



**COST COMPARISON OF FROZEN FOOD AND
FRESH FOOD IN A
SMALL PUB OR RESTAURANT**

MAY 2009

**A BFFF PROJECT IN CONJUNCTION WITH THE
MANCHESTER FOOD RESEARCH CENTRE**



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1. EXECUTIVE SUMMARY

The BFFF launched a foodservice campaign in March which aims to highlight a business case for using frozen food. As part of this, the BFFF instructed the Manchester Food Research Centre to conduct a 'cost comparison' study; investigating the overall cost of using frozen foods compared to 'freshly prepared' foods. The study investigates two set menus (i.e. 2 x starters, 2 x main courses, and 2 x desserts).

BFFF, via a leading national wholesaler, supplied MFRC with each of the above in its frozen format and asked MFRC to recreate the exact same dish using fresh ingredients - evaluating the cost implications on the way. Photographic standards of individual servings are used to ensure the dishes fresh vs. frozen were very similar in appearance.

On the whole the study considered it was more cost effective to buy ready made frozen alternatives than producing dishes from 'scratch', particularly the more labour intensive products such as canapés which involves a high skill level at a considerable cost.

The large time factor involved in the preparation, cooking and finishing times would be significantly reduced using the frozen alternative. This would save on energy costs - for example the three hour cooking time of the lamb shank. Costs would also be saved in terms of wastage - as there would be no if very little preparation of ingredients when using a frozen alternative. In addition, staff costs could be kept to a minimum - as the skill levels of the staff required to run the kitchen would be minimal.



2. METHODOLOGY OF THE PROJECT

The meals tested were two starters, two main meals and two desserts, which were commonly served within UK pubs, restaurants and hotels.

The meals which were evaluated - and which would form the basis of the study when comparing the costs of frozen vs. 'fresh' - are listed below;

- A mixed pack of Classic Canapés (buffet)
- A Breaded Camembert (starter)
- A Lamb Shank (main course)
- Salmon en Croute (main course)
- Profiteroles (dessert)
- Strawberry Cheesecake (dessert)

BFFF, via a leading national wholesaler, supplied MFRC with each meal in its frozen format, along with recipe and product specifications. Their 'fresh' counterparts were made based on these recipes and specifications, to exactly the same weight and serving size. Photographic standards of individual servings were taken to ensure the dishes frozen vs. 'fresh' were very similar in appearance (see Appendix 1).

The cost implications taken into consideration were in the following areas;

- The raw material ingredient costs for each dish (for the 'fresh' dish) or total dish cost (for the pre-prepared 'frozen' dish)
- The cost of energy used to prepare these ingredients into a meal versus cooking a prepared meal (fresh vs. frozen);
- Any wastage costs associated with the preparation of ingredients;
- The costs associated with washing (ingredients) and cleaning; and,
- The cost of the manpower used to create dishes out of individual ingredients.

A breakdown and calculation of these costs is detailed in the 'Cost Descriptors' section of this report.

The basis of these costs is calculated on the running of a small public house or restaurant offering reasonably priced unpretentious meals to the general public.

'Fresh' dishes were made using readily available ingredients and store cupboard basics within such establishments. Raw material costs are based on one portion, with dish spreadsheets showing cost per unit.

It was felt that the meals would be made on a daily basis from wholesalers, supermarkets or cash & carry outlets, and that the ingredients would have little or no storage time - to minimise both the costs associated with storage plus carrying large amounts of ingredient stocks.

The secondary costs include raw material wastage (all peelings and trimmings were weighed), energy costs (these will vary considerably depending of the appliance model, age and efficiency – however average figures were used), water costs used in preparation (washing etc) and cleaning, cost of detergents and sanitizers.

It was anticipated that such establishment kitchens would be manned by a chef and a kitchen assistant - the wage costs of which were sourced through internet based recruitment sites for the hospitality sector. It was calculated that whilst staff were preparing one portion they would plate up approximately eleven other portions - therefore staff costs were divided by twelve. This was felt to be a more realistic representation of the effective utilisation of staff by the establishment management.

The cost comparisons were calculated per portion to reflect the prices supplied by a leading national wholesaler, and the cost difference was expressed as a figure and a percentage. The cost comparisons are discussed in the Discussion and Conclusion Section of this report.



3. COST DESCRIPTORS

The following section details the calculations used in determining the specific cost for each of the parameters that would impact on the finished meal cost.

Staff Costs

The staff costs are based on the grade and skills of the kitchen staff needed to make each 'fresh' dish, as well as the time in minutes taken for the preparation, cleaning and finishing activities.

Staff costs are based on two grades:

- Grade A - Finishing Time - Chef
- Grade B - Preparation Time, Cleaning Time – Kitchen assistant

The cost of a Grade A kitchen staff member is calculated at £ 9.00 per hour which is based on average industry figures which equates to £ 0.15 per minute (<http://jobs.trovit.co.uk/jobs/pub-chef>).

The cost of a Grade B kitchen staff member is calculated at £ 5.73 per hour which is based on Basic Minimum Wage, equating to £ 0.095 per minute (http://www.direct.gov.uk/en/Employment/Employees/Pay/DG_10037277).

Wastage Costs

Average wastage cost by weight, per ingredient, based on raw material preparation is 10%.

This cost was determined by weighing the average ingredient peelings and trimmings.

This amount was added to the relevant ingredient in the final costings, as not all ingredients generated waste. The ingredient is identified on the spreadsheet by an asterisk (*)

Energy Costs

The energy costs associated with cooking time in the oven, where applicable, are calculated as electricity per minute. Cooking time on the hob where applicable is calculated as gas per minute.

The cost of using a Gas Burner per hour is £0.063 which equates to £0.001 per minute (<http://www.powergen.co.uk/NR/rdonlyres/611BDBE9-E510-4F8D-B10C-C886BBD1E904/0/USAGECARD.pdf>).

The cost of using an Electric Oven per hour is £0.097 which equates to £0.002 per minute (<http://www.powergen.co.uk/NR/rdonlyres/611BDBE9-E510-4F8D-B10C-C886BBD1E904/0/USAGECARD.pdf>).

Storage costs are negligible as it is assumed that ingredients are being bought to order on day of producing dish.

Water Costs

Water is used in food preparation and cleaning, as well as within some recipes.

During preparation of each dish, it is calculated that on average 5 litres of water is used, and 40 litres is used during cleaning (one sink full). These figures are used as a cost per 'fresh' dish portion. The removal of waste water is also taken into consideration.

Water figures do vary considerably based on the rateable value of the property or if a water meter is fitted it will depend on water use. However the approximate cost of water per litre is £0.002 (e.g. Severn Trent charge 108.77p per cubic metre for water and 77.23p per cubic metre for sewerage. One cubic metre is 1,000 litres, which equates to 0.108p per litre for water and the combined figure for water and 0.184p for sewage)

Cleaning Costs

The cleaning costs include staff plus detergent costs only. Water has been taken into consideration in the section above.

The cost of detergent is based on the amount required (auto dosed 10ml) per sink full of water. The cost of detergent is £10.00 per litre which equates to £0.10 per 10ml dose. The detergent is auto dosed which reduces the risk of over using the detergent.

Raw Material Costs

Raw material costs are calculated based on a combination of wholesale, supermarket prices and cash & carry prices, although there appeared to be very little difference in these prices.

Wholesale figures were gained via MMU wholesale prices and compared via a visit to a Cash and Carry outlet in Manchester. Supermarket prices were sourced from a leading UK supermarket.

Units Manufactured

Due to the high staff costs in producing one unit it was agreed that a chef would manufacture a dozen units in the time allocated for preparation, cooking and finishing one 'fresh' dish.

Staff costs would need to reflect this, in order to be a realistic representation of the operation of a pub or restaurant kitchen.



4. PRODUCT COST SPREADSHEETS INCLUDING METHODOLOGY

The following section of spreadsheets determines the costs associated with the manufacture of the following 'fresh' meals;

- A mixed pack of Classic Canapés (buffet)
- A Breaded Camembert (starter)
- A Lamb Shank (main course)
- Salmon en Croute (main course)
- Profiteroles (dessert)
- Strawberry Cheesecake (dessert)

The 'notes box' includes the preparation, cooking and finishing times as well as a brief description of the methodology for each of the aforementioned meals.

The spreadsheet breaks down the recipe into its individual constituents and calculates the total cost of raw materials per portion.

The other costs associated with preparation of 'fresh' dishes are also detailed, such as energy, wastage, washing, cleaning and manpower costs used to create the dishes.

| Dish Name | Deep Fried Camembert x 2 | | | | |
|------------------|--------------------------|-----------|-----------|--------------------------------|-------------|
| Ingredients | Amount | Unit Size | Food Cost | | |
| Camembert Cheese | 50 | Grms | 0.09 | Staff Cost Grade A | 0.03 |
| Breadcrumbs * | 10 | Grms | 0.01 | Staff Cost Grade B | 0.08 |
| Egg * | 0.25 | Each | 0.03 | Energy Cost | 0.01 |
| Plain flour * | 50 | Grms | 0.01 | Water Cost | 0.09 |
| | | | | Cleaning Cost | 0.10 |
| | | | | Raw Materials | 0.13 |
| | | | | Wastage @ 10% of * ingredients | 0.01 |
| | | | | Total Dish Cost | 0.45 |
| | | | | | |
| | | Total | 0.13 | | |

Preparation time - 10 minutes @ Grade B

Cooking time 5 minutes at 180C
Finishing time - 2 minutes @ Grade A

Method

Prepare egg wash, flour, breadcrumbs.
Prepare camembert and pass through seasoned flour, egg and bread crumbs.
Clean work surface.
fry for five minutes at 180C.
Serve.

| Dish Name | Canape x 4 Portions | | | | |
|-----------------------|---------------------|-----------|-----------|--------------------------------------|-------------|
| Ingredients | Amount | Unit Size | Food Cost | Staff Cost Grade A | 0.38 |
| Crostini | 12 | 1x 30 | 0.50 | Staff Cost Grade B | 0.95 |
| Avocado * | 0.25 | Each | 0.21 | Energy Cost | 0.01 |
| Lime Juice | 5 | ml | 0.01 | Water Cost | 0.09 |
| Prawns | 50 | grms | 0.29 | Cleaning Cost | 0.10 |
| Goats Cheese | 25 | grms | 0.27 | Raw Materials | 0.47 |
| Yellow & Red Pepper * | 25 | grms | 0.12 | Wastage @ 10% of * ingredients | 0.05 |
| Courgette * | 25 | grms | 0.06 | | |
| Sun dried Tomatoes | 10 | grms | 0.09 | Total Dish Cost per 3 Canapes | 2.05 |
| Tomato * | 50 | grms | 0.09 | | |
| Oil | 10 | ml | 0.01 | | |
| Brussels Pate * | 25 | grms | 0.16 | | |
| Gherkin | 25 | grms | 0.09 | | |
| | | | | | |
| | | Total | 1.89 | | |

Preparation time - 40 minutes @ Grade B

Cooking time - 10 minutes
Finishing time - 20 minutes @ Grade A

Method

Prepare, pate, avacado, and salsa for canapes.
Prepare garnishes for canapes.
Clean work surface.
Assemble canapes and garnish.
Place on service dish and serve.

| Dish Name | Lamb Shank | | | | |
|-------------------|------------|-----------|-----------|--------------------------------|-------------|
| Ingredients | Amount | Unit Size | Food Cost | Staff Cost Grade A | 0.06 |
| Lamb Shank | 430 | grms | 2.87 | Staff Cost Grade B | 0.12 |
| Carrots * | 50 | grms | 0.04 | Energy Cost | 0.24 |
| Potatoes * | 50 | grms | 0.03 | Water Cost | 0.09 |
| Red Wine Sauce | | | | Cleaning Cost | 0.10 |
| Red Wine | 50 | mls | 0.17 | Raw Materials | 3.53 |
| Demi Glace | 31.25 | grms | 0.25 | Wastage @ 10% of * ingredients | 0.02 |
| Rosemary * | 0.25 | Packet | 0.10 | | |
| Red Currant Jelly | 25 | grms | 0.06 | Total Dish Cost | 4.16 |
| | | | | | |
| | | Total | 3.53 | | |

Preparation time - 15 minutes @ Grade B

Cooking time 2 hours at 150C
Finishing time - 5 Minutes @ Grade A

Method

Prepare vegetables for dish and par boil.
Clean worksurface.
Seal lamb shank and place in oven at 150C for 2 hours.
Remove from oven.
Place cooking liquor in pan and add red wine reduction and par boiled vegetables and heat through.
Add lamb shank and serve.

| Dish Name | Salmon en Croute | | | | |
|------------------|------------------|-----------|-----------|--------------------------------|--------------|
| Ingredients | Amount | Unit Size | Food Cost | Staff Cost Grade A | 0.13 |
| Puff Paste * | 118 | grms | 0.23 | Staff Cost Grade B | 0.28 |
| Salmon Fillet | 40 | grms | 0.34 | Energy Cost | 0.02 |
| White Wine Sauce | 50 | mls | 0.13 | Water Cost | 0.09 |
| Brie | 20 | grms | 0.11 | Cleaning Cost | 0.10 |
| Cream cheese | 20 | grms | 0.05 | Raw Materials | 1.13 |
| Dill | 10 | grms | 0.27 | Wastage @ 10% of * ingredients | 0.02 |
| Seasoning | 1 | Pinch | 0.01 | | |
| Smoked Salmon | | | 0.11 | Total dish cost | £1.89 |
| Shallot | | | neg | | |
| | | | | | |
| | | Total | 1.25 | | |

Preparation time - 35 minutes @
Grade B

Cooking time 20 minutes at 180C
Finishing time - 10 minutes @
Grade A

Method

Add brie, cream cheese and chopped dill to white wine sauce. Roll out puff paste putting salmon and sauce into middle. Make into a parcel and seal. Place on a greased baking tray and egg wash. Bake in the oven for 20 minutes at 180C. Clean worksurface. Remove from oven and serve.

| Dish Name | Strawberry Cheesecake | | | | |
|--------------------|-----------------------|-----------|-----------|--------------------------------|-------------|
| Ingredients | Amount | Unit Size | Food Cost | | |
| | | | | Staff Cost Grade A | 0.13 |
| Whipping Cream * | 100 | ml | 0.28 | Staff Cost Grade B | 0.20 |
| Strawberries * | 25 | grms | 0.10 | Energy Cost | |
| Shortcake Biscuits | 10 | grms | 0.01 | Water Cost | 0.09 |
| Arrowroot | 5 | grms | 0.03 | Cleaning Cost | 0.10 |
| Sugar | 10 | grms | 0.01 | Raw Materials | 0.47 |
| Gelatine | 1 | Leaf | 0.04 | Wastage @ 10% of * ingredients | 0.04 |
| | | | | | |
| | | | | Total Dish Cost | 1.03 |
| | | | | | |
| | | Total | 0.47 | | |

Preparation time - 25 minutes @ Grade B

Finishing time - 10 minutes @ Grade A

Method

Prepare mousse, using cream, strawberries and gelatine.
 Prepare biscuit base and place in mould and the mousse mix and refrigerate for 30 minutes.
 Clean down work surface.
 Prepare glaze for top of dish.
 Remove from refrigerator add chopped strawberries and glaze.
 Remould and serve.

| Dish Name | Profiteroles x 12 | | | | |
|------------------|-------------------|-----------|-----------|---|-------------|
| Ingredients | Amount | Unit Size | Food Cost | | |
| | | | | Staff Cost Grade A | 0.38 |
| Water | 0.75 | Pint | | Staff Cost Grade B | 0.71 |
| Butter | 155 | grms | 0.52 | Energy Cost | 0.08 |
| Flour | 185 | grms | 0.05 | Water Cost | 0.09 |
| Whipping Cream * | 300 | ml | 0.84 | Cleaning Cost | 0.10 |
| Eggs | 6 | Each | 0.60 | Raw Materials | 0.62 |
| Chocolate Sauce | | | | Wastage @ 10% of * ingredients | 0.08 |
| Cornflour | 10 | grms | 0.02 | | |
| Milk | 0.5 | Pint | 0.17 | Total Dish Cost per 3 Profiteroles | 2.05 |
| Coca Powder | 10 | grms | 0.07 | | |
| Block Chocolate | 25 | grms | 0.12 | | |
| Sugar | 65 | grms | 0.06 | | |
| Butter | 5 | grms | 0.02 | | |
| | | | | | |
| | | Total | 2.47 | | |

Preparation time including
Chocolate Sauce - 30 minutes @
Grade B
Cooking time - 40 minutes at
160C
Finishing time 10 minutes @
Grade A

Method

Prepare choux pastry mix. Pipe on
greased tray and bake for 40
minutes 180 -150 (the cooking
time will vary as the heat as to be
monitored to ensure the product
dries sufficiently).
Clean work surface
Whip the cream and pipe into
choux buns.
Prepare chocolate sauce.
Place choux buns in service dish.
Top with chocolate sauce and
serve.



5. COST COMPARISONS

The following table highlights a summary of the cost comparison of frozen vs. 'fresh' dishes.

It includes the cost difference and % difference based on the sale price frozen dish costs supplied by a leading national wholesaler.

| Product | Frozen £ | Fresh £ | Cost £ Difference | Buying Frozen % Saving |
|------------------------|----------|---------|-------------------|------------------------|
| Canapés | 0.41 | 0.68 | 0.27 | 66% |
| Camembert ¹ | 0.48 | 0.45 | - 0.03 | - 7% |
| Lamb | 3.05 | 4.16 | 1.11 | 27% |
| Salmon | 1.77 | 1.89 | 0.12 | 6% |
| Strawberry | 0.78 | 1.03 | 0.25 | 24% |
| Profiteroles | 0.24 | 0.68 | 0.44 | 65% |

+ 0.05 'additional costs' are included within the Frozen £. This comprises £0.10 for water plus £0.04 for energy – based on worst case scenario (i.e. Fresh Lamb takes 3 hours cost is £0.24 therefore frozen will take 30 minutes at £0.04). Staff costs are 5 minutes preparation maximum @ Grade B is £0.47. This figure is for 12 units so $\text{£}0.10 + \text{£}0.04 + \text{£}0.04 + \text{£}0.47/12 = \text{£}0.05$ per portion. The costs for frozen did not include all of the regeneration overheads associated with the running of a food service establishment.

¹ It was not possible to replicate an identical 'fresh' version of the frozen breaded camembert dish. The frozen cheese component had been specially manufactured to a smaller size, whilst the 'fresh' cheese component had to be cut from the centre of a regular sized camembert. Due to the lack of an outer rind the 'fresh' product was more likely to 'burst' during the frying time and as such did not provide a like-for-like quality.



6. DISCUSSION AND CONCLUSION

The Cost Comparison study yielded the following conclusions;

On the whole it was more cost effective to buy ready made frozen alternatives than producing the food from 'scratch', particularly the more labour intensive operations such as the production of canapés which involve a high skill level.

An exception was Camembert, although the frozen dish cheese component did appear to be have been specifically manufactured for the purpose - so this may explain its higher price point. The frozen alternative also performed much better in the fryer and there was less chance of the product 'bursting' during the frying time.

The biggest cost difference is the profiteroles which again are very labour intensive. The easiest option for caterers is to buy them pre-filled with cream and then just regenerate the chocolate sauce.

'Fresh' dishes required a larger time factor for their preparation, cooking and finishing times, depending on the dish in question. For example the three hour cooking time of the lamb shank would be significantly reduced using the frozen alternative. This would save on energy costs.

'Fresh' costs would be saved in terms of wastage, as there would be no if very little preparation of ingredients when using a frozen alternative.

Staff costs could be kept to a minimum if using frozen, as the skill levels of the staff required to run the kitchen would be minimal.

'Fresh' cleaning costs would be reduced and significant savings could be made - particularly on the water used during preparation time – if frozen was used, as vegetables, fruit and salad would require no cleaning, peeling or dicing.

The study was purely based on cost comparisons and therefore no sensory differential was taken into consideration during the work carried out.



7. APPENDIX 1

PHOTOGRAPHIC STANDARDS – COMPARISON OF FROZEN AND FRESH EQUIVALENTS MEALS

Canapés – Grey Frozen, Blue Fresh



Camembert – Grey Frozen, Blue Fresh



Salmon en Croute – Grey Frozen, Blue Fresh



Lamb Shank– Grey Frozen , Blue Fresh



Strawberry Shortcake– Grey Frozen, Blue Fresh



Profiteroles– Grey Frozen , Blue Fresh

