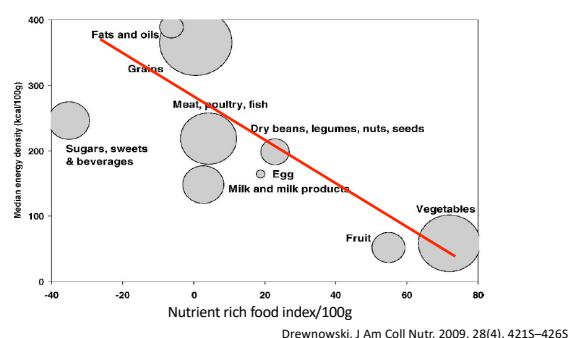
<https://www.nutrition.org.uk/healthyliving/fuller/what-is-energy-density.html>

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=> You don't need to know these

=> Energy density is not a bad thing, but something that needs to be considered when planning a diet

How are energy density and nutrient density related?



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=> Vegetables provide hardly any energy per weight

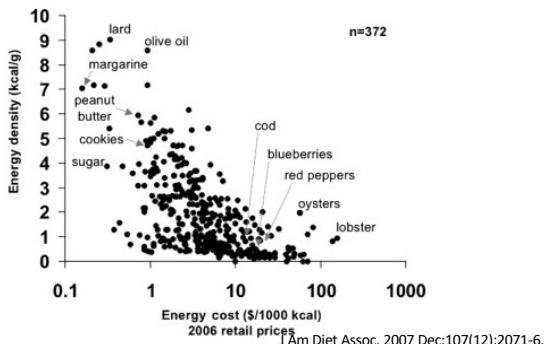
=> Fats, oils, sugars, and carbs provide lots of energy

=> Refined sugars and carbs are low on the nutrient richness scale

=> There is kind of a negative correlation between the nutrient richness of a food and energy density

=> We need a balance of nutrient dense and energy dense food, except for sugar

Why don't we just eat low energy dense, high nutrient dense foods?



=> Only consuming food that is low energy dense and high nutrient dense is unsustainable in terms of cost/price

=> Cookies, sugar, etc. provide a lot of energy per weight; more bang for the buck

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Why should we care?

Serum concentrations of selected vitamins, carotenoids, and lipids by tertiles of percentage of energy from energy-dense, nutrient-poor (EDNP) foods: third National Health and Nutrition Examination Survey, 1988–1994

	Percentage of daily energy from EDNP foods	First tertile (0–16.5%) ¹ 8.9% ²	Second tertile (16.6–31.3%) 23.5%	Third tertile >31.3% 41.9%	P for trend ³
Serum folate (nmol/L) (n = 14256)	17.05 ± 0.5 ⁴	15.28 ± 0.4	14.42 ± 0.5	0.0003	
RBC folate (nmol/L) (n = 14271)	478.0 ± 6.0	449.0 ± 8.0	429.0 ± 8.0	<0.0001	
Serum vitamin B-12 (pmol/L) (n = 7256)	372.0 ± 6.0	348.0 ± 6.0	343.0 ± 8.0	0.01	
Serum homocysteine (μmol/L) (n = 6382)	9.36 ± 0.2	9.80 ± 0.2	10.60 ± 0.3	0.02	
Serum ascorbate (mmol/L) (n = 13733)	43.41 ± 0.7	43.47 ± 1.0	40.67 ± 0.9	0.0012	
Serum vitamin E (μmol/L) (n = 14125)	27.66 ± 0.3	27.20 ± 0.3	26.47 ± 0.3	0.0001	
Serum vitamin A (μmol/L) (n = 14125)	2.13 ± 0.01	2.07 ± 0.02	2.01 ± 0.01	<0.0001	
Serum β-carotene (μmol/L) (n = 14125)	0.40 ± 0.01	0.39 ± 0.01	0.34 ± 0.01	<0.0001	
Serum α-carotene (μmol/L) (n = 14125)	0.10 ± 0.003	0.09 ± 0.002	0.08 ± 0.002	<0.0001	

Kant. Am J Clin Nutr 2000;72:929–36.

=> When people consume food that is high energy density and low nutrient density, their circulating concentrations of vitamins and certain bio-markers are at the least optimal levels

=> Moral: Eat a balance of energy and nutrient dense foods

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Portion Distortion

THE NEW (AB)NORMAL

Portion sizes have been growing. So have the average restaurant meal today, more than four times larger than in the 1950s. And adults are, on average, 30 pounds heavier. Five want to eat healthy, there are things we can do to help. We can eat smaller portions, eat more fruits and vegetables, and exercise more.

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Typical portion sizes have increased over the last 70 years, and with it an increase in the consumption of kcalories.

<http://www.nhlbi.nih.gov/health/educational/eat-right/portion-distortion.htm>

Centers for Disease Control



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=> CDC = Center for Disease Control

=> Fast food portion sizes have grown a lot; contributing to unhealthy diets

=> Greater portion sizes means more energy

=> Increasing fast food portion sizes may contribute to increasing body sizes; no one has researched this yet

Portion Distortion



=> These snacks are meant to trick us into thinking that we are making healthy choices

=> These things can be used to justify snacking and unhealthy eating/snacking

=> These snacks are empty carbs and fillers
