



British Frozen Food Federation N-ice REPORT

The effect of a gourmet 'frozen' restaurant meal on diners'
perceptions of frozen food



Commissioned by
Sheffield Hallam University

CJ Harden, Centre for Food Innovation

EXECUTIVE SUMMARY

BFFF commissioned the first gourmet frozen food restaurant, branded 'N-ice', at the Westminster Kingsway College, during the week 8 – 12th August 2011. The aim of this activity was to invite diners to enjoy a restaurant quality meal and to provide evidence that top quality meals could be created using frozen ingredients.

The restaurant concept received backing by celebrity chefs Atul Kochhar, Galton Blackiston and Simon Rimmer and the menu was designed by chef lecturers at Westminster Kingsway College. All major meal components were sourced from frozen and supplied by BFFF members. Staff and students representing Westminster Kingsway College's Culinary Arts School cooked and served N-ice guests in a 'Winter Wonderland' themed dining room.

The restaurant served over six hundred diners, of which, one hundred and ninety three completed a questionnaire before and after their meal. The questionnaire was divided into five sections to examine; how frequently diners ate frozen food, the type of frozen food consumed, ratings of the sensory attributes of frozen food, ratings of the quality of frozen food and attitudes to the use of frozen food in pubs and restaurants.

The results of this report show, that dining just once at a restaurant which served only frozen food was sufficient to alter diners' perceptions of frozen food on a number of parameters. In particular, guests were 12.5% more likely to eat frozen meat, 10.3% more likely to eat frozen meal components and 14.0% more likely to eat frozen desserts. In addition, ratings of the sensory properties of frozen food increased by 5.7 – 11.8%. Finally, after their N-ice experience, guests agreed, significantly more strongly, that frozen food offered good quality, was an acceptable way for pubs and restaurants to keep meal costs down and that frozen should be more widely used in pubs and restaurants.

This is the first large scale report to present data on how a quality 'frozen' dining experience can change consumer perceptions of frozen food. Significant technological advancements, coupled with frozen food manufacturers' pledges to use only top quality ingredients for freezing is changing the face of frozen food. Consumers can be further reassured that frozen food not only offers value for money, but can also be used to provide a high quality dining experience.

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1.0 INTRODUCTION

Frozen food has been synonymous with convenience and value for money ever since it first became commercially available in the 1940's. While the frozen food market remained buoyant until the late 1990's, intense media coverage of the link between diet and health swayed public opinion of frozen food and resulted in a gentle decline in sales. The food industry responded by employing modern freezing technologies to minimise nutrient losses and insisted on using only premium quality raw foods for freezing. Subsequently, Celebrity Chefs, academics and Government reports have acknowledged the benefits of frozen food, specifically in terms of its contribution towards reduction in food waste, all year-round availability, safety, convenience, improved price stability and extended shelf life.

The message that 'freshly frozen' food offers quality and nutritional benefits is gradually becoming accepted, however consumer perceptions of frozen could still be improved. In August 2011, the British Frozen Food Federation (BFFF) commissioned the first gourmet frozen food restaurant, branded 'N-ice'. The aim of this activity was to invite diners to enjoy a restaurant quality meal and to provide evidence that top quality meals could be created from the sole use of frozen ingredients. The restaurant served over 600 diners, of which, 193 completed a questionnaire before and after their meal. The results of this questionnaire follow.

2.0 METHOD

2.1 The restaurant

The BFFF commissioned the first frozen food gourmet restaurant, branded 'N-ice', at the Westminster Kingsway College, during the week 8 – 12th August 2011.

2.2 Advertising and promotion

The restaurant was promoted through the BFFF website, publicised in consumer magazines such as Time Out, and advertised as a 'Star Deal' via bookatable.com and viewlondon.co.uk. Members of the public, press and food industry were invited to attend.

2.3 The menu

The restaurant concept received backing by celebrity chefs Atul Kochhar, Galton Blackiston and Simon Rimmer and the menu, designed by the chef lecturers at Westminster Kingsway College, comprised:

Starters

- *Atul Kochhar's crisp fried spicy John Dory with grokha chutney*
- Smoked salmon and basil terrine with anchovy butter, pickled ginger crème fraiche and citrus fruits, Melba toast
- Smoked duck with quail Scotch egg, apple chilli and mustard seed chutney
- Roasted aubergine with miso glaze, oriental broth, tempura vegetables
- Grilled asparagus, vegetables a la greque, wild mushrooms

Main course

- *Atul Kochhar's fragrant Kashmiri lamb curry*
- *Simon Rimmer's Italian bean casserole with arancini*
- Roast chicken breast with Moroccan spices, chicken ballotine stuffed with dates, cous cous, harissa sauce
- Beef encroute, creamed spinach, fondant potato, red wine sauce
- Grilled Mahi Mahi marinated in garlic and lemon, sautéed baby squid, white beans, piquillo peppers, ginger butter sauce
- Pan fried snapper, crab dumpling, coconut and lemon grass broth, crispy shallots

Desserts

- *Galton Blackiston's petit pois ice cream with mint*
- Mango soufflé with a Ghanian liquid chocolate centre, macadamia biscotinni.
- Strawberry consommé, vanilla bean panna cotta, chopped pistachios
- Blackberry and elderflower summer pudding, crème Chantilly
- Gooseberry cheesecake, rhubarb compote, vanilla ice cream
- Selection of *Mövenpick Ice Creams*

2.4 The suppliers

Every main component of the meals was sourced from frozen and supplied by BFFF members. N-ice featured ingredients from the following BFFF member companies: 3663, The Abergavenny Fine Food Co., Adams Foods, Ardo UK Ltd., Birds Eye, Brakes, Bri-Tal Foods, Cherry Valley Farms Ltd., Country Range Group, Daregal Gourmet Ltd., Divine Chocolate, Holmes Seafoods, Innovate Foods in association with Orchidwood Mushrooms, JJ Food Service, Manton's, MDC Foods, Mövenpick Ice Cream, Moy Park Foodservice, Paramount, Pidy, Plusfood UK Ltd., Star Catering Supplies, Vestey Foods and Westbridge Foods Group.

Staff and students representing Westminster Kingsway College's Culinary Arts School cooked and served N-ice guests in a 'Winter Wonderland' themed dining room.

2.5 Attendance

The 'pop-up' restaurant served over 600 diners over five days, of which, 193 completed a questionnaire (**APPENDIX 1**) before and after their meal. Diners were not charged for their meals but were asked to make donations to Westminster Kingsway College's Culinary Arts School.

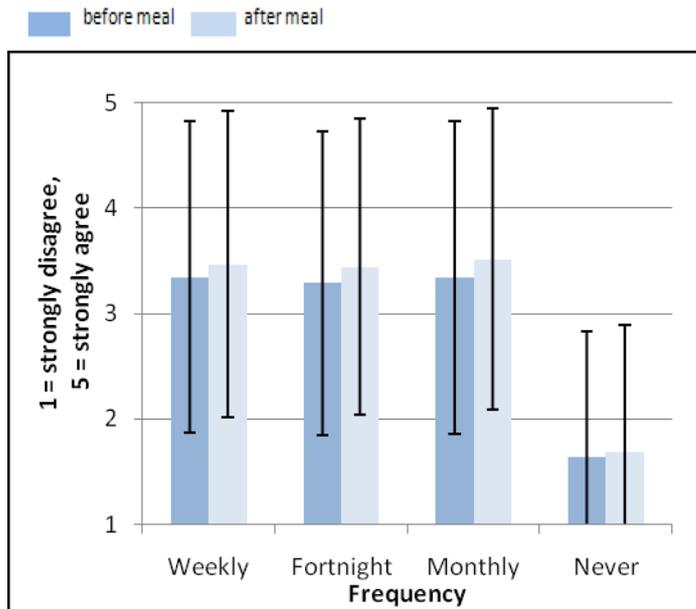
2.6 Questionnaire analysis

The questionnaire was divided into five sections to examine; how frequently diners ate frozen food, the type of frozen food consumed, ratings of the sensory attributes of frozen food, ratings of the quality of frozen food and attitudes to the use of frozen food in pubs and restaurants. Paired-samples t-tests, using PASW Statistics (version 18.0 for Windows, SPSS Inc., Chicago, Illinois) were used to evaluate the impact of dining at N-ice on a variety of parameters. Data are presented as mean \pm standard deviation. A probability value of $p < .05$ was considered statistically significant in all analyses.

3.0 RESULTS

3.1 Frequency of frozen food consumption

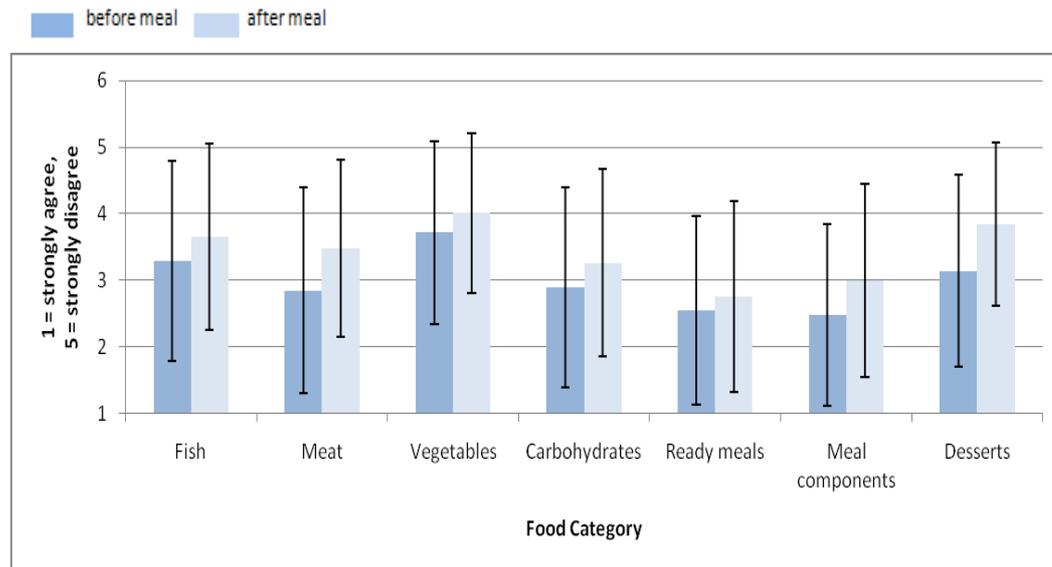
FIGURE 1: Response to the pre meal question 'How frequently do you eat frozen food?', and post meal 'How frequently will you now eat frozen food?'



There was no significant difference in how frequently diners said they would eat frozen food.

3.2 Type of frozen food consumption

FIGURE 2: Response to the pre meal question ‘What types of frozen food do you eat?’, and post meal ‘What types of frozen food will you now be inclined to eat?’



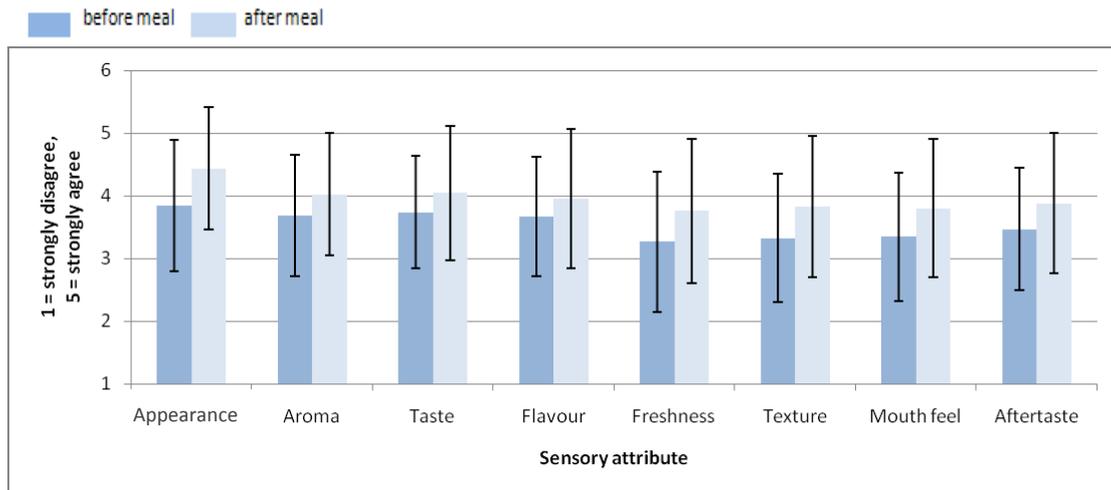
After dining at N-ice, guests were significantly more likely to eat more of all the suggested food categories (all $p < .005$).

Products guests were more likely to eat post meal -193 diners

Product	Increase
Frozen fish	+7.3%
Frozen vegetables	+5.8%
Frozen carbohydrates(for example, chips/potatoes)	+7.2%
Frozen ready meals	+4.2%
Frozen meal components (for example, Yorkshire puddings)	+10.3%
Frozen desserts	+14.0%

3.3 Sensory attributes of frozen food

FIGURE 3: Ratings of the ‘how good’ sensory attributes of frozen food were before and after dining at N-ice.



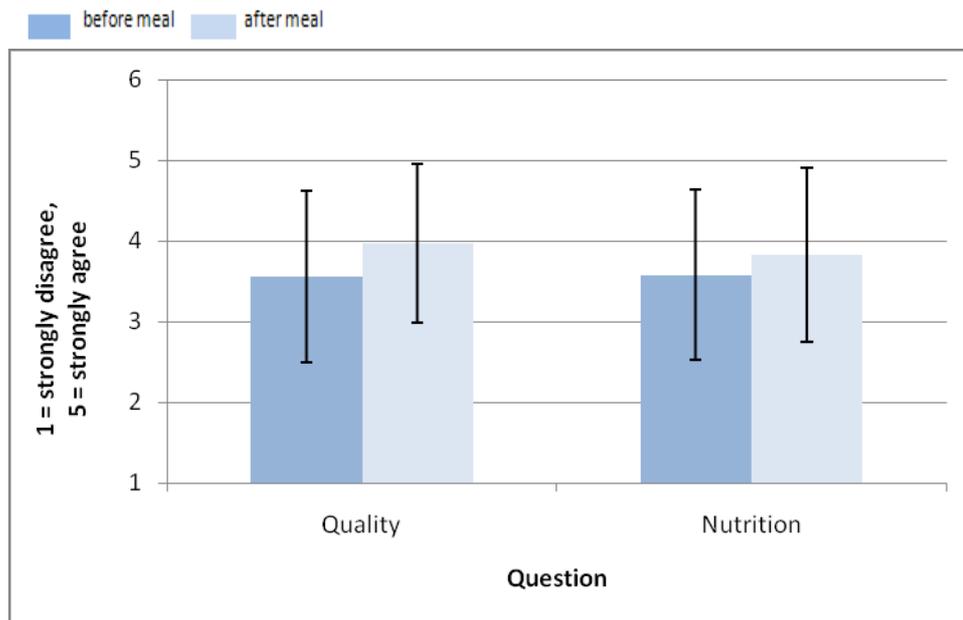
After dining at N-ice, guests rated all the suggested sensory attributes significantly higher (all $p < .005$).

Improvements in ratings of frozen food post meal - 193 diners

Attribute	Increase
Appearance	+11.8%
Aroma	+6.7%
Taste	+6.2%
Flavour	+5.7%
Freshness	+9.8%
Texture	+10.1%
Mouthfeel	+9.1%
Aftertaste	+8.2%

3.4 Quality of frozen food

FIGURE 4: Response to the pre and post meal question ‘How far do you agree with the following statements regarding frozen food quality? I think the quality of frozen food is good; I think the nutritional value of frozen food is good.’



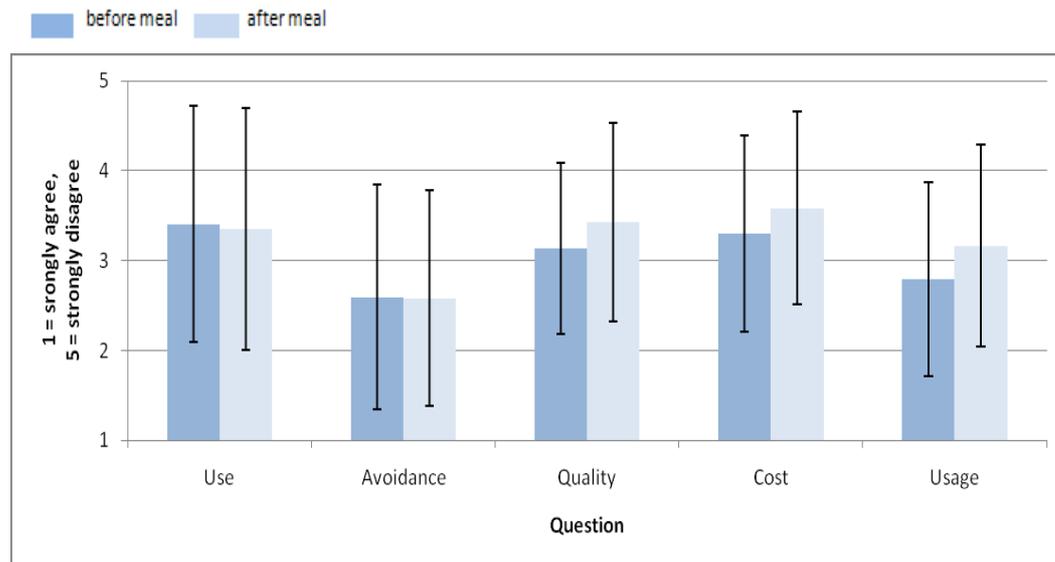
After dining at N-ice, 193 guests agreed more strongly with the statements ‘I think the quality of frozen food is good’ ($p < .000$) and ‘I think the nutritional value of frozen food is good’ significantly ($p = .001$).

Concurrence with statements post meal - 193 diners

Statement	Increase
‘I think the quality of frozen food is good’	+8.2%
‘I think the nutritional value of frozen food is good’	+4.9%

3.5 Use of frozen food in pubs and restaurants

FIGURE 5: Response to the question pre and post meal ‘How far do you agree with the following statements regarding frozen food in pubs and restaurants?’ I want to know whether a pub/restaurant uses frozen food; I would avoid eating at a pub/restaurant serving frozen food; Frozen offers good quality for pub/restaurant meals; Frozen is an acceptable way for pub/restaurant chefs to keep meal costs down for customers; I think frozen should be more widely used in pubs/restaurants.



There was no significant difference in whether diners would want to know if a pub/restaurant served frozen food, or if they would avoid eating at a pub/restaurant that served frozen food.

Concurrence with other statements post meal – 193 diners

Statement	Increase
‘Frozen offers good quality for pub/restaurant meals’	+5.8%
‘Frozen is an acceptable way for pub/restaurant chefs to keep meal costs down for customers’	5.7%
‘I think frozen should be more widely used in pubs/restaurants’	+7.4%

SUMMARY

The results of this report show that, dining just once at a restaurant which served only frozen food was sufficient to alter diners' perceptions of frozen food on a number of parameters.

Whilst dining at N-ice did not impact how frequently diners said they would eat frozen food, it did affect how likely they said they would be inclined to eat certain types of frozen food. In particular, guests were 12.5% more likely to eat frozen meat, 10.3% more likely to eat frozen meal components and 14.0% more likely to eat frozen desserts.

Diners' attitudes to the sensory attributes of frozen foods were significantly altered. After their N-ice experience ratings for the appearance, aroma, taste, flavour, freshness, texture, mouth feel and aftertaste of frozen food increased by 5.7 – 11.8%. Dining at N-ice also made guests agree more strongly that the quality and nutritional value of frozen food was good.

Although the meal did not affect whether diners wanted to know if a pub/restaurant served frozen food, or if they would avoid eating at a pub/restaurant that served frozen food, guests did agree significantly more strongly that frozen food offered good quality, was an acceptable way for pubs and restaurants to keep meal costs down and that frozen should be more widely used in pubs and restaurants.

This is the first large scale report to present data on how a quality 'frozen' dining experience can change consumer perceptions of frozen food. Significant technological advancements, coupled with pledges to use only top quality ingredients for freezing are changing the face of frozen food. Consumers can be further reassured that frozen food not only offers value for money, but can also be used to provide a high quality dining experience.