National 5

Hospitality

Practical Cake Craft

NAME_____

Categories of Ingredients

WORKBOOK 1

KHS

NOTES

Introduction

Cakes are distinguished from breads in that they are usually sweet, with many other ingredients besides flour: Flour, fat, raising agents, eggs and sugar are the most common ingredients.
Cakes fall into two basic categories: those made with fat, and the sponge types made without fat. The exception of the sponge type is the Genoese sponge which combines both types.
In fat-type cakes, the fat is either creamed, melted or rubbed in. Rub-in mixtures are generally used for plain, every day cakes such as Tyrol cake, while creamed cakes are rich and soft with a fairly close, even grain and soft crumb as in a Victoria sandwich.
In melted cakes, for example gingerbread, the fat, often with liquid, sugar, syrup or treacle added, is poured into the dry ingredients to give a batter-like consistency.
The majority of cakes are mixed using an electric mixer, however, mixing by hand, or with a food processor is also acceptable for many methods.
Mixing is a very important aspect of successful cake making. There are several methods and all have the same aims:

- To blend the ingredients into a smooth, even batter
- To beat the maximum amount of air into the batter
- To form a batter that will hold the air until it is baked i.e. be stable
- To develop a desirable visual texture, volume and mouth-feel texture in the baked product
- Some of the most commonly used mixing methods include "Whisking" or "Whipping", "Creaming", and the "All in One" method

Overall, for anyone baking cakes, experience is the best teacher. The problem of under or over mixing is always present and understanding mixing and how different ingredients react during the mixing and cooking process is the key to successful cake making.

Eggs

Crack an egg open and you'll see the large, transparent egg white with the round, yellow yolk in the middle. The ***white*** is made almost entirely of proteins and water; the ***yolk***, on the other hand, is packed full of nutrients, vitamins, and fats. Look closely and you'll also see a thin white strand floating somewhere in the mix. This is called the ***chalazae*** and it anchors the yolk to the white and to the inside of the shell, keeping the yolk suspended.

Eggs play an important role in everything from cakes and cookies to meringues and pastry cream. They create structure, aeration and stability within a batter, they help thicken and emulsify sauces and custards, they add moisture to cakes and other baked goods, and can even act as a glue or glaze.

Between the yolk, the white, and the whole egg, the functions of an egg can overlap and vary widely from recipe to recipe.

Let's take a look at each of these and see how they affect a recipe.

1. The Role of Egg Yolks: Fat

Recipes that use just the yolk of an egg typically do so for the yolk's fat content and emulsifying abilities. The fat gives baked goods extra-rich flavour and a velvety texture. The yolk also has the unique ability to bind liquids and fats together, creating an emulsion that prevents them from separating. This emulsion process helps create a more homogenous mix of ingredients, aiding in an even distribution of liquid and fats throughout a recipe for smooth batters, satiny custards, and creamy curds.

When yolks are heated, the proteins they contain unfold and gel together. This is a delicate situation; too much heat and the proteins will gel too much and turn curdled and grainy, but when warmed gently over low heat, egg yolks have a great ability to thicken products like sauces and custards.

2. The Role of Egg Whites: Foam

When egg whites are used alone, they perform an entirely different role from the yolks, especially when whipped.

Whipping egg whites means incorporating millions of little air bubbles within the white. This creates a fairly stable foam that we can use to make everything from a soufflé to meringue. To help stabilize egg whites even further, we can add acidic elements, like cream of tartar and lemon juice. One of the best ways to use whipped egg whites is as a natural leavening agent in something like a delicate cake or a soufflé.

In the heat of the oven, the air trapped in the foam starts to expand, causing the recipe to rise without the need for things like yeast or baking soda. In fact, whipped egg whites are how many classic baked goods, like sponge cakes, got their lift in the days before baking soda and baking powder.

While the idea of "light" and "airy" whipped egg whites might make you think that more is better, it is possible to overdo it. Over-whipped whites will become clumpy, grainy, and difficult to fold into your batter. Also, using too many whites in a batter can wind up making the final product dry.

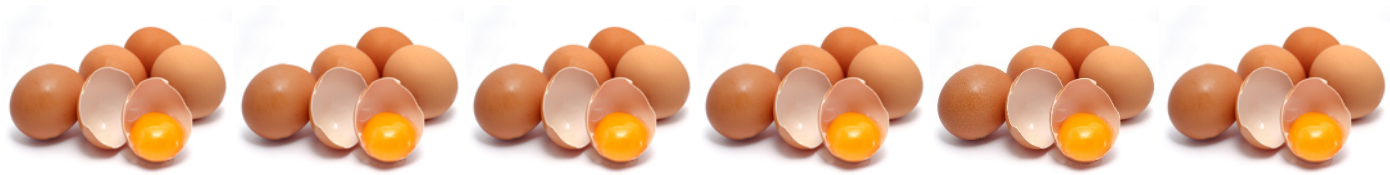
3. The Role of Whole Eggs: Fat and Foam

When you use whole eggs in a recipe, you get some of the best properties of both the yolk and the white. While whole eggs aren't quite as good as straight yolks at creating an emulsion, they are still excellent binding agents, especially in cakes, cookies, and other baked goods. Eggs also firm up and solidify when heated, giving crucial structural support to delicate desserts and pastries. At the same time, eggs make baked goods tenderer, creating light textures. When mixed with sugar as used in a cake or cookie batter, eggs help trap and hold air, not quite as well as whipped egg whites, but enough to give the finished product some lightness and lift. The combination of eggs and sugar also adds a great deal of moisture and flavour to a recipe such as in a Swiss Roll and a Genoese Sponge.

Yolks and whites can also be used separately in the same recipe. This truly is the best of both worlds, with the yolks providing richness to a base or batter while the whipped whites do their job of lightening and leavening. Chiffon cakes, Meringue Pies and Soufflés are good examples of this kind of recipe.

To recap; Eggs

- Hold air when beaten
- Coagulate when heated
- Add colour to mixtures
- Thickens sauces, custards, etc.
- Glaze bread, scones and pastry
- Bind ingredients together
- Provide protein, fat, iron and Vitamins A, B, and E



Complete the following questions;

1. Name the 4 parts of an egg

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2. What does the term "Emulsifying Abilities" mean?

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3. Name 2 type of sponges that use a mixture of whisked eggs and sugar as the base for its recipe

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4. What does the term "Binding Agent" mean?

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5. List the uses of eggs in baking

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6. In the space below draw a diagram of an egg, labelling all the relevant parts.

Additional ICT Task;

1. Research the meanings of the following words and their functional uses in baking.

Coagulation_____

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Aeration_____

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_____

Emulsifying_____

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2. Some people are allergic to eggs, find an egg free recipe for a cake and copy it out in the space provided;

Ingredients

_____ _____ _____

_____ _____ _____

_____ _____ _____

Method

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Flour

Standard flour comes from the berry of the wheat grain. The wheat berry, or kernel, is composed of three parts. The outer layer is known as the bran and the interior is made up of the endosperm and germ. The endosperm comprises mostly of the kernel and holds all of the starches and proteins. The germ is composed mostly of fat. White flour is made by grinding only the endosperm into a fine powder. Whole wheat flour is made from the entire kernel, which is the bran, endosperm, and germ.

How and Why Flour is used in Baking

It is the proteins "glutenin" and "gliadin" found within the flour that perhaps make it so important to baking. When mixed with moisture they create gluten. Flour itself doesn't contain any gluten, but dough does. It is a byproduct of flour manipulated with moisture. The gluten bonds in a dough, traps gases from yeast fermentation or chemical leaveners and create rise. Gluten development is determined by mixing time and presence of fat in the dough. The longer a dough is mixed before baking, the more time the gluten bonds have had to form and the more rise they'll create through trapped gases. Fat actually works to inhibit the strength of gluten because it coats the proteins and weakens the bond it forms within a baked good. Think of a loaf of bread versus a cookie, both have different mixing times and fat content, which among other things, affect the very different end products. The starches in flour have two roles. They contain enzymes that break down into sugars which provide food for yeast and therefore aid in rise. Starches also work to absorb the moisture during baking and set the finished product through a process called gelatinization, which happens at temperatures above 140 degrees F. The proteins are responsible for volume, texture, and appearance, and the starches hold it in place even after it's removed from the heat.

Flour is the basic ingredient in all baked goods and is usually mixed first with other dry ingredients like sugar, baking powder, baking soda and yeast. Flour as an ingredient has many different and important functions? Flour provides the structure in baked goods. The protein content of a flour affects the strength of a dough. Flour can be used as a thickening agent. Wheat flour also holds wet ingredients such as oils, milk and eggs together. Most recipes call for all-purpose flour, which is a mix of refined hard and soft wheats.

What are hard and soft wheats?

Hard wheat is harvested in spring and is high in gluten. It has a high mineral content and is just the thing for making bread. **Soft wheat** has a lower amount of gluten and is used for making cakes and pastries. The mix of hard and soft wheats are why all-purpose flour is ideal for most recipes that need flour.

To Recap; Flour

- Provides fibre (especially if wholemeal)
- If Self-Raising, makes mixtures rise
- Thickens sauces
- Forms the bulk of bread, pastry and cake mixes
- If wholemeal, provides colour and texture
- Gluten in flour produces a stretchy dough
- Provides carbohydrate, Vitamin B, calcium and iron

Complete the following questions;

1. When baking a cake explain the functional properties of flour and how it works

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2. What flour is better for making cakes with and explain why?

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3. Dextrinisation occurs when foods containing flour are cooked using dry heat. Explain what this is and the affect it has on baked goods

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4. Name the 3 parts of a wheat kernel

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5. What is gluten and how is it developed?

Additional ICT Task;

1. Research the meanings of the following words and their functional uses in baking.

Creaming_____

Rubbing in_____

Shortening_____

Gelatinization_____

2. Some people are allergic to flour, find a flour free recipe for a cake and copy it out in the space provided;

Ingredients

_____	_____	_____
_____	_____	_____
_____	_____	_____

Method

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Fat

Generally, fats are solid while oils are liquid. Fats come from a variety of animals and plants. Oils mainly come from plants.

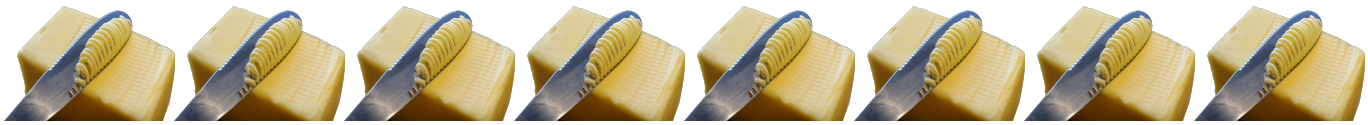
In baking, butter, margarine, shortening and oil are commonly used. Their main functions are to shorten or tenderise the product, to trap air during creaming and so aerate the cake during baking to give good volume and texture, to help prevent curdling by forming an emulsion, and to add flavour.

Butter is the traditional home bakery fat against which all others are judged although margarine has become a successful substitute.

Its success as a bakery product is due to its solid fat profile and crystalline structure. It also has good flavour stability and mouth feel. It can be used in bread, cakes, muffins and all pastries because butter works together with other ingredients like sugar, eggs, and flour to give baked treats body and texture. It is important to add the correct amount of fat as too much will make the baked product greasy and unpleasant to eat, while too little fat will leave a product that will be lacking in flavour and which will go stale quickly.
It's important to fluff up butter with air, that's why the first step of most cake recipes is to cream the butter. When butter or margarine and castor sugar are creamed together with either an electric whisk or wooden spoon, the mixture will contain tiny bubbles of air.

To recap; Fat

- Provide flavour
- Keep products moist and extend shelf-life
- Add colour to foods
- Make pastry 'short' by coating the flour to stop gluten developing
- Hold air when creamed with sugar
- Oil forms an emulsion with liquids (for example, mayonnaise)
- Provide energy and Vitamins A and D



Complete the following questions;

1. What functional properties do fats contribute to all foods?

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2. Explain one way fat can contribute to air being added to foods

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3. When baking a cake explain a functional property of fat

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Additional ICT Task;

1. Research the meanings of the following words and give examples;

Shortening_____

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_____

Glazing_____

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Aeration_____

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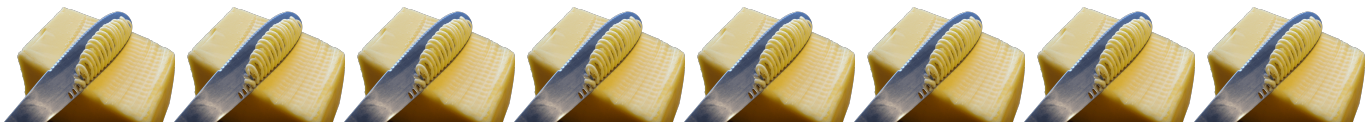

Sugar

Well, although it does it well, making things sweet isn't the only thing that sugars good for. In any given recipe, sugar is performing a number of functions you're probably not aware of. For one, it adds texture, like keeping your baked foods soft and moist. It is also yet another leavened, though working in conjunction with fat, eggs, and liquid ingredients.

Sugar sweetens by the sugar caramelizing in the recipe, and adds that "crunch" to the crusts of cakes and cookies. In cakes, sugar assists with the aeration and stabilising of batters. Sugars improve the crust colour of baked products, improve flavour and helps to retain moisture, keeping products softer for longer and so reducing staling.

However, not measuring your ingredients like sugar correctly can affect the finished quality of your cakes and baked goods. Too much sugar can lead to your cakes having a darker colour, being a sweeter product and your finished cakes will have a hard crust.

Some examples of sugar forms are granulated sugar, castor sugar and icing sugar. Sugar also comes in liquid forms such as syrup, treacle and honey to name a few.

To recap; Sugar

- Provides sweetness
- If brown, provides colour and texture
- Large amounts prevent micro-organism growth (for example, jam/marmalade)
- Caramelises to produce a brown colour
- Retains moisture
- Helps to trap air in cake mixtures
- Provides carbohydrate

Complete the following questions;

1. What will happen to the colour of a cake if the sugar content is reduced?

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2. In what ways does sugar improve a cake?

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3. What will happen if too much sugar is added to a cake batter?

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4. Off the top of your head quickly list as many types of sugars and sweeteners that can be used in baking as you can

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_____ _____ _____ _____

_____ _____ _____ _____

Additional ICT Task;

1. Research the meanings of the following words and give examples;

Crystallisation_____

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Caramelisation_____

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Maillard.Browning_____

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2. Having identified some sugars and sweeteners that can be used in baking previously, now research and list more

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Raising Agents

Raising agents are leavening powders that can be added to baked products to improve or aid their rise through the production of carbon dioxide. The most common one's used in baking today are "Baking Powder" and "Baking Soda". Baking powder and baking soda are not the same and should not be confused as they are chemically different and used in different ways. Which is used will depend on the other ingredients in your recipe

Baking Powder;

Baking powder is a raising agent that is commonly used in cake-making. Baking powder is a chemical aeration agent. It is made from an alkali, bicarbonate of soda, and an acid, cream of tartar, plus a filler like cornflour or rice flour which absorbs moisture. Baking powder works by releasing carbon dioxide gas into a batter or dough through an acid-base reaction, causing bubbles in the wet mixture to expand and thus leavening the mixture. Baking powder is probably the most common aerating agent in baked products like cakes.

Baking powder has a built in acidic ingredient. As long as you are using a double-acting powder, your mixture can sit a while before baking and be fine because they react in two phases and the gas won't be released until baked. Too much baking powder makes your cake taste bitter. Excessive baking powder causes your cake to rise too rapidly and then collapse due to the air bubbles growing too large. Too little baking powder results in a tough cake with compact crumbs and poor volume.

Baking Soda;

Baking soda is pure sodium bicarbonate. It is important that when you use only pure baking soda, you bake your goods immediately because a chemical reaction (bubbles) occurs and they will expand upon baking. Wait too long and your goods will be flat. Recipes that call for only baking soda will have some kind of acidic ingredient such as honey, chocolate or yogurt in it.

To recap; Raising Agents

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Complete the following questions;

1. In the section "To recap; Raising Agents", Identify from the text and write in 5 key bullet points.

2. What is the difference between baking powder and baking soda?

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3. Bicarbonate of soda is a chemical raising agent. Why is it not used in cakes like a Victoria sponge etc.?

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4. What is a Leavening Powder?

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Additional ICT Task;

1. Research why some recipes call for self-rising flour AND baking powder?_____

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KEY NOTES