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EHNI
Environmental Health Northern Ireland

NUTRITIONAL CONTENT OF CHEESECAKE

Results of nutritional analysis of cheesecake available from out of home businesses across Northern Ireland in 2019

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Acknowledgements

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Introduction

Background and rationale for the survey

About the Food Standards Agency

The Food Standards Agency (FSA) is an independent Government department which works across England, Wales and Northern Ireland (NI) to protect public health and consumers' wider interests in food.

In NI, the FSA is responsible for delivering aspects of nutrition and dietary health policy with an aim of improving nutrition and health outcomes for NI consumers by making the healthier choice the easy choice.

Survey data and research

Data from the National Diet and Nutrition Survey (NDNS) shows the NI population are eating too much sugar, saturated fat and salt and not enough fruit, vegetables and wholegrain foods (FSA, 2019). Over the last 10 years the number of people in NI who are overweight or obese has increased. Currently in NI, over half of adults (62%) and a quarter of children aged 2-15 (27%) are overweight or obese (Department of Health, 2020). This increases the risk of heart disease, stroke, type 2 diabetes, non-alcoholic fatty liver disease and some types of cancers.

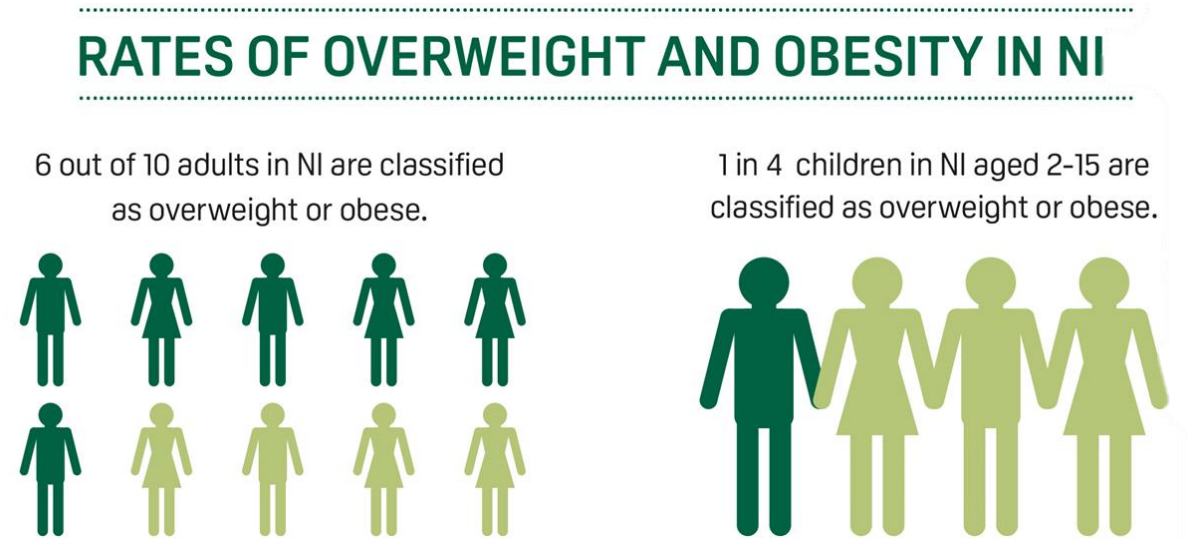

Figure 1. Rates of overweight and obesity in NI

Research commissioned by the FSA in 2018 reported that NI consumers were eating out more, with 95% eating out at least occasionally (NatCen, 2018). In 2019 the FSA's Food and You survey reported that 71% of NI consumers eat out at least once a month, with most of these people eating out at least once or twice a week (30%) (FSA, 2019).

Food eaten outside of the home tends to be less healthy, with more calories and higher in fat, sugar and salt (Jaworowska et al., 2013). Public Health England (PHE) reported that there are more calories in products likely to be consumed on a single occasion out of the home than retailer own brand and manufacturer branded single serve products, across all the food categories included in the Sugar Reduction Programme (PHE, 2019).

Given the increasing influence food businesses have on consumer diets, they now have a greater role in ensuring the healthier choice is the easy choice.

Eating Well Choosing Better

In March 2012, the Department of Health (DoH) launched 'A Fitter Future for All', a cross-departmental framework for preventing and addressing overweight and obesity in NI (DoH, 2019). Under outcome 34, the FSA and District Councils committed to progressing a programme of work to reduce energy, fat, saturated fat, sugar and salt in the foods that contribute most to our diet.

The FSA's Eating Well Choosing Better (EWCB) programme, which is delivered in partnership with District Councils and Knowledge Providers (i.e. local academic institutions), contributes to Outcome 34. The EWCB programme supports small and medium sized food businesses in NI with food product improvement/reformulation, as well as increasing the availability of small and/or reduced portion sizes. The programme aligns with the UK Government's Reduction and Reformulation Programme (PHE, 2017). This tasks the food industry with reducing sugar, calories and salt from the food categories which contribute most to dietary intakes.

This report is one of the deliverables of the EWCB programme. It follows on from a previous report on the nutritional profile of scones available from high street coffee shops in NI (FSA, 2018) which highlighted the wide variety in size and nutritional composition of scones available in NI.

Rationale for surveying cheesecakes

'Puddings' are one of the top ten sources of sugar intake in NI and are included as a food category in the UK Government's Sugar Reduction Programme (FSA, 2019; PHE, 2017). Within this category, cheesecake has been identified by the FSA as

having particular relevance to the NI population. It is a popular option on dessert menus, with many restaurants and hotels offering them as a handmade dessert on their menus.

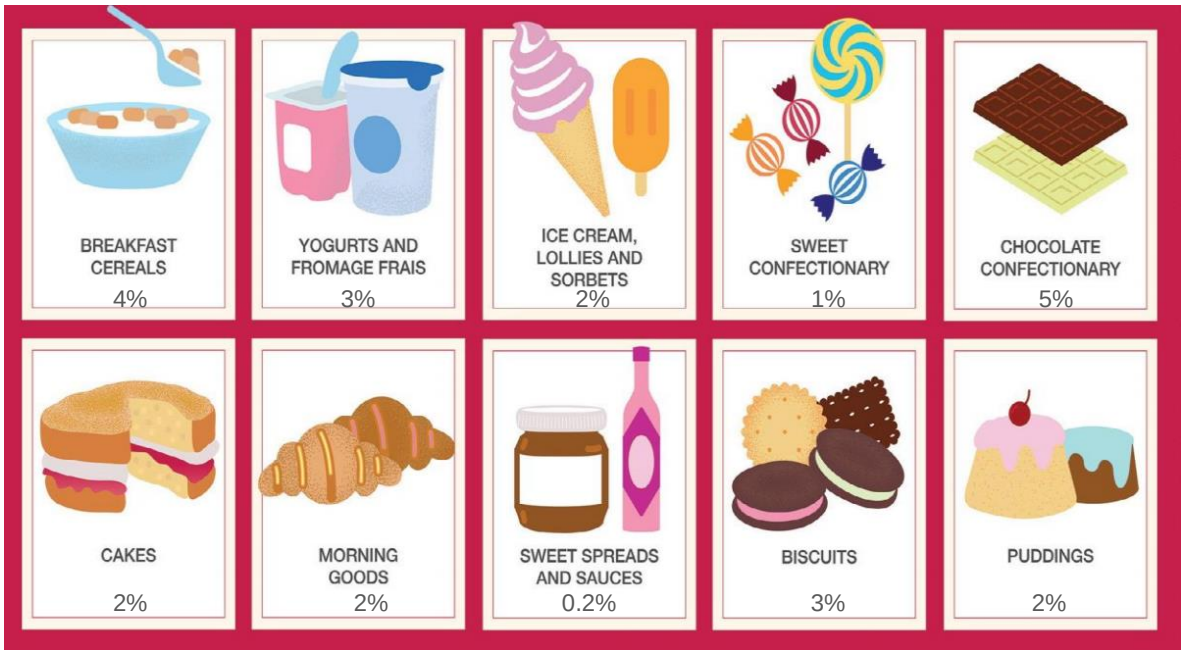

Figure 2. Food categories included in the UK Governments Sugar Reduction Programme and percentage contribution to total sugar intakes for adults aged 19-64 (PHE, 2017; PHE, 2019)

Purpose and scope of survey

The purpose of the survey was to determine the portion sizes and nutritional composition of cheesecake sold in restaurants and hotels in NI.

The results of this survey will inform targeted interventions with food businesses and manufacturers of cheesecake/puddings to improve the nutritional profile and increase the availability of healthier products in local catering establishments.

The results of this survey will be used as baseline data against which any interventions can be measured.

Methods

Sampling

Each of the eleven district councils in NI sampled a minimum of three cheesecake portions from restaurants and hotels in their council area. This was to ensure samples were representative of the cheesecakes on sale across NI.

Samples were collected by district council Environmental Health Officers (EHOs) using a set protocol (Appendix 1). Table 1 describes the inclusion and exclusion criteria for cheesecake sampling.

Table 1. Sample inclusion and exclusion criteria

Inclusion	Exclusion
Cheesecakes from local restaurants and hotels where the product is manufactured in NI	Other food outlets e.g. café, bakeries, service stations
Single serve portions of cheesecakes likely to be consumed by an individual in one eating occasion	Multinational chain restaurants
A range of cheesecake flavours including chocolate, luxury, baked, fruit and other flavours	

The samples were sent to Public Analyst Scientific Services, a UKAS accredited laboratory, for nutritional analysis. While full nutrition information was provided, this publication reports on energy, sugar, fat, saturated fat and salt content per cheesecake portion (as sold) and per 100g.

The following data was also gathered on the preparation methods;

- made from scratch by businesses or bought in ready made
- made with or without the use of measuring equipment
- how the cheesecake was portioned

Data collection

Sampling commenced in July 2019 and ran until the end of September 2019. Public Analyst results were received by the end of November 2019. All data was collated, and quality assured by the end of November 2019. Analysis of the data was complete by the start of December 2019.

Data analysis

Mean, minimum and maximum energy, sugar, fat, saturated fat and salt values per portion (as sold) and per 100g were calculated for –

1. all cheesecakes
2. cheesecake categories –
    a. luxury e.g. salted caramel, raspberry and white chocolate
    b. chocolate e.g. white chocolate, chocolate bar flavoured
    c. fruit and other flavours e.g. passionfruit, blueberry and lemon
    d. baked (any flavour)
3. preparation methods –
    a. made by businesses or bought in ready made
    b. made with or without the use of measuring equipment
    c. portion size standardised or not

Statistical difference in weight and nutritional content

Differences in nutritional value (i.e. energy, sugar, fat, saturated fat and salt) and cheesecake categories were tested for statistical significance using ANOVA. Correlation between portion size and nutritional content was tested for statistical significance for nutrition per portion and nutrition per 100g. Results with a p-value less than 0.05 were considered significant. Grouping of cheesecakes by preparation method (i.e. whether cheesecakes were made by hand, measuring equipment was used when making; portion size was standardised) was unsuitable for statistical analysis due to low and uneven sample sizes.

Multiple Traffic Light (MTL) labelling has been applied to the relevant nutrients to give an indication of what a front of pack nutrition label would look like if the cheesecakes were pre-packed (DoH and FSA, 2016). Full data tables are available in Appendix 2.

Results

Headline Results

Weight	• The average portion of cheesecake weighed 145g • The largest portion of cheesecake weighed 273.9g • As portion size increased so did energy, sugar, fat, saturated fat and salt content
Energy	• The average portion of cheesecake provided 534kcal • The portion with the highest amount of energy provided 972kcal– this is almost half an adults daily recommended energy intake
Sugar	• The average portion of cheesecake contained 27.0g of sugar • The highest amount of sugar in one portion was 68.0g – this is the equivalent of almost 14 teaspoons of sugar
Fat	• The average portion of cheesecake contained 37.5g of fat • The highest amount of fat in one portion was 72.8g – this is almost all the adult fat recommendation of no more than 35% of daily energy intake
Saturated fat	• The average portion of cheesecake contained 22.4g of saturated fat • The highest amount of saturated fat in one portion was 45.6g – this is more than the adult saturated fat recommendation of no more than 10% of daily energy intake

Samples

A total of 47 cheesecake samples were collected. The samples were divided into four categories. Table 2 shows the number of samples per category.

Table 2. Cheesecake categories and number of samples per category

Cheesecake category	Number of samples
1. Luxury (e.g. salted caramel, raspberry and white chocolate)	18
2. Chocolate (e.g. white chocolate, chocolate bar flavoured)	18
3. Fruit and other flavours (e.g. passionfruit, blueberry and lemon)	9
4. Baked (any flavour)	2

Portion size

The weight of a portion of cheesecake ranged from 83g to 274g (Figure 3). The average weight of a portion was 145g. The average weight per portion was greatest for baked cheesecakes (152g) followed by chocolate (147g), luxury (145g) and fruit and other flavours (141g).

There was a statistically significant positive correlation between the weight of a portion of cheesecake and nutritional content per portion (i.e. as portion size increases, energy, fat, saturated fat, sugar and salt also increases). There was no significant correlation between portion size and nutritional content per 100g.

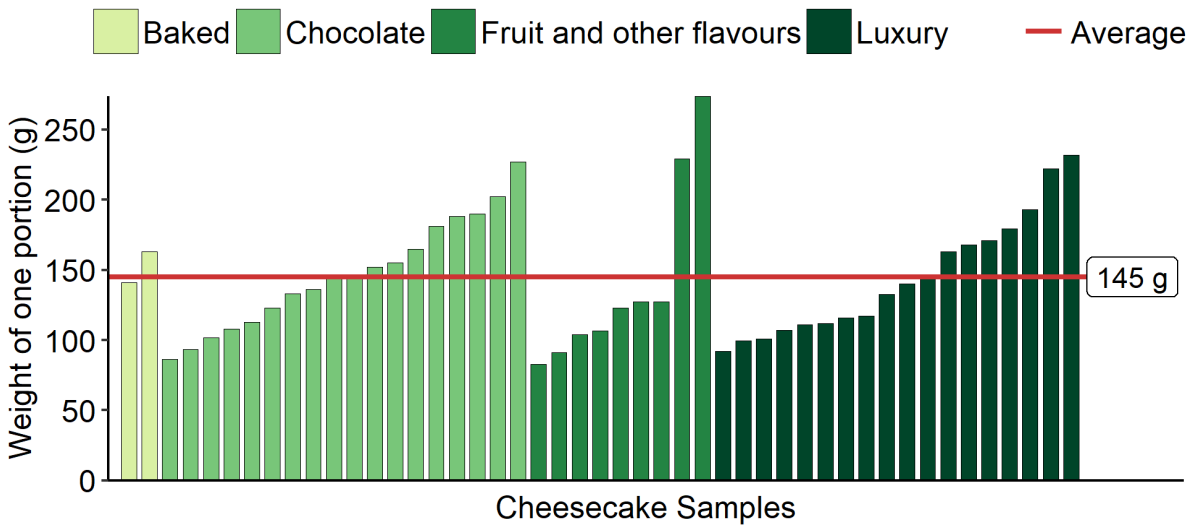

Figure 3. Weight (g) of cheesecake samples per portion

Energy

Per portion

On average, a portion of cheesecake served in a hotel or restaurant in NI will provide 534kcal (Figure 4). The average energy content per portion was greatest for chocolate cheesecakes (552kcal) followed by luxury (547kcal), baked (507kcal) and fruit and other flavours (478kcal).

Energy per portion of cheesecake varied considerably (231 – 972kcal for all cheesecake samples). Luxury cheesecakes ranged from 324 – 972kcal, chocolate from 359 – 906kcal, fruit and other flavours from 231 – 923kcal and baked from 478 – 536kcal.

There was no statistically significant difference between cheesecake type and energy content per portion.

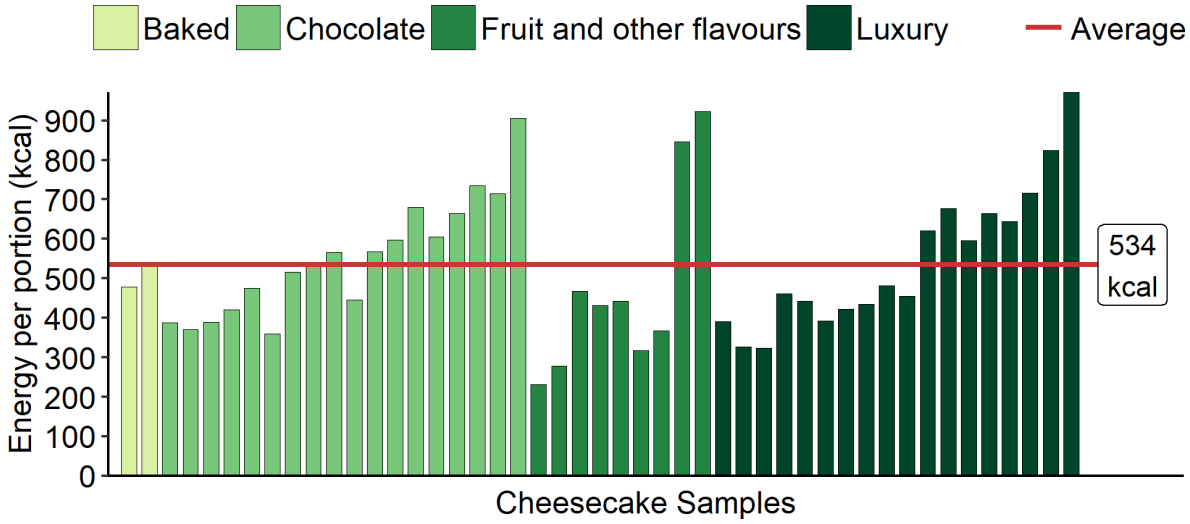

Figure 4. Energy content (kcal) of cheesecake samples per portion

Per 100 g

When comparing energy per 100g, the average content was similar across all cheesecake categories (378kcal/100g for chocolate, 377kcal/100g for luxury, 338kcal/100g for fruit and other flavours and 334kcal/100g for baked) (Figure 5).

The range in energy per 100g varied from 250 – 450kcal for all cheesecake samples, 321 – 432kcal/100g for luxury, 292 – 449kcal/100g for chocolate, 250-450kcal/100g for fruit and other flavours and 329 – 339kcal/100g for baked.

There was no statistically significant difference between cheesecake type and energy content per 100g.

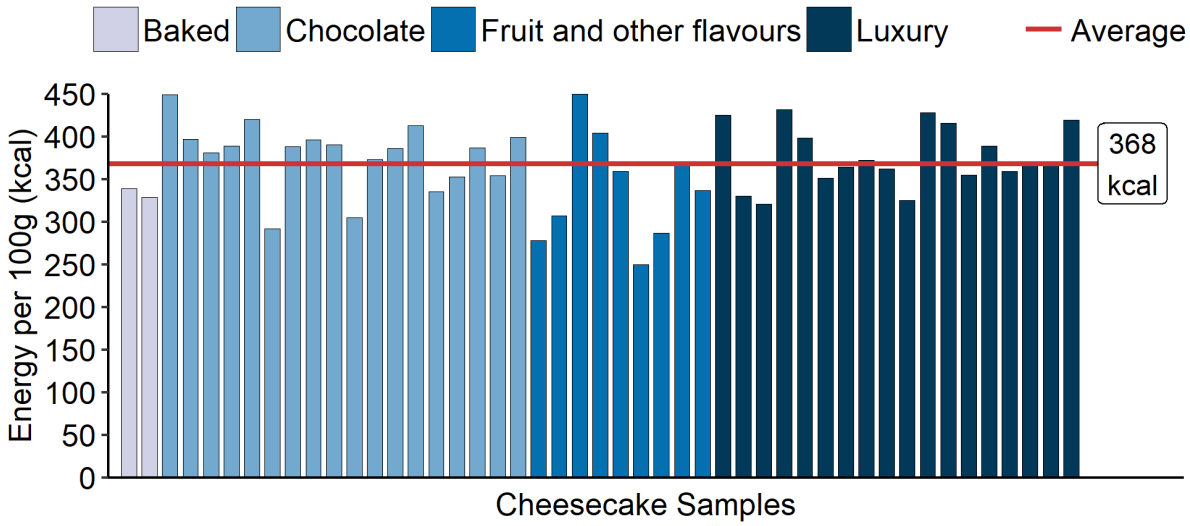

Figure 5. Energy content (kcal) of cheesecake samples per 100g

Sugar

Per portion

On average, a cheesecake served in a hotel or restaurant in NI will provide 27.0g of sugar per portion (Figure 6). The average sugar content per portion was greatest for baked cheesecakes (33.4g), followed by chocolate (28.7g), luxury (28.0g) and fruit and other flavours (20.1g).

The sugar content per portion of cheesecake varied considerably (11.4 – 68.0g for all cheesecake samples). Luxury cheesecakes ranged from 12.1 – 68.0g, chocolate from 12.6 – 65.6g, fruit and other flavours from 11.4 – 40.8g and baked from 28.6 – 38.1g.

There was no statistically significant difference between cheesecake type and sugar content per portion.

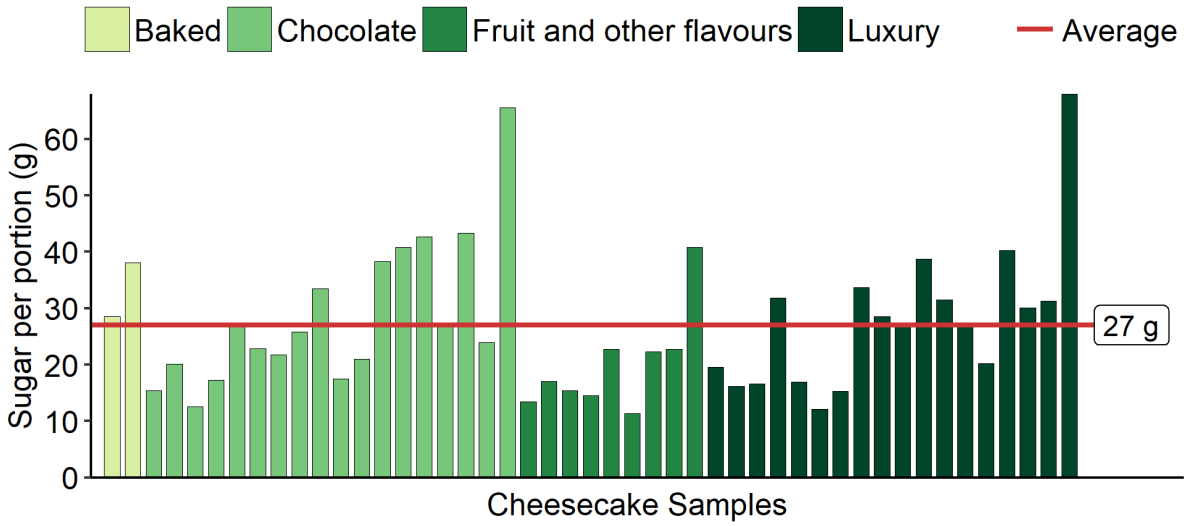

Figure 6. Sugar content (g) of cheesecake samples per portion

Per 100g

When comparing the amount of sugar per 100g, average sugar content for all cheesecake samples was 18.5/100g (Figure 7). The average amount of sugar was greatest for baked cheesecakes (21.9g/100g) followed by luxury (19.3/100g), chocolate (19.2/100g) and fruit and other flavours (14.8/100g).

The range of sugar per 100g for all cheesecakes varied considerably from 9.0 – 29.7g/100g. The sugar content of luxury cheesecakes ranged from 10.8 –

29.7g/100g, chocolate from 11.9 – 28.9g/100g, fruit and other flavours from 9.0 – 18.8g/100g and baked from 20.3 – 23.4g/100g.

There was no statistically significant difference between cheesecake type and sugar content per 100g.

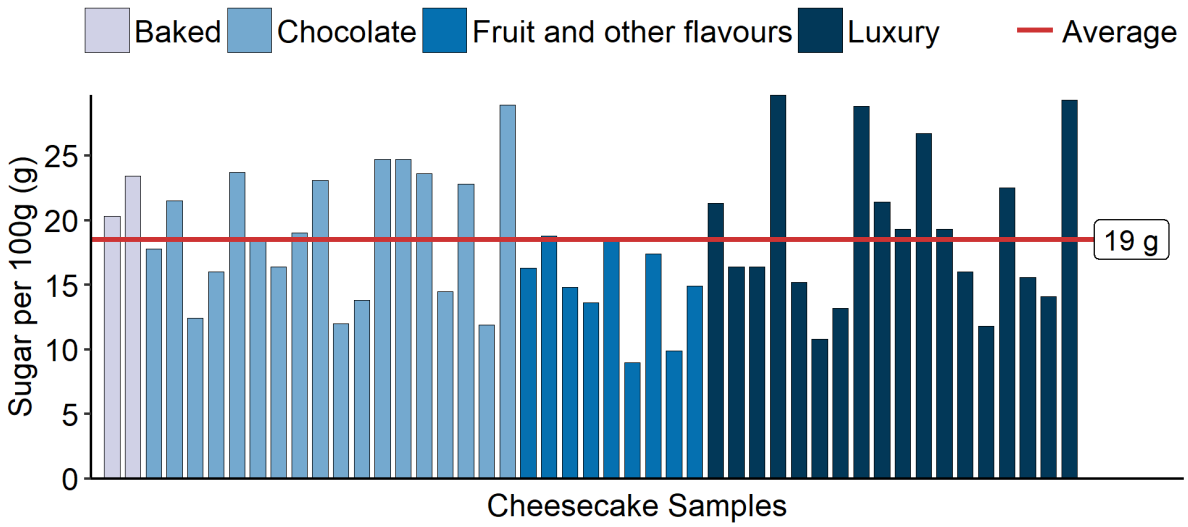

Figure 7. Sugar content (g) of cheesecake samples per 100g

Total fat

Per portion

On average, a cheesecake served in a hotel or restaurant in NI will provide 37.5g of fat per portion (Figure 8). The average fat content per portion was greatest for chocolate cheesecakes (38.4g) followed by luxury (37.8g), fruit and other flavours (36.4g) and baked (30.9g).

Fat content per portion varied considerably from 15.7 – 72.8g for all cheesecake samples, 21.9 – 59.1g for luxury, 25.6 – 58.0g for chocolate, 15.7 – 72.8g for fruit and other flavours and 30.7 – 31.1g for baked.

There was no statistically significant difference between cheesecake type and fat content per portion.

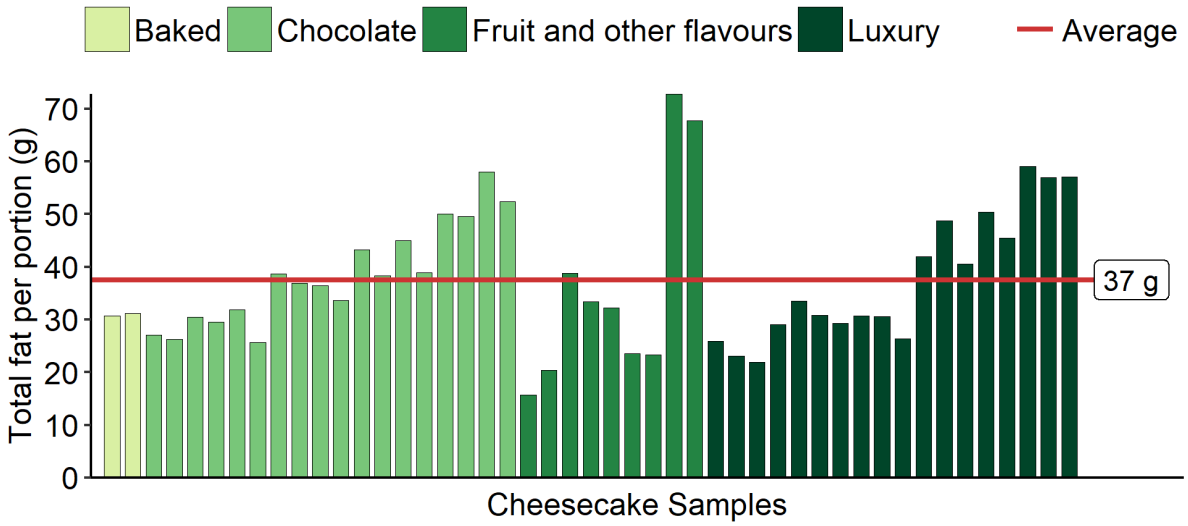

Figure 8. Fat content (g) of cheesecake samples per portion

Per 100g

When comparing fat per 100g, average fat content for all cheesecake samples was 25.9g/100g (Figure 9). The average amount of fat was greatest for chocolate cheesecakes (26.4g/100g) followed by luxury (26.1g/100g), fruit and other flavours (25.5g/100g) and baked (20.5g/100g).

Fat content per 100g varied considerably from 18.2 – 37.3g. The fat content of luxury cheesecakes ranged from 18.8 – 30.6g, 20.8 – 31.2g for chocolate, 18.2 – 37.3g for fruit and other flavours and 19.1 – 21.8g for baked.

There was no statistically significant difference between cheesecake type and fat content per 100g.

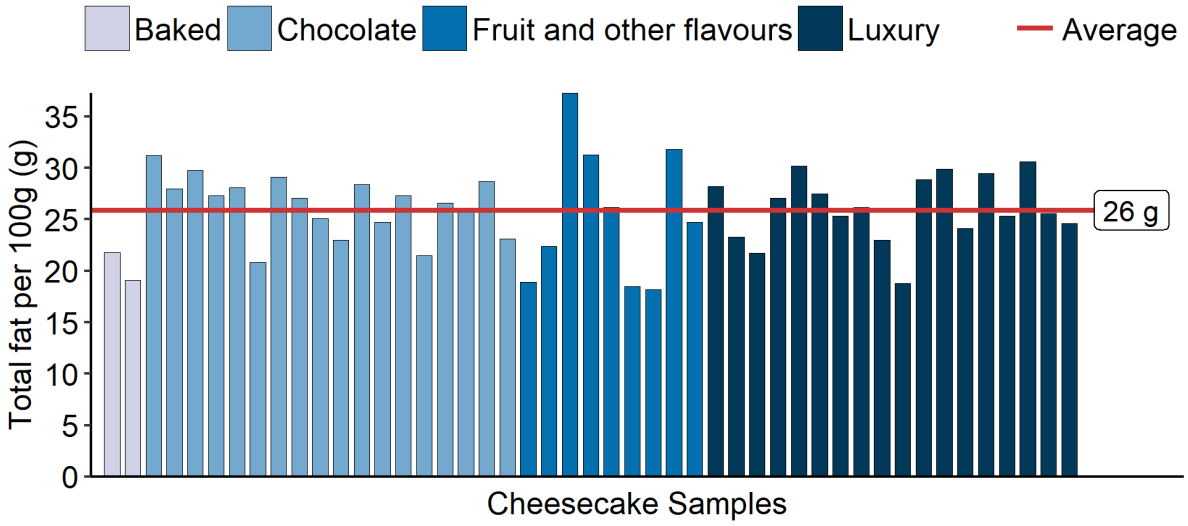

Figure 9. Fat content (g) of cheesecake samples per 100g

Saturated fat

Per portion

On average, a cheesecake served in a hotel or restaurant in NI will provide 22.4g of saturated fat per portion (Figure 10). The average saturated fat content per portion was greatest for chocolate cheesecakes (22.9g) followed by luxury (22.6g), fruit and other flavours (22.1g), and baked (17.6g).

Saturated fat content per portion varied considerably, from 8.6 – 45.6g for all cheesecake samples, 12.6 – 38.4g for luxury, 8.6 – 36.2g for chocolate, 9.9 – 45.6g for fruit and other flavours and 16.8 – 18.5g for baked.

There was no statistically significant difference between cheesecake type and saturated fat content per portion.

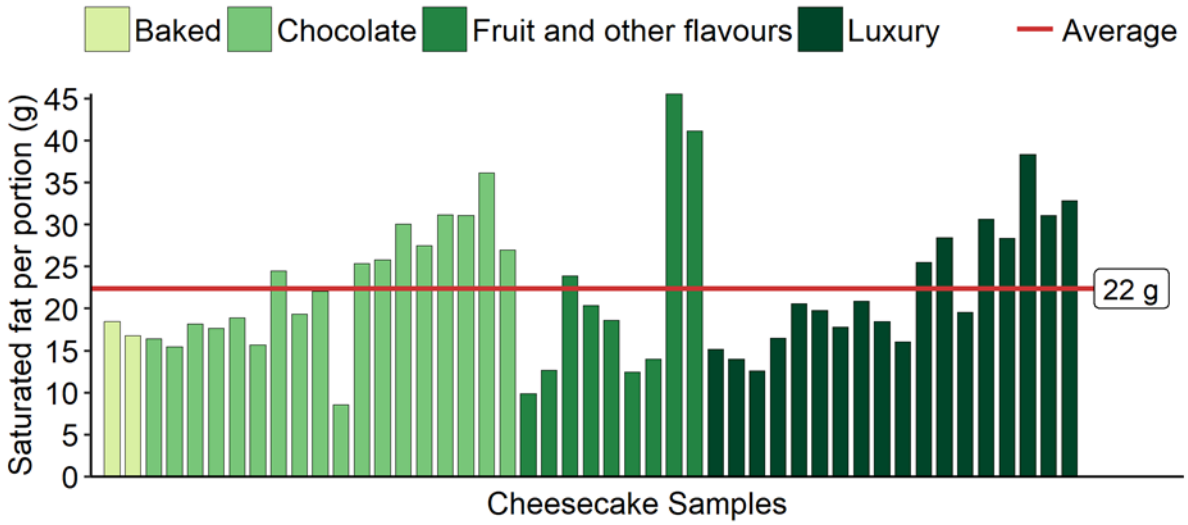

Figure 10. Saturated fat content (g) of cheesecake samples per portion

Per 100g

When comparing saturated fat per 100g, the average saturated fat content for all cheesecake samples was 15.5g/100g (figure 11). The average saturated fat content per 100g was greatest for luxury and chocolate cheesecakes (15.7g/100g) followed by fruit and other flavours (15.4g/100g) and baked (11.7/100g).

Saturated fat content per 100g varied considerably from 5.9g – 23.0g. The saturated fat content of luxury cheesecakes ranged from 11.5 – 19.9g, 5.9 – 19.0g for chocolate, 9.8 – 23.0g for fruit and other flavours and 10.3 – 13.1g for baked.

There was no statistically significant difference between cheesecake type and saturated fat content per 100g.

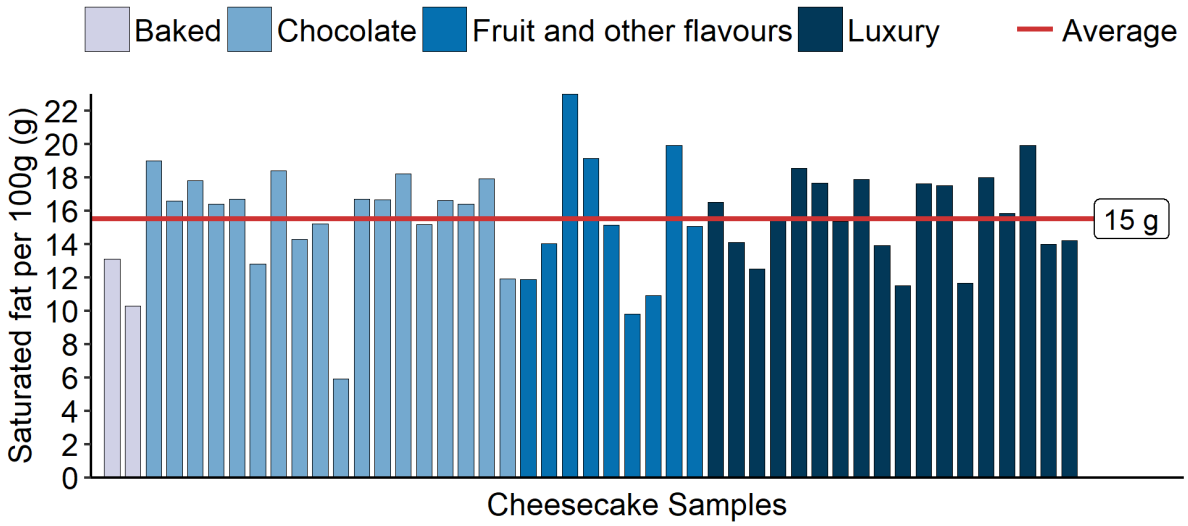

Figure 11. Saturated fat content (g) of cheesecake samples per 100g

Salt

Per portion

On average, a cheesecake served in a hotel or restaurant in NI will provide 0.6g of salt per portion (Figure 12). The average salt content per portion was greatest for baked cheesecakes (0.7g) followed jointly by luxury and chocolate (0.6g) and fruit and other flavours (0.5g).

Salt content per portion varied considerably, from 0.12g – 1.04g for all cheesecake samples, 0.31 – 1.04g for luxury, 0.12 – 0.91g for chocolate, 0.24 – 0.82g for fruit and other flavours and 0.60 – 0.83g for baked.

There was no statistically significant difference between cheesecake type and salt content per portion.

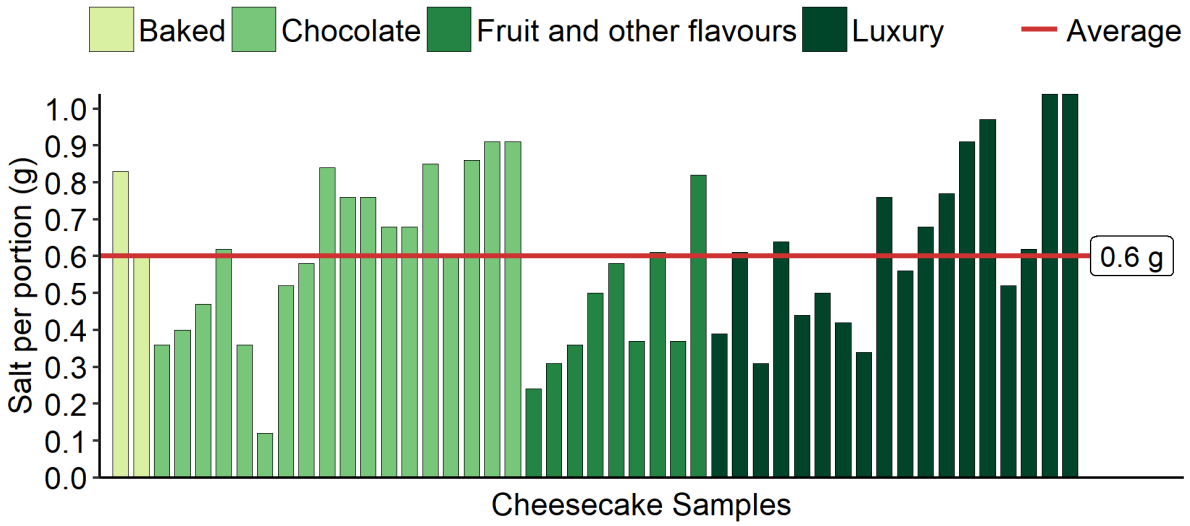

Figure 12. Salt content (g) of cheesecake samples per portion

Per 100g

When comparing salt per 100g, the average salt content for all cheesecake samples was 0.4g/100g (Figure 13). The average salt content per 100g was greatest for baked cheesecakes (.05g/100g), followed jointly by luxury chocolate (0.4g/100g) and fruit and other flavours (0.3g/100g)

Salt content per 100g varied from 0.1 – 0.62g/100g for all cheesecakes combined. The salt content of luxury cheesecakes ranged from 0.29 – 0.62g, 0.10 – 0.58g for chocolate, 0.16 – 0.48g for fruit and other flavours and 0.37 – 0.56g for baked.

There was no statistically significant difference between cheesecake type and salt content per 100g.

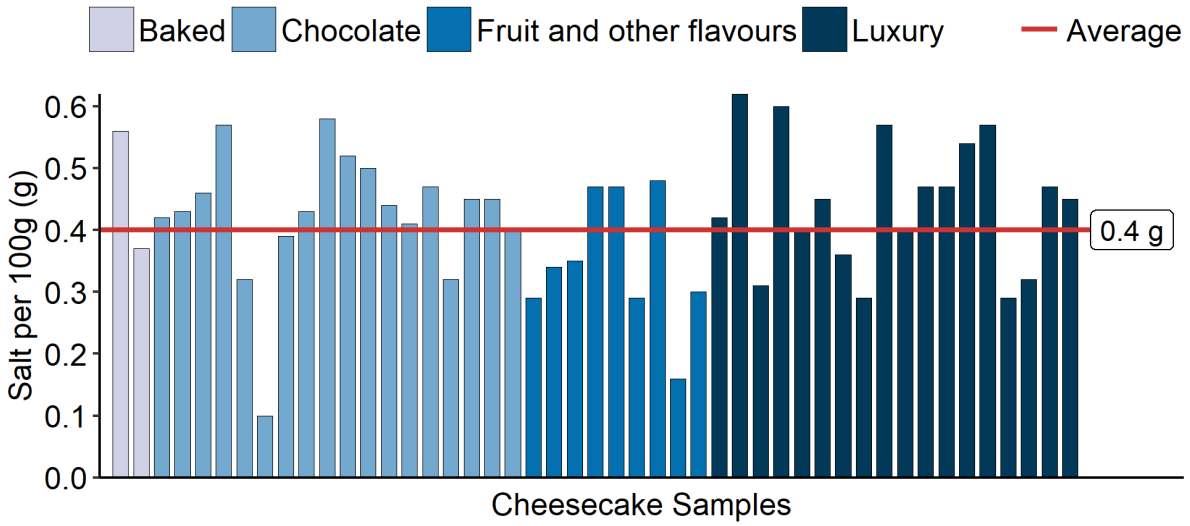

Figure 13. Salt content (g) of cheesecake samples per 100g

Preparation methods

The majority of cheesecakes sampled (89%, n = 42) were made from scratch by the business, with only 11% (n = 5) of businesses buying cheesecakes in ready-made from another NI supplier. Cheesecakes made from scratch by the business were on average higher in energy, sugar, fat, saturated fat and salt than those bought in ready-made, both per portion and per 100g (Table 3 and 4).

Table 3. Average nutritional content per portion for cheesecakes made from scratch and those bought in ready made

	Made from scratch (n = 42)	Bought in ready-made (n = 5)
Weight (g)	147.1	127.3
Energy (kcal)	551.6	388.4
Sugar (g)	27.7	21.2
Total fat (g)	39.0	25.1
Saturated fat (g)	23.3	14.7
Salt (g)	0.6	0.5

Table 4. Average nutritional content per 100g for cheesecakes made from scratch and those bought in ready made

	Made from scratch (n = 42)	Bought in ready-made (n = 5)
Energy (kcal)	375.8	304.4
Sugar (g)	18.8	16.5
Total fat (g)	26.6	19.8
Saturated fat (g)	15.9	11.6
Salt (g)	0.4	0.4

72% (n = 34) of businesses divided cheesecakes using a portion cutter or had a standard portion size. The remaining 18% of businesses (n = 13) did not have standardised portions i.e. cheesecakes were cut by eye. Cheesecakes sampled from businesses that didn't standardise portion size, were on average bigger and contained more energy, sugar, fat and saturated fat per portion than those with a standard portion size (Table 5). When considered per 100g nutritional content was similar (Table 6).

Table 5. Average nutritional content per portion for cheesecakes with a standard portion size and those without

	Portion size standardised	Portion size not standardised
Weight (g)	139	161
Energy (kcal)	508	603
Sugar (g)	24.9	32.5
Total fat (g)	35.9	41.6
Saturated fat (g)	21.5	24.8
Salt (g)	0.6	0.6

Table 6. Average nutritional content per 100g for cheesecakes with a standard portion size and those without

	Portion size standardised	Portion size not standardised
Energy (kcal)	369	366
Sugar (g)	18.1	19.6
Total fat (g)	26.0	25.4
Saturated fat (g)	15.6	15.2
Salt (g)	0.4	0.4

81% of cheesecakes sampled (n = 38) were made using measuring equipment while 6% (n = 3) were made without the use of measuring equipment. For the remaining 13% (n = 6) of sampled cheesecakes, it was unclear from the sample submission

form whether measuring equipment was used, or the cheesecakes had been bought in ready-made. Cheesecakes made without measuring equipment were on average bigger and contained the most energy and salt. Cheesecakes made using measuring equipment had on average the greatest amount of sugar, fat and saturated fat (Tables 7). When considered per 100g nutritional content was similar (Table 8).

Table 7. Average nutritional content per portion for cheesecakes made with and without measuring equipment

	Made using measuring equipment	Made without using measuring equipment	Unclear whether measuring equipment was used or bought in ready-made
Weight (g)	146.9	155.6	128.2
Energy (kcal)	551.8	572.7	403.8
Sugar (g)	27.7	27.0	22.4
Total fat (g)	39.2	38.8	26.1
Saturated fat (g)	23.5	22.4	15.4
Salt (g)	0.6	0.8	0.6

Table 8. Average nutritional content per 100g for cheesecakes with and without measuring equipment

	Made using measuring equipment	Made without using measuring equipment	Unclear whether measuring equipment was used or bought in ready-made
Energy (g)	377.1	363.7	314.0
Sugar (g)	18.8	17.9	17.3
Total fat (g)	26.6	24.7	20.3
Saturated fat (g)	16.1	14.4	11.0
Salt (g)	0.4	0.6	0.4

Accompaniments

It is worth considering that the results were analysed per portion of cheesecake without any accompaniments. Cheesecakes are often served with additions such as cream, ice-cream, coulis or chocolate sauce. The energy content of typical servings of these additions are shown in Table 9. The addition of one of these accompaniments could add between 41 and 149 kcal.

Table 9. Energy content of accompaniments commonly served with cheesecakes

Addition	Portion size	Energy (kcal)
Whipping cream	1 heaped tbsp (30ml)	114
Double cream	1 heaped tbsp (30ml)	149
Ice-cream	1 scoop (40g)	86
Fruit coulis	1 tbsp (15ml)	41
Chocolate sauce	1tbsp (15ml)	41

(Data from MenuCal, January 2020[1])

[1] Available at: https://www.menucalni.co.uk/

Discussion

Cheesecakes served in restaurants and hotels across NI varied widely in terms of portion size and nutritional composition. There was also a wide variety of cheesecake flavours, with a total of 32 different flavours sampled. Compared to cheesecakes available in the main supermarkets in NI, there was a greater range in flavours among the cheesecakes sampled as part of this survey.

Energy content and portion size

Recommended energy requirements for adults are 2000 kcal per day for women and 2500 kcal per day for men (SACN, 2011). The sampled cheesecakes contained on average 534 kcal per portion. This is around a quarter of an adults recommended daily energy intake. Chocolate cheesecakes were the most calorific, containing on average 552 kcal per portion. The cheesecake portion with the greatest amount of energy (972 kcal) contained just under half (49%) the adult recommended daily energy intake, and this is without the addition of any accompaniments such as cream, ice cream, fruit coulis or sauce which could add between 41 and 149 extra calories.

As part of the Sugar Reduction Programme, the UK Government tasked food businesses with reducing the energy content of puddings likely to be consumed by an individual at one time to on average 220 kcal with a maximum of 550 kcal (including additions) per portion (PHE, 2017). All but one of the cheesecakes sampled had an energy content above 220 kcal. 40% (n = 19) of the cheesecake samples contained more than 550 kcal.

In this study, the cheesecake samples were taken from restaurants and hotels where they typically would have been served as a dessert option. In NI, cheesecakes are often enjoyed as a dessert as part of a three-course meal. In a study by Robinson et al. (2018) the average calorie content of a three-course meal in a UK chain restaurant was estimated to be 1896 kcal. This is just under the recommended daily energy intake for a female. As part of its ‘One You’ campaign, PHE suggest aiming for around 400 calories at breakfast, 600 calories at lunch, 600 calories for an evening meal with the remaining calories for drinks and snacks (PHE, 2016). Approximately one third of the cheesecakes sampled were in excess of PHE’s 600kcal for lunch or an evening meal recommendation.

In an observational study conducted by Muc et al. (2019) 20.5% of desserts sampled from UK restaurant chains (n = 479) exceeded 600kcal. While the FSA's nutritional analysis project primarily focuses on one dessert type (i.e. cheesecake) and is conducted in local restaurants and hotels in NI, with chain restaurants excluded, the findings correlate with that of Muc et al.

A positive relationship was found between the portion size of cheesecakes and nutritional content i.e. the greater the portion size, the greater calorie, sugar, fat, saturated fat and salt content. A review paper published in 2015 by Hollands et al., concluded that consumers consistently overconsumed food when offered larger portion sizes, therefore the need for portion size reduction is critical to reducing the amount of energy people consume.

Cheesecakes sold by businesses that did not standardise portion sizes had more energy, sugar, fat and saturated fat when compared to those sold by businesses that did standardise portion sizes. Cheesecakes with a standard portion size had nearly 100 kcal less than those that were not standardised.

The average weight of an individual portion of cheesecake sold in the main supermarkets in NI is 90g. This weight is also the recommended portion size of larger cheesecakes sold in the main supermarkets. However, 89% (n = 42) of the cheesecakes sampled as part of this survey weighed over 90g. When conducting analysis of products likely to be consumed by an individual at one time as part of the Sugar Reduction Programme, PHE excluded puddings that weighed less than 35g and more than 200g (PHE, 2017). 13% (n = 6) of the cheesecakes sampled as part of this survey weighed over 200g.

There is scope for hotels, restaurants and food manufacturers to reduce the portion size of their cheesecakes to improve the overall nutrient profile of their desserts. Research conducted by FSA in NI on Consumer Perceptions to Reformulation of Food, shows that NI consumers are supportive of reformulation. 72% reported that they thought it was a good thing that food businesses are trying to make products healthier. There was a high level of acceptability for reducing sugar, fat and portion size with 69%, 73% and 75% stating that they would buy products with lower sugar, lower fat and smaller portion size respectively.

Sugar

In NI, consumers are eating too much sugar, recent data from the NDNS shows that the average adult consumes approximately 52.8g/day. This is almost twice the adult sugar recommendation of no more than 30g per day. Research conducted by the

FSA shows 57% of NI consumers are concerned about the amount of sugar in foods, which was higher than for any other nutrient (FSA, 2018).

The greatest amount of sugar found in one portion of cheesecake was 68.0g. This is the equivalent of almost 14 teaspoons of sugar. It is difficult to compare the sugar content of cheesecake with the dietary recommendation. This is because the dietary recommendation for sugar is for 'free sugars' while the sugar content of cheesecake is 'total sugars'. Under the definition of free sugars, lactose, the sugar in milk and milk products, such as soft cheese, is excluded (SACN, 2015). Total sugars describe the total amount of sugars from all sources (free sugars plus those from milk and those present in the structure of foods such as fruit and vegetables). At present nutritional analysis does not distinguish between naturally occurring sugars and free sugars. It is likely that the sugar content of many of the cheesecakes sampled exceed the adult sugar recommendation of no more than 30g of sugar per day as 38% contain more than 30g of sugar per portion (SACN, 2015).

As part of the Sugar Reduction Programme, the UK Government tasked food businesses with reducing the amount of sugar in the foods that contribute most to intakes by 20% by 2020. For puddings, the aim is to reduce sugar to 15.1g per 100g. The average sugar content of the cheesecakes sampled as part of this survey exceeds this at 19.0g per 100g. However, there was a wide range in the sugar content of sampled cheesecakes with some meeting the sugar reduction guideline for puddings (9.0 – 29.7g per 100g). This shows there is scope to reformulate and reduce the sugar content of many of the cheesecakes.

Total fat and saturated fat

There was a wide range in the fat and saturated fat content of the cheesecakes sampled, 15.7 – 72.8g and 8.6 – 45.6g respectively.

The greatest amount of fat in one portion of cheesecake was 72.8g. This equates to almost all the recommended total fat intake for an adult of no more than 35% of daily energy intake (78g total fat per day for a woman and 97g for a man) (COMA, 1991). Given that the cheesecakes were sampled from hotels and restaurants, it is likely they will be eaten alongside a main meal, and possibly a starter. Therefore, it is likely that when eating out people are consuming more fat than they need.

The greatest amount of saturated fat in one portion of cheesecake was 42.6g. This exceeds the saturated fat recommendation for an adult of no more than 11% of daily energy intake (24g saturated fat per day for a woman and 30g for a man) (SACN,

2019). 38% (n = 18) of cheesecakes contained more than the daily saturated fat recommendation for an adult.

The main ingredient in cheesecakes is soft/cream cheese which is high in both fat and saturated fat. To reduce the fat and saturated fat content of cheesecakes, food businesses could consider replacing regular soft/cream cheese for a reduced fat version.

Salt

Data from the NDNS indicates that in NI adults aged 19 – 64 years are consuming too much salt. Salt intakes estimated from urinary sodium data suggests that the adult population in NI is consuming 8.6g salt per day – 43% more than the dietary recommendation of no more than 6g per day (FSA, 2019; SACN, 2003). Consumers should therefore be mindful of their salt intake, especially as most of the salt in the diet is already present in food.

While the salt content in the sampled cheesecakes are either low or medium according to MTL FoP guidance, less than 0.3g and between 0.3 and 1.5g respectively, there is still scope to reduce salt. 77% of the cheesecakes sampled fail to meet the salt reduction targets set by PHE in 2017. These state that cheesecakes should contain no more than an average of 0.28g or a maximum of 0.35g salt per 100g. In 2018, PHE reported on progress towards meeting the 2017 salt reduction targets. Only 54% of the out of home sector met the salt reduction target for cheesecakes.

The greatest amount of salt in a portion of cheesecake was 1.04g. The cheesecakes with the greatest amount of salt were also some of the largest portions (222g and 232g). Given the positive correlation between portion size and salt content, reformulation efforts in relation to portion size reduction should be considered, along with salt reduction.

Nutritional overview

Cheesecakes served in hotels and restaurants are not pre-packed and therefore are not legally required to have nutritional labelling. To contextualise the survey's results, Table 10 applies the traffic light colours used in the UK's recommended Front of Pack Nutrition Label to the average portion of cheesecake (145g). See Appendix 3 for traffic light labelling guidelines (DoH and FSA, 2016).

Table 10. Traffic light labelling of the average cheesecake portion (145g)

Energy	Fat	Saturates	Sugars	Salt
2234kJ 534kcal	37g	22g	26g	0.6g
27%	53%	110%	29%	10%

Traffic light labelling has also been applied to the results tables found in Appendix 2 to demonstrate where cheesecake samples contained low, medium or high amounts of sugar, fat, saturated fat and salt. Unsurprisingly, all cheesecakes were found to be high for both fat and saturated fat. In addition, the red colour was often applied for certain nutrients due to large portion size (>100g), in accordance with official guidance (DoH and FSA, 2016).

Table 11 provides the nutritional content of the average portion of cheesecake sampled as part of this survey and other popular puddings. The nutritional content has been provided per 145g portion for all puddings to match the average weight of a portion of cheesecake. Cheesecakes are one of the puddings highest in energy, fat, saturated fat and salt.

Table 11. Nutritional content of the average portion of cheesecake sampled as part of this survey and other popular puddings

	Portion size (g)	Energy (kcal)	Sugar (g)	Fat (g)	Saturated fat (g)	Salt (g)
Cheesecake	145	534	27.0	37.0	22.4	0.6
Apple pie	145	389	19.7	21.7	8.1	0.2
Fruit crumble	145	283	30.6	9.3	3.0	0.1
Brownie	145	734	66.8	44.5	24.0	0.3
Crème brûlée	145	464	24.5	37.6	25.1	0.2
Lemon meringue pie	145	364	42.5	12.3	4.5	0.2
Sticky toffee pudding	145	500	49.4	23.2	13.1	0.7

(Data from Composition of Foods Integrated Dataset, January 2020[2])

[2] Available at: https://quadram.ac.uk/UKfoodcomposition/

Conclusions

Portions of cheesecake served in restaurants and hotels in NI are often very large, weighing an average of 145g with portions of up to 274g. Portion size is the most important factor in determining the nutritional content of cheesecake – the bigger the cheesecake the more energy, sugar, fat, saturated fat and salt it is likely to contain. There does not appear to be much difference in the energy, sugar, fat, saturated fat and salt content per 100g between the different types of cheesecake (i.e. luxury, chocolate, fruit and other flavours and baked) with portion size playing a bigger part in determining overall nutritional value.

The cheesecakes sampled are likely to be eaten as a dessert as part of a two- or three-course meal. Without considering the nutritional contribution of a starter and/or a main course, a slice of cheesecake contributes significantly to energy and nutrient intakes, exceeding maximum recommendations for some nutrients. The largest slice of cheesecake contained 972 kcal, almost half an adults daily recommended energy intake. The sugar content of many of the cheesecakes sampled exceeded the adult sugar recommendation. Although it should be noted that some of the sugar in cheesecake will come from sugars naturally present in the lactose in cream cheese. The contribution to total and saturated fat intake was also high. One slice of cheesecake provided almost all the adult daily recommended total fat intake and the saturated fat content of many of the cheesecakes exceeds the daily saturated fat recommendation. The highest amount of salt in one portion of cheesecake was equivalent to one sixth of the maximum recommended amount.

Cheesecakes made from scratch by food businesses were on average higher in energy, sugar, fat, saturated fat and salt than those bought in ready-made. The majority of cheesecakes sampled were made from scratch (n = 42), presenting a good opportunity for reformulation. There is also scope for more food businesses to standardise portion size as a way of reducing energy, sugar, fat and saturated fat content.

This survey has produced valuable information on the portion size and variety of cheesecakes available in restaurants and hotels across NI and their contribution to consumers nutritional intake.

Recommendations

The recommendations for food businesses, consumers, the FSA and district councils, set out below, are to help improve the nutritional profile of cheesecakes by reducing the amount of energy, sugar, fat, saturated fat and salt they contain and are based on the findings of this survey.

Food businesses

- Reduce and standardise portion sizes of cheesecake/puddings.
- Contact local ingredients suppliers to explore lower calorie, sugar, fat, saturated fat and salt options.
- Adapt recipes to reduce the sugar, fat, saturated fat and salt content of cheesecakes. Try using ingredients such as low fat plain natural yogurt, reduced fat soft cheese and biscuits lower in sugar, fat and salt.
- Refer to Government guidance for the recommended salt, sugar and calorie content for puddings (PHE, 2020; PHE, 2017). The revised salt guidelines state that cheesecakes should contain no more than an average of 0.26g or a maximum of 0.33g salt per 100g. The sugar and calorie guidelines state that cheesecakes should contain no more than 15.1g sugar per 100g and single serve portions no more than 550 kcal with additions, with an average of 220 kcal.
- Avoid serving accompaniments such as cream, ice-cream and sauce with cheesecake/puddings.
- Use MenuCal[3], a free online tool provided by the FSA, to calculate the energy content of portions of cheesecakes/puddings and display this on menus.
- Consider joining the Calorie Wise scheme[4], a free and voluntary scheme delivered by the FSA and district councils in NI. It encourages food businesses to display calorie information on their menus enabling customers to make informed food choices when eating out and on the go.

Consumers

- Be aware of the portion size of cheesecakes. For reference, Figure 14 demonstrates a 60g portion of cheesecake which contains 220 kcal, the PHE

[3] Available at: https://www.menucalni.co.uk
[4] More information on the Calorie Wise scheme can be found online at: https://www.food.gov.uk/business-guidance/calorie-wise

energy guideline for single serve puddings. Figure 15 demonstrates a 145g portion of cheesecake, the average weight of cheesecake samples collected as part of this survey which contains 534 kcal.

- Think about sharing a pudding.
- Ask for a smaller portion.
- If served with an accompaniment such as cream, ice-cream or sauce ask for this not to be added.
- Ask for energy information.

Figure 14. A 60g slice of cheesecake which contains 220kcal, the PHE energy guideline for single serve puddings

Figure 15. A 145g slice of cheesecake which contains 534kcal, the average weight and energy content of a portion of cheesecake sampled as part of this survey

The FSA and district councils

- The FSA and district councils should consult with local knowledge providers (i.e. academic institutions) on the production of technical guidance to assist food businesses to reformulate popular puddings such as cheesecake, to reduce the energy, sugar, fat and salt content.
- Inform food business operators who provided cheesecake samples of the results of nutritional analysis.
- Inform other food businesses of the results of this survey and encourage a reduction in portion size of cheesecakes and other puddings among food businesses and adoption of the technical guidance once produced.
- Promote the Calorie Wise scheme and MenuCal tool.

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Appendices

Appendix 1. Protocol for survey on nutritional analysis of cheesecake desserts available from restaurants and hotels in Northern Ireland 2019

Appendix 2. Nutritional analysis results for cheesecakes per portion and per 100g

Appendix 3. Colour coding criteria used in Department of Health and FSA FOP labelling guidance

Appendix 1. Protocol for survey on nutritional analysis of cheesecake desserts available from restaurants and hotels in Northern Ireland 2019

Introduction

This survey is co-ordinated by the Food and Nutrition Subgroup comprises representatives from District Council Environmental Health Departments and the Food Standards Agency in Northern Ireland.

Background

The Northern Ireland (NI) diet contains too much salt, saturated fat and sugar, whilst at the same time most people do not consume enough fruit, vegetables and wholegrain products. For people's diet to improve, the healthy choice should be the easy choice.

60% of adults and 28% of children in NI are overweight or obese. Poor diet contributes to 50% of heart disease and 33% of all cancer deaths.

Within NI's Obesity Prevention Strategy 'A Fitter Future for All', the Food Standards Agency (FSA) and District Councils have committed to improving the nutritional quality of menu choices including the regulation of portion sizes and the provision of appropriate nutritional information for consumers by caterers.

The FSA Eating Well Choosing Better programme supports small and medium sized businesses in NI with food product improvement / reformulation, as well as increasing the availability of small and/or reduced portion sizes, to make the healthy choice easy for the NI consumer. This applies to all sectors of the food industry whether that be manufacturing, retail or the out of home sector.

The EWCB programme aligns with Public Health England's (PHE) reduction and reformulation programme which tasks the food industry with reducing sugar and calories from the foods which contribute most to these intakes. The FSA reports on the activity of the EWCB programme to the Department of Health, twice per year, under the programme for Government framework. Through the National Diet and Nutrition Survey (NDNS) data the FSA have identified the categories which contribute most to sugar intakes of the population, with puddings highlighted as one of the top ten sources of sugar in the UK diet.

Cheesecakes have been identified within the ‘puddings’ category of the EWCB programme. Cheesecakes are popular in NI with many restaurants and hotels offering them as a handmade dessert on their menus. This provides an opportunity to work with local restaurants and hotels to reformulate their cheesecakes to make the healthy choice the easy choice for consumers.

District Council Environmental Health Officers already work very closely with catering businesses and are therefore well placed to provide targeted advice on providing healthier options in conjunction with the Food Standards Agency and local knowledge providers.

Purpose and Scope of survey

The survey will focus on one type of pudding, cheesecakes, which are consumed regularly in restaurants and hotels throughout NI. The survey will identify the portion size (g) and nutritional information per portion and per 100g (energy, sugar, fat, saturated fat and salt) of cheesecakes available from restaurants and hotels in NI. For the purpose of this survey, restaurants are identified as those establishments which serve evening meals in addition to lunch menus.

The results of this survey will inform targeted interventions with pudding manufacturers supported by technical expertise from one or more of the local knowledge providers (i.e. academic institutions) to increase the availability of healthier products in local catering establishments. The survey will also compliment the ongoing work regarding the ‘Calorie Wise’ initiative.

Duration of Survey

Sampling commences 22nd July 2019 and will run to 30th September 2019

Tests to be carried out:
Group II Nutrition analysis (energy value, fat, saturated fat, available carbohydrate, sugars, fibre, protein & salt)

Foods to be sampled

Single serve portions of cheesecakes likely to be consumed by an individual in one eating occasion.
Minimum sample size per council – a minimum of 3 samples to be taken by each Council area. The flavour/type of cheesecakes sampled should include a selection of the range available, e.g. plain, fruit, luxury etc…. Councils may submit more than the minimum number required if they wish. All three samples may be taken from the one establishment, although it is unlikely restaurants will be serving any more than two flavours.

Sample size – Each separate sample should consist of 1 single portion of cheesecake. To enable the nutritional analysis to be carried out, each sample should be a minimum of 150g in weight. If it appears the portion is smaller than 150g then it will be necessary to purchase two slices/portions for a particular sample.

Cheesecake portions should be purchased from local restaurants and hotels where the produce is manufactured in NI, but preferably made on site.

Samples should be placed into and transported in plastic containers which are lidded and deep enough to maintain the integrity of the sample. These may be containers similar to those used in fast food takeaways. These disposable plastic containers can be purchased in most supermarkets. Samples should also be frozen prior to dispatch to the Public Analyst.

If any Council purchases a sample which is bought in by a hotel or restaurant, this information should be shared as soon as possible via Smarter Comms/RIAMS through the Health and Wellbeing Working group community to avoid duplication of samples.

Cheesecake accompaniments such as fresh cream or ice-cream do not form part of this survey so these should not be purchased as part of the samples.

Collation and Distribution of Results

Public Analyst Scientific Services Limited will collate results and a report will be distributed.

Equipment needed

Sample labels
Sample containers suitable for the food being sampled and for maintaining sample integrity during transport.
Security seals

Label each sample with a unique reference number
Please use the FSS to submit samples, including the NI survey code in the “Survey code” Field. Please also complete the accompanying survey form for each premises visited. This information will assist in evaluating the results of the survey and inform the basis of any future targeted interventions.

Target businesses

Suggestions include local restaurants and hotels which serve cheesecakes.

Appendix 2. Nutritional analysis results for cheesecakes per portion and per 100g

Sample No.	Total Weight (g)	Energy (kcal) per portion	Total fat (g) per portion	Sat Fat (g) per portion	Sugar (g) per portion	Salt (g) per portion	Energy (kcal) per 100g	Total fat (g) per 100g	Sat Fat (g) per 100g	Sugar (g) per 100g	Salt (g) per 100g
1	91	279	20.4	12.7	17.1	0.31	307	22.4	14.0	18.8	0.34
2	123	442	32.2	18.6	22.8	0.58	359	26.2	15.1	18.5	0.47
3	107	431	33.4	20.4	14.5	0.50	404	31.3	19.1	13.6	0.47
4	127	318	23.5	12.5	11.4	0.37	250	18.5	9.8	9.0	0.29
5	83	231	15.7	9.9	13.5	0.24	278	18.9	11.9	16.3	0.29
6	222	825	56.9	31.1	31.3	1.04	371	25.6	14.0	14.1	0.47
7	102	389	30.4	18.2	12.6	0.47	381	29.8	17.8	12.4	0.46
8	93	371	26.2	15.5	20.1	0.40	397	28.0	16.6	21.5	0.43
9	171	665	50.4	30.7	20.2	0.97	389	29.5	18.0	11.8	0.57
10	168	596	40.5	19.6	26.9	0.91	355	24.1	11.7	16.0	0.54
11	92	391	25.9	15.2	19.6	0.39	425	28.2	16.5	21.3	0.42
12	101	324	21.9	12.6	16.6	0.31	321	21.7	12.5	16.4	0.31
13	190	735	49.6	31.1	43.3	0.86	387	26.1	16.4	22.8	0.45
14	152	567	43.2	25.4	21.0	0.76	373	28.4	16.7	13.8	0.50
15	181	606	38.9	27.5	42.7	0.85	335	21.5	15.2	23.6	0.47
16	202	715	58.0	36.2	24.0	0.91	354	28.7	17.9	11.9	0.45
17	112	393	30.8	19.8	12.1	0.50	351	27.5	17.7	10.8	0.45
18	136	539	36.9	19.4	25.8	0.58	396	27.1	14.3	19.0	0.43
19	146	445	33.6	8.6	17.5	0.76	305	23.0	5.9	12.0	0.52
20	229	847	72.8	45.6	22.7	0.37	370	31.8	19.9	9.9	0.16
21	163	536	31.1	16.8	38.1	0.60	329	19.1	10.3	23.4	0.37
22	227	906	52.4	27.0	65.6	0.91	399	23.1	11.9	28.9	0.40
23	232	972	57.1	32.9	68.0	1.04	419	24.6	14.2	29.3	0.45

Sample No.	Total Weight (g)	Energy (kcal) per portion	Total fat (g) per portion	Sat Fat (g) per portion	Sugar (g) per portion	Salt (g) per portion	Energy (kcal) per 100g	Total Fat (g) per 100g	Sat Fat (g) per 100g	Sugar (g) per 100g	Salt (g) per 100g
24	123	359	25.6	15.7	22.9	0.12	292	20.8	12.8	18.6	0.10
25	140	455	26.3	16.1	27.0	0.56	325	18.8	11.5	19.3	0.40
26	111	442	33.5	20.6	16.9	0.44	398	30.2	18.6	15.2	0.40
27	141	478	30.7	18.5	28.6	0.83	339	21.8	13.1	20.3	0.56
28	163	678	48.7	28.5	31.5	0.77	416	29.9	17.5	19.3	0.47
29	107	462	29.0	16.5	31.8	0.64	432	27.1	15.4	29.7	0.60
30	179	644	45.4	28.4	40.3	0.52	359	25.3	15.8	22.5	0.29
31	116	422	29.3	17.8	15.3	0.42	364	25.3	15.4	13.2	0.36
32	99	327	23.1	14.0	16.2	0.61	330	23.3	14.1	16.4	0.62
33	274	923	67.7	41.2	40.8	0.82	337	24.7	15.1	14.9	0.30
34	133	516	38.7	24.5	21.8	0.52	388	29.1	18.4	16.4	0.39
35	104	468	38.8	23.9	15.4	0.36	450	37.3	23.0	14.8	0.35
36	193	716	59.1	38.4	30.1	0.62	371	30.6	19.9	15.6	0.32
37	188	664	50.0	31.2	27.3	0.60	353	26.6	16.6	14.5	0.32
38	87	388	27.0	16.4	15.4	0.36	449	31.2	19.0	17.8	0.42
39	113	475	31.8	18.9	26.8	0.36	420	28.1	16.7	23.7	0.32
40	108	420	29.5	17.7	17.3	0.62	389	27.3	16.4	16.0	0.57
41	117	435	30.7	20.9	33.7	0.34	372	26.2	17.9	28.8	0.29
42	145	566	36.4	22.1	33.5	0.84	390	25.1	15.2	23.1	0.58
43	145	621	41.9	25.5	38.7	0.68	428	28.9	17.6	26.7	0.47
44	133	481	30.6	18.5	28.5	0.76	362	23.0	13.9	21.4	0.57
45	165	681	45.0	30.1	40.8	0.68	413	27.3	18.2	24.7	0.41
46	155	598	38.3	25.8	38.3	0.68	386	24.7	16.7	24.7	0.44
47	128	367	23.3	14.0	22.3	0.61	287	18.2	10.9	17.4	0.48

Appendix 3. Colour coding criteria used in Front of Pack labelling guidance[5]

Text	LOW[8]	MEDIUM	HIGH	
Colour code	Green	Amber	Red	
			>25% of RIs	>30% of RIs
Fat	≤ 3.0g/100g	> 3.0g to ≤ 17.5g/100g	> 17.5g/100g	> 21g/portion
Saturates	≤ 1.5g/100g	> 1.5g to ≤ 5.0g/100g	> 5.0g/100g	> 6.0g/portion
(Total) Sugars	≤ 5.0g/100g	> 5.0g to ≤ 22.5g /100g	> 22.5g/100g	> 27g/portion
Salt	≤ 0.3g/100g	> 0.3g to ≤ 1.5g/100g	>1.5g/100g	>1.8g/portion

Note: portion size criteria apply to portions/serving sizes greater than 100g

[8] The low cut off is based on the "low" nutrition claim for fat, saturates, total sugars and salt in the EU Nutrition & Health Claims Regulation legislation (EC) 1924/2006.

[5] Extract from Department of Health and Food Standards Agency. Guide to creating a front of pack (FoP) nutrition label for pre-packed products sold through retail outlets (2016). Available from: https://www.food.gov.uk/sites/default/files/media/document/fop-guidance_0.pdf

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