

Jumping off a Cliff

A black and white photograph of a person jumping off a cliff into the ocean. The cliff is on the right side of the frame, and the person is in mid-air, falling towards the water. The ocean is on the left side of the frame, and the sky is on the right side of the frame.

New and innovative, co-creation of knowledge promises to increase student engagement and empower student learning. What does co-creation look like in real life? Learn about the exhilarating experience and the many valuable strategies and lessons learned while partnering with students in the re-design of a standard course in nutrition sciences including the creation of an open educational resource.

Sabine Zempleni
UNL Assistant Professor of
Practice Nutrition and Health
Sciences



Co-Creation will lead to better course and learning tool design:

- ✓ Increased course ownership and engagement
- ✓ Content becomes relevant to students
- ✓ Increased understanding of student perspectives and needs



Co-creation is not a time saver:

- Enormous amount of timely editing
- Mentoring of undergraduate students and student workers
- Combine with other learning tools

NUTR251: Nutrition Through the Life Cycle

Quality of life and healthy life expectancy depend on avoiding or delaying chronic diseases during life. Lifestyle choices during all life stages, especially the critical periods, prime the individual for the development of chronic diseases (based on WHO paradigm.)

If your goal is becoming a centenarian dodge chronic diseases.

NCDS

Pre-Pregnancy

Healthy life starts earlier than you think

Pregnancy

Setting the fetal metabolism up for a healthy life

Infants Toddlers

Laying the foundation for a healthy metabolism

School Children

Learning healthy eating and lifestyle habits

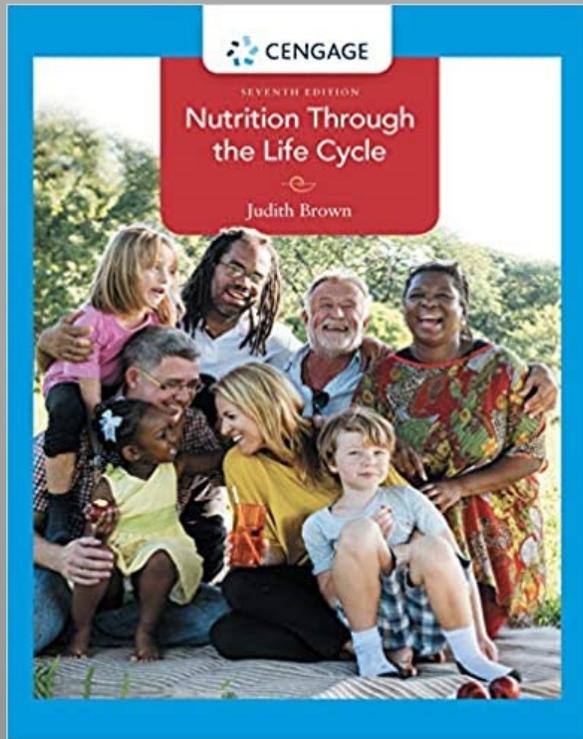
Teens

Developing personal healthy eating habits

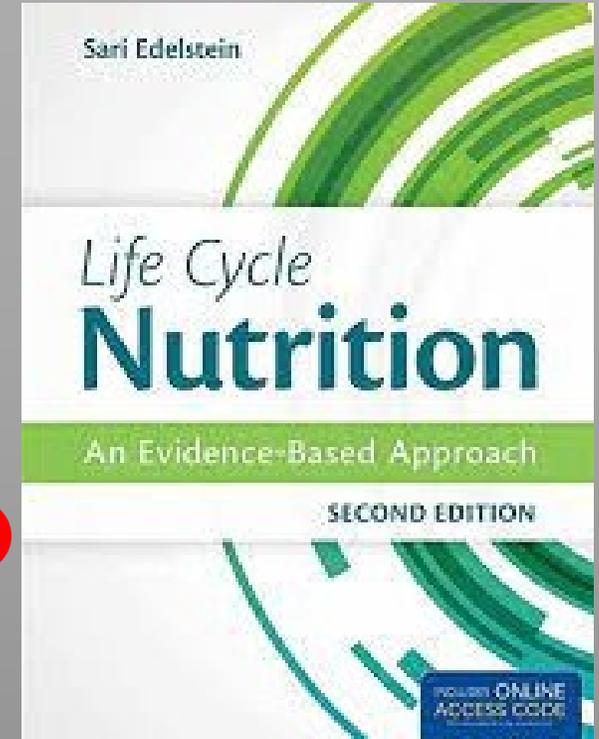
Adults

Living a long, quality life





Which
Textbook





Pro or Novice?

How are you employing co-creation of knowledge designing or re-designing a course?



Or use

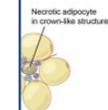
<https://go.unl.edu/cocreation>

EAT LESS, EXERCISE MORE: IS IT REALLY THAT SIMPLE?



Students: This is confusing

The situation becomes even worse because very large, (hyperplastic) adipocytes tend to go into apoptosis (cell



Inflammatory cytokines

Factors on the cell surface, for example, telomeres can dock to

along with other risk factors and other chronic conditions that low-grade inflammation and person develops the reason why someone in obese is not normal and

to central, obesity. This raised types of adipose inflammation and

issue can turn out this happens inflammation at much smaller scale-grade the risk for T2D or

cytokines and other messenger molecules as well.

The cytokines in concert with those other secreted messenger proteins increase inflammation in the adipose tissue.

Increasing inflammatory signals will attract more macrophages which start secreting even more cytokines. You get the point. The adipose tissue is now in a vicious inflammatory cycle.

When the immune system is triggered but the opposite is true. Immune responses need to be measured and balanced because the processes will not just remove the virus or bacterium but damage tissue in the process. Think about the dreaded cytokine storm in COVID-19 patients or auto-immune diseases. The goal is to balance removal with as little damage to body tissues as possible.

Content Review

Content

18 Developing Good Taste

Sabine Zempleni

I grew up in the "clean plate" club. My mother put the plate with food in front of me and I had to eat it, vegetables and all. I vividly remember having to stay at the table after dinner to finish my vegetables especially when spinach, broccoli, cabbage, kale, and other cruciferous vegetables were on the menu. Raw vegetables such as lettuce, tomatoes, cucumbers were fine but cooked, bitter vegetables tasted just awful. Today I'm eating and enjoying all vegetables with two exceptions: Creamed spinach and cooked Brussel sprouts.

Is my mother's strategy the way to go? I never made my daughters eat anything they found repulsive. Both were, like most children less than fond of vegetables. My personal childhood vegetable woes in mind, I encouraged my daughters either to helped me cook or to sit at the kitchen table drawing or completing homework. I used that time to feed them as much of the raw vegetables I was cutting up as they liked. By the time dinner with cooked vegetables rolled around they already ate their vegetable servings. Today, both daughters eat and enjoy vegetables.

Why do so many children, and some adults, hate vegetables? Do we have to accept that vegetables are not for children? Will everybody eat vegetables as an adult anyway?

During this chapter I will explain why children, and some adults, live in a different taste world and how parents can patiently help their children enjoy vegetables over time.

In this chapter you will learn:

Many children in the US eat an unhealthy Western diet right from the start:

- Children in the US do not eat their fruits and vegetables.
- US infants and children eat far too much added sugar.
- Picky eating is a normal development stage for many children

Eating is a complex, multi-sensory experience:

- Taste is a small part of the flavor you perceive when you eat.
- Taste receptors, the olfactory epithelium and the trigeminal nerve deliver the inputs, the brain decides.
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Children live in a different taste world than adults:

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- The infant's taste preference is not for life.

Parents have a couple of tricks up their sleeve to raise a vegetable lover:

- Dietary learning is more pronounced during early life.
- Mothers eating garlic, carrots and anis forces fetus and infant to get used to the flavor.
- Infants and children need time to accept new foods: Trying 8 – 10 times seems to do the trick.
- Parents need to avoid to ingrain the sweet taste preference: No added sugar until 2 years of age.
- Easier said than done: Parents need to be consistent and patient.

Children in the USA Do Not Eat Their Fruits and Vegetables

Feeding of solid foods starts traditionally with iron-enriched baby cereal mixed with human milk or formula in the USA. Per recommendation the next food following the cereal should be a vegetable and vegetables should be introduced before fruits.

US Infants and Children Eat Far Too Much Added Sugar

Sweets, Juice and SSBs:

FITS 2016 study parents reported:

- 73-80 % of the toddlers ate sweets
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Getting back to the FITS study. The FITS study showed that most children under 2 years of age eat sweets, half of them drink fruits juice, and a third of the toddlers drank SSBs (sugar sweetened beverages).

The recommendation for added sugar intake for children under 2 years is simple: None. This means no candy, sugary milk and yogurt, cookies, cakes, ketchup, baked beans. This also means fruit juice only in small amounts. After the age of 2 the recommendation is less than 6 teaspoons.

Another study gives us additional insights. This study looked specifically at added sugar intake and found that 60 % of the infants and almost all toddlers consume foods with added sugar. The top sugary foods for infants are baby snacks and sweets, bakery products, and flavored milk. For toddlers the top three are fruit drinks, bakery products, and sweets.

Even more scary, these toddlers eat a lot of added sugar. Keep in mind that per recommendation they shouldn't have any, but in reality toddlers have an average added sugar intake of just under the recommendation for the older children, 6 teaspoons. Black children had the highest added sugar intake and are the equivalent of 8 teaspoons per day.

High added sugar intake, high consumption of snack food, and low fruit and vegetable intake are in all age groups predictors for overweight and obesity. When it comes to children this is just the tip of the iceberg. During the remaining chapter you will learn that the first years of life are essential for establishing a healthy diet because during this time taste preferences develop.

Picky Eating is a Normal Development Stage For Many Children



The reality is that American children are fed sugary foods very early on and are fed a lot of added sugar.

This eating behavior is contrary to the recommendation not to feed any sweets and products with added sugar before age 2. This recommendation has a reason.

You learned that babies are born with a strong preference for sweet taste. Initially, this is a good mechanism to promote sufficient intake of the sweet human milk. In times past when food was not abundant this was also a good strategy to identify energy rich foods.

Today, this sweet preference sets children up for an unhealthy, energy dense diet. Sweets are abundantly available and most processed food is salty, savory and sweet. The sweet preference increases consumption. Research showed that early exposure to added sugar can strengthen this sweet preference and this might makes it even harder to get the child to eat the healthy, bitter vegetables.

Easier Said Than Done: Parents Need to Be Consistent And Patient

Strategies

Picky eating is a common stage of eating development, and is unlikely to cause any long-term development issues.

- Don't do: Negative reactions of parents, stress, repeated exposure to unfamiliar food, avoiding negativity and pressure, frequent model healthy eating, limiting snack food and sugary drinks, crowding a positive social positive experience, being inconsistent.

Healthy eating is a long-term goal. Children learn over time.

This brings me back to the picky eating section. I jumped over the evidence backed strategies reducing picky eating. Those strategies should be used for all you children, picky or not.

Parent need to keep in mind first and foremost that healthy eating is a long-term goal that requires lots of patience. Negativity and pressure are rather counter-productive. As the studies regarding picky eating show it will not impact growth or development if a child has a picky eating phase.

The (hopefully) relaxed parents should create a positive, social eating environment and modeling healthy

eating. The child should be exposed to many different vegetables in realistic portions. When parents eat vegetables every day consistent, repeated exposure in small amounts is easier.

In addition foods with added sugar should be avoided until age 2 (this will be a difficult conversation with grandparents, aunts, uncles and often the daycare provider) and then limited along with snack food. That ensures that the child is actually hungry for meals and planned snacks.

It will still be rather a marathon than a sprint.

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Want to Know More?

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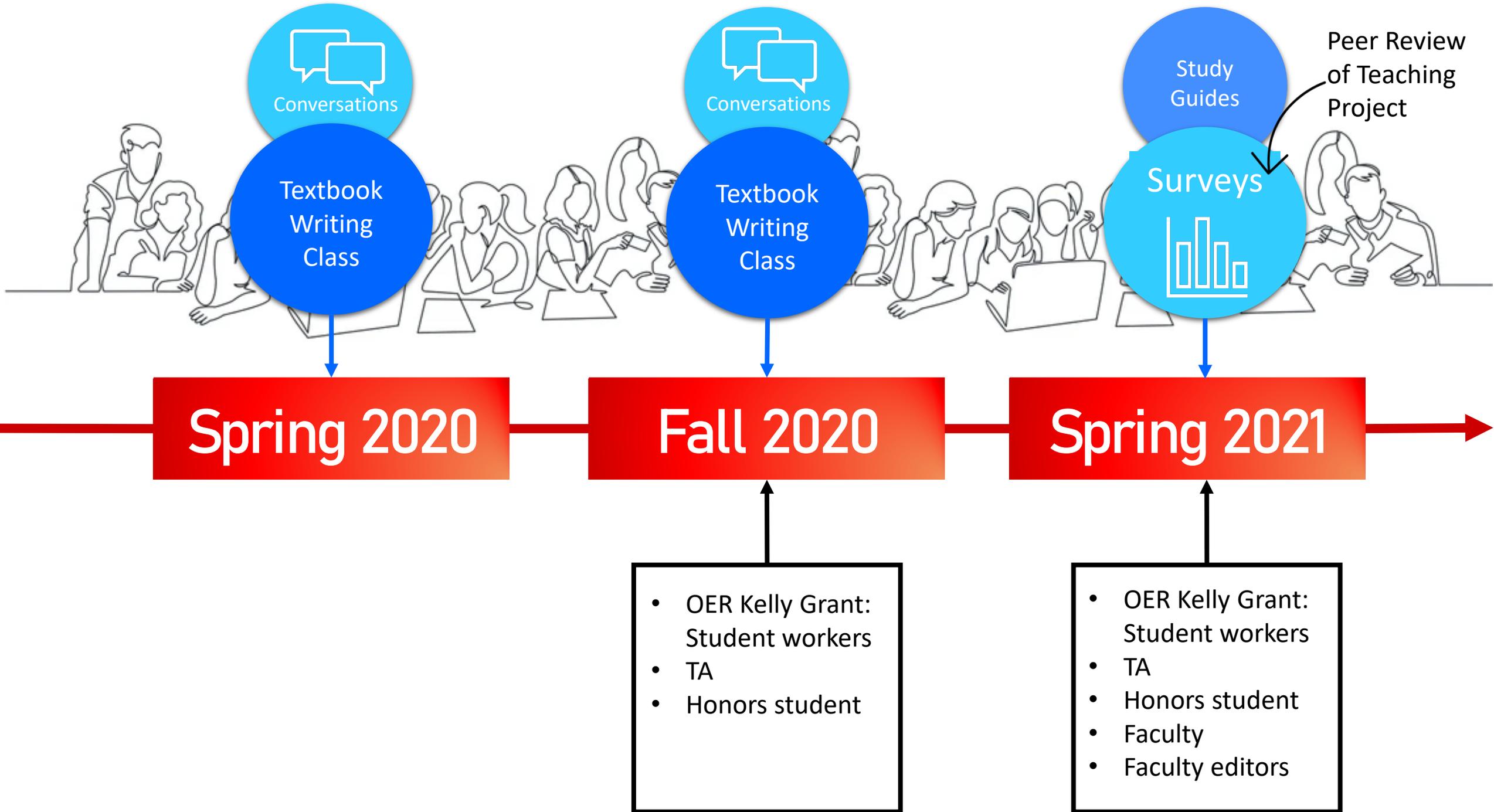
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[Mennella JA, Bobowski NK. The sweetness and bitterness of childhood: Insights from basic research on taste preferences. *Physiol Behav.* 2015;152\(Pt B\):501-507. doi:10.1016/j.phybeh.2015.05.015](#)

My child is a picky eater. My child does not eat vegetables. This is often the argument of parents explaining why their children are on a diet of chicken nuggets, fries, chocolate milk, cereal, pizza, cracker, sweetened yogurt, fruit cups and other unhealthy processed food. Parents tend to be

How We Got There





Conversations

Textbook Writing Class

Spring 2020

Conversations

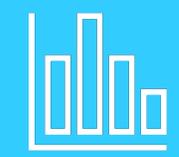
Textbook Writing Class

Fall 2020

- OER Kelly Grant: Student workers
- TA
- Honors student

Study Guides

Surveys

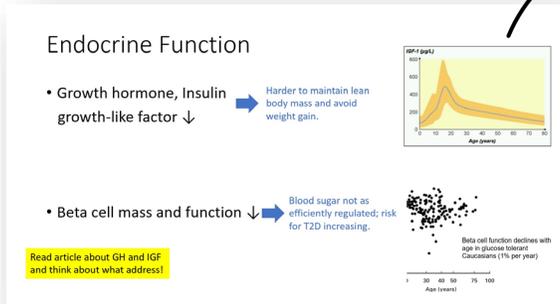


Spring 2021

- OER Kelly Grant: Student workers
- TA
- Honors student
- Faculty
- Faculty editors

Peer Review of Teaching Project

Infographics identify concepts and aid review.



Bitter Taste Receptors

- 25 different taste receptors for bitter
- Diverse receptors pick up different kinds of bitter

For some people vegetables taste super bitter (PROP Super Taster)

- Gene TAS2R38 codes for one of the receptors that detects a bitter chemical in broccoli, brussels sprouts, cabbage and turnips.
- Different alleles (variations) determine higher, intermediate or lower taste threshold

Explains why some people dislike vegetables.

Explains why some people dislike vegetables.



Textbook writing pushed students to more precise learning

Structure:
Main Points
Detail
Terminology/
Definition

Lecture Infographic

Sarcopenia



Sarcopenia is defined by a low muscle mass combined with either low grip strength or slow gait speed.



Why does sarcopenia matter?

Loss of muscle strength and physical performance are connected to:

- Disability
- Morbidity
- Cognitive decline
- Lower survival times

Interventions

Exercise:

- Short-term interventions are effective
- Life course approach

Diet:

- Protein?
- Vitamin D?
- Unclear results

Main Points: Sarcopenia is a muscular condition which results in a loss of muscle strength or performance due to the loss of muscle mass. Sarcopenia can be found in older adults and can cause serious issues with being able to move or take care of oneself. (Alex [redacted])

Detail: Sarcopenia is a condition that is defined as low muscle mass combined with low muscle strength or low physical performance. The muscle mass is determined by a DXA scan. DXA scans are x-ray scans of the body determining bone mass and muscle mass. DXA scans in particular can be very expensive, which can be a disadvantage to using them. Muscle strength is determined by doing a grip strength test. Physical performance is determined by gait speed. Loss of muscle strength and physical performance can lead to disabilities, morbidity, cognitive decline, and lower survival times. Exercise can be an effective way to slow sarcopenia. (Dylan [redacted])

Terminology/Definition:

- Sarcopenia: loss of muscle strength and physical performance
- Gait speed: is the time one takes to walk a specified distance on level surfaces over a short distance
- Dexa Scan: they work by sending two low-dose X-rays which are absorbed differently by bones and soft tissues and usually assess or measure bone density. It may also have uses in determining body composition, such as the percentage of lean muscle and fat (Jacob Sautter)
- Dynameter: is a method used to measure one's grip strength (Jacob [redacted])

Child food insecurity has consequences

Academic Achievement:

- Lower scores in math and reading
- Lower engagement in class
- Loss of school days
- Repeated grades

Health:

- Lower health in general
- More stomach aches
- More headaches

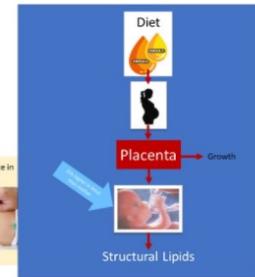
Behavioral Outcomes:

- Externalized: aggression, hyperactivity, inattentiveness
- Internalization: Depression, anxiety, substance abuse

Main Points: (Ericka [redacted])
A child's food status plays a vital role in their academic achievement, health, and behavior.

Essential Fatty Acids

but not too much: supply essential for synthesis and neural ment.



Essential fatty acids translate into higher birth weight and larger head and neural development.

If enough essential fatty acids are consumed, this has been connected with capabilities. These are critical building blocks for the brain and neural while too much essential fatty acids increase peroxidation and will use more

Low fatty acid intake is associated with lower maternal and neonatal PUFA status which reduces incidents of preterm birth.

oxidative membrane damage that affects cell membranes, lipoproteins, and contain lipids. Saturated fats. Docosahexaenoic acid (DHA) is an omega-3 fatty acid essential for brain development in early childhood.

When a family is food insecure about where their meals are from, it affects the child, but the child's academic achievement in math and reading, lower grades. This has negative effects on their behaviors and mental health. Furthermore, a food insecure child may be more likely to be involved in substance use. The child will have more behavioral issues. All of these issues are a result of food insecurity. If not all of these issues are addressed, it can lead to food insecurity for the safety of the child.

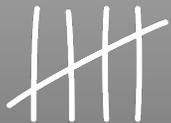
It is important to ensure a sufficient quantity of

wish list

I determine the learning goals and objectives, students have input how they learn.



30 minutes reading
time for each class



4000 to 5000 words

Reading Experience

- ✓ Concepts clearly visible
- ✓ Casual language
- ✓ Story telling techniques
- ✓ Inverted pyramid writing strategies
- ✓ Explain nutrition knowledge as needed

Introduction: Real Life + Review

Conclusions

2 Type 2 Diabetes Is a Complex Disease

Sabine Zempleni



<https://www.menshealth.com/health/a29502047/weight-loss-running-beginner-marathoner/>

Here is a success story from Lincoln NE. "Chris Peck didn't set out to become a runner. After receiving a type 2 diabetes diagnosis in summer 2016, the 45-year-old, self-described "couch potato" and "eater of drive-throughs" simply started walking during his 15 to 20-minute work breaks as a school bus driver in an attempt to lose weight. But before long, Peck's competitive nature inspired him to turn those out-and-back walks into "kind of a contest" to see how much more ground he could cover in the same amount of time. Could he make it to the next corner? Could he explore one more block?" As the story goes Chris Peck became a marathon runner and his T2D a thing of the past." This is a simple and inspiring story but once you know more about T2D you will see that it is not that easy. Most people are not as successful (or lucky since he found something he loved that reversed his T2D before it was too late) reverting their T2D back to a normal metabolic status.

Before you will dive into type 2 diabetes during this chapter make sure to use the following infographic to refresh your knowledge about the part of the glucose metabolism that relates to type 2 diabetes.

Review

Stats And Facts

- 8 in 11 people develop diabetes
- 90% of diabetes cases are type 2
- 1 in 2 adults with T2D are undiagnosed
- Diagnosis is increasingly common in younger age groups

Glucose Utilization

Energy Metabolites | Storage: Glycogen, Fat

Glucose

Dietary CHO's | Glucogenic Amino Acids | Glycerol

Glucose tolerance

describes how efficiently the metabolic system glucose from the bloodstream after a oral health test (OGTT) or fast insulin sensitivity test (euglycemic hyperinsulinemic glucose tolerance) (HAI) is only slowly released from the blood and blood glucose levels stay elevated longer.

Insulin Action

While both oral glucose tolerance and insulin sensitivity tests are useful in diagnosing diabetes, the only accurate in vivo test for insulin resistance is the euglycemic hyperinsulinemic glucose tolerance test (euglycemic hyperinsulinemic glucose tolerance test).

Insulin Sensitivity

High insulin sensitivity means that the cell needs a lower level of insulin to remove glucose from the blood stream.

Insulin Resistance

A lack of insulin receptors, reduced response to insulin, or a combination of the two, results in the cell not responding to insulin, leading to insulin resistance.

Other Insulin Facts:

- Insulin can be used up by the body
- Insulin is secreted by the beta cells of the pancreas
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Connection to everyday life

Review from NUTR250 Human Nutrition and Metabolism

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In this chapter you will learn:

Concepts 1 - x:
Infographic followed by
explanatory text

Interest
peaked?

One
Concept

Next
Concept

Next chapter

US Infants and Children Eat Far Too Much Sugar

Sweets, Juice and SSBs:

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Easier Said Than Done: Parents Need to Be Consistent And Patient

Strategies

Picky eating is a common stage of eating development and is unlikely to cause any long term development issues.

- Repeated exposure to unfamiliar food.
- Avoiding negative and pressure.
- Parent model healthy eating.
- Limiting snack food and sugary drinks.
- Creating a positive social positive experience.
- Being consistent.

Healthy eating is a long term goal. Children learn over time.

This brings me back to the picky eating section. I jumped over the evidence backed strategies reducing picky eating. Those strategies should be used for all your children, picky or not.

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Spring 2021



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Faculty-led Inquiry into Reflective and Scholarly Teaching (FIRST)

UNL Faculty Course Portfolios

Enabling Conceptual Learning in the World of Nutrition Communication

Sabine Zempleni, University of Nebraska

Date of this Version
2021

Document Type
Portfolio

Citation
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Abstract
During the last decades, the flow of information and consumer has changed profoundly and often makes it difficult for students to explain the concepts to the consumer. Many students have not made the transition from conceptual learning. Students will need help to make this transition successfully. The goal of this Peer Review of Teaching Portfolio is to explore how learning tools can contribute to conceptual learning. The



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UNL Faculty Course Portfolios Website



<https://go.unl.edu/nutr251>

Lessons Learned





Co-Creation will lead to better course and learning tool design:

✓ Increased course ownership and engagement

✓ Content becomes relevant to students

✓ Increased understanding of student perspectives and needs

- *Precise learning* ↑
- *Organic discussion* ↑
- *Feedback conversations* ↑
- *Use of textbook* ↑
- *Skimming* ↓
- *“Interesting/enjoy reading”* ↑
- *Understanding* ↑
- *Read before class*
- *Can be used in various ways*
- ***Low scoring students: Infographics overwhelming***



Co-creation is not a time saver:

- Enormous amount of timely editing
- Mentoring of undergraduate students and student workers
- Combine with other learning tools



“..... I noticed a difference when the OER wasn't complete for module three and it impacted my studying where I didn't feel as confident in the information. I felt like I was lacking the in-depth knowledge.”

“I really enjoy the OER, it is easy to read, easy to follow and easy to understand.”

“I like that the infographics are included every page or so. It helps me remember what I read and understand how to summarize the main points that I just read about. It also helps me visualize the topics better.”