THANKSGIVING EBOOK

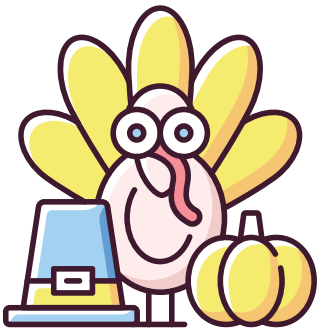
Thanksgiving Science Projects

Fun & Easy Activities Your Kids Will Love!

Contents

FOOD EXPERIMENT

Thanksgiving Dinner Science



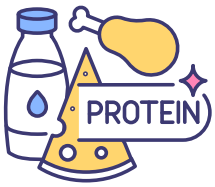
Turn your kids into curious chemists this Thanksgiving! This project will show how to test your family's Thanksgiving feast to see which foods contain the macronutrients: starch, protein, and fat.

This Project Contains 3 Experiments

Find These 3 Macronutrients in Your Thanksgiving Foods

1. Find The Starch

2. Find The Protein



3. Find The Fat

What You Need:

- ☐ Test tube rack
- ☐ Test tubes
- ☐ Pipets
- ☐ Water
- ☐ Gloves
- ☐ Solid or liquid food samples
- ☐ Spatula/scoop or teaspoon
- ☐ Lugol's iodine
- ☐ Biuret reagent
- ☐ Sudan III stain
- ☐ Lab apron
- ☐ Goggles
- ☐ Printed data sheet (pg 3)

1 Find The Starch

In this Thanksgiving food experiment, test your foods for starch using Lugol's iodine.

First, you'll make a simple solution using solid foods. If using liquid foods, this won't be necessary. The solution will turn blue- black if starches are present!

Ready? Let's do this!

What is Starch?

Starch is a complex carbohydrate. When people hear the word "starch," they may think of foods rich in carbs, such as potatoes, rice, and pasta. However, most plants store energy as starch, including fruits and vegetables.

Starchy foods are the primary source of carbohydrates for most people. They play a crucial role in a nutritious, well-balanced diet, as they provide the body with glucose, which is the main energy source for every cell. They also provide a range of vitamins, minerals, fiber, and other nutrients.

How to Test for Starch:

1. To make your test solution: finely chop solid foods with a knife, or break them into small pieces and grind them up using the back of a fork.

2. In a beaker or cup, measure 1/2 teaspoon of ground food to 2 teaspoons of water, and stir to make liquid solutions. For liquid foods (like milk), pour about 2 teaspoons of each into a cup or beaker.

3. Label each solution with the wax pencil (which washes easily off glass) or a piece of masking tape and a permanent marker.

4. To a test tube, add 50 drops of solution to be tested. If using more than one food, mark its name on the test tube using a wax pencil. Get curious and hypothesize about which foods contain starch.

5. Add 5 drops of Lugol's iodine to each test tube and gently swirl to mix.

6. Note color change, if any. If it turns blue-black, the solution contains starch. Record the results in your data sheet.

More About Starch

Extra glucose is usually stored in a more complex carbohydrate called starch. When we eat foods with starch, our body breaks down the large starch molecules into simple sugars, like glucose, to use for energy.

The energy from starch, along with other carbohydrates, allows us to think, move, and do everything else, from reading a book to running a race.

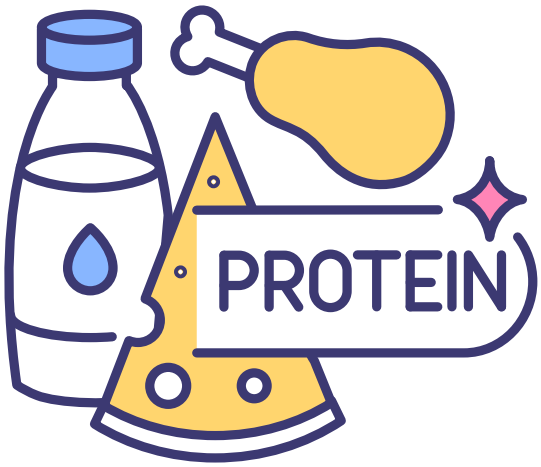
Starch is part of a healthy diet, especially when it comes from whole-grain foods that also contain vitamins and minerals.

2 Find The Protein

In this Thanksgiving dinner science experiment, test food for protein using Biuret reagent.

The blue solution changes to pink-purple when it reacts with protein.

Print out your data sheet and get ready to record what you discover!



What is Protein?

Proteins are made up of molecules called amino acids. Amino acids consist of atoms of carbon, hydrogen, oxygen, nitrogen, and sometimes sulfur. About 20 kinds of amino acids combine into various patterns to make different proteins. Each protein has its own sequence of amino acids. This sequence determines the shape and function of the protein. Most common proteins contain more than 100 amino acids.

A body needs proteins to perform many different functions. Some proteins help control processes in the body. Others transport, or carry, substances from one place in the body to another. Proteins make up collagen, which helps give structure to cells. Antibodies, which fight infections and diseases, are proteins. Enzymes are also proteins. Enzymes help the body digest food and build new cells.

How to Test for Protein:

1. To make your test solution: finely chop solid foods with a knife, or break them into small pieces and grind them up using the back of a fork.

2. In a beaker or cup, measure 1/2 teaspoon of ground food to 2 teaspoons of water, and stir to make liquid solutions. For liquid foods (like milk), pour about 2 teaspoons of each into a cup or beaker.

3. Label each solution with the wax pencil (which washes easily off glass) or a piece of masking tape and a permanent marker.

4. To a test tube, add 50 drops of solution to be tested. If using more than one food, mark its name on the test tube using a wax pencil. Get curious and hypothesize about which foods contain protein.

5. Add 5 drops of Biuret reagent solution to each test tube. Swirl gently to mix.

6. Note color change, if any. Proteins will turn the solution pink or purple. Record the results in your data sheet.

More About Protein

Protein strengthens your muscles and organs, helps your immune system, and controls many processes inside your cells.

Your body also uses specialized protein molecules to make red blood cells, which carry oxygen to all parts of your body.

Protein is an essential part of our diet, but because it is complex, it's difficult to digest, so we can only eat small amounts every day.

Protein doesn't get stored in the body, though, so it is important to eat it regularly.

3 Find The Fats

In this Thanksgiving dinner science experiment, you will test different food dishes and see if you can find fat in them.

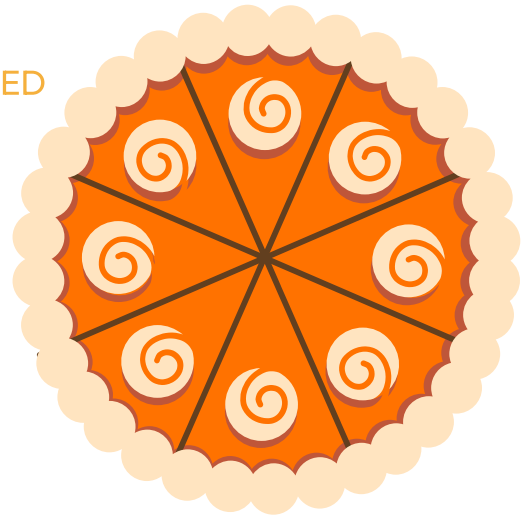
Print out your data sheet and get ready to record what you discover!

What Are Fats?

Fats are nutrients in food that the body uses to build cell membranes, nerve tissue (including the brain), and hormones.

The body also uses fat as fuel. If fats eaten aren't burned as energy or used as building blocks, they're stored by the body in fat cells.

This is the body's way of thinking ahead: by saving fat for future use, it plans for times when food might be scarce.



How to Test for Fats:

1. To make your test solution: finely chop solid foods with a knife, or break them into small pieces and grind them up using the back of a fork.

2. In a beaker or cup, measure 1/2 teaspoon of ground food to 2 teaspoons of water, and stir to make liquid solutions. For liquid foods (like milk), pour about 2 teaspoons of each into a cup or beaker.

3. Label each solution with the wax pencil (which washes easily off glass) or a piece of masking tape and a permanent marker.

4. To a test tube, add equal parts of test solution and water until half full. If testing more than one food, label each test tube. Get curious and hypothesize about which foods contain fat.

5. Add 3 drops of Sudan III stain to each test tube. Swirl gently to mix.

6. A red-stained oil layer will separate out and float on the water surface if fat is present.

More About Fats

Fats and oils are both lipids. Lipids are molecules that are insoluble (won't dissolve) in water. They transport vitamins, help form cell walls, and store energy long-term. Fats contain at least twice the amount of energy as carbohydrates and proteins.

They do not, however, provide instant energy like starch and glucose do, but are used as storage. Eating too much food with fat or oil can be unhealthy, causing heart problems, since lipids flow through the bloodstream and can block your arteries.

A healthy diet should include a few lipids, balanced by eating small amounts of protein every day.

Record Your Data

As you perform your tests, record your results for each food below.

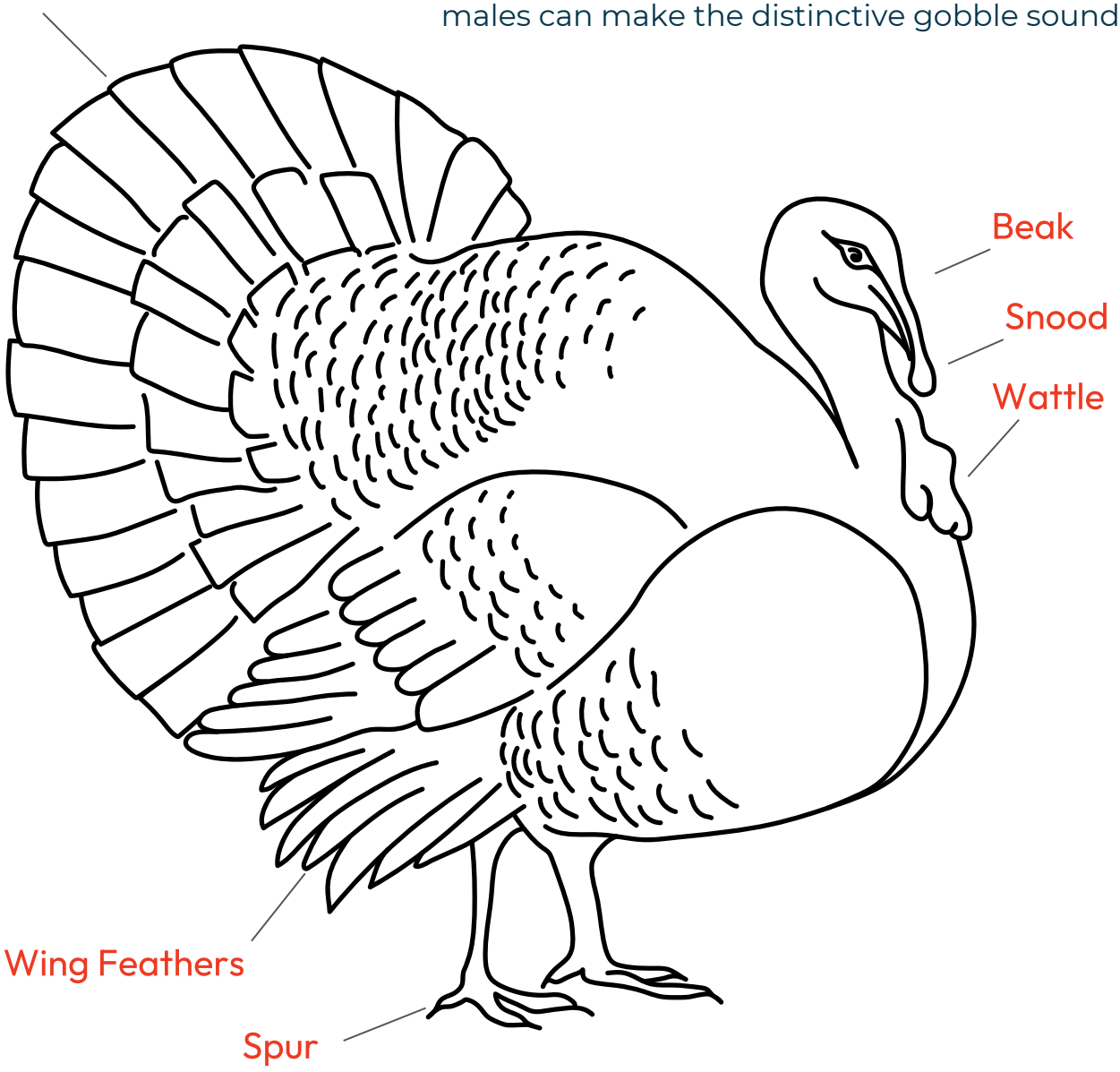
Food	Starch? Yes or No	Protein? Yes or No	Fat? Yes or No
Food #1 _____			
Food #2 _____			
Food #3 _____			
Food #4 _____			
Food #5 _____			

COLORING SHEET

Turkey Anatomy

Color this fun turkey and learn about turkey anatomy!

The male turkey is called a “tom” or “gobbler.” Only males can make the distinctive gobble sound!



A gobbler has a flap of skin hanging over his beak, called a snood. His snood and wattle (flap of throat skin) turn red if he’s excited, and blue if he’s sad. Hens have less prominent snoods and wattles!

WORD SEARCH

Turkey Word Search

THANKSGIVING WORD SEARCH

T	W	F	E	A	S	T	B	V	V	W	B
T	H	A	N	K	S	G	I	V	I	N	G
M	Z	T	W	J	T	U	R	K	E	Y	M
Y	O	G	O	B	B	L	E	R	E	P	N
A	P	G	B	P	O	U	L	T	Y	G	G
W	D	F	S	T	U	F	F	I	N	G	Y
Z	O	V	A	W	A	T	T	L	E	O	D
S	A	S	N	O	O	D	N	Y	C	W	W

Find the following words in the puzzle.

Words are hidden → and ↑

FEAST
GOBBLER
POULT
SNOOD
STUFFING
THANKSGIVING
TURKEY
WATTLE

SCIENCE PROJECT

Pumpkin Petri Dishes

What You Need:

- [ ] 1 pumpkin (or part of it)
- [ ] Ziplock bags
- [ ] Sharpie (to write on bags)
- [ ] Data sheet or paper
- [ ] Pencil or pen

What To Do:

1. Cut a pumpkin into pieces that will fit inside the ziplock bags, placing one piece of pumpkin in a bag. The size of these pieces of pumpkin is not important, just make sure they fit in the bag and that the pieces are fairly uniform in size.
2. Close the ziplock bags most of the way. The environment needs to be moist, yet fresh air needs to enter.
3. Place the bags in various areas around the house such as the refrigerator, a sunny area, a shady area, a warm area, a dry area, a moist area, etc. You may want to label each bag with its location.
4. After choosing the locations for your pumpkin petri dishes, predict which pumpkin will grow the most mold during the course of the experiment.
5. Each day, look at all your pumpkin samples and record how much mold has grown on each piece.
6. Print out and use the Pumpkin Petri Dish Chart to record your pumpkin petri dish data.

Pumpkin Petri Dish

When did the mold start to grow on pumpkin section 1?

Pumpkin section 2? etc...

How would you compare the growth of mold on pumpkin section 1 to that of pumpkin section 2?

How is temperature/time related to the growth of the mold?

What could be done to minimize the growth of mold?

What could be done to maximize the growth of mold?

How would you apply what you learned to where we should keep our food?

How would you adapt this experiment to create a different experiment?

Pumpkin Petri Dish Chart

Directions: Under the location column, list the places each pumpkin petri dish is located. Under the first date column, record the date and how much mold has grown on each piece for that date. Examples would be none, few spots, completely covered, etc. Do this for each subsequent date you check the mold growth on each pumpkin.

Start Date:	Date:	Date:	Date:	Date:
Location:				
Location:				
Location:				
Location:				
Location:				
Location:				

SCIENCE EXPERIMENT

Dancing Corn

What You Need:

- ☐ Water
- ☐ Baking Soda
- ☐ Vinegar
- ☐ Beaker
- ☐ Popcorn kernels

What You Do:

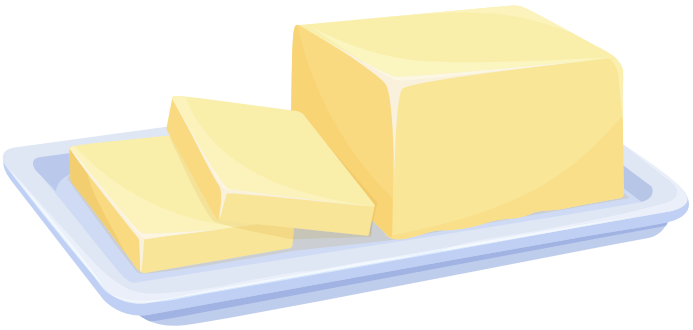
1. Add 1 cup of water to your beaker
2. Mix in 1 tablespoon of baking soda
3. Add a spoonful of popcorn kernels to the mixture
4. Carefully, add 1/2 cup of vinegar to the solution

Science Lesson:

Carbon dioxide gas is the product of the vinegar and baking soda reaction. The **Carbon Dioxide Gas** attaches to the candy and lifts it to the surface of the solution. The Carbon Dioxide bubbles pop when they reach the surface. Because the corn is too dense to float, they sink back to the bottom.

KITCHEN SCIENCE

DIY Butter



What You Do:

1. Make sure the whipping cream you're using is at room temperature (not cold from the refrigerator).
2. Put a half cup of the cream into the jar.
3. Put the lid on, and start shaking the jar. You can try rolling the jar back and forth with a family member, or take turns shaking the jar.
4. Eventually, the cream will form into a ball. When this happens, you can pour off the excess liquid and then add a sprinkling of salt to your homemade butter.

What You Need:

- ☐ Whipping Cream
- ☐ Small Glass Jar

Science Lesson:

Whipping cream is a dairy product that contains a lot of milk fat—usually around 30% or more. Cream comes from skimming off the top of fresh milk, where most of the milk fat has risen. The fat from the cream is contained in tiny droplets, like mini balloons too small to see without a microscope.

When you shake the jar, these balloons break open, letting the bits of fat go free. All the fat is collected together the more you shake it, creating an emulsion, or a mixture of two **immiscible** (not mixable) substances wherein one substance is immersed into the other. Eventually, all the fat comes together and forms butter.

Once the butter is made, there will still be extra liquid in the jar. This is the leftover part of the cream, once the fat has been taken out. It might taste a bit like milk, which has a lot less fat in it than cream does.

SCIENCE PROJECT

Turkey Genetics

What You Need:

- ☐ Printable Turkey Genetics (Last two pages)
- ☐ Scissors
- ☐ Glue Stick
- ☐ Supplies to decorate

Lesson and Activity

Do you have brown eyes, blue, or green? Where do you think your eye color came from? Does one of your parents share the same eye color?

Now, let's take a look at your Turkey Family. Do Mommy Turkey and Daddy Turkey have similar eyes? What about their bodies? Mommy Turkey and Daddy Turkey both have the same color wattle and it's on the same side of their beaks. Because Mommy Turkey and Daddy Turkey share these characteristics, Baby Turkey will also likely have the same eyes and body as their parents.

On the last page, cut out the body and eyes that Baby Turkey should have. Using your glue stick, paste the body and eyes in the "Turkey Baby" space on page 18 Next, let's look at Mommy Turkey and Daddy Turkey's legs. What's similar about them? Both Mommy Turkey and Daddy Turkey have legs that face outwards. Cut out the legs that best match both turkey parents and paste them on Baby Turkey. Finally, we will examine the feathers on Mommy Turkey and Daddy Turkey. What colors do they have? Do they share any colors? How many feathers do they each have? What color feathers would Baby Turkey have?

Cut out 9 feathers and paste them onto Baby Turkey. Baby Turkey will definitely have red feathers since both Mommy Turkey and Daddy Turkey have the red feather trait. Baby Turkey can have any combination of green and orange feathers too (for example: 5 red feathers, 2 green feathers, and 2 orange feathers).
The activity is now complete! For more fun, add googly eyes to Baby Turkey and use coloring tools to create a home for your Turkey Family.

Questions

Find the answers here.

1. Why do the turkey parents look similar?

2. Why do the turkey parents look different?

3. What similarities do Mommy Turkey and Daddy Turkey share?

4. What unique traits does Mommy Turkey have? What about Daddy Turkey?

5. Why does Baby Turkey have the traits that it has?

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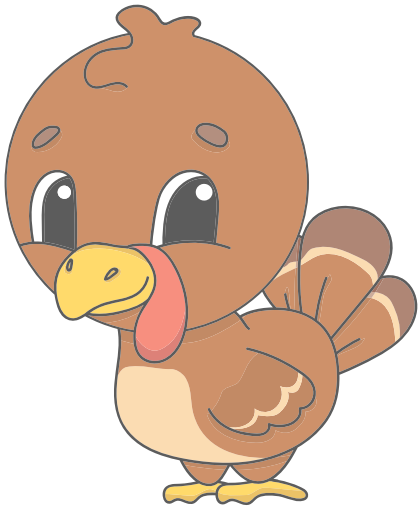

Mommy Turkey

Daddy Turkey

Baby Turkey