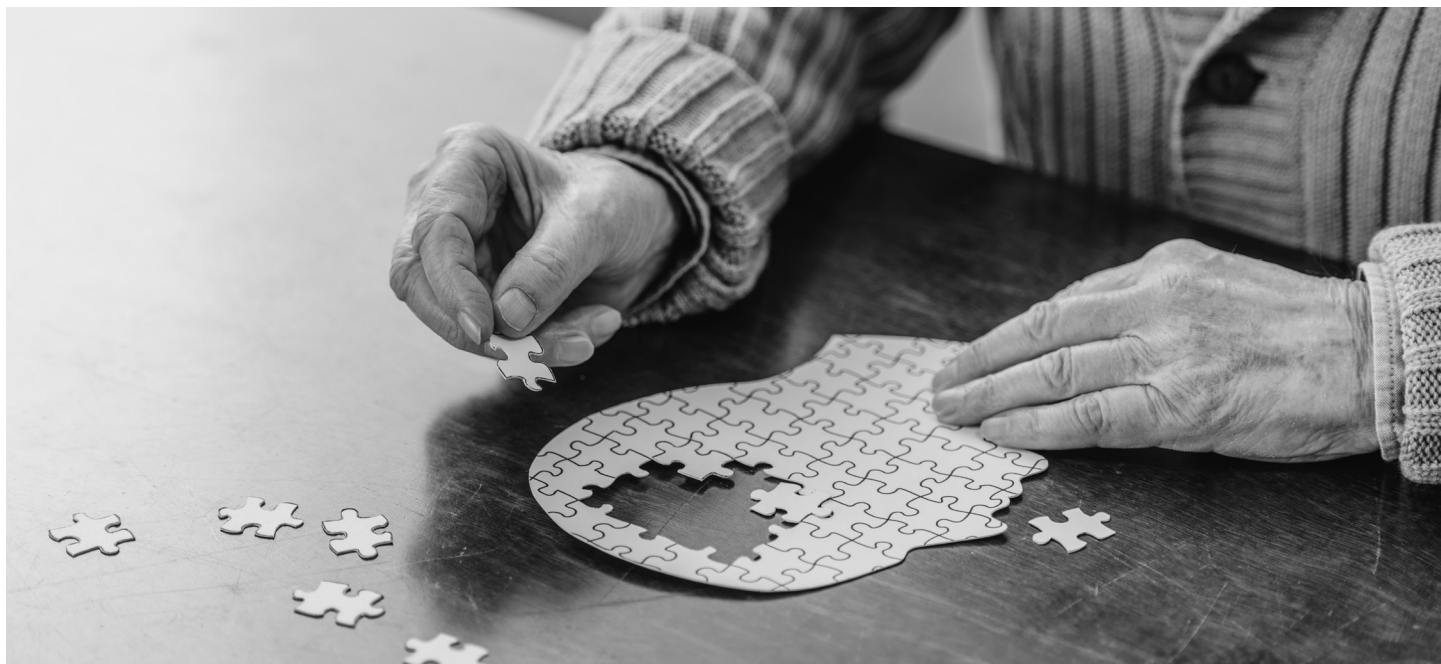


Nourishing the Brain: Recommendations for Combating Neurodegenerative Diseases

K-STATE
Research and Extension
Family and Consumer Sciences

Leader's Guide

2025 Annual Lesson Series



Introduction

The brain is a complex organ that serves as the command center for the body. Sixty percent of the brain is fat, and it is connected to the body via blood vessels and nerves. The brain communicates through neurons, facilitating sensory experiences and bodily movements. The structure of the brain consists of the cerebrum, controlling diverse functions like movement and emotions; the brainstem, regulating activities such as breathing; and the cerebellum, responsible for muscle coordination.

The brain's functionality can change as people age, and good nutrition is crucial to maintain a healthy brain. Essential vitamins support neuron health, while a balanced eating plan ensures a steady energy supply for cognitive processes. Omega-3 fatty acids in fish and nuts reduce brain inflammation and help with neuron communication. Vitamin D, obtained from sources like fortified foods and sunlight, supports memory and cognition. Herbs and

spices like turmeric contain polyphenols that combat inflammation and protect against brain diseases.

A balanced eating plan, like the MIND plan, focuses on brain-boosting foods like green leafy vegetables, nuts, berries, beans, whole grains, fish, poultry, and olive oil. These foods provide antioxidants, vitamins, and minerals crucial for brain health. Additionally, maintaining a healthy gut through an eating plan supports the gut-brain connection, influencing mental functions and mood.

Neurodegenerative diseases like Alzheimer's (AD) and Parkinson's (PD) affect brain health. Alzheimer's is associated with genetics, environmental and lifestyle factors, and age-related changes in the brain that result in the loss of neurons and their connections. This affects behavior, cognitive capacity, memory, and the ability to live independently. In Kansas, about 54,000 people aged 65 and older have AD, and by 2025, it's expected to be 62,000. Across the United States, about 5.8 million people have AD.

Parkinson's is a movement disorder characterized by tremors, rigidity, slowness of movement, and postural instability. Symptoms get worse over time and can affect walking, talking, swallowing, and mood. In the U.S., almost 1 million people have PD, and it is expected to be 1.2 million by 2030.

Educational goals

At the end of this session, participants will be able to:

Understand brain anatomy and its main functions.

Participants will learn about the structure and main functions of the brain. Participants will understand how all these parts work together to control their bodies.

Identify foods that aid in cognitive function.

Participants will learn about foods that help with cognitive functions and what type of eating plan helps best to maintain brain health.

Identify mealtime strategies to help people with Alzheimer's and Parkinson's disease. Participants will learn a few strategies to help manage the nutritional challenges of these diseases at mealtime.

Intended Audiences

Adults of any age; people with AD or PD; care partners of someone with AD or PD; adult children of someone with AD or PD; adults with an interest in brain health and how to prevent brain decline; adolescents and teens interested in knowing more about brain health; senior centers; family community education groups.

Lesson preparation

- Read the "Nourishing the Brain: Nutritional Recommendations for Combating Neurodegenerative Diseases" fact sheet (MF3661) and the leader's guide. Familiarize yourself with the content and terms.
- Study the linked resources in the leader's guide.
- Consider your audience and adjust to their needs and culture.

- Consider any topics you would like to expand on in your group. For example, maybe you want to provide more education on brain anatomy or more emphasis on the foods that aid the brain.
- Consider different learning style preferences and use visual and auditory resources from reputable sources to explain some of the concepts in the lesson.

Leading the lesson

The "Nourishing the Brain: Nutritional Recommendations for Combating Neurodegenerative Diseases" fact sheet is intended to serve as an outline for this lesson. The introduction in this leader's guide summarizes the fact sheet accompanying this leader's guide.

Suggested activities to support this lesson

Ask the group about their previous knowledge. Sample questions: What do you know about the brain? What do you think the brain does for your body? Do you eat specific foods to help your brain stay healthy? Open it up for discussion and encourage participants to share their thoughts and ideas. Make notes about their answers; you will need them throughout the lesson to clarify any unclear concepts.

Brain anatomy activities:

1. You can ask participants what they think the brain looks like and give them paper and pencils to draw it out. Ask them to share their drawing with the rest and then bring up a graphic or a slide with a picture of the brain. Ask them if their drawing looks similar to the graphic. Proceed to explain the different brain parts.
2. You can have the group stand up and hold hands. Ask the person on the edge to start a move and send it down to the rest of the human chain. Ask one of the participants to stop holding hands and interrupt the movement. You can use this activity to explain how neurons connect to each other to perform tasks like walking or balancing. When the chain is interrupted,

the movement might not happen or happen slower than usual.

3. You can look up a video about the brain discussing the three main parts highlighted in this lesson. Here is a video example explaining the three main parts of the brain <https://www.youtube.com/watch?v=pRFXSjpkKWA>.

Brain inflammation activity: You will need a clear container, water, cooking oil, food coloring, and chopsticks. Explain to participants that inflammation is a natural response in the body to injury or infection, and it also happens in the brain. Brain inflammation can affect cognition and decrease brain health. Fill the clear container with water to represent the fluid environment of the brain. Add a layer of cooking oil on top of the water to represent the blood-brain barrier, which helps protect the brain from harmful substances in the bloodstream. Explain that inflammatory molecules can cross the blood-brain barrier, causing disruption and damage in the brain (also called oxidative stress). To demonstrate this, add a few drops of red food coloring on top of the oil layer to represent inflammatory molecules entering the brain. Use the chopstick to gently mix the food coloring into the water beneath the oil layer, showing how inflammation can spread and affect the brain. Talk about how nutrition can help manage inflammation in the brain, bringing protection.

Foods that aid the brain activity: Ask them: How does nutrition help our brain health? Give them the activity chart at the end of this leader's guide. Make smaller groups. As you explain omega-3 fatty acids, vitamin D, herbs and spices, green leafy vegetables, nuts, berries, beans, whole grains, fish, and poultry, stop at each one and ask them to look up on their phones or within their group for examples of foods in those categories. Also, ask them to write down how those foods help the brain in the third column. When you have explained all the foods, give them time to fill out the last column and share with the group. Check out the links in the resource section to adjust this activity to different cultural cuisines. You can use pictures of foods from different cultures to help your participants associate the food with the health benefits.

Alzheimer's activities:

1. You can use two sponges to explain hydration and the brain. Have one soaked in water and then compare it to the dry sponge. Have the participants touch it to feel how soft and spongy it is. Explain how hydration helps with memory and overall thinking (wet sponge).
2. To explain how visual impairments affect people with AD, have foods on the same color plates. For example, red tomato slices on red plates. You can also have a small bowl with food in it but cover the top in clear plastic. Explain that people with AD with visual impairments or problems recognizing food can have issues seeing foods that blend with the plates or have issues seeing clear plastic covers, and that prevents them from grabbing the food on the bowl, causing confusion.

Parkinson's activity:

1. You can present pictures of adaptive utensils to help during mealtime. If you physically have these items, it will help the participant to have a better visual representation.
2. Provide a sampling of different nuts and berries and make slides with the nutritional benefits of the foods they are sampling.

Summarize the lesson by discussing how a balanced eating plan rich in brain-boosting foods supports cognitive health and may help manage neurodegenerative diseases like Alzheimer's and Parkinson's. By understanding the importance of nutrition, individuals can promote brain health and overall well-being.

Resources

Nourishing the Brain: Nutritional Recommendations for Combating Neurodegenerative Diseases Fact Sheet, MF3661

Healthy Body, Healthy Brain Fact Sheet <https://bookstore.ksre.ksu.edu/pubs/MF3602.pdf>

Nutrition and PD | Parkinson's Foundation. (n.d.). <https://www.parkinson.org/library/fact-sheets/nutrition>

Food and Eating. (n.d.). Alzheimer's Disease and Dementia. <https://alz.org/help-support/caregiving/daily-care/food-eating>

Celebrate cultural heritage with healthy recipes <https://www.usda.gov/media/blog/2021/05/11/celebrate-cultural-heritage-healthy-recipes>

Culture and food <https://www.nutrition.gov/topics/shopping-cooking-and-meal-planning/culture-and-food>

MED instead of MEDS recipe finder <https://medinsteadofmeds.com/>

Should we eat the rainbow?, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9268388/>

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**Kansas State University Agricultural Experiment Station and
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Activity

Foods that Aid the Brain

Look up examples of foods for each category. Then, use what you've learned from the presentation and the fact sheet to explain how these foods help the brain. In the last column, add ways to incorporate these foods into your regular eating plan.

Nutrient or food group	Examples of foods	These food helps my brain by...	I can incorporate these foods into my eating plan by.....
Omega-3 fatty acids			
Vitamin D			
Herbs and spices			
Green leafy vegetables			
Nuts			
Berries			
Beans and whole grains			
Fish and poultry			

Evaluation

Nourishing the Brain: Nutrition for Combating Neurodegenerative Brain Diseases

Please take a moment to respond to the questions below.

Date and location of presentation: _____

My county of residence: _____

Gender: Female Male Non-binary Other Prefer not to answer

Ethnicity: American Indian/Alaska Native White Asian Black/African American
 Native Hawaiian/Pacific Islander Other Prefer not to respond

Race: Hispanic/Latino Non-Hispanic/Non-Latino Prefer not to respond

Age: under 18 years 18-29 years 30-59 years 60-75 years 76+ years
 Prefer not to respond

1. Because of this program, I increased my knowledge of how nutrition helps the brain.

Not At All		Somewhat		Very
1	2	3	4	5

2. Because of this program, I increased my knowledge of neurodegenerative diseases.

Not At All		Somewhat		Very
1	2	3	4	5

3. Because of this program, I increased my knowledge of the brain and its functions.

Not At All		Somewhat		Very
1	2	3	4	5

4. Because of this program, I am confident I can include foods in my eating plan that can help my brain health.

Not At All		Somewhat		Very
1	2	3	4	5

5. Please list 2 habits that you plan to incorporate because of this program.

6. Please share any additional comments or suggestions.