DESCRIPTION

Students will discuss the importance of eating high quality fats from the Brain Food category. Students will identify and sort different kinds of foods containing fats into high and low quality fat categories and will define close to the source, high quality fats as fats that come from plants and fish. Students will prepare a close to the source snack of guacamole made with high quality fat from locally grown avocados.

TIME: 45 minutes
SUBJECT: Health

LEARNING OBJECTIVES

After this lesson students will be able to:

- Discuss the health benefits to the brain from eating high quality fats.
- Define high quality fats as those that are beneficial to our bodies and come from plants and fish.
- Define low quality fats as those that can harm our bodies and generally come from land animals or are in processed foods.
- Identify and sort different kinds of foods containing fats into high and low quality fat categories.
- Prepare a snack containing close to the source, high quality fat.

ACADEMIC STANDARDS*

HCPS III: HE.K-2.1.3, HE.K-2.1.5, HE.K-2.1.4

*A detailed list of the Academic Standards can be found in the Unit Overview document

LESSON OUTLINE

I. Introduction (3 minutes)
II. Brain Foods (10 minutes)
  - High Quality Fats
  - Low Quality Fats
III. High vs. Low Quality Fats (10 minutes)
  - High vs. Low Quality Fats Sorting Activity
IV. Close to the Source Snack (20 minutes)
  - Brainy Guacamole Demonstration and Tasting
V. Closing (2 minutes)

KEY TERMS AND CONCEPTS

Brain Foods – High quality fats and oils that help us to learn and remember things; also good for our hearts

Fats – A component of foods that provides fuel for the body; unused energy gets stored as fat in our bodies

Higher Quality Fat – Fats that are beneficial to our bodies; those that generally come from plants and fish

Lower Quality Fat – Fats that may harm our bodies and cause various diseases or conditions; generally those that come from land animals

Oils – Fats that are liquid at room temperature; usually derived from plants and fish

LESSON MATERIALS

Core Supplies:
- ʻĀINA In Schools apron with name tag
- Kōkua Hawaiʻi Foundation cloth bag
- Laminated ʻĀINA Food Guide Poster
- Copy of ʻĀINA In Schools Student Workbook
- Knife (plastic lettuce knife)*
- Cutting board
- Non-latex gloves
- Napkins
- Garbage/compost bag

Lesson Supplies:
- Vocabulary Cards (5)
- High vs. Low Quality Fats Signs (2)
- High vs. Low Quality Fats Cards (28)
- Guacamole Recipe Sign
- Tasting cups for guacamole

High vs. Low Quality Fats Cards

Teaching Team to Provide:
- Serving tray (or use top of supply bin as tray)
- Snack ingredients in separate containers
- Mixing bowl (ideally clear)
- Mixing/mashing fork
- Serving spoon(s)

**Please do not bring knives on campus. The only knives allowed are those that are plastic and very well attended by an adult.*

ACCOMPANYING DOCUMENTS
- Take Home Letter with Guacamole Recipe

ADVANCE PREPARATION
- Lead docent to contact teachers to confirm date/time of the lessons.
- Review lesson content, roles and shopping needs with docent team.
- Shop for snack ingredients and review materials needed for lesson.
- On the morning of the lesson, prepare snack ingredients:
  - Cut avocados in half, leaving seeds in fruit and placing back together
  - Cut limes into quarters.
  - Crush or chop garlic.
  - Slice cucumber “chips”




INGREDIENT QUANTITIES NEEDED FOR SNACK

How much to buy	Up to 20 students	Up to 30 students	Up to 40 students
Avocado* (large)	2-3	3-4	4-5
Limes*	1 lime (2 Tablespoons)	1-2 limes (3 Tablespoons)	2 limes (4 Tablespoons)
Garlic	2 cloves	3 cloves	4 cloves
Salt*	1 pinch, to taste	2 pinches, to taste	3 pinches, to taste
Cucumbers*	3-4 “chips” per student	3-4 “chips” per student	3-4 “chips” per student

**Locally grown*

BACKGROUND INFORMATION

Fats play an important role in nutrition. They provide a concentrated energy source for the body; they are used to store energy, protect major organs, and help the body absorb and transport fat-soluble vitamins. Fats also help to maintain healthy skin and hair and promote healthy cell function.

The human brain is two-thirds fat; specialized cells only found in the brain are made up of fatty acids, which are the molecules dietary fats and oils are composed of. There are two essential fatty acids (EFAs) that cannot be manufactured by the body, which means we must get them from the diet: omega-3 and omega-6 fatty acids. These are essential for normal brain growth and development, and adequate dietary intake of these EFAs has been strongly linked to an increased IQ, improved mood, and ability to concentrate.

There are several types of fats but overall they can be separated into two categories: high quality fats that are beneficial to our bodies and generally come from plants and fish, and lower quality fats that can harm our bodies and generally come from land animals or processed foods.

Higher Quality Fats include monounsaturated fats, polyunsaturated fats, and omega-3 fatty acids that are liquid at room temperature. Unsaturated fats are the main component of olive oil as well as oils from macadamia nuts and avocados. Omega-3 fatty acids are also found in fish, such as salmon, mackerel and tuna. Over 80% of Americans are deficient in beneficial omega-3 fats Eating foods rich in high quality fats improves cholesterol levels, which can decrease your risk of heart disease. Good fats also help us fight cancer, keep our skin soft, lubricate the joints and keep you satisfied after eating.

Lower Quality Fats include saturated fats and trans fats. Saturated fats are solid at room temperature, and usually come from land animals (beef, cheese, milk). Fats that are saturated are readily converted to body fat, can clog arteries, and have been linked to an increase risk of diabetes. These should be limited with an emphasis on avoiding trans fats altogether.

Trans fats occur naturally in very small amounts in beef and whole milk, but are mostly found in processed foods, usually in the form of hydrogenated oils. Hydrogenation is a process in which hydrogen is added to liquid oils and creates fats that are less likely to spoil thereby extending the shelf life of processed foods. Trans fats harm the brain and nervous system, and even moderate amounts have been linked to impaired cognitive function and mental decline. Hydrogenated vegetable oils are associated with cancer, weight gain, diabetes and heart disease. In 2015, the FDA gave food manufacturers three years to phase trans fats out of food products and expects this action will "reduce coronary heart disease and prevent thousands of fatal heart attacks every year." Foods can currently still be described as having zero trans fats if there are less than 0.5g trans fats per serving. This makes it very important to read labels and look for the word "hydrogenated."

Beware of "low-fat", "reduced fat" and "fat-free" processed foods as manufacturers often replace fats with sugar, refined grains, and starches, causing large spikes in blood sugar and often leads to hunger, overeating, and weight gain.

BACKGROUND INFORMATION CONTINUED

	Types of Fats	Where to Find Them
Higher Quality Fats	Includes monounsaturated fats, polyunsaturated fats, and omega-3 fatty acids.	Olive oil, avocados, nuts and seeds, vegetable oils, nut oils, fatty cold-water fish (such as salmon), eggs
Lower Quality Fats	Includes saturated fats, hydrogenated fats, and trans fats.	Cheese, sausage, hot dogs, bacon, butter*; coconut oil*, steak, milk, palm oil, margarine, snack foods (chips, crackers), prepared desserts (cookies, pastries), and many processed foods

*Not all saturated fats are created equal. Studies are now finding that the main saturated fat found in virgin coconut oil (that has not been chemically treated) and whole butter is a medium-chain fatty acid. This has been shown to speed up the metabolism and reduce the body's ability to store fat. Although more studies are needed, eating small amounts of pure coconut, virgin unrefined coconut oil, and real butter from grass-fed cows can be beneficial for your health.

It is important to choose high quality fats for proper nutrition. Adults should try to get between 20-30% of daily calories from high quality fats. Children should try to get 30% of their daily calories from high quality fats to support their normal growth and development.

References:

Human Nutrition by Revilla, Titchenal, Calabrese, Gibby, and Meinke: pressbooks.oer.hawaii.edu/humannutrition/

"In Time: Importance of Omega-3 in Children's Nutrition": ncbi.nlm.nih.gov/pmc/articles/PMC5417803/

"The Nutrition Source: Coconut Oil.": hsph.harvard.edu/nutritionsource/food-features/coconut-oil/

"The Nutrition Source: Fats and Cholesterol." hsph.harvard.edu/nutritionsource/what-should-you-eat/fats-and-cholesterol/

"Shining the Spotlight on Trans Fats." hsph.harvard.edu/nutritionsource/what-should-you-eat/fats-and-cholesterol/types-of-fat/transfats/

INTRODUCTION

3 MINUTES

"Hello again, we are…" State docent names.
"Welcome to your sixth nutrition lesson as part of the ʻĀINA In Schools program!"

"Do you remember our last lesson? We learned about BODY-BUILDING FOODS!"

"During the last five lessons we've talked about the benefits of eating close to the source foods. These foods do not have much taken away or added to them and are best for our body. Who remembers which is closest to the source: the apple or the Apple Jills cereal?"

Desired answer: Apple!

"Right! And who can tell me which BODY-BUILDING food made from dairy is closer to its source: yogurt or ice cream?"

Desired answer: Yogurt!

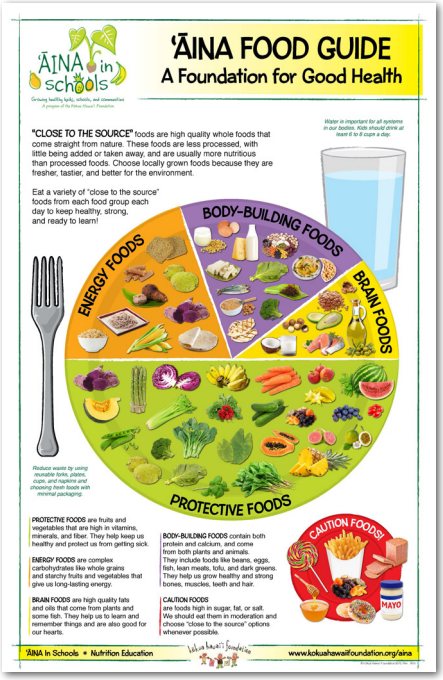
"Who can tell me which BODY-BUILDING food made is closer to its source: grilled chicken or chicken nuggets?"

Desired answer: Grilled chicken!

"In our last lesson we also learned that Body-Building Foods are foods that contain protein, calcium, or both. Remember making the Human Venn Diagram. Who knows an example of a Body-Building Food that contains both protein and calcium?" Accept a few examples.

"Today we're going to talk about high quality fats that are good for your brain. These are called BRAIN FOODS and they are the last food group on the main plate of our ʻĀINA Food Guide."

"Let's get started!"



ʻĀINA Food Guide

BRAIN FOODS

10 MINUTES

What is FAT? Fat is a component of foods that adds not only nutrition, but flavor, texture, appearance, and structure of many foods we eat.

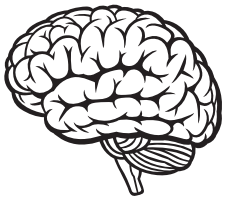
There are high quality fats and low quality fats. HIGH QUALITY FATS typically come from plants and fish and are close to the source because they haven't been changed or processed very much.

LOW QUALITY FATS generally come from land animals and or oils found in processed foods. They are fats that can harm our bodies and cause disease.

Fats that are liquid at room temperature are called oils, and they are made of high quality fats. We include the term 'OILS' when we talk about fat to highlight the difference between high quality fats from plants and fish (oils at room temperature) and LOW QUALITY FATS from land animals (solids at room temperature). Today when we talk about fat, we mean both fats and oils."

"Who has an idea why HIGH QUALITY FATS would be good for our brains?" Accept a couple of answers.

"First let's imagine our brain. It is inside of our head, protected by our skull. Your brain controls everything you do, like eating, drinking, sleeping, thinking, learning, and feeling. It's made up mostly of protein and fat, plus lots of nerve cells. Your brain is still growing and developing, and gets its fuel from the foods you eat."



"Your brain is mostly fat, which means that as it grows and develops, it needs some fat every day. When we eat high quality fats from close to the source foods, our brain is getting what it needs to do its job, like growing larger, storing information that you learn, remembering things, and helping you to be happy."

"Let's look at the BRAIN FOODS section of our 'ĀINA Food Guide. This category contains CLOSE TO THE SOURCE foods that are HIGH QUALITY FATS. What foods do you recognize in this category?"

Desired answers: Coconuts, avocados, nuts, seeds, eggs.

"Close to the source BRAIN FOODS contain the HIGH QUALITY FATS your brain needs every day."

"Do you see how much smaller the BRAIN FOODS section is compared to the other sections of the 'ĀINA Food Guide? This is to remind you that your bodies need more foods from the larger sections like Protective Foods, Energy Foods, and Body-Building Foods. We all need to eat foods with fat. We just don't need as much as the other sections. In fact, if we eat too many foods that are high in fat, especially food with LOW QUALITY FATS that are FAR FROM THE SOURCE, we can become unhealthy."

"Do you see any foods that contain LOW QUALITY FATS that are FAR FROM THE SOURCE on your 'ĀINA Food Guide?" Desired answer: Yes, over on the side plate.

"Which foods do you see?" Possible answers: Mayonnaise, potato chips, French fries, cookies, Spam, sausage.

"They're off to the side and there aren't very many of them. Why do you think they're off to the side?" Desired answer: Because we shouldn't eat too many of these foods and not every day.

BRAIN FOODS CONTINUED

"Foods with LOW QUALITY FAT are not helpful to our brain and some of them can harm our bodies. LOW QUALITY FATS make our blood thicker, making it hard to carry oxygen to our muscles and brain. LOW QUALITY FATS can also make it harder for us to avoid disease and sickness."

"LOW QUALITY FATS may be processed and farther from the source and generally come from land animals and foods made from them, such as…"

- Bacon, sausage, fried chicken, and chicken nuggets.
- Whole-fat dairy products like butter, cheese, ice cream, and whole milk, dairy products and can be a good source of protein and calcium.
- Foods fried in oil, like potato chips, French fries, and doughnuts.
- Highly processed foods like cookies, cakes, and pastries.

"We can eat these foods sometimes, but like our ʻĀINA Food Guide reminds us, we should remember to eat these foods in small amounts and not too often."

"Let's look back at the BRAIN FOODS section."

"HIGH QUALITY FATS are CLOSE TO THE SOURCE and usually come from foods that grow on plants or trees, or that live in the ocean, such as…"

- Nuts, peanuts, soybeans, avocados, and even whole wheat.
- Fish like salmon and tuna.
- Oils like olive oil and macadamia nut oil.

"These HIGH QUALITY FATS help our bodies to absorb certain vitamins, like vitamin A and vitamin D. Vitamin A is important for healthy eyes and skin, while vitamin D helps our bones and teeth stay strong. HIGH QUALITY FATS also help to keep our blood healthy, and helps us avoid disease and sickness."

There is another CLOSE TO THE SOURCE food that contains fat that is good for your brain. I'll give you a hint: They come from chickens!"

Yes! Eggs are CLOSE TO THE SOURCE and contain HIGH QUALITY FAT! Even though eggs come from an animal, they are a BRAIN FOOD containing HIGH QUALITY FATS."

"The difference between HIGH QUALITY and LOW QUALITY FAT is important. We all need some fat in our diet every day. We should choose to eat HIGH QUALITY FATS from CLOSE TO THE SOURCE plants, fish and eggs to stay healthy instead of LOW QUALITY FATS from FAR FROM THE SOURCE processed foods or land animals."

HIGH vs. LOW QUALITY FATS

10 MINUTES

DOCENT NOTE

Assistant Docent: Start passing out High vs. Low Quality Fats Cards to students. If the class is very small, be sure to pass out an equal number of high quality fat and low quality fat cards.

"Now, we're going to have some fun sorting out which kinds of fats are in your food!"

"We just talked about the difference between HIGH QUALITY and LOW QUALITY FATS and now we're going to practice what we learned."

"Each of you has a card. Most of you have cards with a picture of a food on it. Two students have a sign that either reads HIGH QUALITY FATS or LOW QUALITY FATS. Who are these students?"

High vs. Low Quality Fats Cards

Ask these students to stand up, place themselves on opposite sides of the room, and repeat the difference between HIGH QUALITY FATS, which come from close to the source plants and fish, and LOW QUALITY FATS, which are found in far from the source processed foods and fats from land animals.

"Now we have two categories, and each of you have to decide which category your food picture card fits into. Think about your food and about what we discussed. Is it a plant food? A food from the ocean? A food from a land animal? A food that has been processed in fat or oil?"

Give students one minute to discuss with their neighbors which group they think their food item belongs in. Then call the class to order and give the students one minute to silently move to either the HIGH QUALITY FATS or LOW QUALITY FATS group.

The group leader with the sign and key on the back will see if everyone in the group belongs there. Once all the students are in the correct groups, have the group leader share their group name, then have each student read off the name of their picture card and why that food item is a HIGH QUALITY or LOW QUALITY FAT.

ACTIVITY KEY

Higher Quality Fats: avocado, almonds & almond butter, cashews, coconut, eggs, flax seeds, macadamia nuts, natural peanut butter, olive oil, olives, pine nuts, walnuts, salmon, sardines, sunflower seeds

Lower Quality Fats: bacon, canned meat, cookies, donuts, French fries, fried chicken, ice cream, margarine, mayonnaise, onion rings, peanut butter made with hydrogenated oil, potato chips, sausage

"G*reat job everyone! It looks like you know the difference between HIGH QUALITY and LOW QUALITY FATS. Which fats are BRAIN FOODS and better for your bodies and brain?"* Desired answer: High Quality Fats!

Have students return to their seats and pass all of the cards to the front.

"Now it's time to make a CLOSE TO THE SOURCE snack from the BRAIN FOODS section of your 'ĀINA Food Guide that includes some HIGH QUALITY FATS!"

CLOSE TO THE SOURCE SNACK

20 MINUTES

Tell the students that they are lucky today because they get to taste a yummy snack that includes HIGH QUALITY FAT— Brainy Guacamole.

Have the students participate as much as possible in the food preparation process. All helpers must wash their hands.

Make sure you begin with all of the needed items close at hand and all ingredients prepped and in separate containers.

Have the students read from the laminated recipe card each of the preparation steps:

1) **Scoop** the avocado into the mixing bowl.
2) **Squeeze** juice from lime(s) into the bowl.
3) **Add** the garlic to the bowl.
4) **Sprinkle** a pinch of salt into the bowl.
5) **Mash** up all ingredients.

Discuss the ingredients of guacamole:

- What about this food places it in the BRAIN FOOD group?
- How are avocados found in nature? (i.e., grows on trees, plants, etc.)
- How can this food help your body? (i.e., brain health, growth, skin, etc.)
- Which ingredients are grown in Hawai'i?

Help the students spoon guacamole into each tasting cup and distribute along with the cucumber "chips."

SNACK VIDEO

See the ʻĀINA Team make and discuss this and other ʻĀINA Close to the Source snacks: kokuahawaiifoundation.org/ainavideos

DOCENT NOTES

- Point out that anyone with a known allergy to any of the food items should not touch or sample it. By this age, kids should know this about themselves, but please bring it to the attention of the teacher who can make sure that any students with known allergies or intolerances do not receive snacks.
- You may use the Lesson Supply Bin lid as a serving tray.
- Give a snack to the teacher and any other classroom aides.
- Please refrain from verbalizing your own food preferences and be aware of your body language and facial expressions. These subtle cues have a big impact on a child's willingness to try foods!
- Encourage the students to try the snack. Remind them of the "no yuck" rule: They can choose not to try any foods they wish, but if they do try them, they must keep their personal opinions to themselves.

CLOSING

2 MINUTES

Provide a quick review:

- Eating HIGH QUALITY FATS is good for your brain and your whole body.
- HIGH QUALITY FATS come from plants and fish and are close to the source.
- LOW QUALITY FATS generally come from land animals or have been changed through processing so they are far from the source. We should limit how much of these processed fats (like hydrogenated oils) we eat.

Review the Take Home Letter and follow-up activities:

- *"Share the take home letter with your parents and try making the guacamole recipe together. You can eat it with chips or try using cucumber 'chips' instead."*
- Encourage students to create their own recipes inspired by this lesson using ingredients from the Brain Foods group. Students may use the ʻĀINA Recipe Challenge form at the end of their ʻĀINA Nutrition Student Workbooks to share their creations. Kōkua Hawaiʻi Foundation will select recipes to feature in future blog posts, newsletters, and cookbooks.

Thank the students for doing such a great job!

THANK YOU!

DOCENT NOTES

- **Pack your trash!** Please leave the classroom cleaner than you found it by removing all lesson-based trash. We don't want to add any burden or extra trash for the teachers or custodians so please do not throw away any trash in the classroom garbage. Instead:
  - Collect napkins and any leftovers.
  - Avocado skins and lime peels may be composted if composting is available at the school.
  - Use the garbage bag in the Lesson Supply Bin to remove all lesson-related food items from the classroom.
- Please do not leave any food in the supply bin. Perishable props have been known to get moldy and smelly when left in the bin after the last lesson.
- Please complete your online docent survey for this lesson. This is valuable feedback that helps to improve our program.
- Please collect student recipe submissions regularly and turn in to KHF staff at our next docent training.

ADDITIONAL RESOURCES

Lesson Plans and Curricula

- **BrainPOP: Fats:** brainpop.com/health/nutrition/fats/
  This BrainPOP activity explores how fats are used by our bodies and explores which types of fats are better for us.

Videos

- **"'ĀINA In Schools Close to the Source Snack Brainy Guacamole," Kōkua Hawai'i Foundation:** kokuahawaiifoundation.org/ainavideos
  This short video demonstrates how to make a delicious snack filled with high-quality fats with one of our favorite Brain Foods--avocado.
- **"What is Fat?," TedEd:** ed.ted.com/lessons/what-is-fat-george-zaidan#watch
  This animated TedEd video explains how the type of fat you eat is more impactful on your health than the quantity. Learn about triglycerides, the varied molecules that make up fat, and how to identify which types of fat you are consuming. Great for teachers and parents.

Additional Resources

- **"Choose Healthy Fats," Academy of Nutrition & Dietetics:** eatright.org/resource/food/nutrition/dietary-guidelines-and-myplate/choose-healthy-fats
  It used to be that all types of dietary fat got a bad rap. This site breaks down the different types of fats and how they impact our bodies.
- **"The Nutrition Source: Fats and Cholesterol," Harvard School of Public Health:** hsph.harvard.edu/nutritionsource/what-should-you-eat/fats-and-cholesterol
  When it comes to dietary fat, what matters most is the type of fat you eat. Contrary to past dietary advice promoting low-fat diets, newer research shows that healthy fats are necessary and beneficial for health.
- **"The Truth About Fats: the Good, the Bad, and the In-Between," Harvard Medical School:** health.harvard.edu/staying-healthy/the-truth-about-fats-bad-and-good
  Learn why trans fats are bad for you, polyunsaturated and monounsaturated fats are good for you, and saturated fats fall somewhere in-between.

Find more at
kokuahawaiifoundation.org/ainalessons