Food test 1: Creaming with different types of sugars (Practical)

Objective

To investigate the aerating effects of different sugars in cup cakes

Principles

Aeration is the incorporation of air into food products. In bakery products such as cakes and cookies, sugar plays an important role in promoting the lightness in texture. When sugar and fat are creamed together, air can be incorporated in the fat trapping on the face of sugar's crystals. During baking, the air cells expand when filled with carbon dioxide from the leavening agent. Different types of sugars have different crystal size and they will have different ability in assisting in leavening.

Equipment & materials

Equipment	**Materials**	
Baking tin	Butter	50g x 4 (200g)
Medium mixing bowls	Eggs	1 x 4 (4)
Portable electric mixer	Plain Flour	50g x 4 (200g)
Rubber scraper	Baking Powder	1tsp x 4 (4 tsp)
Sieve	Milk	1Tbsp x 4 (4 Tbsp)
	Vanilla Extract	½tsp x 4 (2 tsp)
	Sugar:	
	Sample A	50g Granulated sugar
	Sample B	50g Caster sugar
	Sample C	50g Icing sugar
	Sample D	No sugar

Procedures

1. Preheat the oven to 180^{o}C.
2. Prepare sample A
   - Cream butter and 50g granulated sugar together for 6 minutes until pale in colour.
   - Add vanilla extract to egg. Beat well.
   - Add beaten egg to creamed mixture, a little at a time.
   - Sieve in plain flour and baking powder and fold.
   - Add 1 Tbsp milk.
   - Spoon the mixture into a greased baking tin.
   - Bake in oven for 15 minutes.
3. Repeat step 2 for sample B, C and D.

Results

Sample	Type of Sugar	Appearance		Texture	
		Before baking	**After baking**	**Before baking**	**After baking**
A	Granulated sugar				
B	Caster sugar				
C	Icing sugar				
D	No sugar				

Questions

1. Compare the texture and appearance of the different cupcakes.
2. According to the results of the experiment, which type of sugar is suggested to be used to make cupcakes?
3. What are the differences in crystal size among the three types of sugars?
4. What will be the texture of the cupcakes if syrup is used instead of sugars?
5. Is there any colour difference among the 4 samples? Why?

Vanilla cupcake (Demonstration and Practical)

Ingredients

For cupcake	
Butter	50g
Caster sugar	50g
Egg	1
Plain flour	50g
Baking powder	1 tsp
Milk	1 Tbsp
Vanilla extract	1/2 tsp
For buttercream icing	
Butter	70g
Icing sugar	140g
Milk	1 Tbsp

Procedures

Prepare cupcake

1. Preheat the oven to 180^{o}C.
2. Cream butter and granulated sugar together until pale in colour.
3. Add vanilla extract to egg. Beat well.
4. Add beaten egg to creamed mixture, a little at a time.
5. Sieve in plain flour and baking powder and fold.
6. Add milk.
7. Spoon the mixture into a greased tin.
8. Bake in oven for 15 minutes.

Prepare buttercream icing

1. Cream butter until soft.
2. Add half of the icing sugar and cream until smooth.
3. Add the remaining icing sugar and milk.
4. Mix well.
5. Spoon the icing into piping bag and pipe onto the cupcakes.

Food test 2: Stability of foams - Effects of added ingredients (Practical)

Objective

To investigate the effects of added ingredients on the stability of egg foams

Principles

Foams are dispersions of gas in the liquid. However, air bubbles have a tendency to coalesce and pop. Proteins in egg whites can aggregate around the bubbles and form a film. Air bubbles surrounded by the protein film are less likely to collapse. Foaming is applied in lot of bakery products such as angel cakes, sponge cakes and meringues. During cooking, different ingredients are added to stabilise the foam so as to maintain the texture of the products.

Equipment & materials

Equipment	**Materials**
15 ml tubes Funnels Measuring spoons Portable electric mixer Rubber scraper Small mixing bowls Timer Weighing scale	Sample A: 1 egg white Sample B: 1 egg white + 25g sugar Sample C: 1 egg white + ¼ tsp cream of tartar Sample D: 1 egg white + ¼ tsp egg yolk Food wrap

Procedures

1. Separate egg white from the yolk. Place the egg white in a small mixing bowl.
2. Use the electric mixer to beat the egg white samples:
   Sample A: whip egg white on medium-low speed for 3 minutes
   Sample B: whip egg white on medium-low speed for 1 minute and then slowly add in 25g sugar and continue to beat for 2 minutes
   Sample C: whip egg white and 1/4 tsp cream of tartar on medium-low speed for 3 minutes
   Sample D: whip egg white and 1/4 tsp egg yolk on medium-low speed for 3 minutes
3. Place a funnel on top of a 15ml tube. Use a rubber scraper to put the foam into the funnel. Level the foam and cover the top of the funnel with food wrap. Allow to sit for 20 minutes.
4. Record the volume of any leakage found in the 15ml tube after 20 minutes.

Results

Sample	Texture after beating	Volume of leakage after 20 minutes
A		
B		
C		
D		

Questions

1. Compare the texture of the foams with different added ingredients.
2. Which ingredients stabilise the foam? How do the ingredients stabilise the foams?
3. If you don't have any cream of tartar, what can be used to substitute it for whipped egg white?
4. What happens when sugar is added to the egg white too early?
5. Which ingredient destabilises the foam? Why?

Angel Cake (Demonstration and Practical)

Ingredients

Egg whites	6 large
Caster sugar	3/4 Cup
Cake flour	1/2 Cup
Cream of tartar	1/2 tsp
Salt	1/8 tsp
Vanilla extract	1 tsp

Procedures

1. Preheat the oven at 190^{o}C.
2. Sieve cake flour and salt together.
3. Place the egg whites in a clean large bowl and add in ½ tsp cream of tartar.
4. Beat until white turns opaque.
5. Add sugar, 1 Tbsp at a time.
6. Beat the egg white until soft peaks are formed.
7. Add vanilla extract and mix well.
8. Sieve flour and salt together. Sieve again over the beaten egg white, one third of flour at a time and mix well (Do it gently).
9. Spoon the cake mixture into the angel cake tin.
10. Spread the cake mixture against side of tin.
11. Bake at 190^{o}C for 35 minutes.
12. Turn pan upside down.
13. Cool for 2 hours.

Food test 3: Shortening in pastries (Practical)

Objective

To investigate the shortening power of fats in pastries

Principles

Shortening is the ability of fats to shorten gluten strands. Fat can coat the gluten proteins preventing them from hydrating and forming large and extended network. This can increase the tenderness of the bakery products. The shortening ability depends on the plasticity and degree of saturation of fat. In general, more fat or the softer the fat coats the flour particles, the more it tenderises.

Equipment & materials

Equipment	**Materials**	
Baking tray	All-purpose flour	100g x 3 (300g)
Medium mixing bowls	Salt	1/8 tsp x 3 (3/8 tsp)
Pastry cutter	Water	25ml x 3 (75ml)
Rolling pin	Food wrap	
Rubber scraper	Butter:	
Sieve	Sample A 25g	
	Sample B 50g	
	Sample C 75g	

Procedures

1. Preheat the oven at 180^{o}C.
2. Prepare sample A:
   - Sieve 100g flour and 1/8 tsp salt into a bowl.
   - Add 25g butter.
   - Rub butter into flour until fine breadcrumb are formed.
   - Add 25ml water to the mixture and form into a dough.
   - Wrap the dough and chill for 25 minutes.
   - Roll out the pastry to about the thickness of a $1 coin.
   - Cut the pastry into rounds using pastry cutter.
   - Bake in a greased baking tin at 180^{o}C for 15 - 20 minutes.
3. Repeat Step 2 for sample B and C respectively.
4. Compare the texture and appearance of the samples.

Results

Sample	Amount of butter	Appearance		Texture	
		Before baking	After baking	Before baking	After baking
A	25g				
B	50g				
C	75g				

Questions

1. Compare the texture and appearance of the samples.
2. Rank the tenderness among the 3 samples. (1: least tender)
3. What will be the texture of pastry if vegetable oil is used instead of butter?
4. What will happen if the pastry is too tender?
5. Suggest ways to decrease the tenderness of the pastry.

Fresh fruit tart with pastry cream (Demonstration and Practical)

Ingredients

Short crust pastry	
Fruits	
Pastry cream	
Milk	180 ml
Sugar	1/8 Cup
All-purpose flour	1/8 Cup
Salt	1/8 tsp
Egg Yolk	2 items
Vanilla extract	1/2 tsp

Procedures

Prepare the pastry cream

1. Warm milk in saucepan.
2. Mix sugar, flour and salt together. Add egg yolks and mix well.
3. Add the warm milk to the egg mixture slowly and whisk continuously.
4. Return the egg mixture to the saucepan.
5. Heat the egg mixture and whisk constantly until thickens.
6. Stir in vanilla extract.
7. Cool the pastry cream.

Prepare the tart shell

1. Preheat the oven at 180^{o}C.
2. Prepare the pastry and roll into 3mm thick. Cut into rounds.
3. Grease tart moulds and place rounds in tart moulds. Prick holes and bake at 180^{o}C for 15 - 20 minutes.
4. Fill the tart shells with pastry cream.
5. Arrange the fruits decoratively on top of the cream.

Food test 4: Effects of fats on flakiness in pastries

(Demonstration and Practical)

Objective

To investigate the flakiness in pastries using different types of fats

Principles

Flakiness refers to the tendency to form thin and flat layers in the pastries. The layers of dough are separated by the layers of plastic fat. During heating in the oven, water in the dough evaporates as steam and the layers of fat melt. The melted fat can prevent the escape of steam while the steam pressure can push apart the dough layer from each other and create the flakiness in pastries. In general, the higher the melting point of fat, the more flaky the pastries.

Equipment & materials

Equipment	**Materials**	
Baking tray	Plain flour	65g x 5 (325g)
Forks		40g (Dusting the work surface)
Medium mixing bowls	Salt	1/8 tsp x 5 (5/8 tsp)
Pastry Cutter	Cold water	
Rolling pin	Food wrap	
Sieve	Fat:	
	Sample A:	70g butter
	Sample B:	70g margarine
	Sample C:	70g pure lard
	Demonstration 1 :	35g butter and 35g lard
	Demonstration 2:	70g vegetable oil

Procedures

1. Preheat the oven at 180^{o}C.
2. Sieve 65g flour and 1/8 tsp salt in a medium mixing bowl.
3. Prepare Sample A:
   - Cut 70g butter into the flour and mix with a fork.
   - Mix until the mixture looks crumbly with the average piece of fat about a pea size.
   - Form a well in the centre and add 30ml water. Knead lightly to form a dough.
   - Flour the work surface and rolling pin.
   - Roll the dough to form a rectangle [10cm (W) X 25cm (L)].
   - Fold the top third down to the centre, then the bottom third up and over that. (1st)
   - Give the dough a quarter turn.
   - Roll out again and fold. (2nd)
   - Wrap with cling film and chill for 30 minutes.
   - Repeat rolling out and folding for two more times. (so you will roll and fold the dough for at least 4 times).
   - After the last fold, wrap the pastry in plastic wrap and chill for 30 minutes.

- Roll out the pastry to about the thickness of a $1 coin.
- Cut the pastry into rounds using pastry cutter.
- Place on a greased baking sheet and bake at 180^{o} C for about 20 minutes.

Repeat step 2 and 3 for sample B and C.

Results

Sample	Type of fat	Appearance		Texture		Aroma
		Before baking	After baking	Before baking	After baking	After baking
A	Butter					
B	Margarine					
C	Pure lard					
D	Vegetable oil					

Questions

1. Compare the taste, texture, and appearance of the pastries with different types of fats used.
2. Among the types of fats used in this experiment, which is not effective to make flaky pastry?
3. Which type of fat is easier to handle without melting easily during the process of mixing and folding? Why?
4. What is the advantage of using butter in pastries?
5. List the fat content in butter, margarine, lard and oil respectively.
6. Suggest ways to increase flakiness in pastries.

Ham and mushroom vol au vents (Demonstration)

Ingredients

Vol au vents cases	
Puff pastry	
Egg yolk	1 item
Water	1 Tbsp
Filling : Ham and Mushroom	
Butter	25g
Onion (sliced)	1/3 Cup
Mushroom (quartered)	1 1/2 Cup
All-purpose flour	3 Tbsp
Milk	175 ml
Chicken broth	175 ml
Ham (diced)	1/2 Cup
Pepper	1/8 tsp

Procedures

Prepare vol au vent cases

1. Preheat the oven at 180^{o}C. Prepare egg wash by mixing egg yolk and water.
2. Roll out the pastry to about the thickness of a $1 coin.
3. Use pastry cutter to cut out 8 rounds.
4. Take a slightly smaller round cutter and cut a hole in the middle of 4 rounds.
5. Brush egg wash over the base of vol au vents (the rounds without the hole).
6. Place the rounds with the hole on top of the base.
7. Brush with egg wash.
8. Bake at 180°C for around 10-12 minutes.

Prepare Filling: Ham and Mushroom

1. Melt butter in saucepan.
2. Add onion and cook for 1 minute.
3. Add quartered mushroom and cook until soft for about 4 minutes.
4. Add milk and chicken broth.
5. Whisk in flour and stir constantly.
6. Cook until the mixture thickens.
7. Stir in ham and season with salt and pepper.
8. Spoon the filling into vol au vent cases and serve.

Food test 5: Factors affecting egg coagulation (Practical)

Objective

To investigate the effects of added ingredients on egg coagulation

Principles

When eggs are heated, proteins in both egg white and egg yolk will denature. The protein will then be unfolded and aggregate with each other. This process is known as protein coagulation. Egg custard is thickened by the heat coagulation of egg protein. However, the more eggs are heated, the aggregated network will become rigid and eventually lead to over-coagulate and shrink. Over-coagulation will affect the texture and appearance of the egg custard. Therefore it is essential to add other ingredients in addition to egg for slowing down the coagulation.

Equipment & materials

Equipment	**Materials**
Bowl Chopsticks Steaming rack Wok	4 Eggs 1/2 Tbsp Sugar 50ml Whipping Cream Aluminium foil

Procedures

1. Beat 4 eggs in 4 different bowls.
2. Add the following ingredients to each bowl:

Sample	
A	NIL
B	1/2 Tbsp sugar
C	50 ml water
D	50 ml cream

3. Mix well.
4. Remove the bubbles on top.
5. Cover with aluminum foil.
6. Steam for 12 minutes.

Results

Sample	Appearance	Texture
A		
B		
C		
D		

Questions

1. Which sample has the most curdling?
2. What are the functions of sugar and fat in egg custard?
3. Why dilution of egg can prevent over-coagulation?
4. How about if milk is used to make the steamed egg custard instead of cream?
5. Rank the parts of the egg (whites, yolk, whole egg) from lowest to highest in the rate of coagulation and the tendency to over-coagulate.

Food test 6: Temperature effect on browning of sugar and flour (Practical)

Objective

To investigate the effect of different temperature on browning of sugar

Principles

Sugar contributes to the brown colour of baked product through caramelisation and Maillard reaction. The more heat a bakery product is exposed to, the more browning. Therefore, higher oven temperatures increase the browning of crust as well as the filling of the Portuguese egg tart.

Equipment & materials

Equipment	Materials
Bowl Hand whisk Cooling rack Saucepan Tart moulds Cutters Pastry brush Rolling pin Fork Measuring jug Sieve	Rough Puff Pastry **Egg tart filling:** Egg yolk : 8 Milk: 240ml Cream: 240ml Sugar: 120g

Procedures

1. Preheat the oven at 180^{o}C

Prepare the tart shell

2. Prepare the pastry and roll into 3mm thick. Cut into rounds.
3. Grease tart moulds and place rounds in tart moulds. Prick holes.

Prepare the egg tart filling

4. Warm milk and cream.
5. Dissolve sugar into warm milk and cream. Cool.
6. Whisk egg sinto the sugar and milk mixture.
7. Strain the mixture.
8. Fill the filling into the prepared tart shell.
9. Bake for 20-25 minutes.

**Repeat all steps with baking the egg tart at 230^{o}C.

Results

Sample	Appearance	Texture of egg tart filling	Texture of rough puff pastry
180°C			
230°C			

Questions

1. Which temperature favours the browning of sugar?
2. Why sugar can contribute to the brown colour of bakery products?
3. Why bakery products made with bread flour normally will have browning faster than products made with cake flour?

食物實驗 1：擂油法(實習)

目的

探究不同種類的糖對蛋糕膨鬆之影響

原理

膨鬆是在食物中加入空氣。糖會影響烘焙產品例如蛋糕和餅乾的蓬鬆軟化程度。當用力混合脂肪和糖在一起，空氣的泡沫會藏在脂肪和糖的結晶面之間。烘焙加熱時，由膨脹劑釋出的二氧化碳會進入氣泡使其膨脹。不同種類的糖有不同的晶體大小，而晶體大小會影響食物的蓬鬆程度。

用具及材料

用具	材料	
焗盆	牛油	50 克 ×4（200 克）
中粉盤	雞蛋	1 ×4（4）
電動打蛋機	麵粉	50 克 ×4（200 克）
刮刀	泡打粉	1 茶匙 ×4（4 茶匙）
橡皮刮刀	牛奶	1 湯匙 ×4（4 湯匙）
篩	香草油	½茶匙 ×4（2 茶匙）
	糖：	
	樣本 A	50 克砂糖
	樣本 B	50 克幼砂糖
	樣本 C	50 克糖霜
	樣本 D	不加糖

步驟

1. 預熱焗爐至 180℃。
2. 準備樣本 A
   - 將牛油和 50 克砂糖攪打 6 分鐘至乳霜狀。
   - 香草油加入雞蛋中，打勻。
   - 分次把蛋液加進混合物中，打勻。
   - 篩入麵粉和泡打粉後拌勻。
   - 加入 1 湯匙牛奶後拌勻。
   - 將混合物放入已塗油的焗盆中。
   - 焗 15 分鐘。
3. 重複步驟 2 製作樣本 B，C 和 D。

結果

樣本	糖的種類	外觀		質地	
		烘焙前	烘焙後	烘焙前	烘培後
A	砂糖				
B	幼砂糖				
C	糖霜				
D	不加糖				

思考問題

1. 比較不同蛋糕的質感和外觀。
2. 根據實驗的結果，建議用哪種糖來製作蛋糕？
3. 三種糖的晶體大小有什麼不同？
4. 如果用糖漿代替糖來製作蛋糕，蛋糕的質感會是怎樣？
5. 4 個樣本中的顏色有沒有區別？ 為什麼？

香草蛋糕 (示範和實習)

材料

蛋糕	
牛油	50 克
幼砂糖	50 克
雞蛋	1
麵粉	50 克
泡打粉	1 茶匙
牛奶	1 湯匙
香草油	1/2 茶匙
牛油糖霜	
牛油	70 克
糖霜	140 克
牛奶	1 湯匙

步驟

準備蛋糕

1. 預熱焗爐至 180℃。
2. 將牛油和幼砂糖攪打至乳霜狀。
3. 把香草油加入雞蛋中後打勻。
4. 把蛋液分次加入混合物中後打勻。
5. 篩入麵粉和泡打粉後拌勻。
6. 加入牛奶後拌勻。
7. 將混合物放入焗盆。
8. 焗 15-18 分鐘。

準備牛油糖霜

1. 將牛油發打至軟。
2. 加入一半份量的糖霜，發打至乳霜狀。
3. 加入餘下的糖霜，牛奶和香草油。
4. 拌勻。
5. 裝入有星口擠花嘴的擠花袋內然後把牛油糖霜擠在蛋糕表面。

食物實驗 2：添加物對泡沫穩定性的影響(實習)

目的

研究添加物對雞蛋泡沫穩定性的影響

原理

泡沫是指氣體分散於分散介質中。然而，氣泡有聚結和消泡的傾向。蛋白中的蛋白質可以聚集在氣泡的周圍形成一層膜。由蛋白質膜包圍的氣泡不容易塌下。起泡會在很多烘焙產品中使用，例如天使蛋糕，海綿蛋糕和蛋白酥。在烹飪過程中，會加入不同的添加物來穩定泡沫，從而保持食品的質地。

用具及材料

用具	材料
試管 漏斗 量匙 電動打蛋器 橡皮刮刀 小粉盤 計時器 電子磅	樣本 A：　1 隻蛋白 樣本 B：　1 隻蛋白 + 25 克糖 樣本 C：　1 隻蛋白 + ¼茶匙撻撻粉 樣本 D：　1 隻蛋白 + ¼茶匙蛋黃 保鮮膜

步驟

1. 把雞蛋的蛋白和蛋黃分開，將蛋白放在小粉盤裡。
2. 用電動打蛋器發打以下的蛋白樣本。
   樣本 A：用中低速發打蛋白 3 分鐘
   樣本 B：用中低速發打蛋白 1 分鐘，然後慢慢加入 25 克糖，繼續發打 2 分鐘
   樣本 C：用中低速發打蛋白和 ¼ 茶匙撻撻粉 3 分鐘
   樣本 D：用用中低速發打蛋白和 ¼ 茶匙蛋黃 3 分鐘
3. 把漏斗放在試管的頂部，用橡皮刮刀將泡沫倒入漏斗，把泡沫平頂並用保鮮膜覆蓋，靜立 20 分鐘。
4. 20 分鐘後記錄量筒中液體的容量。

結果

樣本	發打後的質地	20 分鐘液體洩漏的體積
A		
B		
C		
D		

思考問題

1. 比較不同添加物對泡沫質地的影響。
2. 哪些添加物能穩定泡沫？它們如何穩定泡沫？
3. 如果沒有撻撻粉，可以用什麼來替代它？
4. 如果發打蛋白時太早加糖，會發生什麼事情？
5. 哪些添加物不能穩定泡沫？ 為什麼？

天使蛋糕(示範和實習)

材料

蛋白	6 隻
幼砂糖	3/4 杯
蛋糕粉	1/2 杯
撻撻粉	1/2 茶匙
鹽	1/8 茶匙
香草油	1 茶匙

步驟

1. 預熱焗爐至 190℃。
2. 把蛋糕粉和鹽篩在一起。
3. 把蛋白放在碗內，然後加入撻撻粉。
4. 打至起泡。
5. 分次加入糖，每次 1 湯匙。
6. 發打至蛋白呈軟性發泡。
7. 加入香草油後拌勻。
8. 分次把麵粉和鹽篩入蛋白泡沫中，輕輕拌勻。
9. 把蛋糕混合物倒入蛋糕模中，抹平。
10. 放入 190℃焗爐中，焗 35 分鐘。
11. 把蛋糕模倒置。
12. 冷卻 2 小時再脫模。

食物實驗 3：批皮的起酥性(實習)

目的

比較批皮中不同分量脂肪的起酥能力

原理

起酥性是指脂肪使麵筋起酥的能力。脂肪可覆蓋在麵粉表面形成防水層，阻礙麵筋網絡的形成。這樣使烘焙產品更鬆軟和酥脆。脂肪的可塑性和飽和度影響它起酥的能力。愈多脂肪或愈質地柔軟的脂肪更能覆蓋在麵粉表面，使烘焙產品更鬆軟。

用具及材料

用具	材料
焗盤	麵粉　100 克 x 3　（300 克）
中粉盤	鹽　1/8 茶匙 x 3 （3/8 茶匙）
餅模	水　25 毫升 x 3　（75 毫升）
擀麵棍	保鮮膜
橡皮刮刀	
篩	牛油：
	樣本 A　25 克
	樣本 B　50 克
	樣本 C　75 克

步驟

1. 預熱焗爐至 180℃。
2. 準備樣本 A：
   i. 把 100 克麵粉和 1/8 茶匙鹽篩在一起。
   ii. 加入 25 克牛油。
   iii. 把牛油搓入麵粉中至麵包糠狀。
   iv. 加入 25 毫升水，搓成粉糰。
   v. 用保鮮膜包起粉糰，放入雪櫃 25 分鐘。
   vi. 把粉糰輾開至約$ 1 個硬幣的厚度。
   vii. 用餅模切成圓形，放在已抹油的焗盤，用 180℃焗 15 -20 分鐘。
3. 重複步驟 2 製作樣本 B 和 C。
4. 比較樣本的質地和外觀。

結果

樣本	牛油分量	外觀		質地	
		烘培前	烘焙後	烘焙前	烘焙後
A	25 克				
B	50 克				
C	75 克				

思考問題

1. 比較樣本的質地和外觀。
2. 把樣本的鬆軟度排序 (1: 最不鬆軟)
3. 如果用植物油來代替牛油，批皮的質地會是怎樣？
4. 如果批皮太鬆軟，會怎樣？
5. 建議如何減低批皮的鬆軟度。

新鮮水果撻 (示範和實踐)

材料

普通批皮	
生果	
吉士糊	
牛奶	180 毫升
糖	1/8 杯
麵粉	1/8 杯
鹽	1/8 茶匙
蛋黃	2 隻
香草油	1/2 茶匙

步驟

準備吉士糊

1. 用慢火把牛奶加熱。
2. 把糖，鹽和麵粉加入一個大碗中拌勻。加入蛋黃後再拌勻。
3. 將已加熱的牛奶慢慢倒入，不斷發打。
4. 把雞蛋混合物再倒回煲中
5. 加熱混合物，其間不停發打，煮至濃稠。
6. 加入香草油後拌勻。
7. 冷卻吉士糊，備用。

準備批皮

1. 預熱焗爐至 180℃。
2. 把粉糰輾開至 3 毫米厚。用撻模切出圓形批皮
3. 把批皮放在撻殼中。用叉刺小洞疏氣焗 15 -20 分鐘。
4. 將吉士糊加在撻皮內。
5. 再放上水果作裝飾。

食物實驗 4: 脂肪對批皮層片狀的影響(示範和實習)

目的

研究不同種類的脂肪對批皮層片狀的影響

原理

在製作批皮時，脂肪會把粉糰分隔。在加熱過程中，粉糰中的水份會蒸發為蒸汽而脂肪會開始溶化。溶化的脂肪可以防止蒸汽流失，蒸汽壓力會把每一層的粉糰分開，形成層片狀。脂肪的溶點愈高，批皮的層數會愈多。製成的批皮會較酥脆。

用具及材料

用具	材料
焗盤	麵粉　65 克 x5（325 克）
叉	40 克（灑在工作檯和擀麵棍上）
中粉盤	鹽　1/8 茶匙 x5（5/8 茶匙）
餅模	冷水
擀麵棍	保鮮膜
篩	脂肪：
	樣本 A：70 克牛油
	樣本 B：70 克人造牛油
	樣本 C：70 克純豬油
	示範 1：35 克牛油和 35 克人造牛油
	示範 2：70 毫升植物油

步驟

1. 預熱焗爐至 180℃。
2. 把 65 克麵粉和 1/8 茶匙鹽篩在粉盤內。
3. 準備樣品 A ：
   - 把 70 克牛油放在麵粉中用叉子混合。
   - 直到混合物分成小碎塊，差不多一粒豌豆大小。
   - 在混合物中央開一小穴，加入 30 毫升冷水。輕輕揉搓混合物直到粉糰成為一個小球。
   - 在工作檯面和擀麵棍上輕輕灑上麵粉。
   - 用擀麵棍將粉糰輾開成一個約 25 厘米長的長方形。
   - 把粉糰上下對摺，形成三層。
   - 轉 90 度。
   - 重複輾開及折疊。(第二摺)
   - 用保鮮膜包著粉糰，冷藏 30 分鐘。
   - 重複輾開和折疊粉糰至少兩次。
   - 用保鮮膜包著粉糰，冷藏 30 分鐘。
   - 用擀麵棍把批皮輾開成約$ 1 硬幣的厚度
   - 用餅模切出圓形，放在已抹油的焗盤上，焗 15 分鐘。
4. 重複步驟 2 和 3 製作樣本 B 和 C。

結果

樣本	脂肪種類	外觀		質地		香味
		烘焙前	烘焙後	烘焙前	烘焙後	烘焙後
1	牛油					
2	人造牛油					
3	純豬油					
4	植物油					

思考問題

1. 比較不同樣本的味道，質感和外觀。
2. 哪種在這個實驗中使用的脂肪不能有效地製作酥皮?
3. 哪種脂肪在混合和折疊過程中不容易溶化，比較容易處理？為什麼？
4. 用牛油製作批皮的好處是什麼？
5. 列出牛油，人造牛油，純豬油和植物油的脂肪含量。
6. 建議如何提高批皮的酥脆度。

火腿和蘑菇酥盒 (示範)

材料

酥盒	
鬆皮	
蛋黃	1 個
水	1 湯匙
餡料：火腿蘑菇	
牛油	25 克
洋蔥(切片)	1/3 杯
蘑菇	1 1/2 杯
麵粉	3 湯匙
牛奶	175 毫升
雞湯	175 毫升
火腿 (切粒)	1/2 杯
胡椒粉	1/8 茶匙

步驟

準備酥盒

1. 預熱焗爐至 180℃。混合蛋黃和水來準備蛋液。
2. 用擀麵棍把鬆皮輾開成約$ 1 硬幣的厚度。
3. 用餅模切出 8 個圓形。
4. 用細一些的餅模在圓形批皮中切出 4 個空心圓形。
5. 把空心圓形放在圓形批皮上面，用蛋液把兩個圓形粘好。
6. 表面塗上蛋液。
7. 焗 10-12 分鐘。

準備餡料：火腿蘑菇

1. 融化牛油。
2. 加入洋蔥，煮 1 分鐘。
3. 加入蘑菇，煮約 4 分鐘至軟身。
4. 加入牛奶和雞湯。
5. 加入麵粉，不斷發打。
6. 煮至混合物變稠。
7. 加入火腿，鹽和胡椒粉。
8. 把餡料放入酥盒內。

食物實驗 5：雞蛋凝結的因素(實習)

目的

研究添加物對雞蛋凝結的影響

原理

當加熱雞蛋時，蛋白和蛋黃的蛋白質會變性。蛋白質的結構被破壞，引致凝結，使蛋白質硬化及凝固。蛋過度受熱，會導致蛋白質過度凝聚和收縮。過度凝結，會影響燉蛋的質地和外觀。因此在製作燉蛋時會加入一些添加物來減慢凝結的速度。

用具及材料

用具	材料
碗 筷子 蒸架 鍋	4 隻雞蛋 1/2 湯匙糖 50 毫升易打起忌廉 鋁紙

步驟

1. 在不同的碗內各發打 1 隻雞蛋。
2. 在每碗加入以下不同材料：

樣本	
A	----
B	1/2 湯匙糖
C	50 毫升水
D	50 毫升易打起忌廉

1. 拌勻。
2. 隔去蛋中的泡沫。
3. 用鋁紙覆蓋。
4. 蒸 12 分鐘。

結果

樣本	外觀	質感
A		
B		
C		
D		

思考問題

1. 哪個樣本凝结度最高?
2. 糖和脂肪在蒸蛋中有什麼作用?
3. 為什麼稀釋雞蛋可以防止過度凝固？
4. 如果用牛奶而不是忌廉來製作燉蛋，質地會怎樣？
5. 從低到高，把雞蛋（蛋白，蛋黃，全蛋）的凝結速度和容易過度凝結的程度排序。

食物實驗 6：溫度對糖褐變的影響(實習)

目的

研究不同溫度對糖褐變的影響

原理

糖通過焦糖化及梅納反應令食物表面金黃色。烘焙產品受熱愈多，褐變越多。因此，高的烘焙溫度會加快批皮及葡撻蛋漿的褐變。

用具及材料

用具	材料
碗 手動打蛋器 散熱架 鍋 撻殼 切割機 糕點刷 擀麵棍 叉 量杯 篩	簡單鬆皮 **蛋漿:** 蛋黃 ：8 牛奶 ：240 毫升 忌廉 ：240 毫升 糖 ：120 克

步驟

1. 預熱焗爐至 180℃。

準備批皮

1. 預備批皮並把批皮輾開至 3 毫米。用餅模切成圓形批皮。
2. 把圓形批皮放在撻殼中。用叉刺小洞疏氣。

準備蛋漿

1. 暖牛奶和忌廉。
2. 把砂糖放入暖牛奶和忌廉拌溶，放涼備用。
3. 雞蛋打勻，加入糖水，拌勻。
4. 用篩過濾甜蛋漿。
5. 倒進已準備的撻殼內。
6. 焗 20-25 分鐘。

重複所有步驟用 230℃焗蛋撻。

結果

樣本	外觀	批皮質感	蛋漿質感
180°C			
230°C			

思考問題

1. 哪溫度令糖的褐變更快？
2. 為什麼糖可以令烘焙產品的表面金黃色？
3. 為什麼用麵粉製成的烘焙產品通常會比用低筋粉製成的烘焙產品褐變快?