Name: _____ Date: _____

Sauerkraut: Cabbage, Salt, and Bacteria

Circle group

Sauerkraut has just two ingredients, shredded cabbage and salt. After a few weeks, it turns sour, tangy, and crunchy. This is not magic. Tiny microbes do the work. It is a good example of fermentation, a way to make food that lasts.

First, the cook shreds cabbage and mixes in salt. Then the cook squeezes and pounds it until juice comes out. The salt pulls water from the leaves, and the juice becomes a brine. The cabbage goes into a crock or jar. It is pressed down until the brine covers it. This is important, because it keeps out the air that spoilage molds need.

Cabbage leaves already have many bacteria on them. Some are lactic acid bacteria. They do not need air. Salt and no air are hard for many microbes, but they suit these bacteria. They eat sugars in the cabbage and make lactic acid. The acid makes it sour. It also makes it hard for harmful bacteria to live.

After a few days to a few weeks, the sauerkraut is ready. The acid gives the flavor. It also helps the food last, so a jar can be kept cool for months. Pickles and kimchi are made in a similar way.

Questions

1. What are the two ingredients of sauerkraut?

_____

_____

2. How does the brine form?

_____

_____

3. Why must the cabbage stay under the brine?

_____

_____

4. What do lactic acid bacteria make when they eat sugars?

_____

_____

5. Why does sauerkraut taste sour?

_____

_____

6. How does the acid help the sauerkraut last for months?

_____

_____

Words to know

fermentation: a change made when tiny living things eat sugar
brine: salty liquid used to cover food
crock: a heavy pot used for storing food
lactic acid: a sour acid made by certain bacteria

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Sauerkraut: Cabbage, Salt, and Bacteria

Triangle group

Sauerkraut is made from only two ingredients, shredded cabbage and salt, yet it turns tangy, sour, and crunchy after a few weeks. The change is not magic. It is the work of microbes, and it is a good example of how people use fermentation to make safe, lasting food.

First, the cook shreds the cabbage and mixes in salt, then squeezes and pounds it until juice comes out. The salt pulls water from the cabbage leaves, and that juice becomes a brine. The cabbage is packed into a crock or jar and pressed down until it is completely covered by the liquid. Keeping the cabbage under the brine is important, because it keeps out the air that spoilage molds need.

Cabbage leaves already carry a variety of bacteria. Among them are lactic acid bacteria, which do not need air to live. The salty, airless conditions are harsh for many other microbes but suit the lactic acid bacteria well. They feed on sugars in the cabbage and produce lactic acid. As the acid builds up, the mixture becomes more sour, which makes it hard for harmful bacteria to survive.

After a few days to several weeks, depending on the temperature, the sauerkraut is ready. The acid gives the flavor, and it also acts as a preservative, so the jar can be stored in a cool place for months. Many other foods are made this way, including pickles and kimchi.

Questions

1. What are the two ingredients of sauerkraut?

_____

_____

2. How does the brine form?

_____

_____

3. Why must the cabbage stay under the brine?

_____

_____

4. What do lactic acid bacteria produce as they feed on sugars?

_____

_____

5. Why does sauerkraut taste sour?

_____

_____

6. How does the acid help the sauerkraut last for months?

_____

_____

Words to know

fermentation: a change made when tiny living things eat sugar
brine: salty liquid used to cover food
crock: a heavy pot used for storing food
lactic acid: a sour acid made by certain bacteria
preservative: something that helps food last longer

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Sauerkraut: Cabbage, Salt, and Bacteria

Square group

Sauerkraut is made from just two ingredients, shredded cabbage and salt, yet within a few weeks it becomes tangy, sour, and pleasantly crunchy. The transformation is not magic but the work of microbes, and it illustrates how people have long used fermentation to produce safe food that keeps for a very long time.

To begin, the cook shreds the cabbage, mixes in salt, and then squeezes and pounds the mixture until juice emerges. The salt draws water out of the cabbage leaves, and that liquid becomes a brine. The cabbage is packed into a crock or jar and pressed down until the brine covers it entirely. Keeping the cabbage beneath the surface matters a great deal, because it excludes the air that spoilage molds require.

Cabbage leaves already carry a wide variety of bacteria, among them the lactic acid bacteria, which do not need air in order to live. The salty, airless conditions are harsh for many other microbes but favor the lactic acid bacteria. These feed on the sugars in the cabbage and produce lactic acid. As the acid accumulates, the mixture grows more sour, and harmful bacteria find it increasingly difficult to survive.

After several days to several weeks, depending on the temperature, the sauerkraut is ready. The acid supplies the flavor and also serves as a preservative, so a jar can be stored in a cool place for months. Many other foods are produced in a similar way, including pickles and kimchi.

Questions

1. Which two ingredients are needed to make sauerkraut?

_____

_____

2. How does the brine come to form?

_____

_____

3. Why is it important to keep the cabbage beneath the brine?

_____

_____

4. What do the lactic acid bacteria produce as they feed on sugars?

_____

_____

5. What accounts for the sour taste of sauerkraut?

_____

_____

6. In what way does the acid allow a jar of sauerkraut to last for months?

_____

_____

Words to know

fermentation: a change made when tiny living things eat sugar
brine: salty liquid used to cover food
crock: a heavy pot used for storing food
lactic acid: a sour acid made by certain bacteria
preservative: something that helps food last longer

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: Sauerkraut: Cabbage, Salt, and Bacteria

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: Sauerkraut: Cabbage, Salt, and Bacteria

Easier · 203 words · Flesch-Kincaid grade 3.7

1. Shredded cabbage and salt.
2. The salt pulls water out of the leaves and makes juice.
3. It keeps out the air that spoilage molds need.
4. Lactic acid.
5. The lactic acid builds up and makes it sour.
6. It makes it hard for harmful bacteria to live.

Triangle: Sauerkraut: Cabbage, Salt, and Bacteria

This passage · 238 words · Flesch-Kincaid grade 7.6

1. Shredded cabbage and salt.
2. The salt pulls water out of the cabbage leaves, making juice.
3. It keeps out the air that spoilage molds need.
4. Lactic acid.
5. The lactic acid builds up and gives it a sour flavor.
6. It makes it hard for harmful bacteria to survive.

Square: Sauerkraut: Cabbage, Salt, and Bacteria

Harder · 245 words · Flesch-Kincaid grade 9.9

1. Shredded cabbage and salt.
2. The salt draws water out of the cabbage leaves, producing juice.
3. It excludes the air that spoilage molds need.
4. Lactic acid.
5. The lactic acid that accumulates as the bacteria feed.
6. It makes it difficult for harmful bacteria to survive.