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不同製造過程對麵包卷及蛋糕之烘焙時間與水分含量影響

The Effect of Different Manufacturing Process on Baking Time and Moisture Content of Bread Roll and Cake

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摘要

本研究之目的在探討不同品質之小麥原料，烘焙時間及溫度對麵包及蛋糕製品之影響。研究所使用之樣本皆進行含濕量、灰分、化合物含量分析及官能品評，此外，本研究亦整合現行技術以建立防止爆炸結晶及標準化之分析方法，並且以完全不同之麵粉製作各種不同品質的麵包及蛋糕。研究中量化了不同用量及種類之纖維質及穀粒對麵包卷及蛋糕之質地、構造、再水合性質之影響，並探討不同烘焙時間及溫度對產品水分含量之影響。以官能品評之各項參數所得之結果，杯子蛋糕為最受好評之產品，而含 50%纖維麩之麵包則最受消費者喜愛，此結果與前人研究中指出含 60%纖維麩之麵包製品仍被消費者接受之結論一致。另外，含 50%纖維麩之湯匙蛋亦可被消費者接受，若含水率降至 12%以下，則可在無化學添加下有五天的保存期限。烤箱為產品製造過程中最大的碳排放源，約占 35-45%之總碳排，而使用深色蛋糕模具比淺色蛋糕模具較佳之烘焙效率，並可使烘焙溫度降低約 25° F。本研究之結果顯示，若以較佳的烘焙方式及設備進行烘焙，將可減少約 10%總量的碳排放，也就是每年可減少約 57000 噸之二氧化碳排放。

關鍵詞：麵包、 麵包卷、蛋糕塊、杯子蛋糕、烘焙時間、水分含量、低碳排

ABSTRACT

The purpose of the study was to line up bread and cake with fully completely different wheat quality, baking time, and temperature. The prepared samples were chemical analyzed for wet content, ash content, compound content, and organoleptic. The analysis, in addition, established some experimental techniques throughout the assembly technique logs on some way to forestall the explosive crystallization and standardization of the manufacturing technique. The study quantified the impact of amount and kind of fiber and whole grain on i) texture ii) structure and iii) rehydration properties of the bread roll and cake applying different time and temperature with moisture content. Among the four processed products of based on each parameter tested organoleptically, cupcake products were the most preferable one. Bread products made with substitution of 50% have been received by consumer panelists. The results of this study were also in line with the research conducted by which resulted in a substitution of spinach flour substitution of up to 60% still acceptable by panelists. Sponge cake from flour can still be received by panelists with 50% substitution. 12% moisture will help 5 days self-life without chemical preservatives. The oven is the largest of the three consumers and typically accounts for between 35% and 45% of the total site carbon emissions. The dark cake pan, which holds in more heat than light-colored baking pans and bakes our cake batter faster. Through using a dark nonstick pan for baking, can reduce our baking temperature by 25° F. Good practice opportunities can be delivered for various plant/equipment utility serving could deliver on average a 10% saving in total CO_2 emissions for the sector. This would speak to a CO_2 decrease of 57 000 ton CO_2 / year.

Keywords: Bread, Bread Roll, Slice Cake, Cup Cake, Baking Time, Moisture Content, Low Carbon

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Chapter 1 - Preface

1.1 Introduction

Health and biological process policies are presently promoting the rise of dietary fiber content in food particularly in bread, bread roll and cake products. However, incorporation of fiber in bread roll might cause quality problems so decreasing client acceptance. The objective of this study is too raised perceive however dietary fibers have an effect on the standard of bread roll product throughout baking. The studies quantified the impact of supply and quantity of fiber properties. The target of this study was too raised perceive however dietary fibers have an effect on the standard of bread roll and cake product throughout baking. Baking may be an important method however is extremely complicated and somewhat troublesome to know and describe. The look of associate degree kitchen appliance is in the main a matter of warmth transfer and its management except for the baker what happens may be a matter of temperatures and turbulence at specific stages. Heat and temperature don't seem to be constant and may not be confused. It's comparatively straightforward to live temperatures in associate degree kitchen appliance however rather more troublesome to measure heat or heat flux that is that the rate at which heat is being transferred. Heat is transferred rather more effectively if the air is moving close to the dough piece at a given temperature. Cakes are most loved nourishment over the globe but then little is thought about their ecological manageability. The accompanying fundamental item classes are considered: entire cakes cake cuts pies cupcakes and cheesecake. The outcomes uncover that entire cakes have the most minimal effects for 13 out of 18 classes considered. Cheesecake is ecologically the least manageable alternative with all effects however earthly eco toxicity higher than some other cake type. Crude materials are the significant supporters of most of the effect classifications 22%–98% trailed by bundling and assembling. Wheat flour sugar palm oil and milk-based fixings are the fundamental hotspots in the existence cycle. A scope of progress openings is considered over the production network. For instance diminishing sugar content in cakes by 30% would bring down the impacts by up to 3%–11% while diminishing the measure of bundling and vitality utilized in assembling would bring down the effects aggregately by 9%–23%. Limiting waste would diminish water eco toxicity by 6%–28%. In light of yearly utilization in the UK the area of the cake contributes 2% to the vitality utilization and 1% to the GHG emissions of the entire nourishment area. The aftereffects of this work can help the business and government in benchmarking the segment and limiting its ecological effects. The discoveries will likewise hold any importance with shoppers in recognizing naturally increasingly maintainable cake choices.

1.2 Objectives

1) To investigate the results of varied recipes on whole-grain bread rolls and cake.
2) To identify baking time and reduce heat.
3) Moisture control for long self-life without preservatives.

Chapter 2 - Literature Review

According to Subagjo in Ririewa (2009), Cake is batter baked which is made from such as flour, sugar, salt, shortening, milk, eggs, and aroma essential. While Rosyadi (2013) mentions cake is baked batter or steamed batter made from flour, sugar, salt, leavening agents, fat, milk, eggs, and flavor. Therefore the writer concludes that cake is baked batter or steamed batter made from flour, sugar, salt, shortening, milk, eggs, and essential aroma or flavor.

This chapter provides the literature associated with this study. The primary half covers the final info on bread/bread roll foods together with the uses of them. The second half describes the various sorts of bread rolls and cake, that are accountable for deteriorating the standard of a bread roll and also the third half is said to the literature of this present study.

Bread/bread roll represents an invasive phase of food within the world as a result of shopper demands for a convenient and nutritive food product. The consumer's demand has raised for quality food products with taste, safety, convenience, and nutrition.

The goal of the experiment is to study the impact of baking time and temperature on the taste of a cake made from a mix, introduced. The factors are baking time and temperature. The responses are ratings of the cakes given by selected tasters. In this experiment, three times and three temperatures are used, so it is a 3x3 factorial experiment, meaning two factors at three levels each. There are nine combinations of the levels of the factors, and because three taste testers evaluate cakes baked at a given combination, there are three replications. Overall, 9*3=27 tasters and cakes are involved in the experiment. To avoid bias, the 27 cakes are baked according to a random allocation of combinations. The cake-baking experiment is an example of a factorial experiment. The GLM General Factorial Model in SPSS was used to analyze the data. The main effects of time and temperature were found to be statistically not significant. This should not be interpreted to mean that these factors are unimportant. The effects are small for the amount of deviation from the considered levels. Certainly

it is possible to think of deviations that would produce stronger effects. The analysis showed very strong interaction between time and temperature. The profile plots and numerical summaries show that the highest mean rating is achieved with the following combinations of time and temperature: (H, L), (M, M), and (L, H), where L, M, and H denote low, medium, and high level of a factor. Thus it is possible to compensate for a lower time by using a higher temperature and vice versa. The lowest average rating is achieved with the following combinations of time and temperature: (L, L) and (H, H). In other words, a combination of low time and temperature or high time and temperature produces an unsatisfactory cake.

Different analysis employees applied studies on the enrichment bread/bread roll and cake. The chemical, technological, biological and sensory characteristics of enriched for bread/bread roll and cake products have additionally been studied. However, the literature accessible relevant to the current study has been reviewed below the subsequent headings.

- Useful activities
- Nutritional attributes
- Composite technology
- Organic chemistry and Nutritional assay
- Baking time and Temperature

Baking could be an important method however is extremely complicated and somewhat tough to know and describe. The look of a kitchen appliance is primarily a matter of warmth transfer and its management, except for the baker what happens could be a matter of temperatures and turbulence at specific stages. With chemicals leavened foods: below this cluster return to the foods wherever the principle aerating perform is providing by some type of chemicals. CO_2 is just gas presently used for aerating with chemicals leavened bread product though chemical element derived from peroxide has been proprietary as a leavening agent. The supply of CO_2 is baking soda, though carbonate and carbonate are generally employed in bread rolls. The booth of these latter

compounds decomposes fully upon the applications of heat and doesn't need value-added acids as soda.

Making a cake is not a difficult process, but complications can arise whether using a premixed product or baking the cake from scratch. Incorporating dry (flour) and wet (milk) ingredients into the mix. This process runs the risk of over mixing batter and yielding dry, tough cakes. Mix up the procedure a little bit and start by mixing butter with flour before adding any wet ingredients. This will reduce the gluten formation in the flour by first coating the flour in fat before the liquids are incorporated, resulting in a super moist cake. Sponge cakes are naturally fluffy, while vanilla cakes are usually not as moist and fluffy. We need to use cake flour in place of all-purpose flour. Cake flour is flour which has been mixed with some corn starch in order to make it lighter. Cakes baked with cake flour are usually lighter and softer than cakes baked with all-purpose flour. Real butter in place of margarine, even if the recipe calls for it. Margarine or butter substitutes contain more water than fat. However, it is the fat in butter that helps to hold the cake together and moisten it. The excess water in margarine will evaporate in the oven's heat, leaving with a dry texture to cake. Substituting some butter with oil in a recipe always leads to moister cakes. Vegetable oil reduces the production of gluten in the flour, a protein found in wheat products that work as a binding agent. Too much gluten in a cake will cause it to be sticky and tough rather than moist. Consider substituting milk for buttermilk. Buttermilk has a high acidic content which breaks down the gluten in the flour, thus making cakes softer.

Bread

In 1967, Wolfang Lutz, an Austrian doctor, released the book Leben ohne Brot which by many is considered to mark the start of a new dietary trend throughout the western world; the low-carb/high-fat (LCHF) diet (Lutz et al., 2010). A couple of year's later, Robert Atkins launched his book Dr. Atkins Diet Revolution (Atkins, 1972) which sold millions of copies worldwide. In Norway, LCHF was put on the agenda in the early 2000 when Fedon Lindberg introduced us to a "new" term; glycemic index (GI), and

recommended a diet low in easily absorbable carbohydrates from e.g. bread, pasta and potatoes (Bugge, Lavik & Lillebø, 2008).

3-Hydrocolloids and its role: Hydrocolloids are widely used as additives in the food industry, because they are useful for modifying the rheology and texture of aqueous suspensions (Dziezak, 1991). Hydrocolloids due to their high water retention capacity confer stability to the products that undergo successive freezethaw cycles (Lee,et al. 2002; Sanderson, 1996). Today, several antistaling agents are used in the bread making industry.

2.1 Bread roll

Bread is a staple food prepared by baking a dough of flour and water and often additional ingredients, such as butter or salt to improve the taste. Bread is also made from the flour of other wheat species (including durum, spelt and emmer), rye, barley, maize (corn), and oats, usually, but not always, in combination with wheat flour.

2.2 Types of bread:

White bread is formed from flour containing solely the central core of the grain (endosperm).

Brown bread is formed with a reproductive structure and 100% bran. It can even discuss with a staff of life with supplemental coloring (often caramel coloring) to form it brown;

Whole meal bread contains the full of the wheat grain (endosperm, bran, and germ). It's additionally stated as "whole-grain" or "whole-wheat bread", particularly in North America.

Wheat germ bread has supplemental wheat germ for seasoning.

Whole-grain bread will discuss with an equivalent as food grain bread, or to staff of life with additional whole grains to extend its fiber content, as in "60% whole-grain bread".

Roti or pan cake could be a whole-wheat-based bread consumed in South Asia. Chapatti could be a larger variant of roti. Naan could be raised like these.

Flatbread is usually easy, created with flour, water, and salt, and so shaped into a planar dough; most are unleavened, created while not yeast or sourdough culture, although some are created with yeast.

Raw materials of bread:

It isn't a mystery that acute bread that keeps freshness and smell for an all-encompassing time should be heated astoundingly of excellent materials. Fundamentals and additional crude materials are recognized in bread stock creation. The principle elements of that the shrewdest are made are flour salt water yeast. Anyway, the facts demonstrate that nowadays a few creators recollected ongoing receipts of unyeasted mixture propose oftener bread result of characteristic raises. Concerning elective fixings, their use stays steady with the sole qualification of other generation innovation. An additional element of bread on that you should give your consideration is yeast. This fixing adds to the higher raising of batter. Packed yeast is a ton of normally used in prepare homes. Fluid and dried yeast are sought after its capability to utilize yeast cream. Extra ingredients in bread-making production one increasingly material bunch that is widely applied in bread making generation is additional fixings. They grasp totally various styles of fats margarine vegetable oils extraordinary bread fats spread sand sugar and sugar-containing parts nectar syrups starch improving and so on. Besides the receipt anticipates the utilization of elective items: eggs milk creams unique added substances foods are grown from the ground fillers sweetened organic products dried natural products flavors nuts and so forth.

Nutritional value of bread:

Famous filaments are viewed as a major part within the aversion of the commonplace success ailments, for instance, stoutness, heart conditions and sickness of the heart. A fiber lack isn't the explanation for these sicknesses, but strands can hinder the advance of those maladies. Significantly within the industrialized and well – created nations, these flourishing sicknesses show up. Exactly in these spots, the use of refined things, as an example, bread, rice, and white sugar is high. The image of bread as uninteresting or stuffing is also, unexpectedly, as hostile the one amongst a sort job of oat grain nourishments throughout the complete existence of man.

Bread manufacturing process (shortly):

Blending and manipulating the batter: 1 the filtered flour is stuffed with a contemporary liquidizer. Temperature-controlled water is funneled into the liquidizer. This mix is called gluten and provides bread its snap. A pre-estimated quantity of yeast is further. 2 the liquidizer is basically an internal drum that turns at speeds between 35 to75 cycles for every moment. The rehearsed workforce will make sure the consistency by the sound of the mixture. The blending strategy takes in relation to twelve minutes. Fermentation: 3 yeast produces carbonic acid gas out of the sugar blessing within the mixture. Modernly it’s done misuse equipment. Some bread is allowable to age unremarkably. Throughout this case, the mixture is placed in coated metal dishes

associated droop on in an extremely temperature-controlled region until it rises. Division and gas duplicate 4 once the mixture has hardened its stacked into a divider with turning cutting edges that cut the batter into pre-decided masses. The trim machine shapes the mixture into balls and drops them onto a proffer. The batter moves bit by bit through the proffer, therefore, it ought to rest with the goal that the gas duplicate might advance. Trim and heating 5 once the batter rises up out of the proffer it's sent to a resulting trim machine that re-shapes the mixture into parts and drops them into the frying pan. 6 from the proffer the instrumentation enters a passage room machine. The temperature and speed are totally determined therefore once the leaves get on my feet out of the passage they're fully ready and half cooled. The making ready and cooling strategy keep going just about a unit of time. Slicing and bundling 7 the bread keeps on chilling since it moves from the room equipment to the cutting machine. Here vertical scored cutting edges go everywhere at pleasant speeds cutting the bread into methodically measured things. 8 bread is cut by a slicer machine. Pre-printed plastic things are naturally slipped over every portion. At bound pastry outlets, staff shut the things with wire turns. Numerous plants seal the items with heat. The heating strategy contains seven stages 1. Development and broadening of gases 2.trapping of gases in air cells 3.gelatinization of starches 4.coagulation of proteins 5.evaporation of a number of the water regarding 6. The dissolving of shortenings 7. Hull formation and browning.

Formation and expansion of gases: Fundamentally Carbon Dioxide. Framed by: Yeast, Baking Soda Baking Powder - Steam is additionally framed by vanishing dampness.

Catching of gases in air cells: Extended gluten proteins for a grid of air cells which trap gases created by raising operators. Inadequately raised bread is frequently substantial because of the absence of caught air.

Gelatinization of starches: Adds to generally speaking structure of bread as starches firm during cooking Gelatinization starts at roughly 150° F.

Coagulation of proteins: Contributes to generally speaking structure of bread as proteins coagulate during cooking - Protein coagulation starts at roughly 165° F.

Evaporation of some of the water: Weight stipends must be made for water misfortune during preparing - Ex. For a 1# portion of prepared bread, the Baker must scale approximately 18 oz of mixture.

Melting of shortenings: Different shortenings dissolve and discharge caught gases as various temperatures along these lines appropriate shortening ought to be utilized for each prepared item.

Crust formation and browning: The crust is shaped when water vanishes from the

outside of the mixture - Caramelization is liable for the caramelizing impact of bread - Milk sugar and eggs increment cooking.

Quality control: Business bread making is held to severe government rules with respect to nourishment creation. Further, purchaser inclinations propel bread makers to keep up a great standard of appearance, surface, and flavor. Accordingly, quality checks are performed at each progression of the generation procedure. Makers utilize an assortment of trials, compound examinations, and visual perception to guarantee quality. Dampness content is especially basic. A proportion of 12 to 14% is perfect for the anticipation of microbe's development. Be that as it may, naturally prepared bread to have dampness content as high as 40%. Consequently, it is basic that the bread shop plants be kept carefully spotless. The utilization of fungicides and bright light are two well-known practices.

Look at hard, delicate, and durum wheat: Flour utilized in heating is processed from two fundamental assortments or wheat. High-protein, hard wheat shapes very solid gluten. Business dough punchers favor it for making bread. Since delicate wheat is lower in protein, it structures frail gluten. It's optimal when a delicate, sensitive surface is wanted. The third sort of wheat, a discussion is the hardest kind developed—too hard for making heated items. Durum is processed into semolina, grainy flour that gives the pasta its tough structure. The primary quality that recognizes the various flours utilized in preparing is protein content, which influences gluten quality.

Bread rolls

A bread roll is famous nourishment in our nation. For the most part as in the morning meal thing. I like this one better. Not at all like some entire grain bread, are these rolls tasty, delicate, and light. This is a resurrection of bread move which utilizes entire white flour and is a champ in the taste and surface division, however, this one is a lot more beneficial in view of the additional protein and fiber.

2.3 Types of bread rolls

There are such a significant number of sorts of bread moves discovered/use in various nations. Like-1) 100% Whole wheat bread move 2) Whole wheat herbs move 3) 100% entire grain air bun 4) Honey entire wheat move 5) Whole wheat breakfast move 6) Overnight entire wheat move 7) Made at home entire wheat roll and so forth.

Figure 1.1 100% Whole Wheat Bread Roll

Figure 1.2 Overnight Whole Wheat Roll

Figure 1.3 Whole Wheat Herbs Roll

Figure 1.4 Home Made Whole Wheat Roll

Figure 1.5 Whole Wheat Breakfast Roll

Figure 1.6 100% Whole Grain Air Bun

2.4 Discuss of different types of bread roll

Type-1: 100% Whole Wheat Rolls

Figure 1.7 100% Whole Wheat Rolls

Figure 1.8 100% Whole Wheat Rolls

Total product time: a pair of hrs twenty minutes, preparation Time: a pair of hrs, Cook Time: twenty minutes.

Product: yield twenty-five rolls

Recipe:

2 tablespoons yeast
2 cups lukewarm water (105-125 degrees, 16 oz.)
1/4 cup honey (2 oz.)
3/4 cup vegetable oil (6 oz.)
2 eggs, at the temperature
2 teaspoons salt
7 cups whole flour

Procedure:

1. Dissolve yeast in water and honey for concerning five minutes.
2. Mix honey, olive oil, eggs, and salt in an exceedingly massive bowl.
3. Slowly add flour and knead till it loosens from sides of the bowl.
4. Place in an exceedingly massive oiled bowl, cowl and let rise till concerning double. Concerning one hour, take care it's in an exceedingly heat place.
5. Punch down and take away Dough.
6. Form dough into rolls concerning a pair of inches in diameter.
7. Place on an associate non-stick baking sheet, cowl and let rise for a half-hour.
8. Preheat kitchen appliances to 375 degrees.
9. Bake at concerning 375 degrees for about twenty minutes or till bronzed.

This formula seems nice do-it-yourself rolls for people who love 100% whole wheat bread. They rose fantastically and arrive at the kitchen appliance

2.4.1 Nutritional facts for 100% whole wheat rolls

Nutrition facts is most important during eating any meal. Here is nutrition facts for 100% whole wheat rolls given below-
Serving size: 1 (1697 g)
Servings per recipe: 1

Amount per serving	**% Daily value**
Calories 190.6	
Calories from fat 69	36%
Total fat 7.7 g	11%
Saturated fat 1.1 g	5%
Cholesterol 14.8 mg	4%
Sodium 193.7 mg	8%
Total carbohydrate 27.4 g	9%
Dietary fiber 3.8 g	15%
Sugars 2.9 g	11%
Protein 5.3 g	10%

Type-2: Whole wheat herbs roll

Figure 1.9 Whole Wheat Herbs Roll

Complete product time: 2 hrs 20 mins, Prep Time: 2 hrs, Cook Time: 20 mins
Items: Serves: 12 Yield: 12 moves, Units: US | Metric

Plans:

3/4 cup warm water
1 tablespoon dynamic dry yeast
2 tablespoons sugar
2 tablespoons spread, mellowed
1/2 teaspoon salt
1/2 cups entire wheat flour
1 tablespoon wheat gluten
1/2 teaspoon Italian flavoring
1 teaspoon thyme
Production:
1. Dissolve yeast in 1/4 cup warm water.
2. Add remaining water, sugar, spread, salt, 1/2 cup flour, and wheat gluten, mix well.
3. Stir in herbs and 1 cup flour to make a delicate batter. Ply for 8-10 minutes.
4. Place in a lubed bowl spread let ascend until multiplied, around 60 minutes.
5. Punch batter down, partition into 12 equivalent pieces; shape into balls.
6. put the balls in a lubed 8' round skillet. Spread; let ascend in a warm place until multiplied in size, around 45 minutes.
7. Bake at 400F for 15 - 20 minutes.

2.4.2 Nutritional facts for whole wheat herb rolls

Serving size: 1 (35 g), Servings per recipe: 12

Amount per serving	**% Daily value**
Calories 78.9, calories from fat 20	25%
Total fat 2.2	3%
Saturated fat 1.2 g	6%
Cholesterol 5.0 mg	1%
Sodium 12.0 mg	4%
Total carbohydrate 13.3 g	4%
Dietary fiber 2.0 g	8%
Sugars 2.1 g	8%
Protein 2.4 g	4%

Type-3: Honey whole wheat rolls

- Prep: twenty min. + rising Bake: twenty min.
-
- Yield: fifteen Servings twenty
- Fixings
- a pair of bundles (1/4 ounce every) dynamic dry yeast
- one cup heat water (110° to 115°)
- 1/4 cup unfold, liquefied
- 1/4 cup nectar
- 1 egg
- 3/4 cup entire flour
- 1/2 cup antediluvian oats
- one teaspoon salt
- 2-1/4 to 2-3/4 cups usually helpful flour
- further dissolved oleo

Production procedure

- In an exceedingly immense bowl, break down yeast in water. Combine within the oleo, nectar, egg, entire flour, oats, salt and one cup of usually helpful flour; beat till sleek. Embrace enough staying universally handy flour to form a fragile batter.
- Flip onto a floured surface; ply mixture till sleek and versatile, around 6-8 minutes. A spot in an exceedingly lubed bowl, going once to grease prime. Cowl and let ascend in an exceeding heat spot till increased, around hour.
- Punch mixture down. Form into fifteen rolls. A spot in an exceedingly lubed 13-in. x 9-in. making a ready dish. Cowl and let ascend till increased, around forty-five minutes.
- Bake at 375° for twenty minutes or till sensible dark-colored. Brush with oleo. Yield: fifteen rolls.

Nutritional facts: 1 serving (1 each) equals 149 calories, 4 g fat (2 g saturated fat), 22 mg cholesterol, 194 mg sodium, 25 g carbohydrate, 2 g fiber, 4 g protein.

2.4.3 Mam’s 100% whole-grain air bun

I like this one better. Unlike many whole-grain breads, these rolls are delicious, soft, and light. This is a reincarnation of Mam's Air Buns which uses white flour and is a winner in the taste and texture department, but this one is much healthier because of the added protein and fiber.

Ingredients: Serves: sixteen, Yield: sixteen rolls, Units: America | Metric

Figure 2.0 Mam's Air Buns

1 egg
1 one/4 cups heat water, just about
3 tablespoons vegetable oil
3 tablespoons honey
1 tablespoon vinegar
2 tablespoons skimmed milk powder
1 teaspoon salt
2 tablespoons roast unseasoned helianthus seeds
1 tablespoon seasoning
2 tablespoons flax seeds
1/2 cup massive flake oatmeal
2 tablespoons protein
4 cups whole flour, minus a pair of Tablespoons
2 teaspoons bread machine yeast

Directions:
1. Place an egg in a very a pair of cup live, whisk and add enough heated water to come back up to the one 1/2 cup line.
2. Place this water/egg mixture, oil, honey, salt, vinegar, oats, and seeds, within the bucket of the bread machine.
3. Sprinkle the dry milk on prime.
4. Within the bottom of a one-cup life, place a pair of tablespoons of protein, then fill the cup with whole wheat bread flour.
5. Put that, and another three cups of flour on prime of the liquids.
6. Add yeast to the surface, and program for the "dough" cycle.
7. You'll get to add an extra tablespoon or 2 of water to convey a sleek slightly sticky dough once the machine begins to knead.
8. I create either a pair of 9" spherical cake pans of rolls, every with eight rolls per pan, or one pan of rolls, and type the opposite half the dough into a rounded loaf, and let each rise until double (the rolls can fill the pans).
9. Bake at 350°F for twenty minutes for the rolls, and just about twenty-five minutes for the loaf. The rolls are going to be deeply golden brown, and Ohio thus yummy! Loaf. The rolls will be deeply golden brown, and oh so yummy!

2.4.4 Nutritional facts for mam's 100% whole grain air buns (rolls)

Serving size: 1 (66 g)

Servings per recipe: 16

Amount per serving	**% Daily value**
Calories 171.0	
Calories from fat 46	27%
Total fat 5.2 g	8%
Saturated fat 0.5 g	2%
Cholesterol 11.7 mg	3%
Sodium 155.0 mg	6%
Total carbohydrate 27.8 g	9%
Dietary fiber 4.1 g	16%
Sugars 3.7 g	14%
Protein 5.6 g	11%

2.4.5 Discuss common raw materials for bread and bread roll

Variety raw materials are utilized in the heating industry. Though crude materials necessities for convectional bread and bun delivered in machined units are all around characterized an assortment of crude materials in various blends is utilized for various conventional bread things, for example, buns, rolls, and cakes.

The major raw materials are:

- Wheat, atta, maida, leavening agent such as baker's yeast, bran and hops, fermented juice obtained from palm and lactic acid ferment, edible common salt and potable water.
- Milk product such as condensed milk , in milk powder , fat hydrogenated oil or refined edible oil of a suitable type or butter of ghee, margarine on other mixture gluten , sugar and sugar product, honey liquid glucose , malt products edible starches, corn flour and groundnut flour , vitamins glycerin monostearate, lime water, fungal enzyme sorbitol and lysine etc.
- Product improve such as ammonium persulphate, potassium bromated, calcium phosphate and mould inhibitors such as sodium or calcium propionate , acetic acid or lactic acid , sodium diacetate , acid calcium phosphate and acid sodium pyrophosphate.

These raw materials are from of flour, yeast, milk, milk product, shortenings, sugars, eggs, and other minor ingredients etc.

2.4.6 Major ingredients in bread and bread rolls manufacturing

1) Wheat flour
2) Sugar
3) SMP
4) Fat
5) Salt
6) Yeast
7) Bread improver
8) Eggs
9) Water

2.4.7 Wheat flour

It is one in all the premier indispensable fixings within the home getting ready, if not the primary crucial. Its foundations move to the beginnings of improvement. We've got such vast quantities of differed assortments of flour that begin from solely this one grain of wheat. Flour is that the chief producer of protein in a warm product. Protein animates and structures to buns. Whereas not protein ready product wouldn't have the shared characteristic to convey along

2.4.8 Types of flour

There are six distinct categories or styles of wheat. Every category is employed for specific functions to urge the foremost ideal completed item. Exhausting red wheat is best for yeast slices of bread. Delicate wheat is best used in cakes, and different heated product, even as wafers and grain. Hard wheat is that the hardest of all wheat and makes the simplest food. This knowledge can clarify the varied varieties of flour and the way they're best used.

Bread flour: this is processed essentially for business heating use, however, it will be found all things thought-about markets. Whereas like typically helpful flour, it's higher protein content, that is good in creating yeast bread.

Self-rising flour: this is often a sort of universally handy flour that has salt and a raising operator enclosed. One cup contains one ½ teaspoon of getting the ready powder and ½ teaspoon salt. Self-rising will be substituted for typically helpful flour in an exceedingly formula by decrease salt and getting ready powder as per these extents. It's sometimes used in scones and brisk bread or perhaps treats nonetheless isn't prescribed for yeast bread.

Cake flour: this is often fine-finished, much sleek flour processed from delicate wheat and has low macromolecule content. It's used to form a good vary of ready products like cakes, treats, saltines, quick bread and a number of varieties of food. Cake flour contains a higher level of starch and fewer macromolecule than bread flour that keeps cakes and food delicate and sensitive. (One cup of cake flour will be created by estimating one cup universally handy flour, evacuating two tablespoons of flour and displacement that with 2 tablespoons of corn flour.)

Baked sensible flour: this sort of flour has properties that fall between typically helpful flour and cake flour. It's typically made victimization delicate wheat for baked

sensible creating, nonetheless will be used for treats, cakes, saltines, and correspondingly heated things. It's marginally higher macromolecule content than cake flour and fewer starch.

Semolina: this is often the coarsely ground reproductive structure of hard wheat. Hard wheat is that the hardest assortment of the six categories of wheat and has the foremost noteworthy macromolecule substance of all wheat. On these lines, it's best for creating top-notch food and is employed by each yank and Italian producers. It's likewise accustomed build couscous in Africa and geographical region, even as within the U.S. hard wheat is rarely accustomed to building bread.

Durum flour could be a result of the creation of flour. It's usually increased with four B nutrients and iron and accustomed build noodles.

Generally helpful flour: This flour is that the most generally used everything being equal. It originates from the finely ground some portion of the wheat piece known as the reproductive structure, which gets isolated from the grain and germ throughout the process procedure. It's made employing a mix of exhausting and delicate wheat, consequently the term typically helpful. This sort of flour will be used typically for a good scope of heated things – yeast bread, cakes, treats, and food. Generally, helpful flour has iron, and 4 B-nutrients (thiamin, niacin, hepatoflavin and folic corrosive) enclosed sums adore or surpassing what's on the market in entire flour. For all intents and functions, all-white flour oversubscribed within us is increased (over 95%). There's no adjustment in style, surface, shading, heating quality or caloric estimation of increased flour.

2.4.9 Other wheat products

Farina is coarsely ground endosperm of hard wheat varieties, but not durum. It is the prime ingredient in many hot breakfast cereals. It can also be used to make pasta.

Bulgur is made by soaking and cooking the whole wheat kernel, drying it and then removing about 5 percent of the bran and cracking the remaining kernel into small pieces. It is often referred to as par-cooked. It can be reconstituted and added to baked products, salads, desserts, or used as a meat extender.

Cracked wheat, also known as kibbled wheat, is made by cracking the entire wheat kernel into small pieces, but is not precooked. Cracked wheat can be added to baked goods which add a crunchy texture and nutty flavor to breads.

Wheat Germ is the inner part (known as the heart) of the wheat kernel. It is very rich in vitamins and minerals and is often added to a variety of baked goods to improve their nutritional value. Because it contains oil, it is the component of whole wheat flour that makes it more susceptible to rancidity.

Bran is the outer layer of the wheat kernel and is sometimes added to baked products. While noted for its high fiber content, it also is rich in photochemical that contribute to good health.

Crushed wheat is also a standard whole wheat product. Crushed wheat is made when the milling process first tempers cleaned wheat to a higher moisture level. This softens the kernels before they pass through a set of smooth rollers. The wheat berries are literally flattened and very little flour is released.

Rolled wheat is similar to crushed wheat but is thinner and smaller. It is not tempered as long as crushed wheat and the wheat berries are cracked before being rolled. Due to the initial cracking, a little more flour is released. Crushed wheat and rolled wheat are often used in multi-grain and specialty brands.

****Note:** Whole wheat, stone ground and graham flours can be used interchangeably in recipes. They are produced by either grinding the entire kernel of wheat or by combining the white flour, germ and bran that have been separated during the milling process. The only difference is in the coarseness of the flour, which may differ from one flour company to another.

Whole wheat flour: This flour is milled from the entire kernel of wheat. The presence of bran reduces gluten development; therefore, items baked with whole wheat flour tend to be heavier and denser than those made from enriched flour. Bakers often add additional gluten to counteract this. (One tablespoon/cup of whole wheat flour used)

Stone ground: This is a type of whole wheat flour that has been milled by coarsely crushing the kernel between two rotating stones. There is no nutritional difference or advantage to milling the flour in this manner.

Graham flour: This also is coarsely ground whole wheat flour. It is named after Dr. Sylvester Graham, the creator of the graham cracker, who advocated the use of whole

wheat flour in the early 1800s.

Gluten flour: This has a high protein content usually milled from hard spring wheat. It is used primarily to mix in with other non-wheat or low protein wheat flours to produce a stronger dough structure. Gluten improves baking quality and produces high protein bread.

Sugar:

Sugar is a major ingredient for all bread and bread roll products whether in bread/ bread roll along with flour and fat. Primary role of sugar in bread roll is providing sweetness (taste) to the product. Sugar is various forms as sucrose, dextrose, monohydrate, liquid glucose, khandsari, invert syrup, lactose, malt extract and honey etc. The sugars break up the gluten and also act as an antioxidant for fat and increase the keeping qualities.

Color:

Color to the product due to Caramelization. Color of the crust in bread roll loaves is due to the sugar. Basic role of sugar is to activate the yeast to produce carbon dioxide and alcohol during bread roll manufacturing.

Egg:

Egg functions as food-glue and bread rolls are a great food for demonstrating it. Eggs have many used in cooking; they are used in many recipes for many different purposes. The four main functions of eggs are to bind (act as a glue for baking etc), to make things lighter (Whites especially when whipped) to filter (making consume) and the yolk can be used as a setting agent (such as in custard).

Salt:

Salt is a seasoning that sharpens the flavor of other ingredients. If the amount of salt called for in a recipe is reduced, other seasonings should be increased to compensate for the flavor loss. Salt will also enhance the sweetness of a food. The salt in yeast dough slows the fermentation of the yeast, so reducing the amount of salt used will affect the finished product.

Shortening (fat):

This is another essential ingredient of bread roll. It breaks the gluten and gives crispness to bread roll by leavening it and importing it flaky structure. Sufficiently large percentage is used to prevent by gluten forming and hard mass. Vegetable oil preferably without grain, oil, butter, or margarine may be used.

Milk:

Milk in various forms like whole milk, condensed milk, cheese, milk powder, butter milk and its solids and casein etc. may be used.

Miscellaneous products:

Other ingredient used in the preparation of various verities of bread roll includes edible oil, Yeast and bread improver.
The main protein of concern to bakers is gluten. Gluten is formed when two other proteins, gliadin and gluten in are agitated with water. Gluten a rubbery, stretchy protein that can form a web within dough that can trap air bubbles--that's what makes bread roll rise. The higher the protein content of the flour, the more gluten it can produce when mixed with water, and the tougher and chewier the end product.

Lekker (2011) states that the basic ingredients for making of cake divided into 2 types. The first type is making composition of cake: flour, eggs, and milk. The second type is making cake being soft: sugar, fat, and baking powder. Lekker (2011) and Rosyadi (2013) says there are the function of the ingredients.

2.5 Function of Raw Materials

Function of flour: It is the main raw material of buns.

- Flour gives structure of the buns
- It can be used to thickness and graves
- It can be helpful rolling out other material
- Its gives gluten
- Protect the moisture

Function of sugar:

- Sugar act as sweeteners
- Act as preservative
- Sugar break up the gluten act as anti-oxidant
- Increase the keeping quality
- Prevent microorganism

Function of iodide salt:

- Increase test of the buns
- Acts as preservative

Function of leavening agent:

- Yeast act as Leavening agent
- Bread Improver act as a leavening agent

Function of vegetable oil:

- Vegetable oil act as preservative
- Its help to frying the biscuit
- It enhance test of the biscuit
- Its protect the microorganism

Function of milk powder:

- Improve the flavor of the product
- Improve the characteristics of the product
- Incise the nutritive value of the product
- Lactose of the milk helps to toast made.

Function of egg:

- Egg acts as emulsifying agent
- Acts as tenderizing and binding agent.
- Incise the nutritive value of the product

Function of color:

- Improve the appearance
- Increase glassiness of bread and cake

Function of flavor:

- It increases the sensory evaluation
- It increases test of the bun also enhance good flavor of cake.

Function of preservative:

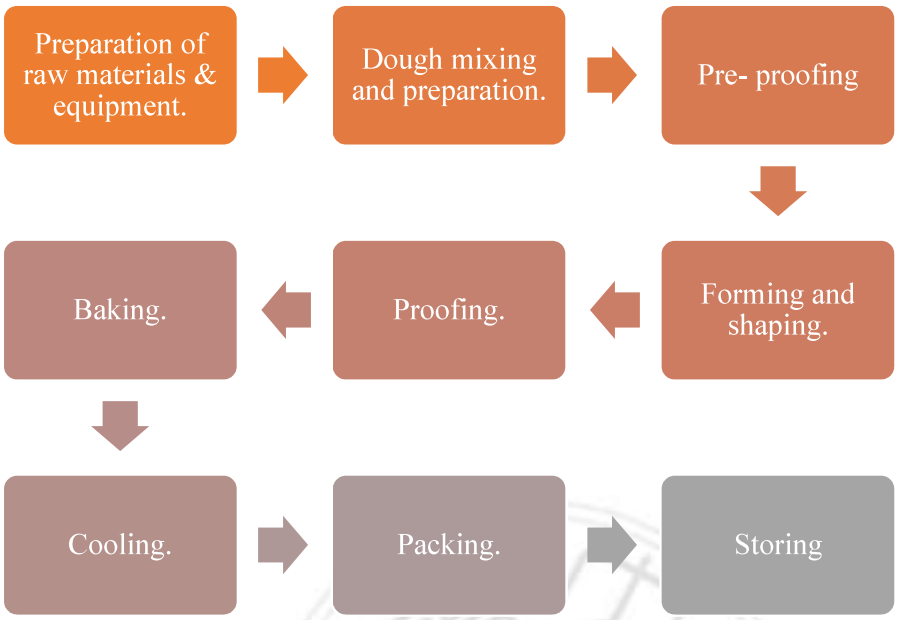
- Calcium propionate and sodium propionate used to preservative.
- Preservative helps to protect microorganism
- Its prevent spoilage and damage of the bun and cake.

2.5.1 Manufacturing process of bread roll

There are 9 steps of the manufacturing process of bread roll. These are:

1) Preparation of raw materials & equipment.
2) Dough mixing and dough preparation.
3) Pre- proofing.
4) Forming and shaping.
5) Proofing.
6) Baking.
7) Cooling.
8) Packing.
9) Storing

2.5.2 Process flow diagram of bread roll manufacturing



Flow Chart of the Bread Rolls Manufacturing.

2.5.3 Description of the manufacturing process of the bread roll given below

1) Preparation: First of all, prepare all the required raw materials and equipment. Then weighing raw materials according to the recipe.

Dough mixing process

Mixing is a process where all ingredients are put together in the right proportion for dough formation. These ingredients are then fed into mixtures where mixing is done and dough are prepared for molding. Major ingredients is flour, fat, sugar and other ingredients. Mixing can be done in one stage, two stages or three stages.

Pre-mixing: One stage or all in one is a type of mixing where all ingredients and water are added. Mixing is allowed until a satisfactory dough is prepared. Normally this type of mixing is used for hard dough.

Final mixing: Stage one: Fat, sugar with other ingredients like milk, etc are mixed. The cream is prepared with a portion of water. When temp. Is 37 °c then added yeast

and stirred gently. Stage two: Salt, egg, bread improver and flavors with color are mixed with water. Stage three: Flour with water is then added to the prepared cream and mixed till satisfactory.

Mixing time: Normally any mixing could be achieved within 3-5 minutes. Much depends on mixing the speed of mixer, flour characteristics or temperatures required for dough.

Mixing process has the following characteristics:

Dough temperatures: Very important factor the temperature ranges between 27°c - 28° c as per bread roll variety. Temperatures are maintained max. 30°c and always checking by the thermometer.

Dough consistency: This is done manually by checking dough and stretching the dough. Should not break either should it be so elastic.

3) Pre- proofing: After preparing dough then take it to rest 10-20 min. for the first fermentation.

4) Forming: For bread rolls variety dough had additional ingredient is kept. Informing sections the dough is passed through several rolls to form sheets, these sheets are then converted into one uniform roll of desired thickness. Weighing machine is used to desire weight and cutters are used to cut roll and convert dough into desired shape and size.

5) Proofing: After shaping & sizing then leave it in the proofer for 2nd and final fermentation for 20-30 min (as per rising) at 37- 40 °c temperature.

6) Backing process: Fermented wet dough pieces of desired weight and shape are then leave into the oven. The oven temperature set at 160 °c and time setting 20-25 °c.

Ovens are different types classified into following categories.

a) single gas oven
b) double gas oven
c) single electric oven
d) double electric oven

Electric single ovens: If space is tight in our kitchen and we have plenty of other units and appliances to fit in, a single built-in oven will be a good option.

Pros: Oven temperature stability can be installed under a counter or at eye-level, plenty to choose from at a variety of prices.

Cons: Having the grill built-in to the main oven capacity limits our cooking options.

Electric double ovens: Larger than singles and with two ovens, electric double ovens offer the option of cooking in both ovens at the same time.
Pros: more cooking options than single ovens.
Cons: They take up more space and larger ovens will need to built-in at eye level, so our kitchen will need to be set up for this.
Gas single ovens:
Pros: Gas is cheaper than electricity so we'll save money if we cook on gas.
Cons: Gas ovens aren't quite as good at distributing heat around the oven as electric ovens.
Gas double ovens:
Pros: More cooking options than single ovens.
Cons: Because of their size, they won't be for every kitchen, and they will need to be professionally installed.
Heat is transfer to the bread rolls on brand through all the three ways' of heat transfer is conduction, convection, and radiation.

Flowing is the chemical and physical change which occurs in the oven.
Physical change:
1. Formation of crust
2. Melting of fat
3. Gas expansion in dough piece due to high temperature
4. Water converted into the steam escape of gas and steam would result in a collapse of the bread roll structure.

Change hence these are:
1. Gas formation
2. Starch gelatinization
3. Protein change
4. Caramelization of sugar
5. Dextrinization

7) Cooling process: The cooling process is as important as any other process when bread rolls come out from oven the temperatures of bread rolls are around 160-180deg c. These bread rolls should be cooled gradually. Cooling brings temperatures to room temperature for the handling of bread rolls for packing. After baking bread rolls are passed through to cooling conveyors for natural cooling prior to packing. These conveyors are generally 300 - 400 ft. and can be of two or 3 deck type as per space availability. In the conveyors, the temperature is brought down to room temperature. Natural cooling is preferred to force cooling as it maintains the texture quality of bread roll.

8) Bread rolls packing: Bread rolls are fed into packing machines in continuous stacks this is either manual or with help of auto feeders with help of feeding chutes. Bread rolls are fed into packing machines in continues packing. These are done through guidelines that could be adjusted as per type of bread rolls.

Some important packing materials for cake:

- Cellulose film
- Polythene film
- Foil limitation
- Paper board cartoon

The major function of packaging is:

- Protect from mechanical damage in transit and loading and unloading
- Protect from loss of moisture and any foreign odor contaminations
- Protect from foreign body infestation.
- Legal compliance for values and ingredients for consumers
- Advertisement
- Bread rolls are wrapped with packing machines and wrappers are sealed as long and end. These are sealed with the help of heaters. Coders are synchronized with machine speed to print details to the packing material.

9) Storage:

Bread rolls are stored in a dry, cool and safe place.

2.5.4 Raw materials & equipment preparation

Figure 2.1 Raw Materials

4.6 Picture of product

Figure 2.2: 1st Day's Product

Figure 2.3: 2nd Day's Product

Figure 2.4: Final Product

Figure 2.5: 1st Day's Product

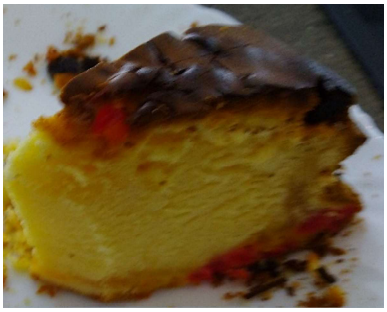


Figure 2.6: 2nd Day's Product

Figure 2.7 Final Products

2.6 Picture of equipment's used in production and quality control

Figure 2.8 Baking Oven

Figure 2.9 pH Meter

2.6.1 Different types of recipes applied in the production of whole-grain bread rolls

Wheat can produce a wide variety of flours depending on which part of the wheat berry is used. The bran, the germ, and the endosperm all play an important role, and all of them vary in the type of flour they produce. A different mix of those parts can have a very different effect on the taste and texture of the baked good.

Recipes:

Batch-1

Table-1 (Batch-1) Production of Whole-Grain Bread Rolls

Name of the ingredients	Recipe-1	Recipe-2	Recipe-3
	Whole grain bread roll (gm)	Reguler bread roll(gm)	Plain bread roll(gm)
White flour (high gluten, 35-38%)	300	300	300
Whole wheat flour	75	50	-
Bran flakes	25	-	-
Milk skim milk powder	50	25	25
Sugar	70 ±5	80	80
Shortening (dalda)	25 ±5	40	25(palm oil)
Dry yeast (instant)	± 5	± 5	± 4
Salt	3	3	2
Egg (1Piece)	50	50	50
Water	± 300	± 300	± 250

Methods of production: Heat milk, sugar, water and shortening, cool to 105°F to 110°F and add yeast, stir to dissolve. Add both flours, salt, and eggs and mixed on low speed of electric mixer until ingredients are well combined. Let the dough rest in the mixing bowl for 30 min. (or until doubled in bulk). Remove & form into bread rolls. Gently press bran flakes on roll tops. Let rise for 30 minutes (or until doubled in size). Bake at 400 0F for 15-20 minutes.

Yield = 12 ± rolls, Weight / roll = 20-25 grms.

Day's -2

(Batch-2)

Table-2 (Batch-2) Production of Whole-Grain Bread Rolls

Name of the ingredients	**Recipe-1**	**Recipe-2**	**Recipe-3**
	Whole grain bread roll (gm)	**Reguler bread roll(gm)**	**Plain bread roll(gm)**
White flour (high gluten, 35-38%)	300+50	300	300
Whole wheat flour	75	50	-
Bran flakes	25	-	-
Milk skim milk powder	50	25	25
Sugar	75	80	80
Shortening (dalda)	40	40	25(palm oil)
Dry yeast (Instant)	7.5	±5	±4
Salt	4	3	2
Egg (1piece)	50	50	50
Water	250	±300	±250
Bread improver	12	12	12

Methods of production: Heat milk, sugar, water and shortening, cool to 105°F to 110°F and add yeast, stir to dissolve. Add both flours, salt, and eggs and mixed on low speed of electric mixer until ingredients are well combined. Let the dough rest in the mixing bowl for 30 min. (or until doubled in bulk).Remove & form into bread rolls. Gently press bran flakes on roll tops. Let rise for 30 minutes (or until doubled in size). Bake at 400°F for 15-20 minutes.

Yield=12± rolls,Wt / roll=20-25 grms.

Final batch
Base: 2kg

Table-3 (Final Batch) Production of Whole-Grain Bread Rolls

Name of the ingredients	Recipe-1	Base-2 kg
	Whole grain bread roll (gm)	Percentage (%)
White flour (high gluten, 35-38%)	970	48.5
Whole wheat flour	250	12.5
Bran flakes	80	4.0
Milk skim milk powder	100	5.0
Sugar	240	12.0
Shortening (dalda)	120	6.0
Dry yeast (instant)	25	1.25
Salt	10	0.5
Egg (1piece)	197	9.85
Bread improver	8	0.5
Total	2000	100 %
Water	± 700	± 35%

Methods of production: Warmth milk, sugar, water and shortening, cool to 37°c to 40°c and include yeast, mix to disintegrate. Include each flour, salt, and eggs and blended on low speed of electric blender till fixings are very much joined. Give the mixture a chance to rest inside the bowl for thirty min. (or till multiplied in bulk).Remove into bread rolls. Delicately press grain drops on roll topnotch. Let ascend for a half-hour (or till multiplied in size). Heat at 400°F for 15-20 minutes.

1) weight per roll= 25 grms.

2) weight per roll= 50 grms.Critical discussion about bread rolls manufacturing

2.6.2 Nutritional information for bread rolls (per 100 grams)

Protein	6.1 g
Fat	18.8 g
Carbohydrate	68.9 g
Sugar	20.24 g
Calcium	29 mg
Iron	2.22 mg
Potassium	111 mg
Sodium	351 mg
Zinc	0.38 mg
Selenium	8.4 mg
Vitamin C	0 mg
Kcl	450 mg

2.7 Sponge cake

Sponge cake or Sponge cake could be a prevailing treat in Asia. Sponge cake creation could be a run of the mill utilization of impotent protein flour that is used for a few frozen dessert parlor things. The Sponge cake take a look at allows manufacturers to assess the reasonableness of the flour for these things. Flour with low macromolecule content low junk content and frail protein attributes create nice quality wipe cake.

Sponge cake

Formula

Flour*	100 grams
Eggs	100 grams
Sugar	100 grams
Water	40 grams

*14 percent moisture basis

Procedure

1. Eggs, water, and sugar are mixed together with gentle heating to achieve a foamy batter with a consistent viscosity (target specific gravity: 25 ±1 grams per milliliters; temperature: 30 ±1 degrees Celsius).
2. Flour is folded into the batter and poured into a round cake pan with a paper liner.
3. The cake is baked at 180 degrees Celsius for 30 minutes.
4. The cake is removed from the oven and placed on a wire cake rack to cool.

2.7.1 Effect of baking temperature of bread roll

What happens in a baking oven?

Baking is a very important process but is very complex and somewhat difficult to understand and describe. The design of an oven is principally a matter of heat transfer and its control, but for the baker what happens is a matter of temperatures and turbulence at specific stages.

Heat and temperature are not the same and should not be confused. It is relatively easy to measure temperatures in an oven but much more difficult to measure heat, or heat flux, which is the rate at which heat is being transferred. Heat is transferred much more effectively if the air is moving near the dough piece at a given temperature.

Nearly all bread rolls are now baked in-band or traveling ovens with several independently controlled zones. This means that oven conditions such as temperature, movement and humidity of the atmosphere may be altered during the course of the baking period. Baking times for bread rolls are quite short, ranging from 20-30 minutes. It is not normally possible to change, quickly, the temperature of a static or reel oven so the results of baking in these ovens compared with that in traveling ovens are often very different.

The conditions needed for different types of bread rolls are not the same because the way in which the structure is developed and the amount of moisture that must be removed depends on the richness (level of fat and sugar) of the recipes. The baking requirements for different types of bread rolls will be considered later.

Although these changes are thought of as being distinct and sequential, broadly in the above order, as the product passes through the oven, it will be shown that there is considerable overlap and coincidence of these physicochemical changes. It is, however, convenient to firstly consider them separately. The chart below summaries the changes that occur and relate them to dough temperature.

2.7.2 Development of bread rolls structure and thickness

This takes place mainly in the first quarter or third of the baking period. The changes are all temperature-related and involve several aspects of the recipe and formed dough piece. Bubbles of gas or water vapor are formed which expands and results in a large reduction in the density of the dough. It is the open porous structure that gives a biscuit a pleasant eating texture. The development of the structure is often known as oven spring as it relates to the thickness of the baked bread roll. The conditions for giving maximum spring which is sustained through the remainder of the bake are imperfectly understood but the changes to the dough piece that are involved include:

1. Heating the starch and proteins to levels were swelling, gelatinization, denaturation, and setting occurs.
2. The liberation of gases from leavening chemicals.
3. Expansion of these bubbles of gases as a result of increasing temperature which also increases the water vapor pressure within them.
4. Rupture and coalescence of some of these bubbles.
5. Loss of moisture from the product surface by evaporation followed by migration of moisture to the surface and continued loss to the oven atmosphere.
6. Increase of sugar solution concentration as the temperature rises.
7. Reduction inconsistency of sugar solutions and fat with temperature rise.

It will be appreciated that the most important changes center around the formation of gas bubbles and their expansion in a medium that at first becomes softer and more flexible followed, in low sugar and fat types, by tightening and hardening. It has been shown by many experimenters that the increase in volume associated with the mass of gas that is liberated from leavening agents is inadequate to explain the magnitude of the oven spring in bread rolls.

2.8 Reduction of moisture content

Hopefully, it will be orchestrated that dampness misfortune happens simply after the structure has set. Obviously this is unthinkable as the battered piece begins to dry when it enters the hot broiler environment. During heating, dampness must be lost from the mixture piece surface so relocation of water to the surface by hair like activity and dissemination must strike empower the focal point of the piece to dry. Both of these marvels are quickened by temperature inclinations. The focal point of the battered piece is warmed primarily by conduction of warmth from the surfaces however as the

outside dries it goes about as a protector and it turns out to be dynamically increasingly hard to warm the inside. On the off chance that the surface is warmed too rapidly, in addition to the fact that it makes it increasingly hard to dry the middle shading changes happen rashly. On the off chance that high warmth proceeds with hue will be extreme before the middle is dry. In this way, preparing involves finding the best states of warmth and time to permit structure improvement, surface hue, and drying of the inside. Thicker scones need longer prepare times at lower temperatures to accomplish this drying. Slim and little bread rolls can be prepared quicker at higher temperatures. The loss of dampness from the bread move surface is identified with the temperature, heat transition and water fume pressure (moistness) at the surface. The possibility of "stickiness" in the stove environment can prompt confusion as far as preparing conditions. Regardless of how much water fume is available in an open environment which is at a temperature of more than 100°C, dampness will consistently be lost from the mixture piece surface. The main conditions where dampness misfortune will be impeded is the place the outside of the battered piece is at under 100°C and the microclimate at the surface is immersed with water fume. The ideal dampness level of bread roll is dictated by two fundamental components. Too low a dampness level and the bread roll will have a consumed taste and might be a darker inside shading. Too high dampness and the structure won't be fresh, the inside will be wetter than the edges and flavor changes related to staling will be increasingly fast.

2.9 Color changes

Although there is usually a change to a yellow-brownish hue during baking, the term color here is used to imply merely a darkening, reduction in reflectance, of the roll surface. The color changes are due to a number of reasons. The main one is the Maillard reaction, non-enzyme browning, which involves the chemical reaction between reducing sugars in the dough with proteins and produces attractive reddish-brown hues. This occurs around 150-160°C and will occur faster in a mildly alkaline situation and only in a moist situation. It is not possible to reheat baked bread rolls to make it happen. The protein in the dough is from the flour and ingredients like milk powders and cheese. The reducing sugars are not from sucrose but from ingredients like glucose syrup,

invert syrup and milk powders. The alkaline reaction is mostly from sodium bicarbonate. If this chemical is omitted from the recipe coloration will be much less. Color also develops associated with dextrinization of starch and caramelization of sugars. At even higher temperatures the biscuit structure chars or burns. It will be appreciated that if the biscuit structure is very open, migration of the moisture to the surface is slower so a local increase in surface temperature and therefore coloration can more easily be achieved. Thus well-sprung puff dough will color more easily than a dense puff structure. An excess of alkali, usually resulting from too much sodium bicarbonate in the recipe, will cause a general yellowish color throughout the biscuit structure and this will be unattractive in products where there is no other coloration present. As drying continues, the coloration due to the changes already described will develop in the thinner or more exposed areas of the biscuit. This change is accompanied by the development of bitterness of flavor. A condition is known as "perishing" will occur if this continues throughout the biscuit structure. Perished biscuits are the most unpleasant to eat. The aim is to produce as even a surface coloration as possible except in crackers that have blisters. In order to prevent parts of the edges of the dough pieces becoming over colored, it is important to arrange that they are placed close together on the oven band. Try to arrange that the spaces sideways are the same as those in line. Some adjustment of the spacing can be achieved when the dough pieces are panned onto the oven band. Where dough pieces are missing it is common for edges of the surrounding biscuits to be colored too much and these have to be rejected and not packed.

2.9.1 Oven temperatures and heat transfer

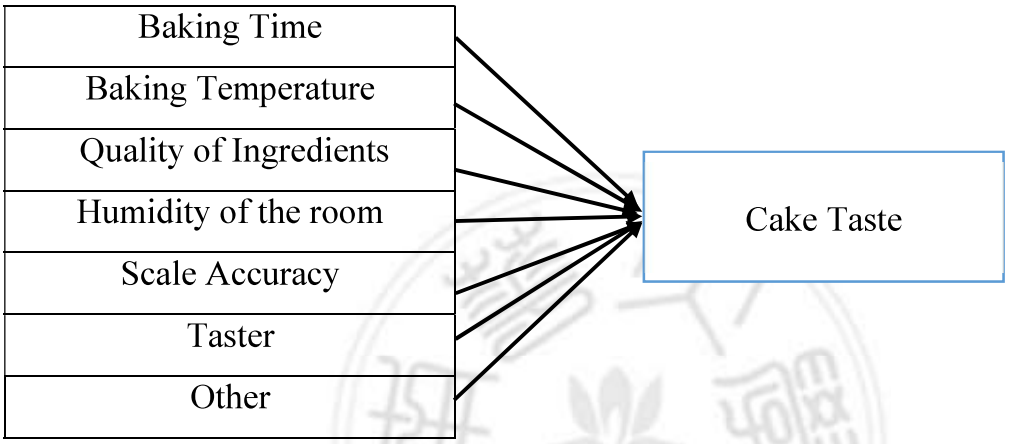
An oven could be a hot box or passage that is meant to administer the best states of heat and temperature to the mixture items and to allow the evacuation of wetness. The heat is given by intense fuel, for instance, gas, oil or power, and this heat is affected by the 3 modes referred to as radiation, conduction, and convection. All of the 3 modes are continually enclosed but building procedures are used to upgrade the impacts of every severally. Stove configuration is settled by the imperatives to administer effective heat move, allow quick and actual management of temperatures underneath dynamical burden conditions and to administer heat in predominately one amongst the 3 modes needed. All stoves miss the mark in therefore regard so comprehension of what is occurring ought to facilitate in setting a broiler to administer the foremost ideal

conditions. After the mixture has extended and therefore the structure has set, it's vital to concentrate on wetness expulsion. Air development can keep the temperature and wetness at the batter piece surface sensible for this to happen. In any case, because the quick bread dries conductivity of heat from the surface to the wetter focus seems to be ceaselessly progressively hard and a vast wetness inclination can produce. During this drying stage and before the surface seems to be too dry the temperature could be modified in accordance with giving a perfect degree of tinge to the roll. It is vital throughout the prepare that stove air conditions ar unbroken even over the dimension of the broiler typically mixture items that are comparable at the passageway to the broiler can show up as bread move with numerous thickness, form or shading within the wake of heating. In varied stoves, the event of gases within the broiler is not good. A typical issue is that air to supersede that hauled out through the vents enters a great deal at every finish of the stove. There’s on these lines vital cooling due to this entrance of air and therefore the powerful length of the broiler, and thence the heating time is consequently weakened. Likewise, it's traditional to find investigation entryways down one facet of the broiler because it was. On the off probability that air enters through these due to awful seals so on, this facet of the stove is going to be cooler.

Chapter 3 - Experimental Design

3.1 Experiment Design

The quality of a cake is affected by several factors such as quality of ingredients baking temperature and time humidity of the room taster and other. The factors are displayed in the diagram below.



Only some of the factors can be controlled. For example we cannot control the humidity of the room the cakes are baked. The ingredients also can be varying quality from package to package. In my experiment I consider the impact of two of the above factors: baking time and temperature on the taste of a cake made from a mix introduced in section 2. The responses are ratings of the taste of the cakes given by tasters. Assume that the range of temperatures to be studied is 300 °F to 350 °F and the range of times is 55 minutes to 65 minutes. A possible experimental strategy is to study the recommended times and temperatures and the extremes of the ranges. With this strategy the three temperature levels are to be studied are 325 °F 350 °F and 375 °F and the three time levels to be studied are 55 minutes 60 minutes and 65 minutes.

The responses are ratings of the taste of the cakes given by tasters. The tasters score the cakes on a seven-point scale, with 0 meaning well below average, 1 below average,

2 somewhat below average, 3 average, 4 somewhat above average, 5 above average, and 6 well above average.
This implies that 9x3=27 tasters and cakes are involved in the experiment. Avoid bias, the randomization process used in the experiment.

The process consists of the following steps:

1. Developed a protocol (that is, a detailed list of instructions) for preparing the cake mix and the oven so that the cakes are prepared under essentially identical conditions. The protocol (recipe) is given in Section 2.
2. Prepare 27 identical dough's according to the protocol specified in 1. Assign numerical labels
   1, 2… 27 to the dough's and mark each of them clearly.
3. Assign randomly the 27 dough's to the nine treatment groups, three dough's in each group. This can be done by creating a deck of 27 cards, three for each of the nine combinations, and laying the well-shuffled cards down in a row or by using the table of random digits.
4. Bake the cakes at combinations chosen in random order. This is done for two reasons. First, if there are effects that carry over systematically from one baking to the next, moving systematically through the table of combinations introduces these carryover effects into the data. Second, the random selection of combinations creates a sound theoretical basis for the use of statistical inference methods in analyzing the data. Use an oven and a timer that provide extremely precise and accurate settings. Substantial error in the experimental equipment compromises the precision of the experimental findings.
5. The baked cakes are assigned to tasters at random by arranging the tasters' names in random order and giving one cake to each taster in that order. Offering cakes to the taste testers in a random order allows you to avoid carryover effects from test to test.

Chapter 4 - Materials and Method

4.1 Materials and methods

The ingredients used in the cake batter preparations were based on a traditional Spanish formulation 10 that contains a leavening system of citric acid and sodium bicarbonate. ingredients used included the following percentages based on flour 100% plain white flour 13.9% moisture 9.7% protein (Golden Dawn, ADM Milling ltd.) 27% pasteurized liquid egg yolks and 54% egg whites (Frampton ltd.) 100% white granulated sugar (British Sugar PLC) 50% skim long-life milk (Tesco PLC) 288 November–December 2019 vol. 59 no. 6 46% sunflower oil (Olympic oils ltd.) 4% sodium bicarbonate (Brunner Mond) 3% citric acid (VWR international ltd.), and 1.5% salt.

4.2 Quality control test of the bread roll product list

1. Raw materials test for quality control
2. Moisture analysis for flour
3. Specification of moisture analyzer
4. Gluten test for flour
5. Milk power test
6. Sugar test for °brix analysis
7. pH- test in potable water
8. Finished product test for quality control
9. Shelf life study
10. Result for the raw material test
11. Moisture analysis result for flour
12. Result for °brix analysis
13. Result of finished product test
14. Moisture test of the Bread roll

4.2.1 Raw materials test

- Moisture test for flour
- Gluten test in flour
- Milk powder test
- Sugar test for °brix analysis
- Mold test.
- pH-test in potable water

4.2.2 Moisture analysis for flour

Moisture analysis covers a variety of methods for measuring moisture content in both High level and trace amounts in solids, liquids, or gases. Moisture in percentage amounts is monitored as a specification in commercial food production. There are many applications where trace moisture measurements are necessary for manufacturing and process quality assurance.

Specification of moisture analyzer:

The analysis covers a variety of methods for measuring moisture content in both High level and trace amounts in solids, liquids, or gases. Moisture in percentage amounts. There are many applications where trace moisture measurements are necessary for manufacturing and process quality assurance.

Heating element: Single 400 wart halogen heater

Heating option: Standard step stet up to three temperature seating.

Display: Backlight Lcd display dual digits and capacity taker 24 mm high digits.

Power supply: Power cord factory set for 110 v or 220v 50\60 Hz operating temperature 30-104 F \ 0-40c.

Overall dimension: (300*250*180) (L*W*H)

Accessories:

- Rs_332 cable
- USB cable
- USB memory stick
- Adam data collection
- Printer paper

In the Nabisco, solids particles are used for moisture analysis.

Equipment:

- Moisture analyzer
- Aluminum pan
- Spoon

Procedure:

At first Press, the start baton after a few minutes open the cover and place the aluminum pan and press zero batons and convert the zero balance. After converting zero balance give five-gram flour in the aluminum pan by using a spoon and after fixed the weight press the start baton. In 111°c temperature, it gives a result. After showing the result when the temperature below 50°c then it is switched off.

Precaution:

- Avoid extremes temperature dose not place in the direct sunlight, not air conducting vent.
- Make, sure there is no heat-sensitive materials above the balance.
- Avoid unstable power sources.

4.2.3 Gluten test for flour

Gluten is flour protein. It is very important for biscuits and biscuits making. It is essential for the human body. But gluten cannot dissolve in water. But it is dissolved in alcohol. It is very important for biscuits and biscuits making.

Equipment for gluten test:

- Analytical balance
- Beaker
- Spoon
- Pan
- Flour

Figure 3.0 Analytical Balance

The procedure of gluten test: At first take 50 g flour by measuring analytical balance. Make the dough by using a 25 ml 2 % NaCl solution. After making the dough it dissolves in one beaker 2% NaCl solution. After 45-50 minutes later it washes thoroughly in water. After washing it dry by the cotton cloth. Then measuring weight by using analytical balance and get a result.

4.2.4 Milk power test

In the laboratory milk powder test in different characteristics these are For example:
Fresh milk powder.
Manufacturing date: 20-07-2018
Expiry date: 20-01-2019
Solubility properties: Properly dissolve in water
Flavor: Milk flavors
Color: Off white

4.2.5 Sugar test for °brix analysis:

Equipment:

- Refractometer
- Sugar
- Beaker
- Spoon
- Distill water
- Thermometer
- Tissue paper
- Conical flax
- Thermometer
- Distill water

Figure 3.1 Refractometer

4.2.6 pH test in potable water

pH is the negative logarithms of hydrogen concentration

$pH = - \log_{10}[H]$

pH scale extends from 1-14. When pH is natural while pH = 6.9 represent the acid range and pH 7-14 represent an alkaline range.

Figure 3.2 pH Meter

Finished product test for quality control:

- Moisture test of bread roll
- Organoleptic test of bread roll
- Shelf life study
- Weight control
- Ass determination

4.2.7 Moisture test of the bread roll

Bread roll has standard moisture according to the Bangladesh Standards and Testing Institution. This moisture is 6 % within 5g product.

Equipment:

- Moisture analyzer
- Aluminum pan
- Spoon
- Bread roll

Procedure:

At first Press the start baton after few minute open the cover and place the aluminum pan and press zero baton and convert the zero balance. The bread roll make powder. After converting zero balance give five gram bread roll in the aluminum pan by using

spoon and after fixed the weight press the start baton. In 111° c temperature it gives result. After showing result when temperature below 50°c then it is switched off.

4.2.8 Organoleptic test:

Test some characteristics that are given below:

- Color
- Flavor
- Texture
- Bite
- Backing color
- Foreign material
- Metallic
- Sour

Shelf life study:

Some bread roll keeps in the quality control lab after weekly, quarterly, and monthly tests the bread roll moisture. Sometimes moisture increases day by day then finds out what is the cause of increasing moisture.

Weight control: Every bread roll has stranded weight. Measure the bread roll weight by maintaining time by batch-wise.

For bread roll:

- Mold test
- Softness test
- Color test
- Shelf life study
- Texture

4.3 Baking process carbon emissions

The focus of the stage 1 IEEA work is to identify opportunities to deliver carbon savings through innovation to the baking process. Figure 3.3 shows a breakdown of the carbon emissions from each process on a typical bread bakery site. They are shown as a percentage of the total site emissions. We will see that the largest single site energy consumer is the baking oven. Other significant uses include proving cooling processes and also space heating and electrical power for ingredients handling conveyors and compressed air. The two colors on the graph bars show the maximum and minimum range of typical usage.

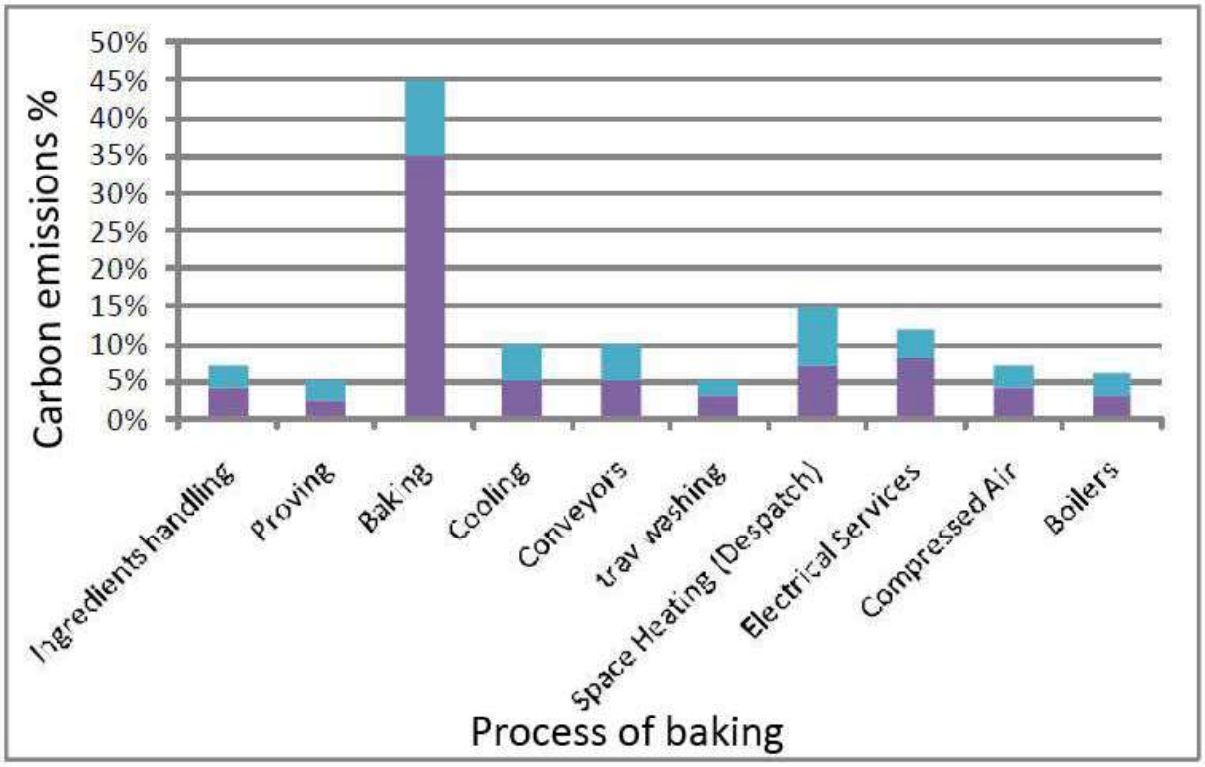
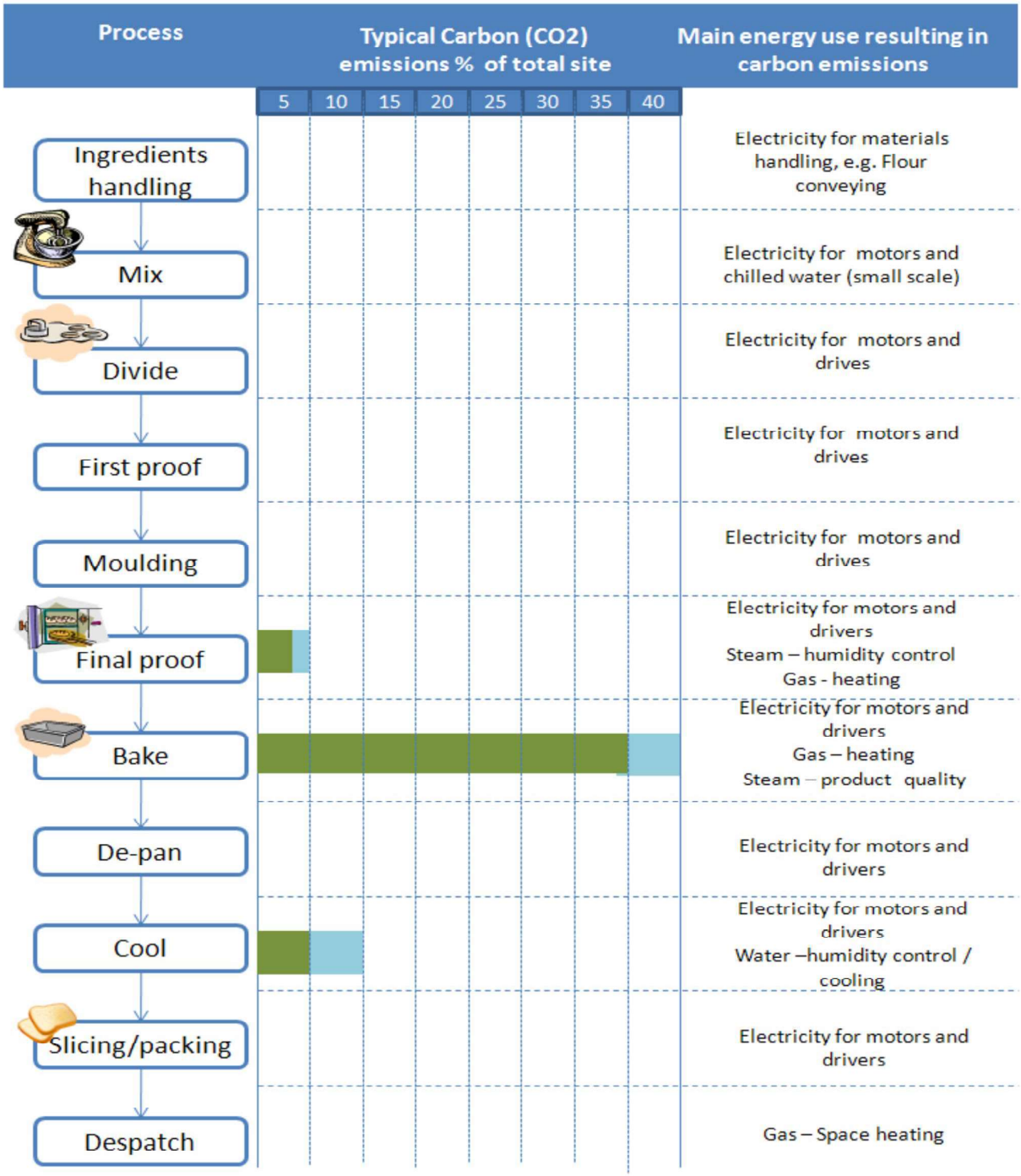


Figure 3.3 Breakdown of CO_2 Emissions from Industrial Bakery Processes (Source: https://www.carbontrust.com/media/206476/ctg034-bakery-industrial-energy-efficiency.pdf)

Figure 3.4 then presents the CBP flow identifying carbon emission points where possible and the main energy uses



(Source:https://www.carbontrust.com/media/206476/ctg034-bakery-industrial energy-efficiency.pdf)

Figure 3.4 Overview of Bakery Processes, Carbon Emissions and Energy Use

By focusing on the proving, baking and cooling operations my investigations covered a major part of the carbon emissions for a typical bakery – typically from Figures 3.3 and 3.4 around 50-60% of total site emissions. The oven is the largest of the three consumers and typically accounts for between 35% and 45% of the total site carbon emissions. The remaining carbon emissions for a bakery site relate to plant operation, such as the mixers, conveyors, tray wash operations and also building services such as lighting and heating and ventilation. For these operations there are efficiency opportunities which can be realised through established 'good practice' activities. Proving, baking and cooling operations are a continuous process. Exact operating regimes for bakeries vary in terms of total operating hours. For example, a well-used plant will run continuously, with short gaps as required, and a single maintenance shutdown for maybe 8-12 hours each week – so energy demands are reasonably.

4.4 Bakery process specific good practice opportunities

Overall estimate that the good practice opportunities below alongside improvements that can be delivered for various plant/equipment utility serving could deliver on average a 10% saving in total CO_2 emissions for the sector. This would speak to a CO_2 decrease of 57 000 ton CO_2 / year.

The carbon impression could be diminished all things considered by 25% by abstaining from toasting and refrigerated stockpiling of bread. Further decreases (5-10%) could be accomplished by diminishing the measure of waste bread disposed of by buyers. The commitment of transport and bundling to the general outcomes is little. Comparative patterns in the outcomes are likewise found in the investigation dependent on the auxiliary information and following the ISO 14044 system.

Chapter 5 - Results

5.0 Result

Mass height and diameter of industrially manufactured bread rolls were measured as standard during the trial period. My production was 12 rolls in total the average mass was in the specification min. 20 g max. 25 g average 22.5 g ± 2.3 g the bread roll height 47.0 mm 2.0 mm and diameter 100.4 mm 1.6 mm were also consistent and within specification. A positive correlation was observed between all pairs of parameters although very small for height and diameter 0.05 and most significant for mass and height 0.70. Wheat flour was primarily carbohydrates in the form of starch averaging about 70% of the total flour. The total protein content was 12.5%. Without chemical use, after 5 days my product was very good whereas local product already spoiled.

5.1 Result for raw materials test

Table-4: Result of the Test Which Is Done in the Sustainability Centre

List of raw materials	Test	Result
Flour	Gluten	36%
Flour	Moisture	12%
Flour	Colour	White
Flour	Flavour	Pleasant
Sugar	Colour	White
Sugar	Brix	99.89%
Yeast	Activity	± 95%
Dalda	Colour	Yellow white
Dalda	Flavour	Pleasant
Dalda	Odour	Nil

5.2 Finish product test

The results of an organoleptic test of processed products can be divided into 2 types of data, they were the ordinal and interval scale. If the assumption of data type was ordinal scale, the result can be seen in Figure 3.5, while the interval data type can be seen in Figure 3.6.

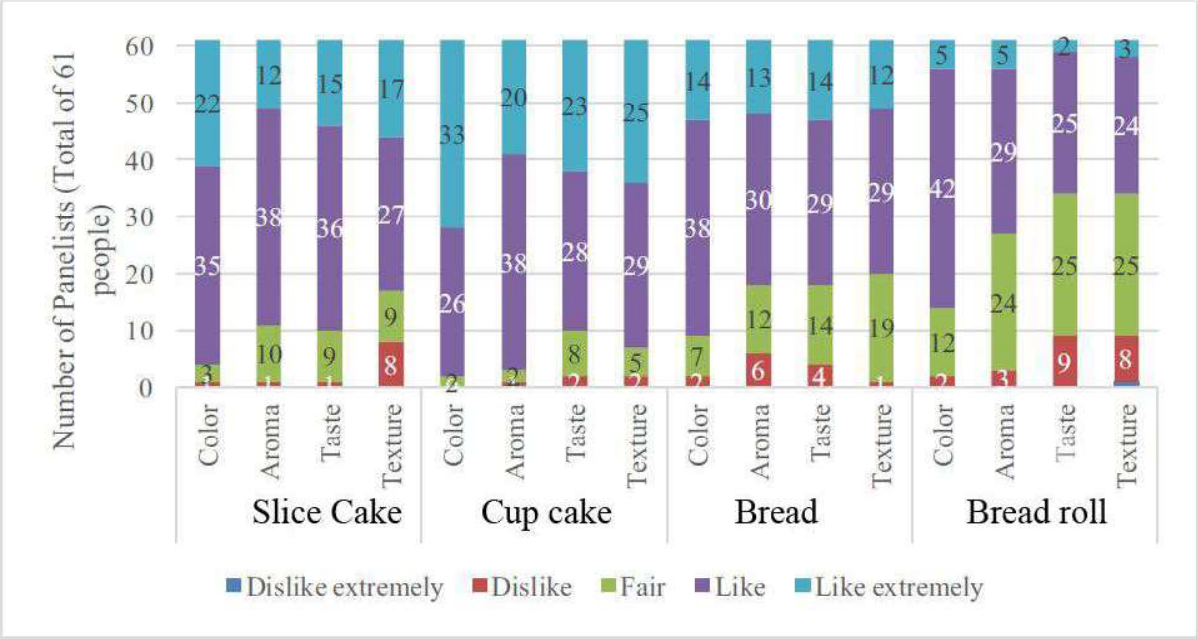


Figure 3.5 Result of Organoleptic Test on (Ordinal Data)

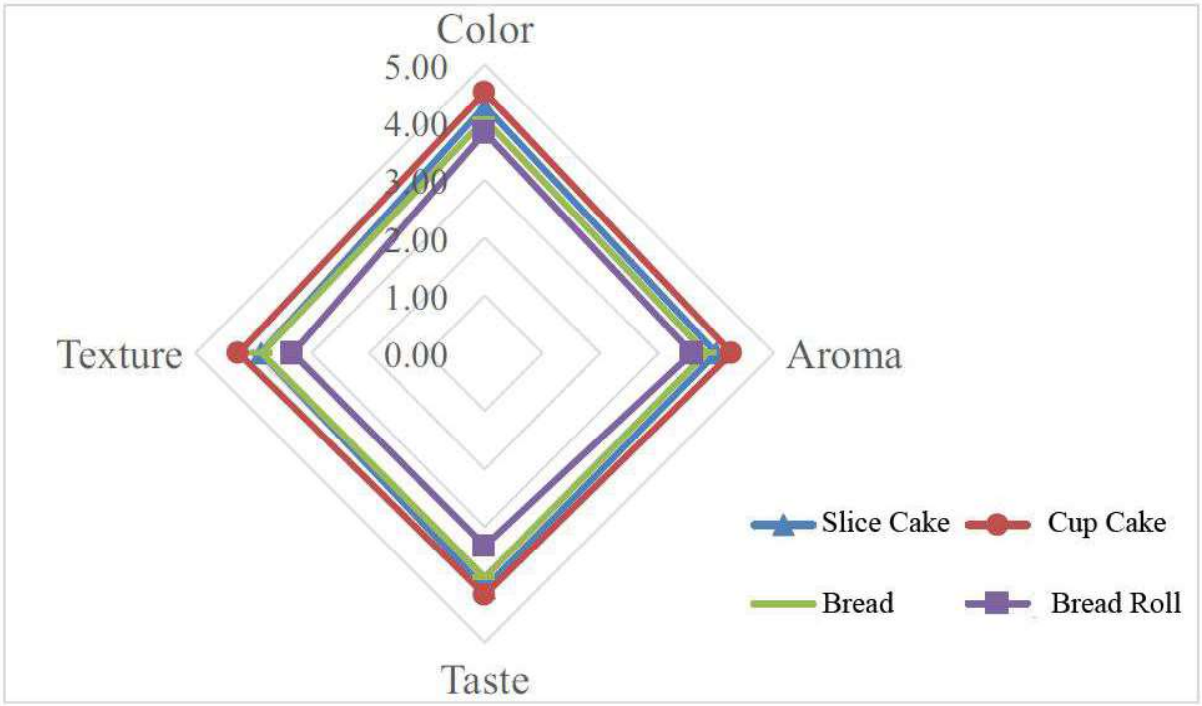


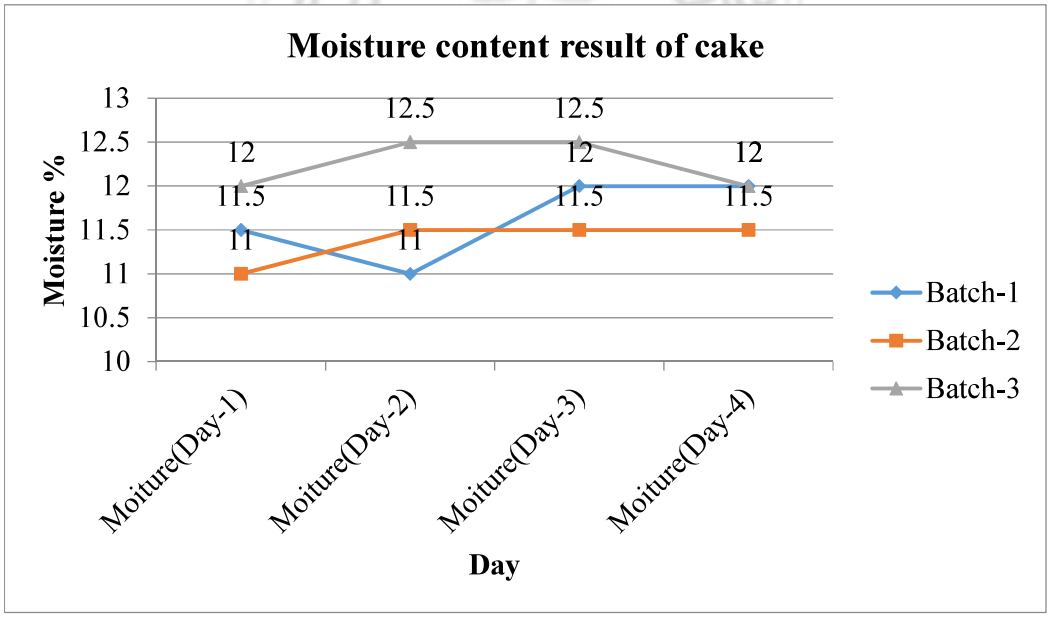
Figure 3.6: Result of Organoleptic Test on (Interval Data)

Organoleptic testing is a test to assess the quality and safety of a food and drink organoleptically, on a scale of 1-5 the panelists/ respondents tend to value slice cake, cupcake, bread, and bread roll in every color, flavor, taste, and texture parameter. When

viewed on an ordinal scale, most of the panelists/ respondents like the processed products whether slice cake, cupcake, bread, or bread roll in any color, flavor, taste, and texture parameters (Figure 3.5). Whereas, when viewed on an interval scale, overall panelists/ respondents favored processed products on any color, aroma, taste, and texture parameters with average values between 3,33-4,51 on a scale of 1-5 (Figure 3.6). Among the four processed products of based on each parameter tested organoleptically, cupcake products were the most preferable one. Whereas the other products that was low incomes compared to the other three processed products is bread roll in each parameter tested, especially texture. This was because it has not been brewed by milk as the way of presentation in general, so the texture of the product was still considered hard. Bread products made with substitution of 50% have been received by consumer panelists. The results of this study were also in line with the research conducted by which resulted in a substitution of spinach flour substitution of up to 60% still acceptable by panelists. Sponge cake from flour can still be received by panelists with 50% substitution. While other studies using mango pulp and mango peel flour were most preferable one in the substitution treatment of 10%.

5.3 Statistical & graphical analysis of result

Chart-1: Statistical & Graphical Analysis Result of Moisture Content



Product moisture was 12% so, no need any preservatives. It helps to keeping good quality of products for 5 days.

Chapter 6 - Discussions

6.1 Discussion

Relative Density: Changes in the relative density of cake batters during mixing are shown in Figure 1. Relative density increased during the first 2 min of multistage mixing and first 4 min of all-in mixing because at those times the ingredients were not yet fully mixed.

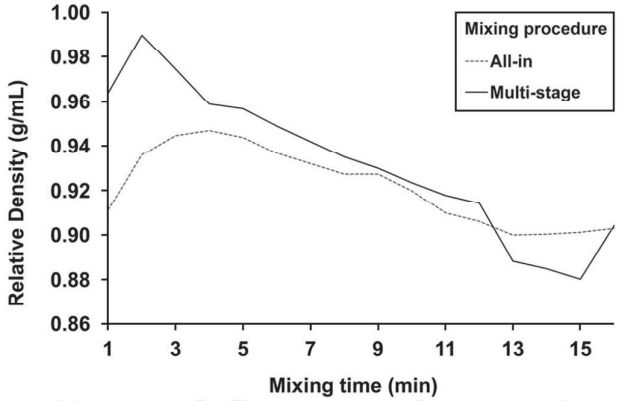


Figure 3.7 Changes in Relative Density During Cake Batter Mixing.

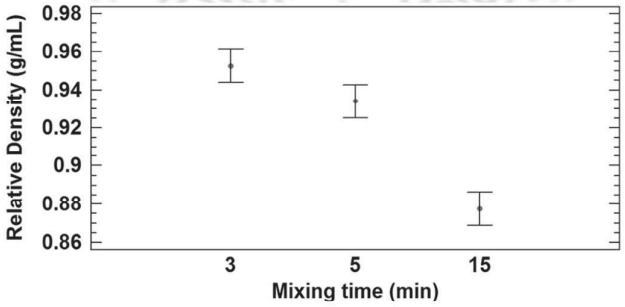


Figure 3.8 Mean Plot, With 95.0% LSD Intervals, of Relative Density of Cake Batters at Three Mixing Times.

6.2 Baking time & temperature

The difference between average bread roll and excellent bread roll usually has less to do with the ingredients being used than the process involved in making it. Once me is comfortable with the basic process of mix, knead, rise, shape, and bake, my experimentation can be done very smoothly. The two variables are used in this work. Below I will discuss how time and temperature change the character of our cake and then show how minor adjustments to the process can improve the quality of our bread roll significantly.

Time: High temperature takes less baking time on the other hand low temperature takes long baking time.

6.3 Temperature's impact on rising

The hotter the temperature, the more dynamic our yeast will be. The more dynamic our yeast is, the sudden the mixture rises. Basic enough, yet we can utilize this in a huge number of ways. For instance:

- If we need to accelerate an ascent, turn our stove on for 30 seconds, turn it off, and afterward place our batter into the marginally above-room-temperature broiler. It should rise to recognizably snappier.
- If we have to leave part of the way through getting ready to heat a, we can toss it into the ice chest. It'll keep on ascending in there at a much slower pace.
- We can make an enormous cluster of pizza mixture and stop singular bits of it in cooler sacks. The yeast will make due at any rate a month or two in the cooler. The day preceding we need to make the pizza, simply move it to the ice chest to defrost it and afterward haul it out of the ice chest when we need it to start its last ascent.

Chapter 7 - Conclusion

The dark cake pan, which holds in more heat than light-colored baking pans and bakes our cake batter faster. Through using a dark nonstick pan for baking, we can reduce our baking temperature by 25° F. The most bread roll is chemically leavened baking products. They are stable foods and have advantages such as long shelf life and the good eating quality. The physical properties of the dough and the recipes in bread roll making depend on the type of bread roll and the method used in the dough formation. Quality standards from the raw materials to the end product are essential in bread roll making. Temperature also has an impact on how our bread roll bakes. The general rule is that crusty bread roll should be baked at as high a temperature as possible. Soft-shelled bread rolls should be baked at lower temperatures. When I increase the temperature of our oven my bread roll bake quicker. In the study, I have prepared the different kinds of bread rolls according to different recipes and findings taste, texture, baking color, flavor, & nutritional values of sample 1 is comparatively best among 3 samples. On the other hand, Sponge cake is assessed for volume outer and inside qualities and surface. The outcomes are communicated as a numerical score dependent on correlation with a control test. Sponge cake is gauged and estimated for volume. The outcomes are communicated in grams for weight and in cubic centimeters for volume. Outside attributes are assessed by visual assessment for shape covering shading and cake appearance. Inner attributes are assessed by visual assessment for cell consistency cell size and cell divider thickness. The surface can be resolved for delicate quality with the ta.xt2 texture analyzer.

In this work, sponge cake baking was studied considering three convection modes (NC, FC and SFC) and three different oven temperatures (140, 160 and 180 °C). A mathematical model was implemented to study the process heat transfer dynamics coupled with volume expansion. As it was observed from height evolution results, volume expansion is significant and strongly depends on the radial position and the baking time. Besides, an increase in oven temperature, airflow and steam injection produces an increase in volume expansion. An empirical fitting equation was proposed to take into account this volume increase in the mathematical model. Simulated results

adequately represent the observed evolution, that is, height and shape, of the sponge cake during its baking. Concerning product temperature, both experimental and simulated profiles verified that the last region to achieve a correct degree of baking is the one near the crust around the axial axis. In consequence, the minimal baking time was defined as the average time at which this region reaches 95–98 °C. Finally, this process variable was strongly affected by the effective oven temperature, with a slight influence of the convection mode, that is, natural vs. forced ones.

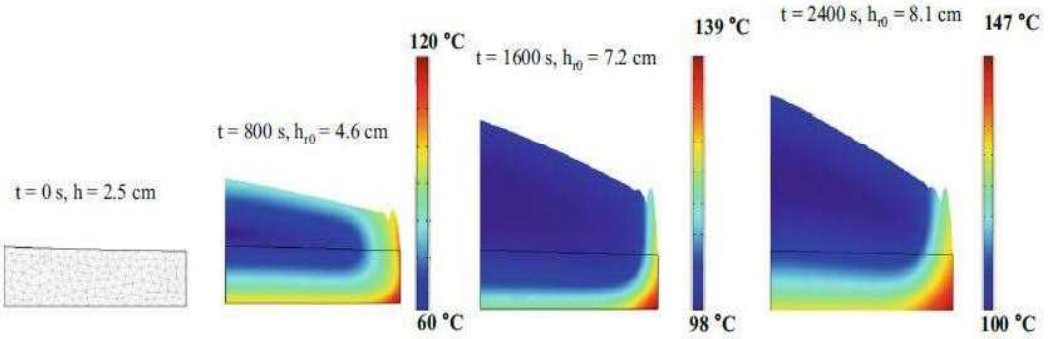


Figure 3.9 Volume Expansion Simulated At Different Stages of Baking, Steam-Assisted Forced Convection, Effective Oven Temperature 151.2 °C (SFC1 Condition)

7.1 Future work

A wide range of adjustments, tests, and investigations have been left for the future because of need of time (for example the investigations with genuine information are typically very boring, requiring even days to complete a solitary run). Future work concerns the further investigation of specific instruments, new recommendations to attempt various techniques, or straightforward interest. There are a few thoughts that I would have jumped at the chance to have a go at during the depiction and the advancement of bread moves structure and thickness in Chapter 2. This proposal has been for the most part centered on the utilization of various kinds of plans applied in the generation of entire grain bread rolls and cake used to locate the best result where gotten from the writing adjusted from these.

The accompanying thoughts could be tried:

1. It could be intriguing to consider the districts in the model and formula with diverse

significance, contingent upon their size or their particular importance concerning the acknowledgment procedure. This system would, for example, help to recognize in very complex issues which are the districts that are fundamental to be discovered, the ones that once in a while show up, and the ones that once in a while do.

2. The manner in which the model is developed could be additionally changed: rather than utilizing one Sponge cake, it could be founded on an alternate formula, so as to give a few the thing on the changeability among the various plans and present it in the qualities. Shockingly, in the sort of formula that I have taken as genuine models the development of a model from every formula is a monotonous undertaking and no further investigation in this heading could be performed. Clearly, the utilization of another formula of individual portrayals explored since they have a significant impact on the outcomes that got toward the end. New approaches toward this path can be prompted from systems depicted in the writing. The exhibitions of the considerable number of plans portrayed in Section 4.2 have not been contrasted with a similar issue. The primary explanation was that some taste is very complex to process and require an impressive execution time to assess every person.

The fundamental consequences of these tests don't appear to be palatable, and further investigation is as yet required so as to comprehend the conduct of these two wellness works and improve it.

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