Chemical Leavening Agents

Summary

Chemical leavening agents in dough and batters.

Main Core Tie

Food Science

Strand 5 Standard 5

Background for Teachers

Two basic concepts are important when working with dough and batters:
1. What is the ingredient?
a. The science aspect-chemically, physically.
b. Nutritional component.
2. What is the function-what does it do?
a. The use of baking products to illustrate cooking principles (skills).
b. The relationship between the proportions used and the finished product. (The proportion of sugar/fat to the quantity of flour/moisture gives the variety of products: bread, quick breads, cakes, cookies, pastry. (Include experiments to show function.)
This unit seeks to answer those questions as far as leavening agents are concerned.

Intended Learning Outcomes

Knowing the differences in leavening agents will help students make knowledgeable choices about ingredients and procedures in producing quality products from dough and batters.

Instructional Procedures

See attachments below:
The students will take a PREASSESSMENT quiz to determine their current knowledge about acid/base reactions, steam, and other leavening agents.
Using information found in the BACKGROUND INFORMATION, the teacher will lead the students in a chalkboard discussion of acids and bases to:

- Describe and identify common acids and bases. List several formulas of acids and bases on the board. These can be the formulas for soda and baking powder, vinegar, lemon juice, etc.
- Understand the pH scale. Use various indicators (litmus paper) to demonstrate and show the presence of an acid or a base in common foods.
- Explain the action of baking soda and baking powder. Use the chemical formulas and show the relationship.

The teacher will discuss BACKGROUND INFORMATION REGARDING CHEMICAL LEAVENING AGENTS.
The students will participate in an experiment to determine the reaction rate/speed of chemical leavening agents. During the experiment the students will:

- Discover the reaction rate of different leavening agents.
- Distinguish the difference between double-acting and single-acting baking powder.
- Describe the chemical reaction that takes place when an acid and a base are combined.
- The students will complete REACTION SPEED OF CHEMICAL LEAVENING AGENTS worksheet.
- The students will participate in a SCIENTIFIC LAB using CUPCAKES as a medium to:
    - Determine the effect of different chemical leavening agents on the quality of cupcakes.

Explain the importance of using an acid with baking soda when using baking soda as a chemical leavening agent.

The students will evaluate the cupcake lab by answering questions on SCIENTIFIC LAB - CUPCAKES worksheet.

The teacher will present a demonstration showing the correct techniques for making POPOVERS. The purpose of the demonstration includes:

Identifying the leavening agent in popovers

Discovering how steam can be used as a leavening agent in quick breads

During the demonstration, the teacher will discuss the BACKGROUND INFORMATION regarding STEAM as a leavening agent.

If time permits, the students will participate in a lab to prepare POPOVERS.

The students will complete a SUMMATIVE EVALUATION - CHEMICAL LEAVENING AGENTS IN QUICK BREADS UNIT TEST.

Authors

Utah LessonPlans