Agricultural Education

Lesson Title: Identifying and Differentiating Cultured Milk Products

Standard: 12) Identify varieties and characteristics of cultured and frozen milk products. Demonstrate in a live setting or presentation the ability to follow procedures used to process buttermilk, yogurt, and ice cream, attending to appropriate ratios and units.

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* The standard is for the Advanced Food Science class and portions of the standard that are highlighted are what the lesson is focused on.

Daily Lesson Plan, Identifying and Differentiating Cultured Milk Products

Angayla Maxwell

Grade: 12

Lesson Title: Identifying and Differentiating Cultured Milk Products

Length of Lesson: 40 minutes

Standard:

12) Identify varieties and characteristics of cultured and frozen milk products. Demonstrate in a live setting or presentation the ability to follow procedures used to process buttermilk, yogurt, and ice cream, attending to appropriate ratios and units.

Objectives:

OBJ. 1- I can identify varieties of cultured milk products. (understand)

OBJ. 2- I can differentiate cultured milk product varieties by their characteristics. (analyze)

Assessment:

Pre-assessment- Students use a QR code to a google form to individually describe their level of understanding and identify a cultured milk product they have observed in their own life.

Formative Assessment: Students pair for a card sort, matching characteristics to the cultured milk product provided (yogurt), assessments will be given feedback in real-time as the instructor walks around checking the progress of student pair work (see Attachment #2)

Formative Assessment: The whole class collaborates to create a spider diagram about cultured milk products via a single scribe on a Sticky Easel Sheet. The sheet of paper allows it to be taken

down for the post-assessment and put back up in the classroom for student viewing through the unit.

Post-Assessment-Students analyze 3 unlabeled cultured milk products, and write the identity of the cultured milk product and write a sentence using characteristic words from the lesson. Feedback will be written on the student's work after grading. (see Attachment #3)

Activating Strategy:

On-screen images of cheese, buttermilk, yogurt, and sour cream and ask students what all of the items have in common.

Instruction:

- (0:00-0:02) Activating strategy, initiating dialogue with students, leading them to recognize the day's lesson is about cultured milk products.
- (0:02-0:05) Students will scan the QR code and complete the pre-assessment to gauge their level of understanding before the lesson.*
- (0:05-0:10) Students are told they have 2 minutes to find 12 informative notecards about cultured milk products hidden around the room. The information on the notecards include vocabulary, the identity of cultured milk products with images, and descriptions of different cultured milk products. (see Attachment #1)
- (0:10-0:12) Students are given time to read through their notecards.
- (0:12-0:20) Students then are paired by the instructor to complete the matching assignment. Students are provided a zip-lock bag of cards with characteristics of yogurt and other characteristics of cultured milk products that do not match yogurt. (see Attachment #2)

* Pre-assessment questions on page 8 can be added to an online quiz you create and provide your own QR code.

- (0:20-0:35) Students then collaborate to amalgamate the information as a class through a spider diagram. The instructor asks for a volunteer scribe, and if no volunteer, the instructor assigns a scribe to draw the diagram on a Sticky Easel Sheet.
- (0:35-0:36) The sheet is then taken down in preparation for the post-assessment and the instructor brings out 3 unlabeled cultured milk product samples without packaging and toothpicks.
- (0:36-0:45)Students complete written post-assessment. (see Attachment #3)

Closure:

Students are then provided the written post-assessment. The students are instructed to complete the assessment using the 3 cultured milk product samples. They are instructed to manipulate the sample with the toothpicks for better analysis if needed.

Modifications/Grouping:

Individual- google form pre-assessment and written post-assessment

Partners- class matching activity, assigned by the instructor

Whole class- spider diagram (class discussion with one individual as the scribe), scribe assigned by the instructor, whole class contributes as each student has unique information vital to the creation of a completed spider diagram from the notecard search

Academic Language:

Students will engage with vocabulary during the lesson by:

+ being introduced via the notecard search

+ using them in a practical setting to analyze a cultured milk product with a partner
+ in a conversational setting through the spider diagram, which simultaneously creates connections between vocabulary words
+ finally applying them in their own words during the post-assessment

Cultured milk product- dairy product resulting from the addition of a culture of lactic acid bacteria

Lactic acid bacteria- bacteria that produce lactic acid as the end product of fermentation of carbohydrates, common varieties Lactobacillus, Leuconostoc, Pediococcus, Lactococcus, and Streptococcus

Culture of bacteria- multiplication of specific desired bacterial cells in a medium under controlled conditions to manage content

Fermentation- a metabolic process where an organism converts a carbohydrate (starch and/or sugar) into alcohol or acid

Aroma- distinctive smell of a substance, a quality factor of cultured milk products, vary between products, can be sour, tangy, yeasty, nutty, grassy

Viscosity- thickness of a semifluid, measures the resistance of a liquid to flow easily, a descriptor of cultured milk products

Texture- the feeling, consistency, or surface of a substance, created through size, shape, density, and arrangement of particles, a descriptor of cultured milk products

Fat Percentage- Dairy products typically have a majority of saturated fats, which are solid at room temperature, cultured dairy products vary in consistency based on fat percentage

Cheese- Made of milk and lactic acid bacteria, is a concentrated form of milk protein and milk fat, contains 60-90% fat, time and environment after the bacteria culture is added alters the taste and consistency from soft solid to hard solid, creating the multiple types of cheese

Yogurt- milk that has been fermented with lactic acid bacteria, lactose is converted to lactic acid, varies from soft solid to the more common thick liquid, an average of 5% fat

Sour cream- cream fermented with lactic acid bacteria, the cream is the fatty component of milk that accumulates at the surface of unhomogenized milk, has an average of 20% fat

Buttermilk- in modern western cultures the majority of buttermilk is cultured by adding bacteria to pasteurized and homogenized milk, with an average of 1% fat, historically buttermilk was made after making butter, which leaves a liquid that has very little fat and is then cultured


Lucerne
DAIRY FARMS
Sour Cream
WITH NATURAL FLAVORS


Kraft
Natural Cheese
Mozzarella


Lifeway
ORIGINAL
unsweetened
KEFIR
Cultured Whole Milk


DANNON
whole milk yogurt
plain


Cultured Whole Milk
Buttermilk
Purity
Cultured Whole Milk
Buttermilk
Extra Rich
Grade A • Pasteurized
Homogenized


ORGANIC VALLEY
Family of Farmers
Unsalted • European Style
CULTURED BUTTER


Daisy
COTTAGE CHEESE
4% Milkfat Min.
Pure & Natural

Cultured Milk Pre-Assessment Questions

What is your level of understanding of cultured milk products?

Do not know anything about cultured milk products				Could help teach about cultured milk products
1	2	3	4	5

What is a cultured milk product you have tasted or seen before?

Cultured milk product- dairy product resulting from the addition of a culture of lactic acid bacteria	Lactic acid bacteria- bacteria that produce lactic acid as the end product of fermentation of carbohydrates, common varieties Lactobacillus, Leuconostoc, Pediococcus, Lactococcus, and Streptococcus
Culture of bacteria- multiplication of specific desired bacterial cells in a medium under controlled conditions to manage content	Fermentation- a metabolic process where an organism converts a carbohydrate (starch and/or sugar) into alcohol or acid
Aroma- distinctive smell of a substance, a quality factor of cultured milk products, vary between products, can be sour, tangy, yeasty, nutty, grassy	Viscosity- thickness of a semifluid, measures the resistance of a liquid to flow easily, a descriptor of cultured milk products
Texture- the feeling, consistency, or surface of a substance, created through size, shape, density, and arrangement of particles, a descriptor of cultured milk products	Fat Percentage- Dairy products typically have a majority of saturated fats, which are solid at room temperature, cultured dairy products vary in consistency based on fat percentage

Cheese- Made of milk and lactic acid bacteria, is a concentrated form of milk protein and milk fat, contains 60-90% fat, time and environment after the bacteria culture is added alters the taste and consistency from soft solid to hard solid, creating the multiple types of cheese	Yogurt- milk that has been fermented with lactic acid bacteria, lactose is converted to lactic acid, varies from soft solid to the more common thick liquid, average of 5% fat
Sour cream- cream fermented with lactic acid bacteria, cream is the fatty component of milk that accumulates at the surface of unhomogenized milk, has an average of 20% fat	Buttermilk- in modern western cultures the majority of buttermilk is cultured by adding bacteria to pasteurized and homogenized milk, with an average of 1% fat, historically buttermilk was made after making butter, which leaves a liquid that has very little fat and is then cultured

Solid	Semi-Solid
Liquid	Tangy Aroma
Sour Aroma	Grainy Texture
Smooth Texture	High Fat Percentage
Low Fat Percentage	High Viscosity
Low Viscosity	Dense

CULTURED MILK PRODUCT ASSESSMENT

Name:_____ **Date:**_____ **Score:**____/ 15

Observe each sample carefully. Identify the sample and consider the characteristics of the sample.

Document the characteristics of each sample using at least 3 words from the word bank.

Word Bank

Samples: Butter, Buttermilk, Cheese, Sour Cream, Whole Milk, Yogurt

Characteristics: aroma, color, consistency, fat percentage, liquid, smooth, soft solid, solid, texture, viscosity

Sample A: _____ (2 points) (Obj. 1)

Write a sentence describing the characteristics of Sample A: (3 points) (Obj. 2)

Sample B: _____ (2 points) (Obj. 1)

Write a sentence describing the characteristics of Sample B: (3 points) (Obj. 2)

Sample C: _____ (2 points) (Obj. 1)

Write a sentence describing the characteristics of Sample C: (3 points) (Obj. 2)