



National Certificate of Educational Achievement  
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

## **Exemplar for Internal Achievement Standard Technology**

This exemplar supports assessment against:

**Achievement Standard 91643**

**Implement complex procedures to process a specified product**

An annotated exemplar is an extract of student evidence, with a commentary, to explain key aspects of the standard. It assists teachers to make assessment judgements at the grade boundaries.

New Zealand Qualifications Authority

To support internal assessment

	Grade Boundary: Low Excellence
1.	<p>For Excellence, the student needs to implement complex procedures to process a specified product.</p> <p>This involves implementing complex procedures in a manner that economises time, effort, and materials, taking into account yield and cost.</p> <p>This student has implemented complex procedures to process a gluten free, vegan cheesecake.</p> <p>The assessor has attested to the student's ability to execute the complex procedures relating to making the gluten free base, plant-based custard, vegan jelly and carob coating in a manner that economises time, effort and materials, taking into account yield and cost (1).</p> <p>For a more secure Excellence, the student could have ensured that all the processes carried out economised effort. For example, providing evidence of consistently using the preplanned flowchart and ensuring that all tests and trials were relevant and purposeful.</p>

**Student 1: Low Excellence**  
Intended for teacher use only

GRADE AWARDED	TEACHER COMMENT
<p><b>E</b></p> <p><i>Final grade will be decided using professional judgement based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.</i></p>	<p>Great work, thorough reflection after each trial to see what worked and how to solve problems. Excellent outcome that met all specifications.</p> <p>Student changed steps, e.g. chilling filling in fridge to speed up setting time so jelly could go on sooner. Experimented with varying amounts of agar in the jelly topping until ideal setting level reached.</p> <p>The student worked purposefully in a planned and prepared way, looking for ways to speed the process up.</p> <p>You thoroughly understand the processing steps and the purpose of your tests and you responded to testing feedback intelligently improving your outcome to meet your specifications.</p>

1

**Teacher Practical Observations**

Student: XXXXXXXXXX

Overall comments on student	Overall comments on outcome
Student demonstrated confidence and efficiency in the processing and testing throughout. Well organised, questioning, challenging XXXself to improve the outcome.	Excellent outcome, very consistent in all aspects. Testing ensured when it came to executing the final cheesecake the whole process was without issue. The careful measurement and timing ensured all components were perfect and there was no ingredient wastage.

1

Practical criteria for implementation	Evidence observed by teacher
Student follows steps in their flow diagram <ul style="list-style-type: none"> <li>Executing processing operations</li> <li>Executing tests</li> </ul>	Student executed all processes and tests in the flow diagram which <span style="background-color: blue; color: blue;">XXXX</span> had written prior to the final implementation. Tests were timely and not excessive.
Student modifies processing operations in response to testing feedback	Student modified several processes in response to testing feedback, e.g. length of cooking, amount of agar, amount of time for setting, amount of blending of nuts for almond flour etc.
Student undertakes accurate testing using replicate measurements	Accurate and independent tests carried out throughout trials to determine correct temperatures, viscosity, setting times, taste and texture.
Student explains <ul style="list-style-type: none"> <li>Processing operations</li> <li>How reliable test feedback can inform choice of processing operations, equipment, time, temperature and/or techniques</li> </ul>	Student explained how <span style="background-color: blue; color: blue;">XXXX</span> modified processing as a result of testing feedback. <span style="background-color: blue; color: blue;">XXXX</span> could clearly communicate how testing helped her decision making in regards to equipment, cookery methods, temperatures for cooking and storage. Feedback informed changes to cooking time, blending times, cooking times and amount of thickening ingredients.
During processing student implements: <ul style="list-style-type: none"> <li>Their developed health and safety plan</li> <li>Their developed quality assurance plan</li> </ul>	Student adhered to HACCP plan and QA plan during processing. Quality assurance testing wasn't excessive but sufficient to ensure high standard of finish.
Student demonstrates accuracy and independence?	Student accurately measured and weighed and processed ingredients. In final pie <span style="background-color: blue; color: blue;">XXXX</span> misread the amount of sweetener, but her sensory test picked up the mistake and <span style="background-color: blue; color: blue;">XXXX</span> self corrected realising her error. Outcome was unaffected.
Student demonstrates efficiency in materials, time and effort?	Efficiency demonstrated in materials, time, and effort. Testing was effective but not excessive. Small amount of wastage calculated into costing without affecting yield.



	Grade Boundary: High Merit
2.	<p>For Merit, the student needs to skilfully implement complex procedures to process a specified product.</p> <p>This involves showing independence and accuracy when executing complex procedures, and predicting costs and comparing actual and predicted costs per unit of finished product.</p> <p>This student has skilfully implemented complex procedures to process a ragu filling, bechamel sauce and pasta sheets for a beef lasagna.</p> <p>The student has evaluated how testing helped them to work independently (1) and accurately (2). For example, by comparing techniques they realised that hand kneading required a lot of physical effort compared to the chosen thermomixer method. This reduced the waste of ingredients allowing for more accurate prediction of costs.</p> <p>The student used an Excel spreadsheet to accurately predict the cost of each portion of lasagne, and then to compare the predicted (3) with actual (4) costs per unit of the finished product. This has included a detailed breakdown of labour and energy costs.</p> <p>Independence and accuracy have also been attested to by the assessor in the assessment schedule (5).</p> <p>To reach Excellence, the student could have shown how they executed all three procedures for the lasagna in a manner that economised time, ingredients and effort, taking in to account the yield and the cost.</p>

**Student 2: High Merit**  
Intended for teacher use only

**Evaluating my Accuracy.** Before, this process I had never endured on cooking a lasagna from scratch before, this meant I was very unsure of what I was going to expect, however, I was prepared to work hard individually to improve my knowledge of cooking complex dishes. After each trial, I took it upon myself to analyze everything that I did well and not so well, this meant that I was able to improve my lasagna for next time, and enabling myself to better my professionalism. When making the lasagna, it was definitely not perfect the first time, as there were many errors that I needed to improve on. An example of this being, the dryness of the lasagna as a whole. however, I managed to improve this as previously stated, due to analysing the good point to continuing doing them, and the bad point, to adapt and learn what to do instead if something is not working. When carrying out this process of making lasagna, I deeply took into account the level of accuracy that needed to go into it. An example of this being, when rolling out the dough, I ensured the kitchen aid was on 8 each time, in order to ensure consistency and accuracy. Because I have tried this and I now know it works, I am able to set it to 8 each time knowing that my lasagna sheets will be thin and consistent but will not break, therefore making my lasagna to the best of my ability.

**Evaluating how I was independent.** Throughout this unit, I have shown my independence while using the kitchen by myself. Meaning I apply basic kitchen safety skills appropriately along with comprehending how the kitchen operates when using the facilities at the same time. This is shown by making a successful lasagna as there are complex factors involved mainly including the making of the pasta, as most people buy the sheets made. I began by making the dough in the thermomix, then kneading the dough with my hands, and putting it into the fridge to cool. Once the dough was cooled I had to roll it out. Throughout my trials, I found that the eclectic roller was the most efficient, and effective. Therefore, each trial after and from now on when making lasagna for my family, I will ensure to roll out the dough with an electric roller, as it makes the pasta thin, consistent, and delicious. As said above from this I learnt to maintain the roller on size 8, as that gives the perfect consistency for lasagna. This was all done with very little help from [redacted]

Predicted costs		
Prime beef mince	300g	2.6
olive oil	4tbsp	0.39
brown onion	113g	0.11
garlic	1g	0.04
carrot	50g	0.14
stock beef	1.5cups	1.28
tinned tomatoes	800g	3.9
parsely	6.7g	0.02
baby spinach	.5 cup	0.46
parmesan	1 cup	4.84
diced tomatoe	90g	0.69
capsicum	220g	1.79
oregano	1Tbsp	0.4
thyme	1Tbsp	0.15
butter	4Tbsp	0.33
flour	200g	0.12
milk	4 cups	3.5
cheddar cheese	200g	2.12
salt	1Tbsp	0.02
pepper	1Tbsp	0.4
1 egg	65g	0.65
<b>SUBTOTAL</b>		<b>23.95</b>
labour		60
energy		8.46
packaging		0.2
		<b>92.61</b>
16 slices		5.78 one portion

**Calculated predicted costs per unit of finished product**

Labour: 20 (minimum wage) x 3 (hours) = \$60  
 Foil trays= \$0.20  
 Ingredients= \$24.17  
 12 servings (2x 20cm by 5.5cm containers)  
**Total=\$84.37**

Stove top		Freezer	
Cost Per Hour: 0.1500	Hours Used Per Day: 1	Cost Per Hour: 0.0035	Hours Used Per Day: 24
Cost Per Day: 0.1500	Power Use (Watts): 1500	Cost Per Day: 0.0840	Power Use (Watts): 35
Cost Per Month: 4.56	Price (kWh): 0.10	Cost Per Month: 2.56	Price (kWh): 0.10
Cost Per Year: 54.76	Calculate Reset	Cost Per Year: 30.66	Calculate Reset
kWh Per Day: 1.50		kWh Per Day: 0.84	
Oven		Refrigerator	
Cost Per Hour: 0.2400	Hours Used Per Day: 0.75	Cost Per Hour: 0.0180	Hours Used Per Day: 24
Cost Per Day: 0.1800	Power Use (Watts): 2400	Cost Per Day: 0.4320	Power Use (Watts): 180
Cost Per Month: 5.48	Price (kWh): 0.10	Cost Per Month: 13.14	Price (kWh): 0.10
Cost Per Year: 65.71	Calculate Reset	Cost Per Year: 157.70	Calculate Reset
kWh Per Day: 1.80		kWh Per Day: 4.32	

Final costing		
Prime beef mince	330g	2.86
olive oil	4tbsp	0.39
brown onion	113g	0.11
garlic	1g	0.04
carrot	50g	0.14
stock beef	1.5cups	1.28
tinned tomatoes	800g	3.9
parsely	6.7g	0.02
baby spinach	.5 cup	0.46
parmesan	1 cup	4.84
diced tomatoe	90g	0.69
capsicum	220g	1.79
oregano	1Tbsp	0.4
thyme	1Tbsp	0.15
butter	4Tbsp	0.33
flour	235g	0.15
milk	4 cups	3.5
cheddar cheese	200g	2.12
salt	1Tbsp	0.02
pepper	1Tbsp	0.4
2 eggs	65g	1.3
SUBTOTAL		24.89
labour		80
energy		8.46
packaging		0.2
		113.55
yield	12	9.4 one portion

### Final costs per unit of finished product

As we can see my final energy cost is the same as my predicted energy cost. I believe this to be because of the time I thought I was over compensating for the amount of time I was using the facilities, however after timing each one, I believed it actually does take this amount of time. However, the labour wage increased, this is due to the fact that making a lasagne is intensely time consuming, therefore, I did not think it would take over 3 hours, however it ended up taking 4 hours on average after timing each trail. This brings my final cost up \$20 as the hourly labour wage is that amount.

Labour: 20(minimum wage) x 4 (hours) = \$80  
Foil trays= \$0.20  
Ingredients= \$24.17  
12 servings (2x 20cm by 5.5cm containers)  
**Final cost=\$104.37**

Oven	Stove top
Cost Per Hour: <b>0.2400</b> Cost Per Day: <b>0.1800</b> Cost Per Month: <b>5.48</b> Cost Per Year: <b>65.71</b> kWh Per Day: <b>1.80</b>	Cost Per Hour: <b>0.1500</b> Cost Per Day: <b>0.1500</b> Cost Per Month: <b>4.56</b> Cost Per Year: <b>54.76</b> kWh Per Day: <b>1.50</b>
Hours Used Per Day: <input type="text" value="0.75"/> Power Use (Watts): <input type="text" value="2400"/> Price (kWh): <input type="text" value="0.10"/> <input type="button" value="Calculate"/> <input type="button" value="Reset"/>	Hours Used Per Day: <input type="text" value="1"/> Power Use (Watts): <input type="text" value="1500"/> Price (kWh): <input type="text" value="0.10"/> <input type="button" value="Calculate"/> <input type="button" value="Reset"/>
Freezer	Refrigerator
Cost Per Hour: <b>0.0035</b> Cost Per Day: <b>0.0840</b> Cost Per Month: <b>2.56</b> Cost Per Year: <b>30.66</b> kWh Per Day: <b>0.84</b>	Cost Per Hour: <b>0.0180</b> Cost Per Day: <b>0.4320</b> Cost Per Month: <b>13.14</b> Cost Per Year: <b>157.70</b> kWh Per Day: <b>4.32</b>
Hours Used Per Day: <input type="text" value="24"/> Power Use (Watts): <input type="text" value="35"/> Price (kWh): <input type="text" value="0.10"/> <input type="button" value="Calculate"/> <input type="button" value="Reset"/>	Hours Used Per Day: <input type="text" value="24"/> Power Use (Watts): <input type="text" value="180"/> Price (kWh): <input type="text" value="0.10"/> <input type="button" value="Calculate"/> <input type="button" value="Reset"/>

<p>showing independence and accuracy when executing complex procedures</p> <p><b>For example (partial evidence):</b> <i>The student has independent work ethic &amp; makes the agreed product with minimal advice and guidance from the teacher</i></p>	4	X	
<p>predicting costs and comparing actual and predicted costs per unit of finished product.</p> <p><b>For example (partial evidence):</b> <i>The student has evidence of considering cost with each trail.</i></p>	5	X	

	Grade Boundary: Low Merit
3.	<p>For Merit, the student needs to skilfully implement complex procedures to process a specified product.</p> <p>This involves showing independence and accuracy when executing complex procedures, and predicting costs and comparing actual and predicted costs per unit of finished product.</p> <p>This student has implemented complex procedures by combining and manipulating ingredients to process profiteroles from choux pastry with a custard filling and chocolate glaze.</p> <p>The assessor has attested to the student's independence and accuracy when implementing the complex procedures (1).</p> <p>The student has compared predicted and actual costs for the choux pastry per unit (2).</p> <p>While teacher observations show that the student worked independently and accurately when processing the profiteroles, a more secure Merit would require additional evidence of predicted costs and actual costs of all components of the specified product. These predictions should be made prior to testing, which would allow for a more accurate comparison between predicted and actual costs per finished profiterole ahead of final production.</p>

<b>Student 3: Low Merit</b>
Intended for teacher use only

GRADE AWARDED	TEACHER COMMENT
<p style="text-align: center; color: red; font-weight: bold; font-size: 1.2em;">M</p> <p><i>Final grade will be decided using professional judgement based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.</i></p>	<p>Great work, implemented skillfully and with minimum input for teacher. <span style="float: right; border: 1px solid red; border-radius: 50%; padding: 2px;">1</span></p> <p>Independently responded to test results to improve your product. Good discussion around how your processes achieved your specifications. Accurate weighing, measuring, cooking, implementation of most processes and tests. Student expressed concern at the chocolate enrobing during tests but never fully resolved the issue. Some assistance needed with this when processing final batch. Good quality products that met all specifications mostly independently.</p> <p>Predicted and compared costs, these could have had a bit more detail. </p>

## COSTS & YIELD

### Estimation 2

Estimate the **yield** from one batch of your Choux Pastry

*The estimated yield is 20 pieces of choux pastry*

Estimate the **cost** to make

- cost of ingredients - \$15
- cost of power - \$3
- cost of labour - \$20 per hour x 1.20 (80 mins) hrs = \$24

Estimated cost per unit: \$42 divided by 20 = \$2.10

Table Calculating Ingredients Cost

Ingredients	Used	Bought	Price	Calculation
Butter	119g	500g	\$5.30	\$1.26
Flour	125g	1500g	\$2.70	\$0.225
Eggs	6	12	\$8.10	\$4.05
Sugar	123g	1500g	\$3.30	\$0.27
Salt	1.25g	300g	\$2.10	\$0.009
Heavy cream	250ml	500ml	\$4.01	\$2.00
Milk	593ml	2000ml	\$3.81	\$1.13
Chocolate	170g	200g	\$2.80	\$2.38
Cornstarch	12g	500g	\$1.90	\$0.0456
Vanilla extract	15ml	125ml	\$1.99	0.2388

**Total Cost: \$11.61**

Links for ingredients costs:

[Wholegrain Organics Online Shop](#)

[Countdown Online](#)

Table for Calculating Labour Cost

Time needed (in minutes)	Cost per minute	Total labour cost (time x cost)
80 minutes	0.33	\$26.40

**My final cost per unit: \$38.81 divided by 20 = \$1.94**

### Actual

Calculate the **yield** from your finished product: **About 16-20**

Calculate the **actual cost** of your finished product (including ingredients, power and labour):

**Cost of choux pastry-** \$11.61

**Labour cost -** \$26.40

**Total power cost-** \$0.80

**Total cost:** \$38.81

### Compare

How did your **estimate** compare to your **actual** costs?

Can you explain why they were different (if they were)?

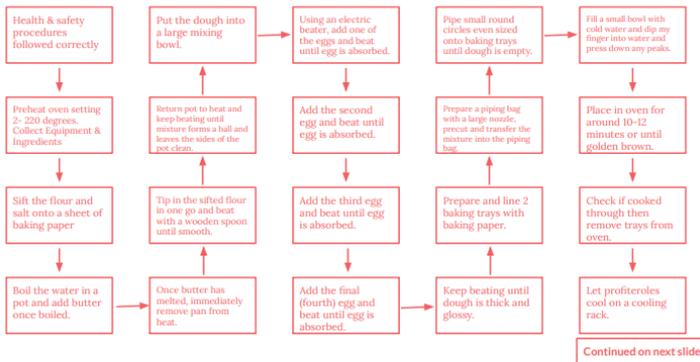
What could you do to make it more cost effective per slice of pie?

The actual cost of making the choux pastry was abit cheaper than my estimated price. My estimated price for making the choux pastry was about \$15-16 and the actual cost to make the choux pastry was \$11.61. I think if I had switched to cheaper alternatives for ingredients then maybe my cost of making the choux pastry would've been abit cheaper. For example, maybe using another alternative for chocolate. But I think as the price of the eggs are much higher nowadays it could have been one of the reasons why the total cost of making the choux pastry was high.

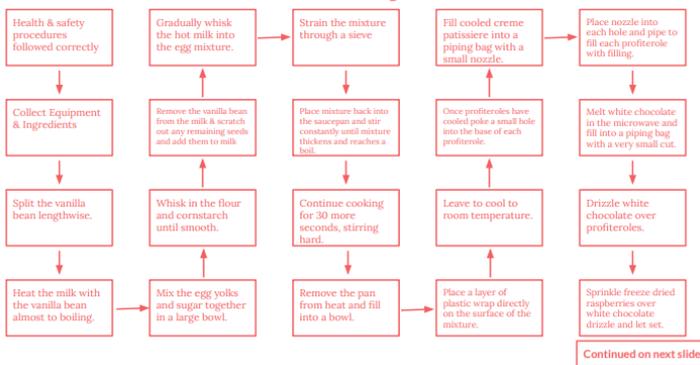
	Grade Boundary: High Achieved
4.	<p>For Achieved, the student needs to implement complex procedures to process a specified product.</p> <p>This involves:</p> <ul style="list-style-type: none"> <li>• creating a flow diagram showing interactions between processing operations and tests</li> <li>• executing processing operations and tests in accordance with the steps in the flow diagram</li> <li>• modifying processing operations in response to testing feedback</li> <li>• undertaking accurate testing using replicate measurements</li> <li>• explaining processing operations and how reliable test feedback can be used to inform choice of processing operations, equipment, time, temperature and/or techniques for processing the product</li> <li>• calculating yield</li> <li>• calculating actual financial costs per unit</li> <li>• developing and implementing a health and safety plan and a quality assurance plan.</li> </ul> <p>This student has implemented complex procedures to process profiteroles and creme patisserie for a croquembouche.</p> <p>They have created (1), tested (2) and modified (3) a flow diagram for both preparing the different components and assembly of the final product. Processing operations and tests were carried out in accordance with final flow diagram, which was modified as a result of testing feedback.</p> <p>The student has undertaken accurate testing by using replicate measurements, e.g. randomly measuring item-to-item variation for the profiteroles and the custard and repeating the same test in a second production run (2, 4).</p> <p>This testing has enabled the student to explain their chosen operations for processing and testing. It also informed their choices of equipment, time, temperature and/or techniques, e.g. dipping a finger in water and pressing down on the dough to remove peaks, and using the larger size piping nozzle (5).</p> <p>The yield has been calculated by the student determining the total cost of all resources, and then dividing this by units produced to calculate actual unit cost (6).</p> <p>A HACCP plan has also been written, which includes a quality assurance plan for testing. (7)</p> <p>To reach Merit, evidence of predicting costs and actual costs to compare and identify any differences is required. This should include the cost of labour and energy.</p>

**Student 4: High Achieved**  
Intended for teacher use only

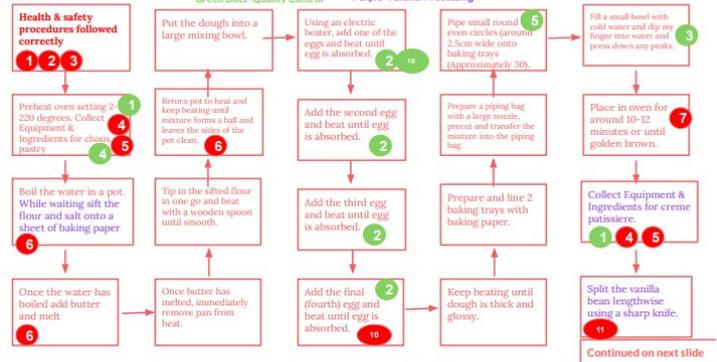
**Initial Flowchart- Profiteroles**



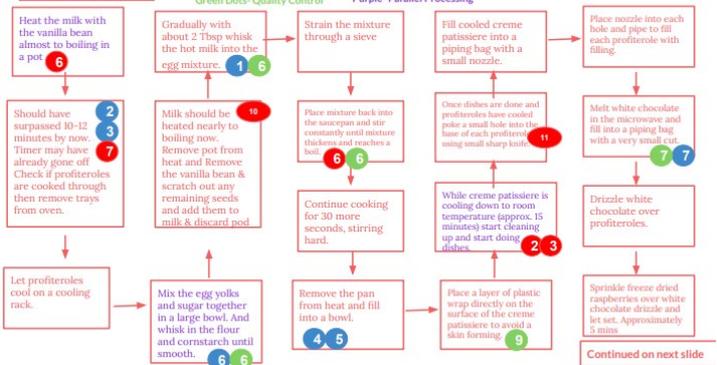
**Initial Flowchart- Creme Patisserie & Filling of Profiteroles**



**Final Flowchart**



**Final Flowchart**



**Testing & Trialling- Trial 1 Choux Pastry**

The specification I am trialling is making my profiteroles hollow and all the same size. The purpose of this trial was to have our first experience with making the choux pastry dough and experimenting with the different methods of different recipes in order to choose the best recipe and to become more confident in making our choux pastry.

The results showed that recipe 2 had a great outcome and the profiteroles were crisp and perfectly hollow in the inside. The profiteroles were a tiny bit small so next trial I will test making bigger more even sizes.

In this trial I used an electric beater and I found it quick and efficient and created a very even dough texture therefore I will be using it again in my next trials. I conducted this trial to be fair test by using different recipes with different methods however using the hospitality kitchen ovens which are all identical and using the same temperature and setting.

As a result of this trial I will continue to trial the same recipe however improving on the making bigger even spheres as well as working on the shape as the profiteroles all had a cooked peak. I have found out that to prevent this from happening you dip your finger in water and press the peak down. I will try this in my next trial. Next trial I will also trial whether it is more visually appealing and ideal to use a nozzle to pipe the dough vs just using the piping bag. From now on I will use Recipe 2 for all of my trials.



**Testing & Trialling- Trial 2 Choux Pastry**

The specification I am trialling is making my profiteroles hollow and all the same size. The purpose of this trial was to figure out what would be the best size profiteroles for our croque-mouches. I decided to double the recipe so that I could see the difference in dough quantity and how many larger ones I could make. It turned out that I made the same number of around 30 as last time. I tried 3 different sizes each slightly larger than the other. I found that the smallest of the ones I made in this trial would be the best to use as it is better suited for the croque-mouches. The profiteroles were perfectly hollow again, which is perfect for my creme patissiere filling.

I conducted this trial to be fair as I followed the recipe and used the same oven at the same temperature and setting as last time- 220 degrees. I also trialled dipping my finger in water and then pressing down on the dough once piped to remove the peaks. This worked wonders as the results showed a lovely nice patterned top by using the larger size piping nozzle with no peaks. I will definitely be using the technique of pressing down my peaks in my next trials.

I also found that since I made bigger profiteroles they take about at least 5 minutes longer in the oven to properly cook through. As a result of this trial I will continue using the larger piping nozzle and double the recipe to get larger profiteroles that will look more presentable with no peaks on my croque-mouches.

As a result of this trial I have developed my initial specification into my final specification of "My profiteroles will all be piped using the same piping bag in circles of a 2.5cm diameter and a 2.5cm height. The profiteroles will all bake to be the same even size of around 4cm in diameter.



**Testing & Trialling- Trial 3 Vanilla Creme Patisserie**

The specification I am trialling is that the profiterole must have a nice flavour, has a good viscosity and a smooth texture.

The purpose of this trial was to make the creme patissiere for the first time and to identify which recipe is most suited to the viscosity, texture and taste to what I would like my creme patissiere recipe to be.

The recipe I chose was recipe 5 which was from The Spruce and used whole vanilla pods that I cut in half and threw into the milk heating on the stove, this allowed the vanilla beans to infuse into the milk and give a lovely smooth, creamy, luxurious taste. The results show that the texture and viscosity would be perfect for my creme patissiere filling as it was thick enough to be piped into the profiteroles and not clumpy. I also found that my recipe said to place glad wrap directly over the creme patissiere once done to avoid skinning, this worked well as there was no skinning of the milk and all of the creme patissiere was smooth. Although I really enjoyed the taste of vanilla and the simplicity of the flavour I would like to further trial different flavour options of the creme patissiere such as berry, lemon, passionfruit, chocolate.

I conducted this trial to be fair as I used the same base recipe and only changed the type of vanilla in the recipe. I also used the same stovetop and the same equipment. As a result of this trial I will use the same recipe as a base for my future trials of testing flavour options for my creme patissiere as the recipe has the perfect texture and worked well for me and what I want my creme patissiere to be for my profiterole filling. I will also continue placing plastic wrap directly on my creme patissiere as it worked very well at avoiding skinning.



**Testing & Trialling- Trial 4 Flavoured Creme Patisserie**

The specification I am trialling is that the profiterole must have a nice flavour, has a good viscosity and a smooth texture. The purpose of this trial was to trial different flavours of creme patissiere to see whether I want to add any extra flavours to the base recipe.

For this trial I decided to try a raspberry vanilla flavoured creme patissiere. I used the same base recipe as the previous trial and included the whole vanilla pods as well as ½ cup of freeze dried whole raspberries for texture and 1 teaspoon freeze dried raspberry powder for colour as I found that using only the powder didn't give enough colour and texture and that the whole raspberries didn't give enough colour. I added both freeze dried raspberry powder and the whole raspberries into the milk to infuse the raspberry flavour and to colour the creme patissiere a nice pink. I found that having both the vanilla and raspberry flavour tasted much more natural however I found it to be quite sweet and quite strong. My results also showed that the vanilla flavour was quite overpowering to the raspberry flavour, so therefore if I was to further experiment with flavours I would try the base recipe excluding the vanilla. The viscosity and texture was the same as previous trials making it perfect for the profiterole filling.

I conducted this trial to be fair as I used the same base recipe using the same ingredients and only changed the flavouring for each one to see how the flavour would act. As a result of this trial I would like to further trial and experiment with different flavour options such as a lemon or passion fruit creme patissiere to see whether I want to stick with the traditional vanilla or have a different flavour. I will also trial excluding the vanilla pod for the flavours to see the difference in the finished product and the taste.

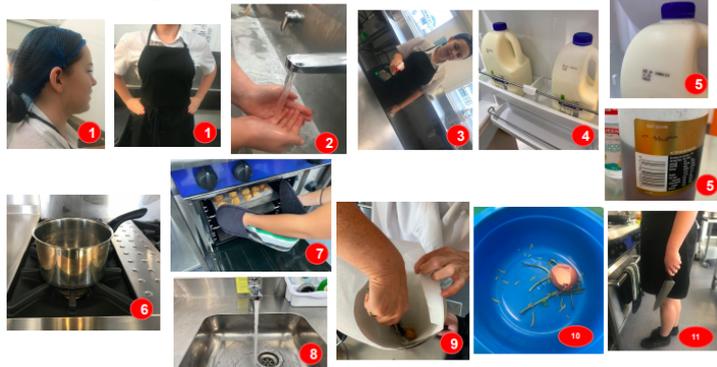


### Health & Safety Plan

Having a health & safety plan is a crucial part of any hospitality business. This plan ensures that all health and hygiene measures are met so that no customers become ill off any food handled and produced. Due to the recent circumstances involving the COVID-19 pandemic, we have adapted our health and safety plan to include more regular sanitising of surfaces and equipment as well as more regularly increased longer hand washing techniques before during and after practicals. Below are some of the health & safety precautions I take when going through any practical.

- 1 Health and Safety procedures are followed in the form of: wearing closed shoes, aprons, hair tied back with hair net, no nail polish, no jewellery.
- 2 Hand washing- Washing hands for at least 20 seconds with antibacterial soap to remove bacteria and drying with a single use paper towel.
- 3 Sanitising all surfaces before, during and after practicals to remove bacteria and pathogens.
- 4 Perishables are kept in fridge until use to avoid products spoiling.
- 5 All ingredients are checked for any spoilage and best before dates are checked.
- 6 Pot Handles are facing inwards to avoid any spills and injuries.
- 7 Using oven mitts when putting trays in and out of oven to avoid any burns that could have been avoided.
- 8 Cold water on standby for burns to help cool down any burns.
- 9 Use tongs to stack profiteroles with the hot toffee to decrease any risk of burns.
- 10 Food scraps are placed in scrap bowl and discarded when appropriate decreases the risk of contamination from rubbish to food.
- 11 Correct knife practices and procedures are followed such as holding knife by side when walking to avoid any injuries.

### Health & Safety Plan Photos



### Quality Control Plan

Below are some of the Quality Control points that I have noted to ensure my croquebouche turns out exactly how I want it to and so that it meets all of my specifications.

- 1 All ingredients have been weighed correctly using precise scales and all equipment eg. measuring cups and spoons have been leveled off for accuracy.
- 2 Eggs are added one at a time when making the choux pastry to allow each egg to first be absorbed and to be absorbed easier.
- 3 Finger is dipped in cold water and any choux pastry peaks are pressed down to make even round profiteroles.
- 4 Oven must be preheated and racks must be in the centre to allow for the best distribution of heat to bake profiteroles perfectly.
- 5 Profiterole shapes are piped the same round dots of 2.5cm wide.
- 6 Whisk is used for the creme patissiere for the texture to be completely smooth and free of any lumps.
- 7 Stirring white chocolate every 20 second when melting in microwave to avoid chocolate from burning or seizing.
- 8 Wiping down sides of toffee pot with cold water and a pastry brush to avoid sugar crystallizing.
- 9 Placing plastic wrap directly on creme patissiere surface to ensure no skin forms.
- 10 Electric beater is used for the choux pastry for accuracy and to ensure the mixture is perfectly mixed and smooth.

### Quality Control Plan Photos



### Yields and Costs

Product	Amount Used	Unit Price
Plain Flour	1 Cup & 3 Tablespoons	\$1.40
Butter	110 grams	\$0.24
White Sugar	1 cup & 7 Tablespoons	\$0.54
Vanilla Bean Pod	1 Pod	\$6.00
Glucose Syrup	1 Tablespoon	\$0.15
Eggs	10	\$3.80
Milk	2 Cups (480 ml)	\$0.80
Cornstarch	3 Tablespoons	\$0.25
Caster Sugar	¼ of a cup	\$0.12
White Chocolate	100 grams	\$0.12
Freeze Dried Raspberries	1 Teaspoon	\$1.25
<b>Total Price:</b>		<b>\$14.67</b>

The total price for me to make my croquebouche including the choux pastry, creme patissiere, toffee and decorations is \$14.67. I will divide this price by 30 to get the unit price for each of my profiteroles as I am producing 30 profiteroles. The unit price for one of my profiteroles is 48 cents. This is slightly more expensive compared to the existing profiterole products on the market however as I am using high end natural products which taste better and are more visually appealing the price increase is justifiable for a higher quality product. This is also on the higher side of my predicted cost that each profiterole would cost between 25-50 cents to make, however my final unit price is still within this price range. This cost also excludes any other expenses including power, water and labour which should also be considered as they add to the cost of production. The most expensive ingredient is the vanilla bean pod which can easily be replaced with much cheaper alternatives of vanilla essence or vanilla bean paste.

Due to my croquebouche ingredients costing a total of \$14.67 I can say that my croquebouche meets the specification of costing less than \$15 to produce.

7

6

### Final Product- How I met the specifications

My croquebouche has met its specification of holding its shape without any support and using a croquebouche cone and toffee to assemble.

My profiterole has met its specification of having a pleasant sweet, vanilla, berry and white chocolate scent.

My profiteroles met the specification of being hollow and having a perfect pastry to filling ratio.

My creme patissiere met its specification of having a nice flavour by being infused by vanilla bean.

My croquebouche has met its specification of profiteroles being used to form the base of the entire structure by using 30 stacked profiteroles.

My croquebouche has met its specification of having some type of decorative element which include crystallized pansies, white chocolate drizzle with raspberries and spun sugar shapes.

My croquebouche has met its specification of being aesthetically pleasing by using a range of decorative elements seen in the photos below.

My profiteroles met their specification of being all the same size of 4cm in diameter.

My croquebouche meets the specification of being at least 18 cm tall as it is 29 cm in height.

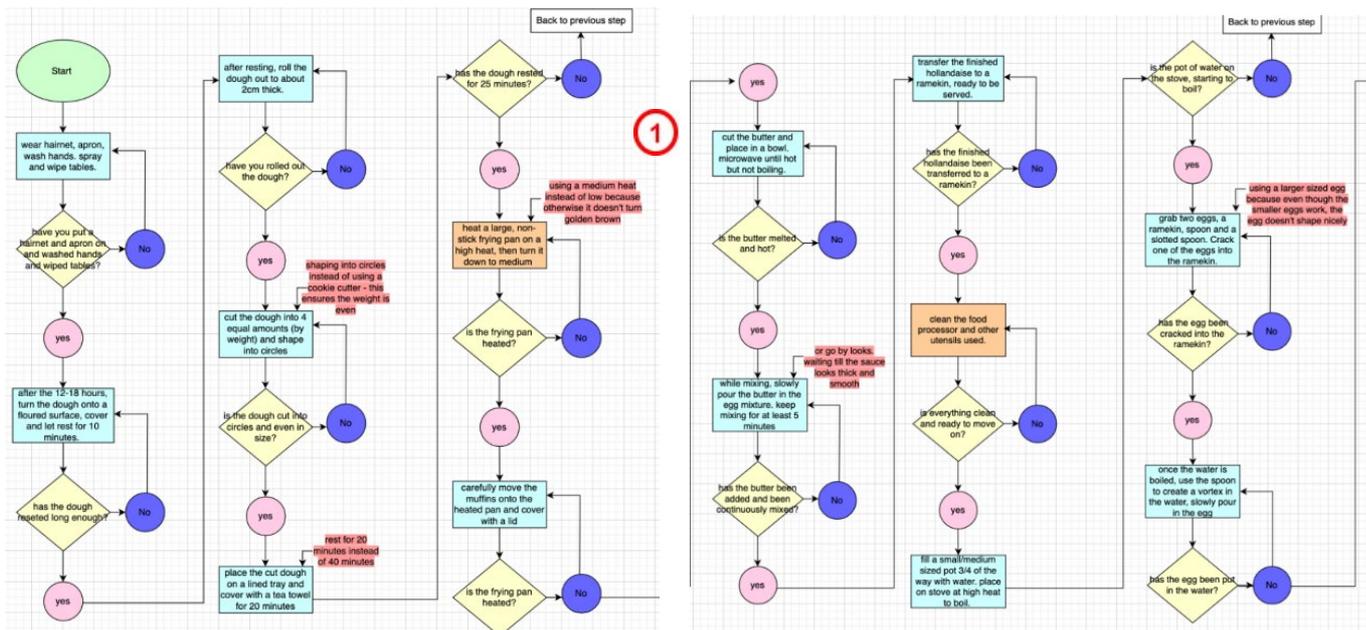
My profiteroles have met its specification of having a filling that is a creme patissiere that is vanilla flavoured.

My Creme patissiere met its specification of being smooth, creamy and having a viscosity of 1.

My croquebouche has met its specification of not costing more than \$15 to produce. See Slide 35 for reference.

	Grade Boundary: Low Achieved
5.	<p>For Achieved, the student needs to implement complex procedures to process a specified product.</p> <p>This involves:</p> <ul style="list-style-type: none"> <li>• creating a flow diagram showing interactions between processing operations and tests</li> <li>• executing processing operations and tests in accordance with the steps in the flow diagram</li> <li>• modifying processing operations in response to testing feedback</li> <li>• undertaking accurate testing using replicate measurements</li> <li>• explaining processing operations and how reliable test feedback can be used to inform choice of processing operations, equipment, time, temperature and/or techniques for processing the product</li> <li>• calculating yield</li> <li>• calculating actual financial costs per unit</li> <li>• developing and implementing a health and safety plan and a quality assurance plan.</li> </ul> <p>This student has implemented complex procedures to process eggs benedict.</p> <p>They have created a flow diagram that shows the interaction between the processing operations required to make muffins, poach the eggs and make the hollandaise sauce. They have executed processing operations and tests in accordance with the steps in the diagram (1).</p> <p>The student has undertaken accurate testing using replicate measurements. For example, they have randomly measured item-to-item variation for the muffins, and repeated this testing in a second production run (2).</p> <p>A brief explanation has been given for how the processing operations and testing feedback informed choices of equipment, time, temperature and technique for processing the components of the eggs benedict (3).</p> <p>The student has used the weight of all raw ingredients and the weight of the end product to determine the total cost of all resources, and they have divided this by units produced to calculate actual unit cost (4).</p> <p>A HACCP plan has also been written, which includes a quality assurance plan for testing (5).</p> <p>For a more secure Achieved grade, further explanation is required of how testing feedback informed selections of time and temperature for processing muffins and hollandaise sauce.</p>

**Student 5: Low Achieved**  
Intended for teacher use only

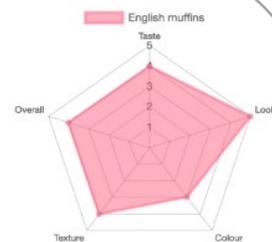


**Trial one:**

**Aim:** My aim is to make English muffins for the first time.

**Specification:**

- Crisp on the outside
- Golden coloured
- Light and airy (not doughy)
- Appropriately sized for requirements

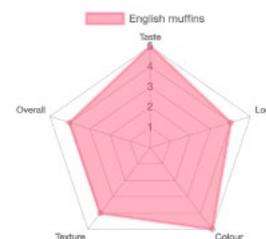


**Trial two:**

**Aim:** My aim for this trial is to see if there will be any effect to my dough if I rest it at room temperature rather than in the fridge

**Specification:**

- Crisp on the outside
- Golden coloured
- Light and airy (not doughy)
- Appropriately sized for requirements



**Recipe Modification/changes:**

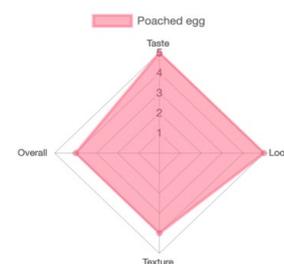
Instead of putting my dough in the fridge, I left it on the bench (at room temperature) to see if that would change anything when it came to cutting and cooking the muffins

**Trial three:**

**Aim:** My aim for this trial was to see if cutting the time the dough needs to be rested would affect the outcome of the English muffin and cutting the dough differently from the first two trials.

**Specification:**

- Crisp on the outside
- Golden coloured
- Light and airy (not doughy)
- Appropriately sized for requirements



**Recipe modification/changes:** In this trial I decided to see if changing the amount of time I rested the muffin dough would make a difference. Prior to cooking the English muffins the recipe says to rest them for 40 - 45 minutes, however I cut the time in half and rested the muffins for 20 minutes. I also changed how I cut the muffins - instead of using a cookie cutter I cut the dough into four even sized pieces and tried my best to shape them into circles.

Techniques/Processes tested:	What I learned from tests and feedback
<b>Boiling the water, then reducing to a low heat</b>	When boiling the water makes sure it is hot enough to cook the egg but turning the heat down to low makes it more controllable and means the egg won't get all broken up when being cooked
<b>Putting the egg into a fine sieve (optional)</b>	This can be done to remove the watery egg white from the egg to help with the eggs shape when poaching, stops there being too much loose egg white around the egg which look better and has better texture
<b>Stirring the water into a vortex</b>	This swirls the egg around, keeping all the egg together and creating the desired shape. Making them look better.
<b>Placing the egg in a ramekin</b>	Makes it easier/smoothier when putting the egg into the water
Tools used in recipe:	What I learned from testing and feedback
<b>Non-stick frying pan/lid</b>	Is the best to cook the muffins as the lid keeps the steam in and this helps cook the muffins on the low-medium heat
<b>Cookie cutter</b>	Cutting the muffin dough by hand was not very consistent, Miss suggested I used a 8cm cookie cutter to cut the dough into the correct shape. I learned to weigh the dough first to make sure they were all equal
<b>Rolling pin</b>	Used to roll the dough out evenly and prepare the dough to be cut by the cookie cutter
<b>Spatula</b>	The plastic spatula was better to flip the muffins as it was flexible.
<b>Scale</b>	Digital scales were really helpful and accurate for getting the weight of each muffin the same.

3

Yield/servings:		4		
Recipe Link		<a href="https://www.biggerbolderbaking.com/homemade-english-muffins/">https://www.biggerbolderbaking.com/homemade-english-muffins/</a>		
<b>English muffins</b>				
Ingredient	Purchase quantity (g)	Cost (\$)	Quantity needed for the recipe (g)	Calculated cost of the ingredient
Countdown plain flour	1500	\$2.50	177	\$0.30
Edmonds active yeast	150	\$6	1	\$0.04
Countdown salt	110	\$4	1	\$0.04
Countdown milk lite	3000	\$5.79	71	\$0.14
Countdown butter	500	\$6.50	7	\$0.09
		Price per hour (\$)	Hours to make	
Labour (min wage in NZ from 1st april 2023)		22.7	1.5	\$34.05
			Time in oven, stove, fridge (hours)	
Power (using 29c per kwh - ref Electricity Networks Association (MBIE sourced data)		0.29	0.5	\$0.15
<b>Hollandaise</b>				
Yield/serving		1 <a href="https://downshiftology.com/recipes/hollandaise-sauce">https://downshiftology.com/recipes/hollandaise-sauce</a>		
Ingredient	Purchase quantity (g)	Cost (\$)	Quantity needed for the recipe (g)	Calculated cost of the ingredient
Countdown eggs dozen free range size 7	12	11	3	\$2.75
Countdown lemon juice	250	2.2	21.25	\$0.19
Countdown dijon mustard	200	3.5	5	\$0.09
Essentials salt iodised	500	2.1	1.4	\$0.01
Mainland unsalted butter	500	8.5	113	\$1.92
		Price per hour (\$)	Hours to make	
Labour		22.7	0.3	\$6.81
			Time in oven, stove (hours)	
Power		0.29	0.5	\$0.15

4

**HACCP**

**English Muffins:**

CCP/QCP Critical Control Point Quality Control Point	Process Steps from your flowchart	Hazard What is the risk? What could go wrong?	Risk Assessment CCP = High QCP = Low	Control What will you do to minimise/stop the hazard?	Test How will you check this?
CCP	Take all jewellery off. Wash hands with hot water and soap. Put hair net on and tuck in all the hair.	Physical and Biological (hair coming out and hands not washed, filled with bacteria)	High	Wear a hair net and tuck in all your hair. Wash hands for 30 seconds with hot water and soap.	Visual & Time
CCP	Spray and wipe the work surface with antibacterial spray	Biological (tables can be filled with bacteria and germs)	High	Spray and wipe work surface with antibacterial spray	Visual
CCP	Gathering all ingredients together	Biological (ingredients might be expired/spoiled)	High	Check the expiry dates for all the ingredients or for moulds.	Visual
QCP	In a medium bowl add the flour, yeast and salt. Mix briefly. Set aside	Physical - If the yeast and salt touch directly, the salt can kill the yeast.	Low	Put the salt and yeast on opposite sides of the bowl and mix slightly	Visual

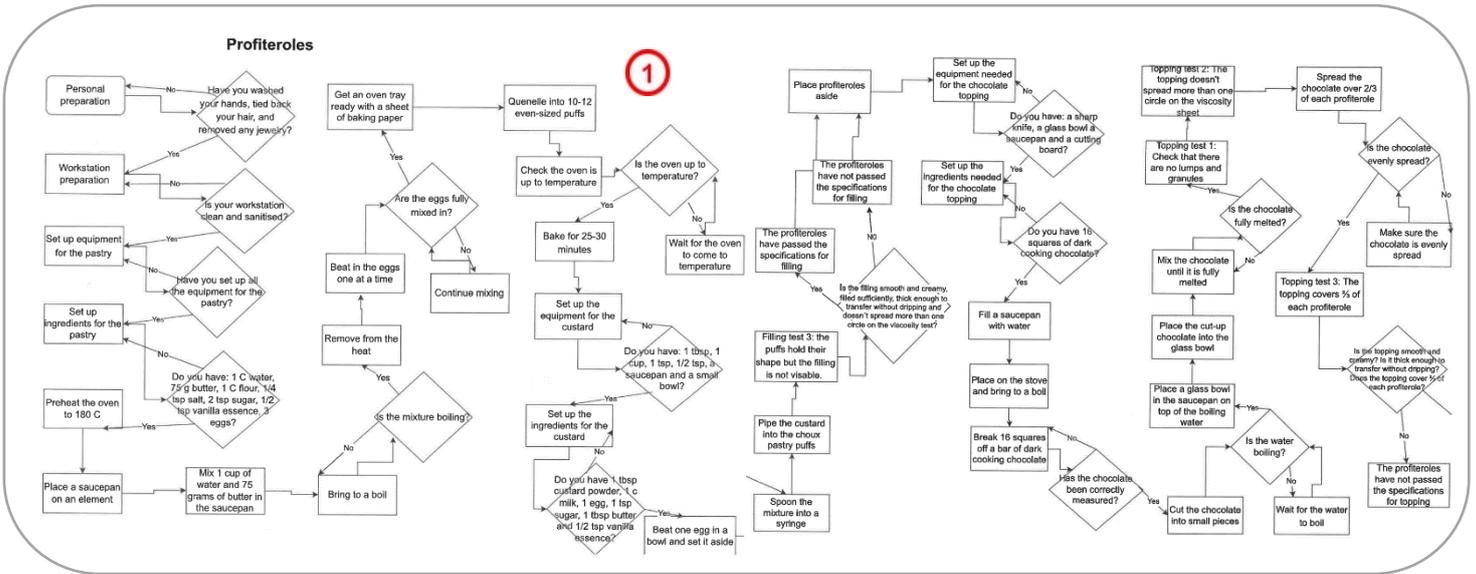
5

**Hollandaise sauce and poached eggs:**

CCP/QCP Critical Control Point Quality Control Point	Process Steps from your flowchart	Hazard What is the risk? What could go wrong?	Risk Assessment CCP = High QCP = Low	Control What will you do to minimise/stop the hazard?	Test How will you check this?
CCP	Take all jewellery off. Wash hands with hot water and soap. Put hair net on and tuck in all the hair.	Physical and Biological (hair coming out and hands not washed, filled with bacteria)	High	Wear a hair net and tuck in all your hair. Wash hands for 30 seconds with hot water and soap.	Visual & Time
QCP	While mixing, slowly pour the butter in the egg mixture. Keep mixing for at least 5 minutes	Physical - Not mixing it for long enough could mean that the sauce isn't thick and smooth. Adding the butter too fast could cook the egg.	Low	Putting a timer on to make sure that it has been mixed for at least 5 minutes.	Visual & Time
QCP	Transfer the finished hollandaise to a ramekin, ready to be served	Physical - It spills or separates while sitting waiting to be served.	Low	Stirring it slightly regularly while waiting to use it.	Visual
CCP	Clean the food processor and other utensils used	Physical and biological - If it isn't cleaned properly it could cause bacteria to grow.	Low	Cleaning and drying the food processor and utensils properly, checking them when done.	Visual

	Grade Boundary: High Not Achieved
6.	<p>For Achieved, the student needs to implement complex procedures to process a specified product.</p> <p>This involves:</p> <ul style="list-style-type: none"> <li>• creating a flow diagram showing interactions between processing operations and tests</li> <li>• executing processing operations and tests in accordance with the steps in the flow diagram</li> <li>• modifying processing operations in response to testing feedback</li> <li>• undertaking accurate testing using replicate measurements</li> <li>• explaining processing operations and how reliable test feedback can be used to inform choice of processing operations, equipment, time, temperature and/or techniques for processing the product</li> <li>• calculating yield</li> <li>• calculating actual financial costs per unit</li> <li>• developing and implementing a health and safety plan and a quality assurance plan.</li> </ul> <p>This student has implemented complex procedures to process profiteroles.</p> <p>They have created a flow diagram that shows the interaction between processing operations required to make the choux pastry and custard (1).</p> <p>The student has undertaken processing operations and tests in accordance with steps in the diagram (2), and modified processing operations in response to testing feedback (3).</p> <p>Replicate testing relating to making the profiterole has also been undertaken (2, 4). For example, the student has taken random samples from one production run and tested them for desired crispiness and size. They have then repeated the same test on a different production run.</p> <p>The weight of all raw ingredients and the weight of the end product have been used to determine the total cost of all resources. This was divided by units produced to calculate actual cost per profiterole (5).</p> <p>A health and safety plan (6) and a quality assurance plan (7) has been developed and implemented.</p> <p>To secure an Achieved grade, additional testing between two batches of the choux pastry recipe would have helped to ensure that properties identified in the quality control and specifications could be met. This replication would test whether the desired properties can be seen in samples from both batches.</p> <p>Additional explanation of how testing feedback was used to inform selection of equipment, time and techniques is also required.</p>

**Student 6: High Not Achieved**  
 Intended for teacher use only



**Tests**

2

To test that we baked the profiteroles for the correct amount of time, we tested the crispiness by checking that the profiteroles resisted a gentle prod.

To test that we added the correct amount of each ingredient, we tested the airiness by checking that the profiteroles were moist and chewy but not doughy.

To test that all our profiteroles were an equal size, we used a ruler to measure them.

We used a viscosity sheet to measure the viscosity of the filling, to make sure that it was the correct thickness.

We used a viscosity sheet to measure the viscosity of the topping to make sure that it was the correct thickness.

**Modifications**

3

The profiteroles were proportionally correct, and not too much or too little of any ingredient was added. The profiteroles rose to have enough air that I could successfully pipe the filling inside. The profiteroles had a good texture, and the desired taste.

Through the trials of creating the profiteroles, we modified the measurements of several ingredients to fit our desired results. One example is that we changed the number of eggs from three to two, the reason being that in our trials we found the profiteroles to taste too much like eggs.



Profiteroles that passed the specification for quantity,

**Production Costs**

**Choux Pastry**

Ingredients (per component)	Cost per Item	Cost per Batch (12 Cream Puffs)	Cost per Batch (halved)	Cost per Single Unit
Butter (75 g)	\$6.00 (500g)	\$0.90	\$0.45	\$0.07
Flour (150 g)	\$6.70 (1kg)	\$1.0	\$0.5	\$0.08
Sugar (11.4g)	\$5.60 (3kg)	\$0.02	\$0.01	\$0.002
Vanilla Extract (2.8 g)	\$6.99 (50ml)	\$0.39	\$0.20	\$0.03
Eggs (3)	\$6.00 (12 pack)	\$1.50	\$0.75	\$0.13
Salt (1.4 g)	\$1.69 (300g)	\$0.03	\$0.02	\$0.003
<b>Total</b>	<b>\$32.98</b>	<b>\$3.84</b>	<b>\$1.93</b>	<b>\$0.32</b>

**Chocolate Topping**

Ingredients (per component)	Cost per Item	Cost per Batch (12 Cream Puffs)	Cost per Batch (halved)	Cost per Single Unit
Chocolate (84 g)	\$5.50 (250g)	\$1.83	\$0.91	\$0.15
<b>Total</b>	<b>\$5.50</b>	<b>\$1.83</b>	<b>\$0.91</b>	<b>\$0.15</b>

**Total Costs**

Ingredients (per component)	Cost per Item	Cost per Batch (12 Cream Puffs)	Cost per Batch (halved)	Cost per Single Unit
	\$71.97	\$9.91	\$4.97	\$0.83

**Energy Costs**

Appliance	Temperature	Time	Energy	Cost
Electric oven	180 C	1 hour	2.0kw	\$0.32

**Custard Filling**

Ingredients (per component)	Cost per Item	Cost per Batch (12 Cream Puffs)	Cost per Batch (halved)	Cost per Single Unit
Flour (85 g)	\$6.70 (1kg)	\$0.60	\$0.30	\$0.05
Milk (340 ml)	\$2.20 (1L)	\$0.75	\$0.38	\$0.06
Eggs (3 yolks)	\$6.00 (12 pack)	\$1.50	\$0.75	\$0.13
Sugar (170 g)	\$5.60 (3kg)	\$0.32	\$0.16	\$0.03
Butter (7.15 g)	\$6.00 (500g)	\$0.08	\$0.04	\$0.007
Vanilla Extract (7.15 g)	\$6.99 (50ml)	\$0.99	\$0.50	\$0.08
<b>Total</b>	<b>\$33.49</b>	<b>\$4.24</b>	<b>\$2.13</b>	<b>\$0.36</b>

**Labour**

Minimum wage: \$21.50  
Labour cost per unit: \$1.79  
Materials: \$0.83

Total cost per cream puff: \$2.94

5

**Hazard Analysis and Critical Control Points for Profiteroles**

**Choux Pastry**

Process	Hazard	Control Points	Standard	Monitoring Action	Corrective Action
Receiving Ingredients	-Butter could have gone rancid from light or heat exposure. -Eggs could be contaminated if the shell is dirty.	-The packaging of the butter, and the temperature it is stored. -The source and the cleanliness of the eggs.	The ingredients are taken from a reliable source with packaging that is intact upon use. The butter is kept in a chilled area.	Check the expiry dates of the products as well as the smell and visual appeal.	If products are rancid or expired, then discard them.
Storing Ingredients	-Bacterial growth could occur in the eggs or butter if they are light or heat exposure. -Insect infestation in the flour if it isn't correctly sealed.	-The temperature of the fridge, as well as the packaging on the butter. -The storage method of the flour.	-The butter and eggs are kept in a chill environment. -The ingredients are taken from a reliable source with packaging that is intact upon use.	-Check the expiry dates of the products as well as the smell and visual appeal. -Check the temperature of the fridge. -Check the products are correctly sealed.	-If products are rancid or expired, then discard them. -If an insect infestation is found in flour, discard the flour.
Preparing Choux Pastry	Cross contamination from unclean work surfaces or	-Ensure personal and workstation hygiene is to a good	-Dishwashing and cleaning policy applied. -Personal	Follow the necessary methods for cleaning the kitchen, and	Dispose of any contaminated pastry.

6

**Quality Assurance Plan**

A quality assurance plan is a series of steps to help companies deliver consistent quality of their product. A plan might include measuring a product like profiteroles to ensure they all have the same dimensions of height, as well as the same amount of filling and topping, and the same colour. During the production process, a quality assurance plan plays an important role, keeping the standards of hygiene, health, and safety practices high. To ensure we were correctly following our quality assurance plan, we set out specifications and tests. This included testing that all our profiteroles had a very similar proportion, appearance, and dimension.

The proportion of our profiteroles included the amount of choux pastry mixture used to quennelle each profiterole, as well as the amount of filling and topping needed to fill and cover each profiterole to the same level. To test the proportion, we used visual tests to ensure our profiteroles passed the specifications. This included making sure there was no visible filling, and the topping covered 2/3 of each profiterole.

To test the appearance of our profiteroles, we ensured that all of the profiteroles were visually the same. This included using a ruler to measure the size of each profiterole, making sure they all measured 5-6 centimetres in diameter. As well as visually checking the filling and topping of each profiterole, to guarantee they were filled and covered uniformly.

The dimension of our profiteroles included the measurement of each profiterole. To test this, we used a ruler to measure each profiterole, ensuring that they were an equal dimension of 5-7 centimetres high and 6 across.

We used visual checks to guarantee that our workstations and ourselves were to the required health and safety standard, ensuring that the equipment and surfaces were visually clean, as well as our aprons. We ensured that our hair was tied back, and that we were wearing no jewellery, as well as that our hands were thoroughly washed. We checked the expiry dates of all our ingredients, discarding any ingredients that were out of date.

Chilled ingredients such as butter, eggs, and milk were stored in the fridge, at a temperature below 5 degrees celsius to prevent them from going rancid. Other ingredients, including flour and sugar, were stored in airtight containers to prevent mould and pest contamination. Any ingredients we didn't use were given to the pigs, preventing waste. Any packaging that could be recycled was.

7