

Focus on Pulse Foods

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NDSU

EXTENSION

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Cooking Abbreviations

c. = cup

tsp. = teaspoon

Tbsp. = tablespoon

g = gram

mg = milligram

oz. = ounce

lb. = pound

pt. = pint

qt. = quart

pkg. = package



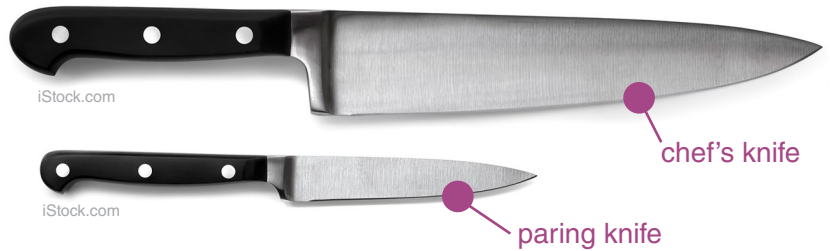


Lesson 1

- Knife Skills
- Introduction to Pulses

Knives are important kitchen tools. The French or chef's knife, with a blade from 6 to 14 inches, has a strong, weighted blade used for a wide range of chopping and slicing tasks, while the smaller paring knife has a 3- to 6-inch blade. A paring knife is ideal for hand tasks such as peeling and coring fruits and vegetables.

Classic length for a chef's knife is about 8 inches, whereas a paring knife is only about 3 inches. Some knives, such as bread knives, have serrated edges for cutting through crust, softer foods and produce without damaging them. No matter which knife you are using, you must know how to use it safely.



Activity 1: Knife Safety

Mark the boxes of the safety rules that you follow when using a knife:

- Before using a knife, make sure that you are focused and there are no distractions.
- Never attempt to catch a falling knife, and always use a cutting board.
- Hold the knife firmly by the handle, making sure that your fingers are completely wrapped around the handle. The grip should feel comfortable and secure.
- Curl in the fingers of the hand holding your food to prevent cuts, and always cut away from your body and anyone else who may be nearby.
- Be sure your knife is sharp! Dull knives are more dangerous than sharp ones.
- Place a damp rag under the cutting board to prevent slipping if the cutting board is not already equipped with gripping "feet."
- Never place knives into a sink filled with water because this can lead to injuries. Clean as you go and let your knife air dry where it cannot accidentally fall towards the floor.

Activity 2: Knife Cuts

Many types of knife cuts can be used in the kitchen. Once you feel comfortable using your knife safely, try experimenting with more advanced techniques. Draw a line from the type of cut (numbered 1-9) to its correct definition (lettered A-I).

- | | |
|---------------|---|
| 1. Chiffonade | A. This is used to roughly cut food into bite-sized pieces. |
| 2. Mince | B. This cut is made by stacking herb leaves, rolling the stack and slicing the stack into thin ribbons. |
| 3. Julienne | C. This cut results in evenly cut cubes that can be small, medium or large. |
| 4. Dice | D. This is used to cut cylindrical vegetables into round disks. |
| 5. Batonnet | E. This method cuts vegetables diagonally, forming more surface area. |
| 6. Bias | F. This is a very small cut made by finely chopping garlic or ginger. |
| 7. Brunoise | G. This cut is used to cut vegetables into thick sticks, such as carrot sticks or French fries. |
| 8. Chop | H. This cut forms uniform matchstick-sized pieces that are about $\frac{1}{8}$ inch wide and 2½-inches long. It is usually used for vegetables such as carrots, celery and cucumbers. |
| 9. Rondelle | I. This cut forms perfect $\frac{1}{8}$ -inch cubes. |

Introduction to Pulses

Pulses are a type of legume, which are seeds that grow in their pods. Unlike other legumes, pulses refer to the dry edible seeds within a pod. They include chickpeas, lentils, dry beans and dry peas.

The word “pulse” comes from the Latin word “*puls*,” which means thick soup. Pulses were first collected by hunter-gatherers. They were among the first plants to be domesticated and grown as a crop. The first evidence of agricultural production of pulses dates to 7000-8000 B.C. in a region in the Middle East called the Fertile Crescent, but some archeologists think they have been grown for more than 20,000 years!

Activity 3: Name That Pulse

Match each pulse in the word bank to its correct description and image.

WORD BANK:

Whole dry peas
 Split dry peas
 Chickpeas (or garbanzo bean)
 Split red lentils
 French green lentils
 Black lentils
 Fava beans
 Great Northern beans
 Cranberry beans
 Kidney beans
 Black-eyed peas
 Pinto beans
 Black beans
 Adzuki beans
 Navy beans
 Small red beans
 Mung beans
 Pink beans

1		This green or yellow pulse is small and round and is often boiled or steamed. Yellow varieties have a milder flavor than the sweeter green varieties.
2		This medium-sized, oval-shaped bean has mottled beige and brown skin. It is the most widely produced bean in the U.S. and one of the most popular in the Americas.
3		This pulse is a variation of the green lentil. They require a longer cooking time because they stay firm when cooked.
4		This small, oval-shaped bean has a pale pink skin and is very popular in Caribbean countries.
5		This medium-sized, oval-shaped bean with matte black skin is sweet-tasting with a soft texture. It is commonly used in Central American, South American and Caribbean cuisine.
6		These small black pulses are sometimes called beluga lentils because they resemble beluga caviar.
7		This green bean has a broad, flat shape and is often used in Mediterranean and Middle Eastern cuisine.
8		This medium-sized, oval-shaped bean has thin white skin and a delicate flavor. It is popular in French cuisine, as well as Mediterranean cuisine.
9		This medium-sized, oval-shaped bean with spotted tan and red skin is known for its creamy texture. The red specks disappear when they are cooked. It is especially popular in northern Italy and Spain.
10		This bean was named after its shape and color which resemble an organ. It has a firm texture which holds up well in soups or other dishes that cook for a long time.
11		This pulse is off-white with a black spot on one side, resembling an eye. Contradicting its name, it is a variety of bean.
12		This small, dark red bean is grown in East Asia and the Himalayas. It has a sweet, nutty flavor and is used in both sweet and savory recipes.
13		This pulse is also found whole. It cooks very quickly, but it can easily become mushy. The split variety is often used to thicken dishes.
14		With an optional Spanish-derived name, this round, beige pulse is commonly made into hummus.
15		This small white bean was named because of its inclusion in the U.S. Navy diet during the second half of the 19th century.
16		This bean is small and oval-shaped with red skin. It is particularly popular in the Caribbean region, where it is normally eaten with rice.
17		This green or yellow pulse is often used in soups and purees.
18		This small green bean is used in sweet and savory recipes. In Asian countries, it is often made into a sweet paste for desserts and baked goods.

Recipes



Black Bean and Fruit Salsa

- ½ c. mango, peeled and cubed
- 1 c. papaya, peeled and diced
- ½ c. pineapple, diced
- ½ c. black beans, canned, drained and rinsed
- 1 Tbsp. cilantro, minced
- 1 Tbsp. lime juice (fresh-squeezed for best flavor)
- 1 Tbsp. canola or vegetable oil
- 1 tsp. cumin
- ¼ tsp. black pepper
- 1 clove garlic, minced

Combine all ingredients in a large bowl; toss gently to coat.

Makes 8 servings. Each serving has 40 calories, 2 g fat, 0 g protein, 6 g carbohydrate, 1 g fiber and 0 mg sodium



Roasted Radish and White Bean Salad

- 1 lb. radishes, washed, stemmed and sliced in half
- 2 Tbsp. canola oil (or your favorite cooking oil), divided
- Salt and pepper, to taste
- 1 (15-oz.) can cannellini beans, drained and rinsed
- Juice of ½ lemon
- ⅛ tsp. garlic powder (or to taste)
- ¼ c. fresh parsley, stemmed and chopped
- 2 oz. feta cheese, crumbled

Preheat oven to 450 F. In a large mixing bowl, toss the radish halves with 1 Tbsp. olive oil and season with salt and pepper to taste. Place the seasoned radishes on a baking pan or in a cast iron skillet. Roast for 20 minutes, tossing occasionally, until tender and caramelized. While the radishes are roasting, place the cannellini beans in the same mixing bowl and add 1 Tbsp. olive oil, lemon juice and garlic powder. Season with salt and pepper to taste. When the radishes are done roasting, add them to the bowl with the beans and add parsley. Sprinkle with feta cheese and adjust seasonings as necessary. Serve warm.

Makes 8 servings. Each serving has 120 calories, 5 g fat, 14 g carbohydrate, 4 g fiber and 190 mg sodium.



Rainbow Cabbage Salad

- 3 c. coleslaw mix
- ½ small head red cabbage, shredded
- 1 red bell pepper, diced
- 1 c. carrots, shredded
- 1 c. edamame, shelled
- ½ c. almonds, sliced or slivered
- ½ c. cilantro, chopped

Dressing

- ¼ c. apple cider vinegar
- 2 Tbsp. honey
- 2 Tbsp. low sodium soy sauce
- 1 Tbsp. peanut butter
- 1 Tbsp. fresh ginger, minced

In a large bowl, combine the coleslaw mix, cabbage, peppers, carrots, edamame, almonds and cilantro. Stir to combine. Add the dressing ingredients to a medium bowl and whisk until combined. Pour dressing on top of cabbage salad and toss to coat.

Makes 12 servings. Each serving has 90 calories, 4.5 g fat, 4 g protein, 10 g carbohydrate, 3 g fiber and 115 mg sodium.





Hummus Lettuce Wraps

- 8 romaine lettuce leaves
- 1 c. roasted red pepper hummus
- 1 red pepper
- 1 yellow pepper
- ½ c. shredded carrots
- 1 medium zucchini
- ½ white onion
- 2 c. spinach, chiffonade cut

Slice the vegetables into strips and set aside. Finely cut the spinach and set aside. Spread 2 Tbsp. hummus on the lettuce leaf and place 3-4 strips of each vegetable onto the leaf, 1 Tbsp. of carrots and a little spinach onto the leaf. Roll and enjoy.

Makes 8 servings. Each serving has 90 calories, 4.5 g fat, 3 g protein, 11 g carbohydrate, 2 g fiber and 150 mg sodium.



Teriyaki Chicken and Pineapple Fried Rice

- 1 lb. chicken (breast or tenderloin)
- ⅓ c. teriyaki sauce, low sodium
- 3 c. brown rice, cooked
- 2 c. pineapple, diced (fresh or canned)
- 1 c. frozen peas and carrots
- 1 c. onion, diced
- 2 Tbsp. olive oil
- 2 tsp. garlic, minced
- ¼ tsp. ground ginger

Preheat the oven to 400 F. Line the sheet pan with foil for easy cleanup. Create a boat with a second piece of aluminum foil to fit half the pan size. Place the chicken in a single layer in the boat and drizzle with teriyaki sauce. Cook in the oven for 15 minutes.

While the chicken is cooking, add the remaining ingredients to a bowl and stir to combine. After the chicken is done cooking, add the rice mixture to the other half of the sheet pan. Spoon teriyaki sauce over chicken as necessary and return the pan to the oven. Cook for an additional 10 minutes or until the chicken reaches 165 F.

Makes six servings. Each serving has 310 calories, 6 g fat, 22 g protein, 42 g carbohydrate, 4 g fiber and 360 mg sodium





Lesson 2

- Measuring Skills, Equivalencies
- Health Benefits of Pulses

Measuring cups, etc.

- Be sure to correctly measure ingredients because adding too much or too little of an ingredient can change the outcome of your recipe. Dry measuring cups and spoons are used to measure dry ingredients, such as flour, breadcrumbs, white sugar and spices, as well as sticky ingredients, such as brown sugar, butter, shortening and peanut butter. Liquid measuring cups are used for wet ingredients, including milk, water, oil or honey.
- To measure dry ingredients, scoop the ingredient into the dry measuring cup using a spoon, fill it without packing or tapping the cup, and level with the flat edge of a butter knife. If a recipe calls for flour to be sifted, place the measuring cup on wax paper, sift the ingredient into the cup and level off with a spatula.
- To measure sticky ingredients, pack the ingredient into the correct dry measuring cups or spoons to eliminate air pockets and level off. Use a rubber scraper to make sure you get all the ingredient out of the cup.
- To measure liquid ingredients, pour into a liquid measuring cup to the correct line. Your liquid will form a “U” shape, called the meniscus. View the liquid at eye level and use the bottom of the meniscus to determine if you have measured to the correct measurement line.



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Activity 1: Measuring Practice

How much of a difference does it make if you use the incorrect measuring tool or technique? Let's find out!

Materials: Kitchen scale, ½ cup dry measuring cup, spoon, butter knife, wax paper, sifter, flour, liquid measuring cup, water

Experiment 1: Sifting

You are making a cake that calls for ½ cup of sifted all-purpose flour.

1. Place an empty ½ cup dry measuring cup on your scale and zero it out.
2. First, measure ½ cup of flour without sifting by scooping it into the cup with a scoop and leveling off with a butter knife. Place the full measuring cup on the scale and record the weight here: _____
3. Next, sift ½ cup of flour into the dry measuring cup over wax paper and level off with a butter knife. Place the full measuring cup on the scale and record the weight here: _____
4. Which flour weighed more, sifted or not sifted? _____
What is the difference between sifted and scooped?

5. How might using non-sifted flour when the recipe calls for sifted flour change the outcome of your cake?

Experiment 2: Liquids

1. First, measure using the incorrect measuring tool. Fill the ½ cup dry measuring cup with water.
2. Pour the measured water into the liquid measuring cup.
3. Is the meniscus at the ½ cup measuring line? If not, is it above or below the line? _____
4. How might measuring a liquid incorrectly change the outcome of a recipe? _____

Health Benefits of Pulses

- Pulses are an excellent source of dietary fiber, protein, vitamins and minerals. These nutrients can promote the health of the skin, bones, heart, digestive system and eyes. Pulses also contain phytochemicals and antioxidants that may reduce the risk of certain types of cancers.
- Pulses contain both insoluble fiber, which helps prevent constipation, as well as soluble fiber, which can lower blood cholesterol levels.
- They contain about 7-8 grams of protein per ½ cup cooked.
- Pulses are high in B-vitamins, especially folate, which is essential for brain development and function. It is recommended that all women of childbearing age consume at least 400 micrograms of folate per day to reduce the risk of neural tube birth defects.
- Pulses are also good sources of minerals, including iron, potassium, calcium, magnesium, phosphorus and zinc. The body is able to use some of these minerals better than others because of substances called phytates, which may reduce their absorption.
- Pulses are unique in that they can be counted towards the protein food group or the vegetable food group. 1 cup of whole or mashed pulses is equivalent to 1 cup of vegetables, and ¼ cup of cooked pulses counts as 1 ounce equivalent of protein. It is recommended that adults consume 2½ to 3 cups of vegetables each day and 5 to 6 ounce equivalents of protein per day.



Activity 2: Word Find

Pulses have many nutrients that contribute to health. Try this word find activity to see if you can find all the nutrients listed below!

- antioxidants
- calcium
- fiber
- folate
- iron
- magnesium
- minerals
- phosphorus
- phytochemicals
- protein
- vitamins
- zinc

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

Recipes



Chocolate Chip Bean Muffins

- 2 (15.5-oz) cans beans (Great Northern, navy, or white kidney), drained and rinsed
- 1/3 c. low-fat milk
- 1 c. sugar
- 1/4 c. butter or margarine
- 3 eggs
- 3 tsp vanilla extract
- 1 c. all-purpose flour
- 1/2 c. whole-wheat flour
- 1 tsp. baking soda
- 1/2 tsp. salt
- 3/4 c. semisweet chocolate chips

Combine beans and milk in a food processor or blender until smooth. Mix sugar and butter or margarine in a large bowl; beat in eggs and vanilla. Add bean mixture, mixing until well blended. Mix in flours, baking soda and salt. Add in chocolate chips. Spoon mixture into 16 greased or paper-lined muffin tins about half full. Bake at 375 F for 20 to 25 minutes. Cool on wire racks.

Makes 16 servings. Each serving has 240 calories, 7 g fat, 6 g protein, 37 g carbohydrate, 5 g fiber and 115 mg sodium.



Peanut Butter Bread (or swap other nut butter)

- 1/3 c. white sugar
- 1/3 c. brown sugar
- 1 1/4 c. all-purpose white flour
- 3/4 c. whole-wheat flour
- 1 Tbsp. baking powder
- 1/4 tsp. salt
- 1 c. creamy peanut butter (not natural)
- 2 eggs
- 3/4 c. nonfat milk
- 1/2 c. plain Greek yogurt, nonfat
- 1 tsp. vanilla

Preheat oven to 350 F. Spray a 9- by 5-inch loaf pan with nonstick cooking spray. In a mixing bowl, combine the sugar, brown sugar, white and whole-wheat flour, baking powder, and salt. Set aside. In a separate bowl, combine peanut butter, eggs, milk, Greek yogurt and vanilla. Gradually add dry ingredients to wet ingredients, gently folding ingredients together. Mix until just combined; the batter may be lumpy. Pour into loaf pan and bake for 48 to 52 minutes. Check bread 10 to 15 minutes before the timer goes off, and if the bread is browning too much, place aluminum foil on top and continue baking for duration of time. Allow bread to cool for 10 minutes, remove from pan, and place on cooling rack.

Makes 16 servings. Each serving has 200 calories, 9 g fat, 7 g protein, 25 g carbohydrate, 1 g fiber and 210 mg sodium.



Garlic Smashed Potatoes

- 1 lb. baby red potatoes (or use Yukon Gold or fingerling potatoes)
- Pinch of salt
- 4 Tbsp. butter, melted
- 2 cloves garlic, minced
- 1 tsp. fresh thyme leaves
- Freshly ground black pepper, to taste
- 1/2 c. freshly grated parmesan cheese

Preheat oven to 425 F. In a large pot, cover potatoes with water and add a pinch of salt. Bring water to a boil and simmer until potatoes are tender, about 15 minutes. Drain and let sit until cool enough to handle. On a large rimmed baking sheet, toss potatoes with melted butter, minced garlic and thyme leaves. Using the bottom of a small drinking glass or Mason jar, press down on potatoes to smash them into flat patties. Season with salt and pepper, then sprinkle with parmesan. Bake until bottoms of potatoes are beginning to crisp and parmesan is golden, about 25 minutes.

Makes six servings. Each serving has 160 calories, 10 g fat, 4 g protein, 15 g carbohydrate, 2 g fiber and 220 mg sodium.

Recipe from: <https://www.eatforhealth.gov.au/eating-well/healthy-recipes/chickpea-and-couscous-salad>



Lentil Naan Bread

- 1 tsp. sugar
- ½ c. warm water
- 2 tsp. dry yeast
- ¼ c. cooked or canned lentils, drained and rinsed
- ¼ c. canola or olive oil
- ⅓ c. plain yogurt or sour cream
- 1 egg
- 2½ c. all-purpose flour
- 1 tsp. salt
- ¼ c. chopped fresh cilantro or parsley, optional

In a small bowl, dissolve sugar in the warm water. Stir in dry yeast and let stand for 10 minutes or until frothy. In a food processor, add lentils, oil, yogurt or sour cream, and egg and purée until smooth. In a medium bowl or mixer, combine flour and salt. Stir in yeast and lentil mixture and fresh herb if using. Place dough on a lightly floured surface and knead until soft, adding more flour 1 Tbsp. at a time if necessary. Dough should be soft but not sticky. Place dough in a well-oiled bowl, cover with a cloth or plastic wrap and let rest for 1 hour in a warm area. Preheat griddle or cast-iron pan to medium high heat. Turn dough out onto lightly floured surface. Divide dough into 12 pieces and then flatten into discs. Cook naan on griddle or in cast-iron pan until golden brown, then flip over and cook the other side until golden brown.

Makes 12 servings. Each serving has 150 calories, 6 g fat, 5 g protein, 20 g carbohydrates, 1 g fiber and 220 mg sodium.
Recipe from: <https://albertapulse.com/recipe/lentil-naan-bread/>



Strawberry Cardamom Scones

- 1½ c. all-purpose flour
- 1 c. whole wheat flour
- 2 Tbsp. wheat germ
- 1 Tbsp. baking powder
- ½ tsp. baking soda
- ¼ tsp. ground cardamom
- ½ c. cold butter, cut into small cubes
- ½ c. maple syrup
- 1 egg
- 1 c. split red lentil puree (place cooked lentils in a food processor. For every 1 c. of lentils, add ¼ c. water. Blend until smooth.)
- 1 c. sliced strawberries

Preheat oven to 400 F. In a large bowl, mix flours, wheat germ, baking powder, baking soda and cardamom. Cut butter into flour mixture with a pastry blender or use your fingers to mix in. The mixture should resemble oat flakes. In a medium bowl, whisk together maple syrup, egg and lentil puree. Add strawberry slices. Turn dough onto a floured surface. Halve the dough into two discs, approximately 1-inch thick. Cut each disc into eight pieces. Bake on a parchment lined baking tray for 20 minutes, or until the tops are lightly browned. Cool on a baking rack before serving.

Makes 16 servings. Each serving has 170 calories, 6 g fat, 4 g protein, 24 g carbohydrate, 2 g fiber and 45 mg sodium.
Recipe from: <https://www.lentils.org/recipe/strawberry-cardamom-scones/>



Lesson 3

- Equivalencies
- Preparing Dry Pulses

A standard set of dry measuring cups contains a $\frac{1}{4}$ cup, $\frac{1}{3}$ cup, $\frac{1}{2}$ cup and 1 cup. Liquid measuring cups come in various sizes. Size does matter.

Be sure to use the liquid measuring cup closest to what is needed.

If you use a 1-quart liquid measure to measure just $\frac{1}{2}$ cup for example, the amount may not be the most accurate. If you don't have the correct measuring cup or spoon, you can use a combination of the ones you have to reach the correct measurement.

Activity 1: Measuring Equivalency

1. How would you measure $\frac{2}{3}$ cup of sugar if you are missing your $\frac{2}{3}$ cup and $\frac{1}{3}$ cup measuring cups? _____
2. How many cups are in 2 gallons? _____
3. How many teaspoons are in $\frac{1}{2}$ cup? _____
4. If you were doubling a recipe that calls for 2 Tbsp. of cocoa powder, which measure would you use? _____
5. If you were halving a recipe that calls for 1 qt. of skim milk, which measure would you use? _____

tsp. = teaspoon
 Tbsp. = tablespoon
 c. = cup
 lb. = pound
 oz. = ounce
 pt. = pint
 qt. = quart

3 tsp. = 1 Tbsp.
 4 Tbsp. = $\frac{1}{4}$ c.
 $5\frac{1}{3}$ Tbsp. = $\frac{1}{3}$ c.
 8 Tbsp. = $\frac{1}{2}$ c.
 $10\frac{2}{3}$ Tbsp. = $\frac{2}{3}$ c.
 12 Tbsp. = $\frac{3}{4}$ c.
 16 Tbsp. = 1 c.
 16 oz. = 1 lb.
 2 Tbsp. = 1 fluid oz.
 1 c. = 8 fluid oz.
 2 c. = 1 pt.
 4 c. = 1 qt.
 16 c. = 1 gallon
 4 qt. = 1 gallon



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Preparing Dry Pulses

- Pulses come canned, packed in water, in plastic bags, dried or in bulk. Canned chickpeas and beans are precooked and ready-to-use, while lentils and dried peas are usually purchased dry. Canned pulses should be rinsed before use to reduce the sodium content. Dried pulses must be cooked before eating and before using in some recipes.
- Dry beans, whole peas and chickpeas need to be soaked before cooking, while dry lentils and split peas do not.
- To prepare dry lentils and split peas, first rinse the pulses and remove any stones. Add pulses and water to a pot and heat water to boiling; you will need $2\frac{1}{2}$ cups of water for every 1 cup of lentils and 2 cups of water for every 1 cup of split peas. Then, reduce heat and simmer until tender. Lentils will take 15-20 minutes, while split peas will take 35-40 minutes.
- To prepare dry chickpeas, beans and whole peas, first rinse the pulses and remove any stones. If available, it is best to use filtered water and water with the hardness removed. Then, the pulses must be soaked by one of the methods below. Drain and rinse the soaked pulses, then add to a pot with 2 cups of water for each 1 cup of pulses. Heat to boiling, then reduce heat and simmer until tender. Chickpeas will take $1\frac{1}{2}$ -2 hours, whole peas will take 30-45 minutes and beans will take 1-2 hours depending on the type.
 - **Slow soak:** Cover 1 pound of dry pulses with 10 cups of water and refrigerate six to eight hours or overnight. Drain pulses and discard soak water. Rinse pulses with fresh, cool water.
 - **Hot soak (preferred):** Place pulses in a large pot and add 10 cups of water for every 2 cups of pulses. Heat to boiling, then boil for another two to three minutes. Remove pulses from heat, cover and let stand for four to 24 hours. Drain beans and discard soak water. Rinse beans with fresh, cool water.
 - **Quick soak:** Place pulses in a large pot and add 6 cups of water for every 2 cups of pulses. Bring to a boil and boil for an additional two to three minutes. Remove pulses from heat, cover, and let stand for one hour. Drain pulses and discard soak water. Rinse beans with fresh, cool water.

Safety note: If you are soaking pulses for longer than four hours, place the container in the refrigerator to avoid the growth of bacteria and the production of harmful toxins.

Almost all beans are interchangeable in recipes.

Activity 2: Ordering the Steps

Below are the steps for preparing dry chickpeas, whole peas and beans. Can you put the steps in the correct order?

- Step 1: _____ a. Pulses are soaked.
- Step 2: _____ b. Pulses are brought to a boil and simmered.
- Step 3: _____ c. Pulses are drained and rinsed.
- Step 4: _____ d. Pulses are rinsed and stones are removed.
- Step 5: _____ e. Pulses are placed in a pot with water.

Activity 3: Fill in the Blanks

Given the following equivalencies, fill in the blanks to convert the amounts for dry pulses to cooked pulses, or cooked pulses to dry pulses. Round to the nearest hundredth.

- 1 c. dry chickpeas = 2 c. cooked chickpeas
1 c. dry split peas = 2 c. cooked split peas
1 c. dry lentils = $2\frac{1}{2}$ c. cooked lentils
1 c. dry beans = 2 to $2\frac{1}{2}$ c. cooked beans
 $1\frac{1}{2}$ cups cooked beans = 1 can drained beans

1. $\frac{1}{2}$ c. dry chickpeas = _____ c. cooked chickpeas
2. _____ c. dry split peas = 3 c. cooked split peas
3. 3 c. dry lentils = _____ c. cooked lentils
4. $2\frac{1}{2}$ c. dry beans = _____ to _____ c. cooked beans
5. _____ cans drained beans = 4 c. cooked beans

Recipes



Split Pea Salsa

- 1 c. dry green or yellow split peas, rinsed
- 2½ c. water
- 1 (19-oz) can black beans, drained and rinsed
- 2 c. frozen corn
- ½ c. red bell pepper, chopped
- ¼ c. fresh cilantro, chopped
- ¼ c. lime juice
- 2 medium tomatoes, diced
- ½ c. onion, diced
- 1 tsp. ground cumin
- Optional seasonings (cayenne pepper, hot sauce, etc).

In a medium saucepan, bring peas and water to a boil, reduce heat, cover and simmer until peas are tender (about 20 minutes). Drain and transfer to a large bowl. Wash and prepare all produce. Combine all ingredients in a large bowl. Serve with tortilla chips.

Makes 10 servings. Each serving has 110 calories, 0.5 g fat, 5 g protein, 20 g carbohydrate, 4 g fiber and 250 mg sodium.



Greek Lentil Salad

- 1 (19 oz.) can lentils, rinsed and drained (or 1 c. of dry lentils, prepared according to pkg. directions)
- ½ c. calamata olives
- ½ c. onion, chopped
- 1½ c. grape tomatoes, halved
- ½ c. green peppers, chopped
- 1 c. cucumber, diced
- ¼ c. feta cheese, crumbled
- ¼ c. fresh parsley, chopped
- ¼ c. olive oil
- ¼ c. lemon juice
- 1 Tbsp. dried oregano

In a large bowl, combine lentils, olives, onion, tomatoes, green peppers, cucumber, feta cheese and parsley. Whisk oil, lemon juice and oregano together. Toss salad with dressing to coat.

Makes 16 servings. Each serving has 110 calories, 4.5 g fat, 4 g protein, 13 g carbohydrate, 3 g fiber and 45 mg sodium.

Recipe from: <https://www.lentils.org/recipe/greek-lentil-salad/>



Whole Wheat Honey Banana Roll-ups

- 8 (8-inch) whole wheat tortillas
- ½ c. almond butter, divided into 8 portions of 2 Tbsp.
- 2 Tbsp. and 2 tsp. chia seeds
- 8 medium bananas

Spread 2 Tbsp. almond butter on tortilla. Drizzle with 2 tsp. honey and sprinkle 2 tsp. chia seeds. Next, top with 1 banana and roll up tightly. Slice into pinwheels or eat whole.

Makes six servings. Each serving has 470 calories, 22 g fat, 13 g protein, 64 g carbohydrate, 7 g fiber and 430 mg sodium.





Black Bean Quesadilla

- 1 (15-oz.) can black beans, drained, rinsed
- ¼ c. chopped tomato
- 3 Tbsp. chopped cilantro
- 8 (6-inch) whole-wheat tortillas
- 4 oz. soy cheese/jalapeno jack, shredded
- About 32 spinach leaves, shredded

Preheat oven to 350 F. Mash beans. Stir in tomato and cilantro. Spread evenly onto four tortillas. Sprinkle with cheese, spinach and salsa. Top with remaining tortillas. Bake tortillas on ungreased cookie sheet for 12 minutes. Cut into wedges and serve.

Makes eight servings. Each serving has 190 calories, 3.5 g fat, 11 g protein, 32 g carbohydrate, 4 g fiber and 480 mg sodium.

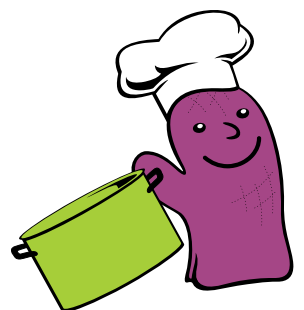


Omelet Stuffed Peppers

- 2 bell peppers, halved and seeded
- 4 eggs
- ¼ c. skim milk
- 2 Tbsp. cheddar cheese, shredded
- ½ c. vegetables, diced
- 1 Tbsp. bacon, crumbled
- 1 Tbsp. chives, minced
- Salt and pepper to taste

Preheat oven to 400 F. Halve bell peppers creating a bowl and remove seeds. Place in a baking dish. Combine eggs and milk in a bowl. Pour mixture evenly between the four halves. Add diced veggies and top with cheese. Bake 35-45 minutes or until eggs are set. Season with salt and pepper and garnish with bacon crumbles and chives.

Makes four servings. Each serving has 130 calories, 7 g fat, 9 g protein, 8 g carbohydrates, 2 g fiber and 190 mg sodium.

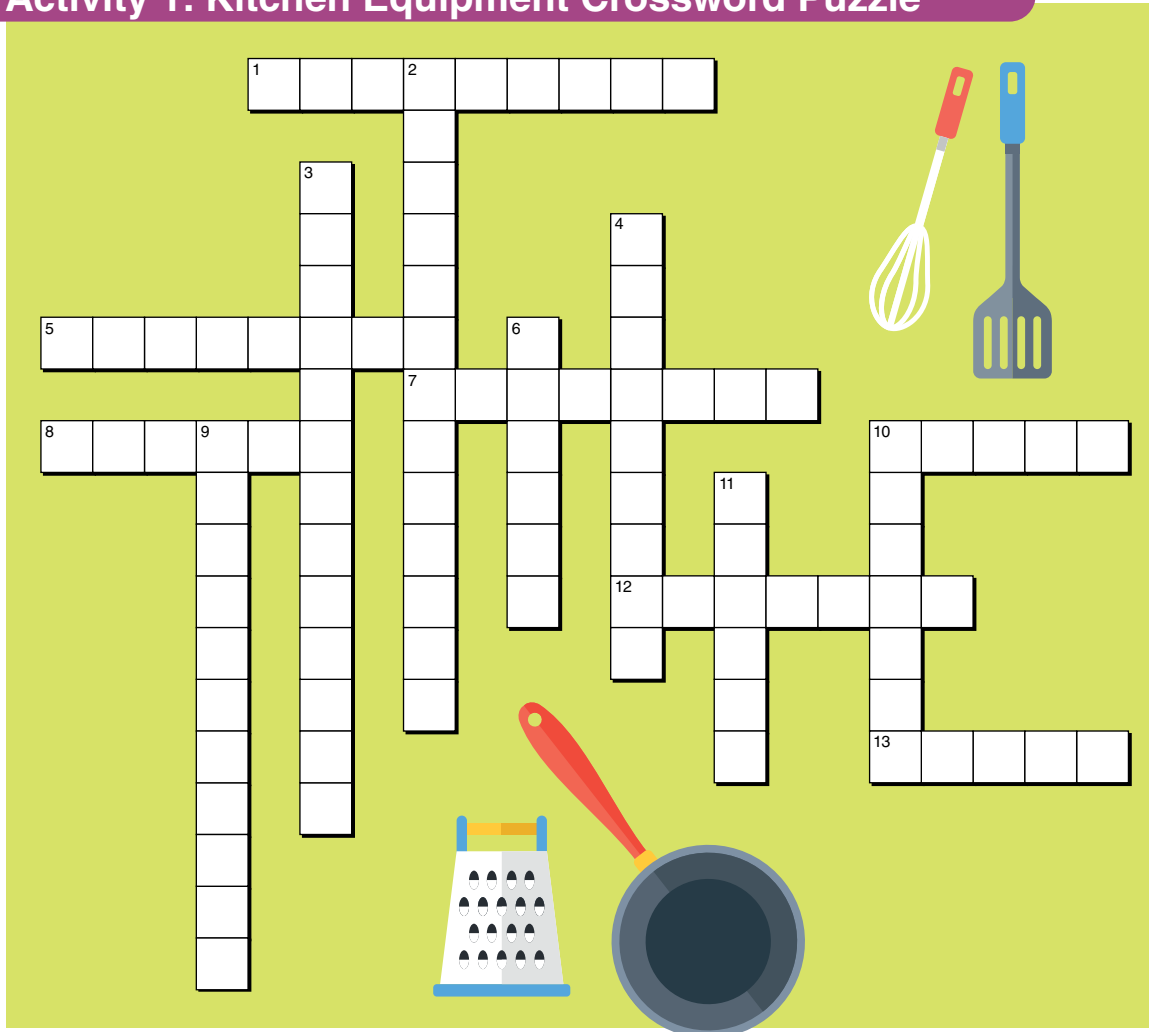




Lesson 4

- Equipment Use
- Pulses Around the World

Activity 1: Kitchen Equipment Crossword Puzzle



Terms:

- colander
- food processor
- grater
- juicer
- microwave
- rubber scraper
- saucepan
- sifter
- skillet
- spatula
- stove
- thermometer
- tongs
- wire whisk

Across

1. Kitchen appliance that cooks food by passing an electromagnetic wave through it
5. Bowl-shaped kitchen utensil with holes used to drain and rinse foods
7. A deep pan with a handle intended for use on the stovetop used for stewing and boiling
8. Kitchen device used for breaking up lumps and loosening flour or powdered sugar
10. Large kitchen appliance consisting of burners and an oven used to cook food
12. Kitchen utensil with a long handle and a flat edge designed for lifting or turning foods
13. Kitchen utensil used for picking items up, commonly used when grilling

Down

2. Kitchen utensil designed for scraping insides of bowls or jars to remove all of the contents
3. Small kitchen appliance with interchangeable blades used for shredding, blending, chopping or slicing foods
4. Kitchen utensil with wire coils used to beat eggs, cream, etc.
6. Kitchen device used for extracting juice from fruits such as oranges or lemons
9. Use this to make sure that foods are cooked to a safe temperature
10. A pan that is usually large and heavy with moderately shallow sides used for frying or cooking a meal
11. Kitchen utensil with sharp perforations used to shred foods such as cheese or vegetables

Pulses Around the World

- The United Nations declared 2016 the International Year of Pulses, recognizing the role of pulses in the future of health, nutrition and sustainability.
- The major pulse-producing countries are India, Myanmar, Canada, China, Nigeria, Brazil and Australia.
- India grows, imports and consumes the most pulses, while Canada exports the most pulses.
- Pulse crops were found in the pyramids of Egypt, which were built over 4,000 years ago. Peas that were over 11,000 years old were found in caves in Thailand.
- Tribes in Mexico and Peru began growing beans for food 7,000 years ago, and this practice spread throughout North and South America. Explorers from Portugal and Spain that arrived in America brought these crops back home to Europe, allowing beans to spread throughout Europe, Africa and Asia.
- Pulses are used in dishes throughout the world. In many countries, it is also a part of cultural heritage.



Activity 2: Match Game

Draw a line from the cultural dish (numbered 1-12) to its correct description (lettered A-L).

- | | |
|----------------------------------|--|
| 1. Kwati | A. Savory Middle Eastern dip made from pureed chickpeas blended with tahini, lemon juice, garlic and other spices. It is often served with pita bread. |
| 2. Dal | B. A soup made of nine types of sprouted beans and pulse crops. It is served in Nepal during the major festival of Gun Punhi. |
| 3. Hummus | C. Popular in the Southern U.S., this dish is made with dark and light red kidney beans. |
| 4. Falafel | D. This dish originated in the state of Texas as a combination of chili peppers and meat. Stories say that on cattle drives, cowboys added beans to the mixture for extra protein when beef was scarce. |
| 5. Split Pea Soup | E. A term in Indian cuisine that refers to dried, split pulses and a dish that is made from them. To make this dish, the pulses are simmered with a variety of spices and ingredients until thick. It is often served with naan bread or rice. |
| 6. Pease Pudding | F. A casserole made with meat, pork skin and white beans that is popular in France. |
| 7. Ashure | G. A type of British porridge made from yellow split peas that was often prepared in a large cauldron hung over an open fire and was a staple for poorer families. |
| 8. Cassoulet | H. A Middle Eastern dish made from chickpeas, herbs and spices formed into patties. It is usually deep fried, but it can also be baked. |
| 9. Carribean Pink Beans | I. Also known as Noah's pudding, this is a Turkish dessert prepared on the 10th day of Muharram. It is made from a mixture of legumes, beans, fruits, nuts, pulses and dried fruits. According to Turkish legends, it was first prepared by the prophet Noah when food supplies diminished on the ark. |
| 10. Grah | J. Directly translated to "bean," this is a Croatian bean and smoked sausage soup. |
| 11. Louisiana Red Beans and Rice | K. This dish has been consumed for centuries around the world due to its heartiness, nutritional value and low cost. It is often prepared with root vegetables and pork. |
| 12. Chili | L. Popular in Caribbean countries, this dish is made with no added fat and flavored with sofrito, which is a mixture of tomatoes, bell pepper, onions and garlic. |

Recipes



Photo by John Borge

Savory Hummus

- 1 (15-oz.) can chickpeas, drained and rinsed
- 4 Tbsp. tahini
- ¼ c. lemon juice
- 3 cloves crushed garlic
- 1 tsp. salt (or to taste)

Puree chickpeas in blender or food processor. Add remaining ingredients and blend until smooth. The final product should be thick and smooth. Serve with carrot sticks and other vegetables, pita chips, or whole grain crackers. Or use as a spread on sandwiches.

Makes 12 servings. Each serving has 70 calories, 3 g fat, 3 g protein, 8 g carbohydrate, 2 g fiber and 200 mg sodium.



NDSU photo

Chocolate Dessert Hummus

- 1 (15-oz.) can chickpeas, drained and rinsed
- ⅓ c. honey
- ½ c. unsweetened cocoa powder
- 1½ tsp. vanilla
- ¼ tsp. salt
- 3-4 Tbsp. water

Drain and rinse chickpeas, and place in a food processor. Place all other ingredients into the same food processor and puree until a smooth texture is visible. If needed, add additional honey one tablespoon at a time until desired sweetness level is met. Serve with fruit such as strawberries, graham crackers or vanilla wafers.

Makes 11 servings. Each serving has 70 calories, 0.5 g fat, 2 g protein, 14 g carbohydrate, 2 g fiber and 105 mg sodium.



NDSU photo

Colorful Veggie Kabobs

- 2 medium zucchini, cut into 1-inch pieces
- 1 large onion, cut into ½-inch thick pieces
- 1 green bell pepper, cut into 1-inch strips
- 1 yellow bell pepper, cut into 1-inch strips
- 1 small pkg. cherry tomatoes
- ½ lb. mushrooms, quartered
- ⅓ c. oil-based salad dressing, such as Italian

If using bamboo skewers, soak them in water for two hours prior to using to reduce charring. Thread vegetables alternately on skewers. Brush generously with salad dressing. Grill for three minutes; turn vegetables over, brushing with extra salad dressing. Grill for another three to four minutes until done.

Not able to go outside? Try broiling the kabobs. Place an oiled pan with kabobs about 6 inches from the top of the preheated oven. Turn over once and cook until golden brown (about 6 minutes).

Makes six servings. Each serving has 150 calories, 8 g fat, 5 g protein, 17 g carbohydrate, 4 g fiber and 360 mg sodium





Baked Cinnamon Apples

- 6 c. sliced apples
- ¼ c. sugar
- ¼ c. light brown sugar, packed
- 1 Tbsp. cornstarch
- 1 tsp. cinnamon
- ½ tsp. nutmeg
- 2 Tbsp. sour cream
- 1 Tbsp. lemon juice
- 2 Tbsp. butter, thinly sliced

Preheat oven to 375 F and grease a baking dish with cooking spray. Core, peel and slice apples into a large bowl. In a separate small bowl, mix together sugar, light brown sugar, cornstarch, cinnamon and nutmeg. Add the sugar mixture, sour cream and lemon juice to the apples and mix well. Pour the apple mixture into the greased baking dish and top with pieces of thinly sliced butter. Bake the apples for 30 to 45 minutes or until they are tender, softened and bubbly. Stir the apples halfway through baking. Serve the baked apples with a dollop of whipped topping, a scoop of vanilla ice cream or vanilla yogurt.

Makes eight servings. Each serving has 120 calories, 4 g fat, 0 g protein, 25 g carbohydrate, 1 g fiber and 30 mg sodium.



Three-Bean Chili

- 1 lb. lean ground beef
- 1 c. onion, finely chopped
- 2 cloves garlic, minced
- 2 Tbsp. chili powder
- 1 tsp. ground cumin
- 3 Tbsp. brown sugar
- 1 (15-oz) can diced tomatoes, undrained
- 2 c. tomato juice
- 1 (8-oz) can tomato sauce
- 1 (15-oz) can black beans, drained and rinsed
- 1 (15-oz) can kidney beans, drained and rinsed
- 2 (15-oz) cans pinto beans, drained and rinsed

Cook meat, onion and garlic in a large saucepan over medium heat until browned; drain. Add chili powder, cumin, brown sugar, undrained tomatoes, tomato juice and tomato sauce. Cook for 10 minutes or until thickened, stirring occasionally. Add beans, cook for five minutes.

Makes 16 servings. Each serving has 180 calories, 14 g protein, 3 g fat, 28 g carbohydrate, 3 g fiber and 390 mg sodium.



Hoisin Turkey and Lentil Lettuce Wraps

- Canola oil, for cooking
- 1 lb. ground turkey
- 1 red pepper, cored and diced
- 2 garlic cloves, minced
- 1 Tbsp. fresh ginger, grated
- ¼ c. cilantro stems, chopped
- ¼ c. red lentils
- ⅓ c. hoisin sauce
- 1 Tbsp. soy sauce
- 2-3 green onions, chopped
- 1 head lettuce (butterhead, romaine or leaf)
- Peanuts, for garnish

Heat a drizzle of oil over medium-high heat in a large, heavy skillet. Add the ground turkey and red pepper and cook, breaking up with a spoon until the meat is no longer pink. Add the garlic, ginger, cilantro and lentils and cook, stirring, for a minute. Add 1/3 c. water and simmer for 10 minutes, until the lentils are tender, any excess moisture has evaporated, and the meat has started to brown. Add the hoisin sauce, soy sauce and green onions. Cook for another minute or two, stirring to coat everything well and heat through. Core the head of lettuce, separating the leaves, and serve the turkey-lentil mixture in a bowl, family-style, with lettuce leaves and your choice of garnishes.

Makes six servings. Each serving has 210 calories, 18 g protein, 14 g carbohydrate, 4 g fiber and 390 mg sodium.

Recipe from: <https://www.lentils.org/recipe/hoisin-turkey-lentil-lettuce-wraps/>



Lesson 5

- Food Safety
- Pulses in Gluten-Free Baking

Activity 1. Food Safety Checklist

Which of these food safety practices do you and/or your family members do? Mark the boxes with an X.

- Wash food, hands, utensils, cutting boards and countertops often and/or with each use to avoid spreading bacteria throughout the kitchen.
- Wash your hands for at least 20 seconds with warm water and soap before and after handling food and if they are contaminated during the cooking process.
- Wash dish cloths and towels with each use using hot water in the washing machine.
- Don't cross contaminate – keep raw meat, poultry, seafood and eggs separate from ready-to-eat foods such as fruits and vegetables. Don't place unwashed fruits and vegetables directly on a cutting board or other cleaned surface. Use the sink. If someone in your home is sensitive to gluten, avoid cross-contamination.

- Use a food thermometer to make sure you cook food to the proper temperature. This assures harmful bacteria are destroyed without overcooking your food.
 - Egg dishes – 160 F
 - Poultry – 165 F
 - Ground Beef – 160 F
 - Beef Roast or Steaks – 145 F (Let rest for 3 minutes before cutting.)
 - Pork Chops or Roast – 145 F (Let rest for 3 minutes before cutting.)
 - Leftovers – 165 F
- Refrigerate foods quickly – cold temperatures slow the growth of harmful bacteria.
- Never let raw meat, poultry, eggs, cooked food, or cut fruits and vegetables sit at room temperature for more than two hours.
- Cool food in shallow pans and bowls to increase the surface area of the food and allow it to cool faster.
- Do not overpack a refrigerator because leaving room for air to circulate allows the refrigerator to run effectively.
- When in doubt, throw it out! If you are unsure if a food is safe to consume, discard it.



CLEAN



SEPARATE



COOK

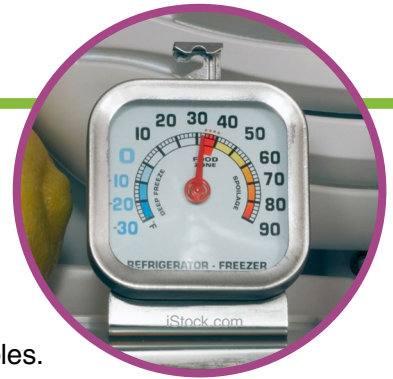


CHILL

Activity 2. True or False?

Circle “T” for true and “F” for false.

1. T or F Refrigeration at 40 F or below is one of the most effective ways to reduce the risk of foodborne illness.
2. T or F Frozen food should be defrosted at room temperature.
3. T or F You should use detergent or bleach to wash fresh fruits or vegetables.
4. T or F Keep fresh fruits and vegetables separate from raw meat, poultry or seafood in your refrigerator.
5. T or F You should use separate cutting boards for fresh produce and raw meat, poultry and seafood.
6. T or F You can let raw meat, poultry, eggs, cooked foods, or cut fruits and vegetables sit at room temperature for up to 3 hours before putting them in the refrigerator or freezer.
7. T or F Using a calibrated food thermometer can ensure that you have cooked foods to the proper temperature.
8. T or F Chicken should be cooked to at least 155 degrees Fahrenheit.
9. T or F Raw meat should be stored on the top shelf of the refrigerator to avoid cross contamination.



Pulses in Gluten-free Baking

Pulses are naturally gluten-free and are nutritious additions to the diets of those with celiac disease or gluten intolerances. Gluten is present in common ingredients used for baking, including flour made from wheat, barley, rye, bran or graham.

Gluten-free flours made from rice, almond and oats are popular, but pulses also can be ground into flour. As they also add additional fiber and protein, they are a great substitute for gluten-free baking.



Activity 3: Calorie Calculations

1 gram of carbohydrates or protein contains 4 calories, while 1 gram of fat contains 9 calories. Given the grams of carbohydrates, protein and fat in ¼ cup of the following gluten-free pulse flours, calculate the total calories to the nearest ten.

Example: ¼ cup of all-purpose flour: 23g carbohydrates, 3g protein, 0g fat. $23 \times 4 = 92$ calories from carbohydrates, $3 \times 4 = 12$ calories from protein, $0 \times 9 = 0$ calories from fat. $92 + 12 + 0 = 104$ calories, rounded to the nearest tenth = 100 calories.

1. ¼ c. chickpea flour:
21 g carbohydrates, 5 g protein, 1.5 g fat. _____ calories
2. ¼ c. lentil flour:
29 g carbohydrates, 12 g protein, 0.5 g fat. _____ calories
3. ¼ c. green pea flour:
18 g carbohydrates, 8 g protein, 0 g fat. _____ calories
4. ¼ c. black bean flour:
22 g carbohydrates, 8 g protein, 0 g fat. _____ calories

Recipes



Chickpea Flour Pancakes

- 1¼ c. chickpea flour
- 1 c. water
- Pinch of salt
- 1 egg
- 1¼ tsp. baking powder
- 1¼ tsp. baking soda
- 1 tsp. vanilla extract
- 3 Tbsp. olive or canola oil

Mix together the flour, water and salt. Crack in the egg and mix well. Add the baking powder, baking soda and vanilla extract. Stir to combine. Let batter rest for a few minutes at room temperature. Lightly oil a frying pan with a little oil, heat until very hot and add a ladle of batter. Cook until lightly golden. Turn the pancake over with a spatula and cook for one minute. Repeat with the remaining pancake batter, re-oiling the pan each time.

Makes 10 servings. Each serving has 90 calories, 5 g fat, 3 g protein, 7 g carbohydrate, 1 g fiber and 270 mg sodium.



Smoothie Bowls

- ½ c. spinach
- ½ c. vanilla Greek yogurt
- 1½ c. frozen fruit
- 2 Tbsp. toppings (fresh fruit, granola, coconut, chia seeds, etc.)

Add spinach, yogurt and fruit to a blender or food processor. Blend until smooth. Pour smoothie in a bowl and top with desired toppings.

Makes two servings. Each serving has 110 calories, 2.5 g fat, 7 g protein, 19 g carbohydrate, 5 g fiber and 40 mg sodium.



Vegetable Dip Cups

- 24 whole green beans
- 1 red bell pepper
- 1 orange bell pepper
- 5 celery stalks
- 8 party cups

Dip

- 1 c. fat-free cottage cheese
- 8-oz. carton plain Greek yogurt
- 0.4 oz. envelope ranch dry salad dressing mix

In a bowl, add the cottage cheese, plain Greek yogurt and ranch packet and mix to combine, set aside. After washing, cut the celery and bell peppers into strips. Place 4 Tbsp. of the dip in the bottom of each party cup along with 3-4 strips of each vegetable.

Makes eight servings. Each serving has 100 calories, 0 g fat, 7 g protein, 12 g carbohydrate, 4 g fiber and 210 mg sodium.





Photo by John Borge



Photo by John Borge

Lentil Mini Pizzas

- 1/3 c. dry lentils, rinsed
- 1 1/3 c. water
- 4 (6-inch) whole-wheat pitas
- 1 medium zucchini, thinly sliced
- 1/4 c. red onion, thinly sliced into rings
- 1/2 c. red bell pepper, chopped
- 1/4 tsp. black pepper
- 1/8 tsp. salt
- 1/2 c. garlic-and-herbs spreadable cheese
- 6 Tbsp. shredded Asiago cheese (or cheese of choice)

In a 1-qt. saucepan, combine lentils with water and bring to a boil; reduce heat, cover and simmer gently until lentils are tender, about 25 minutes. Drain lentils and set aside. Preheat broiler and place pitas on a nonstick baking sheet; broil for three minutes. Heat a nonstick skillet over medium heat; coat with cooking spray. Add zucchini, onion, red bell pepper, black pepper and salt. Sauté mixture for three minutes or until vegetables are crisp tender. Stir in lentils. Remove pitas from the oven, then spread 2 Tbsp. of spreadable cheese on each pita. Top evenly with vegetables and shredded cheese. Broil three minutes or until edges are brown and cheese is melted.

Makes four servings. Each serving has 340 calories, 13 g fat, 13 g protein, 45 g carbohydrate, 7 g fiber and 710 mg sodium.

Chickpea Chocolate Cake

- 1 1/2 c. semi-sweet chocolate chips
- 1 (15-oz) can chickpeas, rinsed and drained
- 4 eggs
- 3/4 c. white sugar
- 1/2 tsp. baking powder
- Optional toppings: powdered sugar, frosting or fresh berries

Preheat oven to 350 F. Grease a 9-inch round cake pan. Melt chocolate chips in a microwave-safe bowl, stirring occasionally until chocolate is smooth. Combine chickpeas and eggs in a food processor or blender and process until smooth. Add sugar and baking powder; blend. Pour in melted chocolate, then blend until smooth. Transfer batter to prepared cake pan. Bake for 40 minutes or until toothpick inserted in center of cake comes out clean. Cool on wire rack.

Makes nine servings. Without frosting, each serving has 320 calories, 13 g fat, 7 g protein, 47 g carbohydrate, 3 g fiber and 190 mg sodium.





Lesson 6

● New Appliances: Instant Pot and Air Fryer

● New Appliances

What kitchen appliances do you have at home? Most people have access to an oven, microwave oven, stovetop, refrigerator, mixer and many other items. Many households have slow cookers in their kitchens.

Electric multifunction cookers and air fryers are kitchen appliances that have become popular in recent years. These appliances can be used for cooking with pulses.

Multifunction Cookers (such as “Instant Pots”)

- Pressure cookers, or electric multicookers, have become very popular. Pressure cookers are not “new,” but earlier versions were used on stovetops. Recent versions of countertop appliances may include the following functions: sautéing/browning, pressure cooking, rice cooking, slow cooking, warming, yogurt-making and sometimes other functions.
- Pressure cookers can speed the preparation time for dry beans. While traditional soaking and cooking dry beans on a stove may require hours of preparation time, 1 pound of dry beans can be prepared in less than an hour in a pressure cooker.
- See “[Pressure Cook Dry Beans to Save Money and Time \(FN1939\)](#)” from NDSU Extension for more information.



Air Fryer

- The air fryer, ranging in cost from \$49 to \$299, is a piece of kitchen equipment that has been gaining popularity as an alternative to deep fat frying because of cost, convenience and quickness.
- Instead of immersing foods in oil, you can air fry foods by just tossing them in a small amount of oil. Although air frying does not produce the exact same product as deep frying would, air frying is an easy way to reduce added fat and calories.
- An air fryer works with a fan circulating hot air at high speeds, crisping and browning food via a chemical reaction called the Maillard reaction.
- To use an air fryer, follow the manufacturer’s instructions. Although not usually necessary, it is recommended to preheat the air fryer, but check with the individual brand instructions. Once you are ready to cook, spread out food in the basket in a single layer. While cooking, shake the contents once or twice to make sure the food is cooked evenly.
- Foods are cooked for less time and at a lower temperature than when baking in the oven. As a rule of thumb, decrease the temperature of a recipe by 25% and the cook time by 20%. Use a calibrated thermometer to make sure food is fully cooked.



- Air fryers can be used instead of baking, roasting or grilling in addition to frying. Roasted vegetables, chicken, meat, fish, dessert and frozen foods can be cooked in an air fryer. You can even use it to reheat leftovers to make them crisper than if you would microwave them.
- Safety Tips: Read the safety/instruction manual that comes with your appliance. Always keep the cords and outlet dry and away from hot surfaces. Never use running water to clean the electrical components of the air fryer – just wipe down the basket separately with soap and water. The appliance will be hot after use – be careful of steam when you open the drawer, and make sure it is fully cooled before cleaning.

Slow Cooker

- Slow cookers usually allow one-step preparation. Placing all the ingredients in the slow cooker saves preparation time and cuts down on cleanup.
- A variety of foods can be cooked in a slow cooker, including soups, stews and casseroles.
- See “Now You’re Cookin’! Slow Cooker Meals” (FN1511) from NDSU Extension for more information.



Activity 1: Be creative!

Can you think of a food from each food group that could be made in the air fryer?
How would you prepare it?

Food Group	How would you prepare it?
Fruit:	
Vegetables:	
Grains:	
Protein:	
Dairy:	

Recipes



Boston Baked Beans

- 1 lb. Great Northern beans, dry
- 8 c. water
- 1/3 c. molasses
- 1/3 c. brown sugar
- 3 Tbsp Dijon mustard
- 8 oz. bacon, cut into half-inch pieces
- 1 medium onion, diced

Combine the beans and water in an electric pressure cooker. Secure the lid and set on manual; cook for 20 minutes. Allow a natural pressure release, about 15 minutes, then release any remaining pressure. Beans should be mostly cooked through but still firm. Save 1½ cups of liquid and set it aside. Lift the hot inner pot out of the pressure cooker and drain the beans into a colander in the sink carefully to avoid burning yourself. Wash the pot and return it to the pressure cooker.

In a small bowl, whisk together the molasses, sugar, mustard and reserved bean cooking liquid. Set aside. Turn the pressure cooker to sauté and add the bacon. Sauté until some fat is in the bottom of the pot, about five minutes. Then add onion and sauté until it is translucent, about five more minutes. Stir the beans and the seasoning liquid into the pot with the bacon and onions. Secure the lid on the pressure cooker and set manually for 15 minutes. After cooking is complete, allow pressure to release naturally. Serve.

Makes 15 servings. Each serving has 210 calories, 6 g fat, 9 g protein, 29 g carbohydrate, 6 g fiber and 150 mg sodium



7-Bean Soup

- 1/2 c. navy beans, dry
- 1/2 c. black beans, dry
- 1/4 c. pinto beans, dry
- 1/4 c. kidney beans, dry
- 1/4 c. red lentils, dry.
- 1/4 c. green lentils, dry
- 1 Tbsp. olive oil
- 4 carrots, chopped
- 4 celery stalks, chopped
- 1 large onion, chopped (about 1½ c.)
- 1 Tbsp. garlic, minced
- 8 c. low-sodium vegetable broth
- 1 tsp. salt
- 1/2 tsp. black pepper
- 1/2 Tbsp. thyme, dry
- 1/2 tsp. sage, dry.
- 1 (14-oz) can diced tomatoes
- 2 bay leaves
- 1 c. kale, chopped

Turn the pressure cooker to sauté function. Add oil and heat until the oil shimmers. Rinse then prepare vegetables as directed. Sauté carrots, celery, onion and garlic until softened and translucent. Add remaining ingredients except kale and cover with the lid seal to lock. Press the manual pressure cook button and set the timer to 20 minutes. Let the pressure release naturally for 10 to 15 minutes. Release any remaining pressure and remove cover. Add kale and cook for five more minutes. Then remove the bay leaves and serve.

Makes 11 servings. Each serving has 170 calories, 2 g fat, 9 g protein, 30 g carbohydrate, 7 g fiber and 430 mg sodium.



NDSU photo

Roasted Chickpeas Four Ways

1 (15.5-oz.) can garbanzo beans, drained
Seasoning mix of choice (below)
1 tsp olive or canola oil

Cinnamon sugar seasoning mix

1 Tbsp. granulated sugar
½ tsp. cinnamon

Makes eight servings. Each serving has 5 calories, 0 g fat, 0 g protein, 2 g carbohydrate, 0 g fiber and 0 mg sodium.

Chili lime seasoning mix

1 tsp. chili powder ¼ tsp. garlic powder
½ tsp. cumin ¼ tsp. True Lime (powdered lime)
½ tsp. salt

Makes eight servings. Each serving has 0 calories, 0 g fat, 0 g protein, 0 g carbohydrate, 0 g fiber and 160 mg sodium.

BBQ seasoning mix

1½ tsp. paprika ½ tsp. garlic powder
1 tsp. brown sugar ½ tsp. dry mustard
½ tsp. celery salt ¼ tsp. black pepper

Makes eight servings. Each serving has 5 calories, 0 g fat, 0 g protein, 1 g carbohydrate, 0 g fiber and 55 mg sodium.

Ranch seasoning mix

1 Tbsp. ranch dressing packet

Heat air fryer to 390 F. Drain and rinse chickpeas (no need to dry). Toss with oil and spices. Place the whole batch of chickpeas in the air fryer basket. Cook for 10 to 12 minutes, shaking a few times throughout. When chickpeas are cooked to your liking, remove from air fryer. Store in an open container.

Makes eight servings. Each serving has 5 calories, 0 g fat, 0 g protein, 0 g carbohydrate, 0 g fiber and 85 mg sodium.



NDSU photo

Parmesan Rosemary Carrot Fries

3-4 large carrots, peeled
3 Tbsp. olive or canola oil
¼ c. grated parmesan cheese
1 Tbsp. garlic powder
Leaves from 4 sprigs of fresh rosemary, chopped
¼ tsp. salt
¼ tsp. pepper

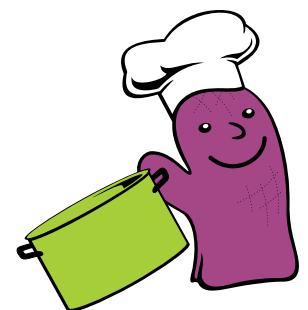
Oven Directions

Preheat oven to 400 F. Peel and cut the carrots lengthwise to resemble the shape of French fries. Mix olive oil, Parmesan, garlic powder, rosemary, salt and pepper in medium bowl. Add carrots and toss to coat. Place carrots on baking sheet lined with parchment paper and bake for 15 to 20 minutes or until carrots become slightly crispy. Turn carrots over halfway through baking.

Air Fryer Directions

Preheat air fryer to 425 F. Peel and cut the carrots lengthwise to resemble the shape of French fries. Mix olive oil, Parmesan, garlic powder, rosemary, salt and pepper in medium bowl. Add carrots and toss to coat. Spread carrots evenly throughout basket, then air fry at 375 F for 20 minutes. Turn carrots halfway through air frying.

Makes four servings. Each serving has 110 calories, 7 g fat, 3 g protein, 10 g carbohydrate, 2 g fiber and 290 mg sodium.





Falafel*

- ½ c. parsley leaves, stems removed and chopped
- 2 green onions, cut into 1-inch pieces
- 2 garlic cloves, crushed
- ¼ c. dry bread crumbs, Panko style
- 1 Tbsp. olive or canola oil
- 1 tsp. ground cumin
- 1 tsp. ground coriander
- 1 tsp. ground turmeric
- ½ tsp. salt
- ¼ tsp. ground pepper
- ¼ tsp. cayenne or chili powder
- 1 Tbsp. lemon juice
- 1 tsp. baking powder
- 1 egg
- 1 (19-oz) can chickpeas, drained and rinsed (no salt added, if available)

Place chopped parsley, green onion and garlic in a food processor and pulse until just combined, but not a paste. Add breadcrumbs, oil, spices, lemon juice, baking powder and egg and pulse until just combined. This should be a soft mixture. Add chickpeas and pulse ingredients 4 to 6 times, just until combined and roughly chopped. The chickpeas should be roughly broken up and the mixture damp enough to stick together. Spoon a small ball of the mixture and gently flatten into patties, about 2-inches in diameter. Place on a parchment-lined cookie sheet and chill in the freezer for 5 minutes before cooking. In a shallow frypan, pour enough canola oil to cover about ½-inch. Over medium heat, fry patties in small batches, about 3 minutes per side, until crispy on the outside. Top up oil as needed. Serve hot or store in the fridge or freeze between layers of plastic wrap. Reheat in a moderate oven for a few minutes before serving.

To air fry instead of pan fry: preheat air fryer to 400 F, then air fry at 350 F for 15 minutes, flipping halfway through.

Makes 18 servings. Each serving has 93 calories, 6 g fat, 2 g protein, 7 g carbohydrate, 1 g fiber and 88 mg sodium.

Recipe courtesy of <https://albertapulse.com/recipe/falafels/>

*Falafel are balls or patties made from chickpeas, herbs and/or spices fried in oil. These vegetarian foods often are stuffed in pita bread with vegetables and served with a side of hummus. Falafel are popular as Middle Eastern food sold from street vendors.

Answer Keys

Lesson 1: Matching Knife Cuts

1. B
2. F
3. H
4. C
5. G
6. E
7. I
8. A
9. D

Lesson 1: Name that Pulse

1. Whole dry peas
2. Pinto beans
3. French green lentils
4. Pink beans
5. Black beans
6. Black lentils
7. Fava beans
8. Great Northern beans
9. Cranberry beans
10. Kidney beans
11. Black-eyed peas
12. Adzuki beans
13. Split red lentils
14. Chickpeas
15. Navy beans
16. Small red beans
17. Split dry peas
18. Mung beans

Lesson 2: Word Find- Nutrients

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

Lesson 3: Equivalency Questions

1. ½ c. + 2 Tbsp. + 2 tsp.
2. 32 cups
3. 24 tsp.
4. ¼ c.
5. 1 pt.

Lesson 3: Ordering the Steps

- Step 1. D
- Step 2. A
- Step 3. C
- Step 4. E
- Step 5. B

Lesson 3: Fill in the Blanks — Dry to Cooked Pulses

1. 1
2. 1.5
3. 7.5
4. 5, 6.25
5. 2.67

Lesson 4: Equipment Crossword

Down:

2. rubber scraper
3. food processor
4. wire whisk
6. juicer
9. thermometer
10. skillet
11. grater

Across:

1. microwave
5. colander
7. saucepan
8. sifter
10. stove
12. spatula
13. tongs

Lesson 4: Matching Cultural Dishes

1. B
2. E
3. A
4. H
5. K
6. G
7. I
8. F
9. L
10. J
11. C
12. D

Lesson 5: True or False- Food Safety

1. True
2. False – Foods should be defrosted in the refrigerator, in cold running water or in the microwave. If defrosting in the microwave, cook the food immediately after.
3. False – Detergent and bleach are not meant for human consumption
4. True
5. True
6. False – You may let raw meat, poultry, eggs, cooked foods or cut fruits and vegetables sit at room temperature for a maximum of two hours before refrigerating.
7. True
8. False – Poultry should be cooked to at least 165 F.
9. False – Raw meat should be stored on the bottom shelf of the refrigerator to prevent juices from dripping onto other foods, creating cross contamination.

Lesson 5: Calorie Calculations — Pulse Flours

1. 120 calories
2. 170 calories
3. 100 calories
4. 120 calories

More information

USA Pulse. 2022. Baking with Pulse Flours for Flavor and Functionality. <https://www.usapulses.org/resources/1116-baking-with-pulse-flours>

Garden-Robinson. 2019. Pressure Cook Dry Beans to Save Money and Time (FN1939). NDSU Extension. <https://www.ag.ndsu.edu/publications/food-nutrition/field-to-fork-pressure-cook-dry-beans-to-save-money-and-time>

Garden-Robinson, J. and others. 2022. Beans, Lentils, Chickpeas and Split Peas (various titles). NDSU Extension. Available at <https://www.ndsu.edu/agriculture/extension/extension-topics/food-and-nutrition/food-preparation/beans-lentils-chickpeas-and-split>

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