Title: Mandating calorie labelling of food and drink in out-of-home settings **IA No:** 13009 **RPC Reference No:** RPC-DH-4216(3) **Lead department or agency:** Department of Health and Social Care (DHSC) **Other departments or agencies:** n/a	**Impact Assessment (IA)** **Date:** 08/01/20 **Stage:** Final IA **Source of intervention:** Domestic **Type of measure: Secondary legislation** **Contact for enquiries:** Childhood.Obesity@dhsc.gov.uk

Summary: Intervention and Options

RPC Opinion: Fit for Purpose

Cost of Preferred (or more likely) Option (in 2018 prices)			
Total Net Present Social Value	**Business Net Present Value**	**Net cost to business per year**	**Business Impact Target Status**
£5,568m	-£10.0m	£0.5m	Qualifying provision

What is the problem under consideration? Why is government intervention necessary?

Children and adults are consuming too many calories. Eating out accounts for a significant proportion of people's energy intake. When eating out, however, there is limited access to energy information making it difficult for consumers to identify healthier options for themselves and their families. Ensuring this information is available will allow consumers to make informed choices, supporting Government policies to reduce childhood obesity.

What are the policy objectives and the intended effects?

The objective is to develop a mandatory calorie labelling scheme, which is adopted across the out-of-home sector – that is any outlet where food or drink is prepared in a way that means it is ready for immediate consumption. The policy is intended to provide consumers with consistent energy information that will help them make informed choices and identify healthier options when eating out. A further aim is that calorie labelling will encourage businesses to reformulate existing products and design new recipes with lower energy content.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

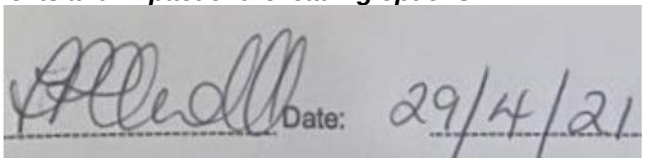
Option 1: Do nothing
Option 2: The Department mandates a calorie labelling scheme for use across the catering industry, for businesses of all sizes.
Option 3: Same as Option 2, excluding micro businesses.
Option 4: Same as Option 2, excluding micro and small businesses..
Option 5: Same as Option 2, excluding micro, small, and medium businesses.

Option 5 has been chosen as the preferred option. Option 5 ensures that businesses who might find calorie labelling more challenging are not impacted while still delivering significant health benefits as nearly half of all food and drink sold will be required to be calorie labelled.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 04/2026

Does implementation go beyond minimum EU requirements?		Yes			
Is this measure likely to impact on trade and investment?		No			
Are any of these organisations in scope?	**Micro** No	**Small** No	**Medium** No	**Large** Yes	
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)		**Traded:** n/a	**Non-traded:** n/a		

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister: 

Summary: Analysis & Evidence

Policy Option 1

Description: "Do nothing" scenario

FULL ECONOMIC ASSESSMENT

Price Base Year	PV Base Year	Time Period Years	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	**High:** Optional	**Best Estimate: 0**

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Optional		Optional	**Optional**
High	Optional		Optional	**Optional**
Best Estimate				

Description and scale of key monetised costs by 'main affected groups'

These are defined to be 0

Other key non-monetised costs by 'main affected groups'

These are defined to be 0

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional		Optional	**Optional**
High	Optional		Optional	**Optional**
Best Estimate				

Description and scale of key monetised benefits by 'main affected groups'

These are defined to be 0

Other key non-monetised benefits by 'main affected groups'

These are defined to be 0

Key assumptions/sensitivities/risks **Discount rate (%)**

These are defined to be 0

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: 0	**Benefits:** 0	**Net:** 0	

Summary: Analysis & Evidence

Policy Option 2

Description: Mandating calorie labelling of all 'standardised' food and drink items in all out-of-home settings at the point of choice

FULL ECONOMIC ASSESSMENT

Price Base Year 2018	PV Base Year 2019	Time Period Years 25	Net Benefit (Present Value (PV)) (£m)		
			Low: -272	**High:** 18,903	**Best Estimate:** 11,780

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	35		3	**82**
High	295		48	**1,106**
Best Estimate	115		22	**479**

Description and scale of key monetised costs by 'main affected groups'

Appraisal is over 25 years of policy implementation. Expected costs to out-of-home businesses include familiarisation and transition costs of £20m; transition costs associated with calculating the energy content of products of £46m and ongoing annual costs of £21m (calculating the energy content of new and modified products); and initial labelling costs of £49m. The use of a calorie calculator tool is estimated to cost £1m per year. The enforcement cost is estimated to be around £0.4m per year.

Other key non-monetised costs by 'main affected groups'

The impact on profit as a result of the policy has not been quantified due to the uncertainty around how this policy will affect sales, which will be dependent on consumer choice and whether businesses choose to reformulate. Depending on relative profit margins, out-of-home businesses may face a loss in profits from consumers switching between higher and less energy dense products within one establishment, or switching between establishments. If this policy affects the profitability to the point of destabilising micro or small businesses, it would have a magnified impact to micro and small business owners and employees. If businesses choose to reformulate there may be additional costs associated with this – although we expect businesses to do this only if it improves their profits.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional		Optional	**827**
High	Optional		Optional	**18,990**
Best Estimate				**12,290**

Description and scale of key monetised benefits by 'main affected groups'

Expected benefits are the health benefits that would accrue because of lower calorie consumption amongst overweight and obese children and adults directly due to labelling and reformulation – equivalent to £10.1bn over the 25-year assessment period. There would be NHS savings worth £0.9bn, and social care savings worth £1.0bn. Economic activity through increased labour force participation would be expected to result in benefits worth £176m.

Other key non-monetised benefits by 'main affected groups'

The calorie model used to monetise the benefits does not factor in life-long benefits to health and some health conditions related to obesity. Depending on relative profit margins, businesses may increase profits from consumers switching between products or establishments.

Key assumptions/sensitivities/risks **Discount rate (%)** 1.5/3.5

Health benefits rely on fewer calories being consumed as a result of this policy. The evidence for labelling leading to a reduction in calorie intake is mixed but generally supportive. We use an American systematic review that suggests 81 fewer calories are consumed in the presence of contextual labelling. Due to the uncertainty around this evidence, given that is from North America, calorie consumed and overall eating habits are different between the countries, and changes to the food offer, this calorie reduction is down-weighted by 50% to form the starting point of each policy. Evidence of calorie labelling without contextual labelling is more mixed. Long-term health benefits require the direct impacts of the policy intervention to not be offset. Cost assumptions cover the energy values of menu items, labelling costs, and enforcement of the policy. A discount rate of 1.5% has been applied to health impacts, and 3.5% to all other monetised impacts. There is complexity in defining and implementing the policy; our considerations assume that these are successfully overcome.

BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:						Score for Business Impact Target (qualifying provisions only) £m:
Costs:	-28.1	**Benefits:**	0	**Net:**	-28.1	126.4

Summary: Analysis & Evidence

Policy Option 3

Description: Mandating calorie labelling of all 'standardised' food and drink items in all out-of-home settings, except for micro businesses, at the point of choice

FULL ECONOMIC ASSESSMENT

Price Base Year 2018	PV Base Year 2019	Time Period Years 25	Net Benefit (Present Value (PV)) (£m)		
			Low: 311	**High:** 15,110	**Best Estimate:** 9,519

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	5		2	**32**
High	45		15	**305**
Best Estimate	16		4	**76**

Description and scale of key monetised costs by 'main affected groups'

Appraisal is over 25 years of policy implementation. For Option 3, expected costs to out-of-home businesses include familiarisation and transition costs of £3.5m; transition costs associated with calculating the energy content of products of £8.8m, ongoing annual costs of £2.5m (calculating the energy content of new and modified products), and labelling costs of £3.9m. The use of a calorie calculator tool costs £1m per year. The enforcement cost is estimated to be around £0.2m per year.

Other key non-monetised costs by 'main affected groups'

The impact on profit as a result of the policy has not been quantified due to the uncertainty around how this policy will affect sales, which will be dependent on consumer choice and whether businesses choose to reformulate. Depending on relative profit margins, out-of-home businesses may face a loss in profits from consumers switching between higher and less energy dense products within one establishment, or switching between establishments. If this policy affects the profitability to the point of destabilising small businesses, it would have a magnified impact to small business owners and employees. If businesses, choose to reformulate there may be additional costs associated with this – although we expect businesses to do this only if it improves their profits.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional		Optional	**638**
High	Optional		Optional	**15,145**
Best Estimate				**9,633**

Description and scale of key monetised benefits by 'main affected groups'

Expected benefits are the health benefits that would accrue because of lower calorie consumption amongst overweight and obese children and adults directly due to labelling and reformulation – equivalent to £7.9bn over the 25-year assessment period. There would be savings to the NHS, worth £743m and social care savings of £821m. Economic activity through increased labour force participation would be expected to result in benefits worth £138m.

Other key non-monetised benefits by 'main affected groups'

The calorie model used to monetise the benefits does not factor in life-long benefits to health and some health conditions related to obesity. Depending on relative profit margins, out-of-home businesses may experience an increase in profits from consumers switching between products or between establishments.

Key assumptions/sensitivities/risks	**Discount rate (%)**	1.5/3.5

Health benefits rely on fewer calories being consumed as a result of this policy. The evidence for labelling leading to a reduction in calorie intake is mixed but generally supportive. We use an American systematic review that suggests 81 fewer calories are consumed in the presence of contextual labelling. Due to the uncertainty around this evidence, given that is from North America, calorie consumed and overall eating habits are different between the countries, and changes to the food offer, this calorie reduction is down-weighted by 50% to form the starting point for the evaluation of each policy option. Evidence of calorie labelling without contextual labelling is more mixed. Long-term health benefits require the direct impacts of the policy intervention to not be offset. Cost assumptions cover the energy values of menu items, labelling costs, and enforcement of the policy. A discount rate of 1.5% has been applied to health impacts, and 3.5% to all other monetised impacts. There is complexity in defining and implementing the policy; our considerations assume that these are successfully overcome.

BUSINESS ASSESSMENT (Option 3)

Direct impact on business (Equivalent Annual) £m:						**Score for Business Impact Target (qualifying provisions only) £m:**
Costs:	-4.5	**Benefits:**	0	**Net:**	-4.5	20.1

Summary: Analysis & Evidence

Policy Option 4

Description: Mandating calorie labelling of all 'standardised' food and drink items in all out-of-home settings, except for small and micro businesses, at the point of choice.

FULL ECONOMIC ASSESSMENT

Price Base Year 2018	**PV Base Year** 2019	**Time Period Years** 25	**Net Benefit (Present Value (PV)) (£m)**		
			Low: 237	**High:** 11,544	**Best Estimate:** 7,124

COSTS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Cost** (Present Value)
Low	1		1	**16**
High	8		8	**145**
Best Estimate	2		2	**33**

Description and scale of key monetised costs by 'main affected groups'

Appraisal is over 25 years of policy implementation. Expected costs to out-of-home businesses include familiarisation and transition costs of £0.4m; transition costs associated with calculating the energy content of products of £1.2m and ongoing annual costs of £0.6m (calculating the energy content of new and modified products); and initial labelling costs of £0.5m. The use of a calorie calculator tool costs £1m per year. The enforcement cost is estimated to be around £0.1m per year.

Other key non-monetised costs by 'main affected groups'

The impact on profit as a result of the policy has not been quantified due to the uncertainty around how this policy will affect sales, which will be dependent on consumer choice and whether businesses choose to reformulate. Depending on relative profit margins, out-of-home businesses may face a loss in profits from consumers switching between higher and less energy dense products within one establishment, or switching between establishments. If businesses, choose to reformulate there may be additional costs associated with this – although we expect businesses to do this only if it improves their profits.

BENEFITS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Benefit** (Present Value)
Low	Optional		Optional	**392**
High	Optional		Optional	**11,560**
Best Estimate				**7,160**

Description and scale of key monetised benefits by 'main affected groups'

Expected benefits are the health benefits that would accrue because of lower calorie consumption amongst overweight and obese children and adults directly due to labelling and reformulation – equivalent to £5.9bn over the 25-year assessment period for. There would be savings to the NHS, worth £552m and social care savings, worth £612m. Economic activity through increased labour force participation would be expected to result in further benefits worth £103m.

Other key non-monetised benefits by 'main affected groups'

All expected benefits would be scalable based on the proportion of businesses that are mandated to implement calorie labelling and the way they do it. The calorie model used to monetise the benefits does not factor in life-long benefits to health and some health conditions related to obesity. Depending on relative profit margins, businesses may increase profits from consumers switching between products or establishments.

Key assumptions/sensitivities/risks	**Discount rate (%)**	1.5/3.5

Health benefits rely on fewer calories being consumed as a result of this policy. The evidence for labelling leading to a reduction in calorie intake is mixed but generally supportive. We use an American systematic review that suggests 81 fewer calories are consumed in the presence of contextual labelling. Due to the uncertainty around this evidence, given that is from North America, calorie consumed and overall eating habits are different between the countries, and changes to the food offer, this calorie reduction is down-weighted by 50% to form the starting point for the evaluation of each policy option. Evidence of calorie labelling without contextual labelling is more mixed. Long-term health benefits require the direct impacts of the policy intervention to not be offset. Cost assumptions cover the energy values of menu items, labelling costs, and enforcement of the policy. A discount rate of 1.5% has been applied to health impacts, and 3.5% to all other monetised impacts. There is complexity in defining and implementing the policy; our considerations assume that these are successfully overcome.

BUSINESS ASSESSMENT (Option 4)

Direct impact on business (Equivalent Annual) £m:						**Score for Business Impact Target (qualifying provisions only) £m:**
Costs:	1.9	**Benefits:**	0	**Net:**	-1.9	8.6

Summary: Analysis & Evidence

Policy Option 5

Description: Mandating calorie labelling of all 'standardised' food and drink items in all out-of-home settings, except for micro, small, and medium businesses, at the point of choice.

FULL ECONOMIC ASSESSMENT

Price Base Year 2018	**PV Base Year** 2019	**Time Period Years** 25	**Net Benefit (Present Value (PV)) (£m)**		
			Low: 226	**High:** 9,128	**Best Estimate:** 5,568

COSTS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Cost** (Present Value)
Low	0		0	**6**
High	2		2	**36**
Best Estimate	1		1	**10**

Description and scale of key monetised costs by 'main affected groups'

Appraisal is over 25 years of policy implementation. Expected costs to out-of-home businesses include familiarisation and transition costs of £0.1m; transition costs associated with calculating the energy content of products of £0.6m and ongoing annual costs of £0.4m (calculating the energy content of new and modified products); and initial labelling costs of £0.1m. The use of a calorie calculator tool costs £0.1m per year. The enforcement cost is estimated to be around £0.1m per year.

Other key non-monetised costs by 'main affected groups'

The impact on profit as a result of the policy has not been quantified due to the uncertainty around how this policy will affect sales, which will be dependent on consumer choice and whether businesses choose to reformulate. Depending on relative profit margins, out-of-home businesses may face a loss in profits from consumers switching between higher and less energy dense products within one establishment, or switching between establishments. If businesses, choose to reformulate there may be additional costs associated with this – although we expect businesses to do this only if it improves their profits.

BENEFITS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Benefit** (Present Value)
Low	Optional		Optional	**270**
High	Optional		Optional	**9,140**
Best Estimate				**5,580**

Description and scale of key monetised benefits by 'main affected groups'

Expected benefits are the health benefits that would accrue because of lower calorie consumption amongst overweight and obese children and adults directly due to labelling and reformulation – equivalent to £4.6bn over the 25-year assessment period for. There would be savings to the NHS, worth £430m and social care savings, worth £477m. Economic activity through increased labour force participation would be expected to result in further benefits worth £80m.

Other key non-monetised benefits by 'main affected groups'

All expected benefits would be scalable based on the proportion of businesses that are mandated to implement calorie labelling and the way they do it. The calorie model used to monetise the benefits does not factor in life-long benefits to health and some health conditions related to obesity. Depending on relative profit margins, businesses may increase profits from consumers switching between products or establishments.

Key assumptions/sensitivities/risks **Discount rate (%)** 1.5/3.5

Health benefits rely on fewer calories being consumed as a result of this policy. The evidence for labelling leading to a reduction in calorie intake is mixed but generally supportive. We use an American systematic review that suggests 81 fewer calories are consumed in the presence of contextual labelling. Due to the uncertainty around this evidence, given that is from North America, calorie consumed and overall eating habits are different between the countries, and changes to the food offer, this calorie reduction is down-weighted by 50% to form the starting point for the evaluation of each policy option. Evidence of calorie labelling without contextual labelling is more mixed. Long-term health benefits require the direct impacts of the policy intervention to not be offset. Cost assumptions cover the energy values of menu items, labelling costs, and enforcement of the policy. A discount rate of 1.5% has been applied to health impacts, and 3.5% to all other monetised impacts. There is complexity in defining and implementing the policy; our considerations assume that these are successfully overcome.

BUSINESS ASSESSMENT (Option 4)

Direct impact on business (Equivalent Annual) £m:						Score for Business Impact Target (qualifying provisions only) £m:
Costs:	-0.6	**Benefits:**	0	**Net:**	-0.6	2.5

Executive Summary

1. Both children and adults are consuming too many calories[1]. Eating out now accounts for a significant proportion of energy intake from food and drink consumed in England. When eating out, however, there is limited access to energy information making it difficult for consumers to make informed choices and identify healthier options. Ensuring information is available that allows consumers to make an informed choice supports Government policies to tackle the high rates of childhood obesity.
2. The objective of this policy is to develop a mandatory scheme which is adopted across the out-of-home sector. The intended effect of providing consumers with consistent energy information is that it will help them make informed choices and identify healthier options when eating out. A further aim is that enforced calorie labelling will encourage caterers to reformulate existing products and design new recipes with lower energy content.
3. The options for menu labelling considered at consultation were:

   Option 1: Do nothing – Rely on existing voluntary calorie labelling and momentum in the out-of-home sector to provide adequate nutritional information for consumers.
   Option 2: The Department mandates a calorie labelling scheme for use across the catering industry, for businesses of all sizes.
   Option 3: Same as Option 2 but excluding micro businesses from the regulations.
   Option 4: Same as Option 2 but excluding micro and small businesses.

4. Following responses at consultation and further consideration of the impact on businesses, we present an additional option:

   Option 5: Same as Option 2 but excluding micro, small and medium businesses from the regulations. This means only large businesses would be in the scope of the policy.

Preferred Option

5. Option 5 has been presented as the preferred option. In Option 5, the Department mandates a calorie labelling scheme for only large businesses, exempting micro, small, and medium businesses. In comparison to the other options, Option 5 ensures micro, small, and medium businesses are not impacted by the policy, whilst still returning a large net present value (NPV). The NPV over 25 years is £5.6bn, with total costs of £12m and total benefits of £5.6bn.
6. The expected costs to out-of-home businesses include transition costs of £0.8[2]m (familiarisation costs of £0.1m, costs for calculating energy content of products of £0.6m, and labelling costs of £0.1m) and ongoing annual costs of £0.4m (calculating the energy content of new and modified products (changes to the recipe) and the use of a calorie calculator tool).
7. Government would experience costs for the enforcement of the policy: Familiarisation cost for trading standards officer are estimated at £25,000 and annual enforcement costs at £0.1m (equivalent to £1.6m over the 25 years).
8. The evidence for calorie labelling leading to a reduction in calorie intake is mixed but positive results are seen in the large review papers; this is especially true among papers which examine the impact of contextual calorie labelling. The estimated benefits are the health benefits that would accrue because of lower calorie consumption due to labelling directly and due to reformulation– equivalent to £4.6bn over the 25-year assessment period for Option 5. There would be savings to the NHS, worth £430m, and social care savings, worth £477m. Economic activity through increased labour force participation would be expected to result in further benefits worth £80m.

Alternative Options

Option 2

[1] Calorie reduction: the scope and ambition for action, Public Health England, 2018: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685359/Calorie_reduction_The_scope_and_ambition_for_action.pdf (last accessed 06/06/18)

[2] This figure has been updated following RPC's final opinion dated 20 December 2019, in order to address comment regarding inconsistency with the calculations.

9. Option 2 (calorie labelling becomes mandatory across the sector) has an NPV of £12.0bn. Total costs are £500m and total benefits £12.3bn.

Option 3

10. The exemption of micro businesses results in an NPV of £9.5bn. Total costs are £114m and total benefits are £9.6bn.

Option 4

11. The exemption of small and micro businesses results in an NPV of £7.1bn. Total costs are £38m and total benefits are £7.2bn.

Critical value analysis

12. It is possible that wider factors will shift to offset some of the calorie reduction expected because of this policy. While this is not considered to be the most likely outcome, this cannot be ruled out. In order to assess the impact of a potential offset, we consider the degree of offsetting required to result in a neutral NPV.
13. For Option 5, the combined benefits are estimated to be worth £5.6bn and total costs are valued at £12m over the 25-year assessment period. This suggests that 99.8% of the direct benefits of the policy would need to be offset in order for the policy to not be deemed socially beneficial. An average calorie reduction of 0.02 kcal per person a day is necessary to achieve a positive Net Present Value.
14. If this policy is implemented and results in no calorie reduction, the full costs still occur but none of the resulting benefits ensue. For Option 5 this would result in an NPV over 25 years of -£12m.

Summary of NPV

15. The table below shows the breakdown of costs, benefits, and total NPV for all options. Following analysis of the feedback received through the consultation process as well as discussions on the proposals with sector stakeholders, Option 5 has been chosen as the preferred option. DHSC acknowledges the preferred option (Option 5) does return the lowest NPV over 25 years. However, in choosing Option 5, we are minimising the costs incurred by businesses and ensuring the burden of introducing calorie labelling is not disproportionately affecting micro, small, and medium businesses who may find this more challenging.
16. For a further discussion on the rationale for choosing Option 5, please see Policy objective, context and options.

Summary of NPVs

	Costs	**Benefits**	**NPV**
Option 1	£0	£0	£0
Option 2	£510m	£12.3bn	£11.8bn
Option 3	£114m	£9.6bn	£9.5bn
Option 4	£38m	£7.2bn	£7.1bn
Option 5	£12m	£5.6bn	£5.6bn

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Evidence Base

Problem under consideration

1. Childhood obesity is one of the biggest health problems this country faces. Nearly a quarter of children in England are obese or overweight by the time they start primary school aged five, and this rises to one third by the time they leave aged 11[3]. Obesity is a global issue, with rates doubling since 1980. The WHO estimates that over 650 million adults were obese in 2016, about 13% of the global population[4].

2. Obesity is a major cause of ill health in the UK, increasing the likelihood of conditions such as heart disease, stroke, type II diabetes, and cancer. Obese females are over ten times more likely to develop type II diabetes than their healthy weight counterparts, with obese males over five times more likely[5]. This imposes a substantial burden on the NHS, with overweight and obesity costing the health service in England £5.1bn in 2014/15[6]. Obesity causes further costs to society and government through premature mortality, increased sickness absence and additional benefit payments.

3. In 2017, 64% of adults were classified as overweight or obese, with 29% being obese. Amongst children, the equivalent figures were 29% and 16% respectively[7]. Obese children tend to remain overweight and become obese adults. Moreover, the more obese the child is, the higher the chance of them becoming an obese adult. For example, based on analysis of the 1958 birth cohort, 38% girls who were above the 91st BMI percentile at age 7 went on to become obese at age 33, while 60% of girls who were above the 98th BMI percentile at age 7 were obese at age 33[8].

4. Without action, the burdens of obesity and its related conditions are expected to grow substantially over time. Projections suggest that the proportion of the UK adult population who are obese will increase significantly over the coming decades[9,10].

5. There are also significant inequalities in childhood obesity rates by socioeconomic group. The obesity prevalence is higher among children from more deprived families than among the least deprived[11].

6. There is evidence suggesting there are more fast food outlets in more deprived areas[12,13], which is likely to lead to a higher number of calories consumed outside the home. Likewise, the Food and You survey (2014)[14] reports that unemployed respondents were more likely to report having takeaways compared with those in work.

7. Many restaurants in the UK provide specific menus for young children[15] with further evidence showing that food with poor nutritional quality are easily accessible and commonly targeted at children and

[3] NHS Digital. (2018) National Child Measurement Programme 2017/2018

[4] WHO Obesity factsheet http://www.who.int/mediacentre/factsheets/fs311/en/ (last accessed 18/01/19)

[5] The incidence of co-morbidities related to obesity and overweight: A systematic review and meta-analysis, Guh et al, BMC Public Health 2009

[6] Estimates for England in 2014/15 are based on: Scarborough, P. (2011) The economic burden of ill health due to diet, physical inactivity, smoking, alcohol and obesity in the UK: an update to 2006–07 NHS costs. Journal of Public Health. May 2011, 1-9. These have been uplifted to take into account inflation. No adjustment has been made for slight changes in overweight and obesity rates over this period. It has been assumed England costs account for around 85% of UK costs, in accordance with UK population estimates splits between the four nations.

[7] Health Survey for England, 2017, NHS Digital

[8] Lake et al. (1997) Child to adult body mass index in the 1958 British birth cohort: associations with parental obesity. Archives of Disease in Childhood, 77, 376-381.

[9] Tackling Obesities: Future Choices – Project report, 2007

[10] Pineda E, Sanchez-Romero LM, Brown M, Jaccard A, Jewell J, Galea G, Webber L, Breda J. Forecasting Future Trends in Obesity across Europe: The Value of Improving Surveillance. Obesity facts. 2018;11(5):360-71.

[11] NHS Digital. (2018) National Child Measurement Programme 2017/2018

[12] Macdonald, L. et al. (2007). Neighbourhood fast food environment and area deprivation—substitution or concentration?. Appetite, 49(1), 251-254.

[13] Cummins, S. et al. (2005). McDonald's restaurants and neighborhood deprivation in Scotland and England. American journal of preventive medicine, 29(4), 308-310.

[14] FSA (2014) Food and You, available online at https://www.food.gov.uk/sites/default/files/media/document/food-and-you-2014-uk-bulletin-3_0.pdf (last accessed 18/01/19)

[15] Young M, Coppinger T, Reeves S. The Nutritional Value of Children's Menus in Chain Restaurants in the United Kingdom and Ireland. Journal of Nutrition Education and Behavior. 2019;

young people. Without the calorie information, parents don't have the information to make informed choices[16].

8. Obesity in childhood affects physical and mental health and is associated with an increased risk of obesity in adulthood when most of costs due to obesity occur. It is estimated that on average, compared with those of ideal body weights, overweight and obese children consume between 140 and 500 excess calories per day for boys and between 160 and 290 for girls, depending of their age[17].
9. Although food habits are not perfectly stable over the life course, there is considerable scope for influencing lifetime habits by intervening in children[18]. Adjusting the consumption patterns of children through providing calorie labels and raising awareness of the calorie content of meals therefore offers substantial benefits in the long term.

Rationale for intervention

10. The demand for food stems largely from two distinct channels – the requirement to consume sufficient energy and nutrients to survive, and the pleasure derived from the taste, texture and aroma. While additional consumption of food will continue to deliver benefits to an individual through the second of these channels, once consumption reaches a certain point, no further nutritional benefit is gained. When daily energy intake exceeds energy expenditure individuals will gain weight, potentially leading to obesity and the health problems this can cause.
11. Optimal market outcomes require individuals to be fully informed of the costs and benefits of consuming products. The energy content of food is key information for assessing a product's ability to deliver satiation and its potential to result in overconsumption. In the retail environment consumers have easy access to accurate calorie and nutrient information on the labels of pre-packaged food, which can be used by consumers to inform choices. There is currently a clear case of information asymmetry in the out-of-home food sector – while producers of food have (to varying degrees) knowledge of the nutritional content of their food, consumers do not.
12. This problem is compounded by the relationship between food as a provider of both nutrients and utility (through taste etc.). Where consumers can observe only the taste of a product, but not its nutritional composition, producers will naturally have an incentive to enhance the properties of the former, even if this must come at a cost to the latter. In other words, where taste may be improved through the addition of energy dense ingredients, the incentive to do so is greater when consumers are not aware of the additional health costs this imposes.
13. The provision of calorie labelling for foods consumed in the out-of-home sector will allow individuals to more accurately assess the potential health costs of foods, and thus make more rational purchasing decisions after considering all characteristics of a product.
14. It should be noted that individuals face only some of the costs associated with obesity, as universal healthcare ensures that the financial costs of treating ill health are faced by the taxpayer. As with any case of negative externalities, this results in a sub-optimal outcome from a societal perspective. The provision of calorie labelling does not attempt to correct for this difference between individual and societal costs – merely to improve the functioning of a market operating under this constraint.
15. Evidence has shown that the energy content in UK restaurants is excessive, with one study[19] finding only 9% of meals meet the public health recommendations for energy content, and 46% of meals were found to have an excessive energy content. An additional study[20] focussing on starters, sides, and desserts in UK restaurants found that 1 in 4 starters and 1 in 5 sides and desserts exceeded the recommended energy intake for an entire meal. This excess of calories also extends to takeaways in

[16] Wills, W.; Danesi, G.; Kapetanaki, A.B.; Hamilton, L. Socio-Economic Factors, the Food Environment and Lunchtime Food Purchasing by Young People at Secondary School. Int. J. Environ. Res. Public Health 2019, 16, 1605

[17] Calorie reduction: the scope and ambition for action, Public Health England, 2018: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685359/Calorie_reduction_The_scope_and_ambition_for_action.pdf (Accessed 21/08/2019)

[18] Hursti UK (1999) Factors influencing children's food choice. Annals of medicine, Jan 1;31(sup1):26-32.

[19] Robinson et al. "(Over) eating out at major UK restaurant chains: observational study of energy content of main meals." BMJ 363 (2018): k4982.

[20] Muc et al. (Under Review) A bit or a lot on the side? An observational study of the energy content of starters, sides and desserts in major UK restaurant chains. This paper is awaiting publication.

the UK, with a study[21] looking at random samples of takeaway meals finding the majority of meals were excessive in terms of energy, and in some cases, the consumption of one meal would be enough to provide daily energy.

16. Government intervention is required as previous voluntary efforts to encourage the provision of calorie labelling in out-of-home settings have resulted in a low level of market coverage, which looks unlikely to increase of its own volition.

17. The Public Health Responsibility Deal[22] was launched in March 2011 and aimed to allow businesses and other influential organisations to make a significant contribution to improving public health through their influence on food, alcohol, physical activity behaviours, and health in the workplace. Organisations who signed up to the Responsibility Deal committed to taking action voluntarily to improve public health via a selection of collective pledges.

18. One of the voluntary pledges was Voluntary Out of Home Calorie labelling[23] which stated:

    "We will provide energy information for food and non-alcoholic drink for our customers in out of home settings from 1 September 2011 in accordance with the principles for calorie labelling agreed by the Responsibility Deal."

19. The intended aim of the out-of-home calorie labelling pledge was to inform and empower people to make healthier choices more often when eating out, as well as encouraging food businesses to make healthier options more available.

20. The pledge asked catering businesses, who sell food in out-of-home settings, to provide energy information for customers on menus or menu boards. Signatories agreed to make a voluntary commitment to display energy information clearly and prominently at the point of choice e.g. on menus and/or menu boards, for standardised food and non-alcoholic drinks. Out-of-home settings included restaurants, quick service restaurants, takeaways, cafes, pubs, sandwich shops & staff restaurants etc.

21. 45 out-of-home businesses signed up to this pledge to provide energy information at the point of choice. However, this voluntary pledge did not have the intended result of getting a large proportion of the industry to include calorie labeling at the point of choice.

22. Data from 2013-2014 estimated that just 26% of meals served in out-of-home settings carried calorie labelling[24]. A more recent study conducted in 2018[25] visited the website and/or retail outlets of 104 of the largest food chains in the UK, and found that only 17% of businesses provided in store calorie labelling. This study also consisted of 16 businesses that had previously signed up to the Responsibility Deal. Of these, only 12 were found to have calorie labelling and none of these were found to meet all the recommended labelling practices.

23. There is evidence to suggest the Responsibility Deal itself was actually not the drive for businesses signing up to the pledge. Findings in Dunrand et al.[26] suggested that businesses would sign up to pledges in which they were already engaged (and specifically quotes calorie labelling in regards to this), while one evaluation[27] indicated that only 4% of signatories providing calorie labelling were judged as being motivated by the Responsibility Deal.

24. The Responsibility Deal has since been discontinued and the food related work is being taken forward by Public Health England in their wider reformulation initiatives. Given the findings discussed above,

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[21] Jaworowska et al. "Nutritional composition of takeaway food in the UK." Nutrition & Food Science 44.5 (2014): 414-430.

[22] [22] Public Health Responsibility Deal: https://webarchive.nationalarchives.gov.uk/20130104155853/http://responsibilitydeal.dh.gov.uk/about/ (lased accessed 29/01/19)

[23] Public Health Responsibility Deal: Food Plegdes. Available online at https://webarchive.nationalarchives.gov.uk/20130104160351/http://responsibilitydeal.dh.gov.uk/2011/12/20/food-pledges/ (last accessed 18/01/19)

[24] DHSC analysis combined with findings from the 2013/2014 publication of the responsibility deal.

[25] Robinson et al. "Point of choice kilocalorie labelling in the UK eating out of home sector: a descriptive study of major chains" Available online: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7017-5

[26] Durand, M. A. et al. (2015). An evaluation of the Public Health Responsibility Deal: Informants' experiences and views of the development, implementation and achievements of a pledge-based, public–private partnership to improve population health in England. Health Policy, 119(11), 1506-1514.

[27] Knai et al. (2015) Has a public–private partnership resulted in action on healthier diets in England? An analysis of the Public Health Responsibility Deal food pledges http://www.sciencedirect.com/science/article/pii/S0306919215000391 (last accessed 28/11/2017)

it is clear that further action must to taken if we wish to ensure calorie information is consistently displayed at the point of choice in out-of-home settings.

25. International evidence from the US and parts of Australia, where calorie labelling in out-of-home settings has been mandated and already come into effect, is mixed but on balance suggests calorie labelling delivered a small but significant reduction in calories purchased by consumers who noticed and used the information. Further discussion of benefits, drawing on international evidence, can be found in the 'Health Benefits' section below.

26. A regulatory approach where all businesses fall within the scope of the regulation would result in a level playing field across the out-of-home sector. A voluntary approach would only deliver a level playing field if every business chose to provide calorie labelling. However, the most recent voluntary approach, the Responsibility Deal, is estimated to have only resulted in a small proportion of establishments displaying calorie labels.

Policy objective, context and options

Policy objective

27. Mandating out-of-home calorie labelling is intended to:

- Enable consumers to make informed and healthier choices for themselves and their families by providing energy information at the point of choice;
- Ensure energy information is provided in a consistent manner across all out-of-home settings, ensuring wider market penetration to increase consumer use, and consistent presentation of information aiding understanding;
- Encourage caterers to reformulate high calorie products and provide healthier options;
- Create a level playing field across the catering industry, removing disincentives for out-of-home businesses with a high proportion of energy dense products not to provide calorie labelling;
- Recognise and address the importance of the out-of-home sector to overall food consumption, and assist the wider obesity strategy to reduce circumstances currently contributing to the obesogenic environment.

Policy context

Obesity and eating out

28. The proposal to mandate calorie labelling in the out-of-home sector is part of a wider set of policies included in the Government's Childhood obesity: a plan for action – chapter 2, published in June 2018. The plan sets out the Government's national ambition to halve childhood obesity by 2030 and significantly reduce the gap in obesity prevalence between children from the most and least deprived areas[28]. The proposals outlined in chapter 2 include consulting on ending the sales of energy drinks to children, encouraging further action in local areas and further restrictions on the marketing of HFSS (high sugar, salt, and fat) products to children. The proposed policies will help parents make the best decisions for their families by changing the food environment, so that healthier choices become the easiest choices.

29. In August 2016, the Government launched the first part of its plan for action[29]. This comprehensive plan aims to help children and families make healthier choices and be more active[30]. Key measures in the plan included a Soft Drinks Industry Levy (SDIL), a sugar and calorie reduction programme, and

[28] Childhood obesity: a plan for action, chapter 2 https://www.gov.uk/government/publications/childhood-obesity-a-plan-for-action-chapter-2 (last accessed 06/08/2018)

[29] Childhood obesity: a plan for action is available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/546588/Childhood_obesity_2016__2__acc.pdf (last accessed 06/08/2018)

[30] Ibid.

a commitment to helping children enjoy an hour of physical activity every day. Chapter 2 builds on the first chapter of the plan, both to cement the action already taken, and to take action in other areas.

30. The SDIL has been designed to incentivise reformulation and is charged on drinks with a total sugar content of 5 grams or more per 100 millilitres. There is a higher charge for drinks that contain 8 grams or more sugar per 100 millilitres. The levy came into force in April 2018 and has already resulted in the average sugar content of drinks subject to the soft drinks industry levy decreasing by 28.8% between 2015 and 2018[31].

31. As part of the wider nutrient reformulation programme, in August 2017 Public Health England announced an extensive calorie reduction programme. This programme aims to remove excess calories from the foods children eat most, helping to make the healthy choice the easy choice for consumers. The calorie reduction programme challenges the food industry to achieve a 20% reduction in calories by 2024 in product categories that contribute significantly to children's calorie intakes and where there is scope for substantial reformulation and/or portion size reduction. This requires work to be undertaken by retailers and manufacturers, restaurants, pubs, cafes, takeaway and delivery services and others in the eating out-of-home sector. The products covered by the programme include ready meals, pizzas, meat products, savoury snacks, sauces and dressings, prepared sandwiches, and other "on the go" foods[32]. PHE will publish the calorie reduction guidelines for industry soon.

32. A range of policies are being proposed because the *'causes of obesity are embedded in an extremely complex biological system, set within an equally complex societal framework'*[33] to which there is no single, simple solution. The size of the problem has led to its normalisation and the inability of many people to judge their own weight accurately[34]. Furthermore, evidence suggests that 50% of parents underestimate their overweight/obese child's weight[35].

33. We know that a significant proportion of the food people eat is consumed outside of the home, with the UK spending £49 billion on food and drink purchased outside the home in 2017[36], with UK households spending £3,152 per year on groceries, and £1,602 on eating out[37]. Recent surveys tell us that 96% of people eat out, and 43% do so at least once or twice a week[38]. Between 2005 and 2015, there was a 53% increase in the number of places to eat out, meaning there were more places to eat out than shops to buy food in[39]. People are also eating out more often; in 2014, 75% of people said they had eaten out or bought takeaway food in the past week, compared to 69% in 2010[40]. In March 2017, Cancer Research UK reported that the UK population consumes more than a 100 million takeaways and ready-made meals in a week[41]. In terms of what proportion of all meals are consumed out of home, evidence suggests 18% of meals (approximately one in six) are now eaten outside the home[42].

34. Evidence suggests that eating out is one contributor to the excess energy intake that leads to overweight and obesity; studies from the US suggest that people dining out consume around 200 more calories per day than when eating at home[43]. It is clear, then, that looking at how to reduce the

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[31] https://www.gov.uk/government/publications/sugar-reduction-progress-between-2015-and-2018 (last accessed 02/10/2019)

[32] PHE (2018) Calorie reduction: The scope and ambition for action. Available at: https://www.gov.uk/government/publications/calorie-reduction-the-scope-and-ambition-for-action (Accessed 29/06/2018)

[33] Tackling Obesities: Future Choices – Project report, Government Office for Science, 2007: https://www.gov.uk/government/publications/reducing-obesity-future-choices (Accessed 15/06/2018)

[34] Johnson et al. (2014) Do weight perceptions among obese adults in Great Britain match clinical definitions? Analysis of cross-sectional surveys from 2007 and 2012, BMJ Open

[35] Lundahl et al. (2014) Parental underestimates of child weight: a meta-analysis. Pediatrics 014;133:e689–703.

[36] Kantar Worldpanel https://uk.kantar.com/consumer/shoppers/2018/the-uk-spent-over-%C2%A349bn-on-eating-and-drinking-out-last-year/ (last accessed 08/02/19)

[37] https://www.nimblefins.co.uk/average-uk-household-cost-food (last accessed 15/03/19)

[38] FSA Food and You Survey (2017) https://www.food.gov.uk/sites/default/files/media/document/food-and-you-w4-combined-report_0.pdf

[39] https://foodfoundation.org.uk/wp-content/uploads/2016/07/The-Food-Foundation-64pp-A4-Landscape-Brochure-AW-V32.pdf

[40] FSA Food and You Survey (2010 and 2014) https://www.food.gov.uk/sites/default/files/food-and-you-2010-main-report.pdf, https://www.food.gov.uk/sites/default/files/media/document/food-and-you-2014-uk-bulletin-3_0.pdf (last accessed 06/08/2018)

[41] Cancer Research UK 'A Weighty Issue' 2017 http://www.cancerresearchuk.org/sites/default/files/a_weighty_issue.pdf (last accessed 09/05/2018)

[42] PHE (2015) Sugar reduction: the evidence for action, page 28, available online at https://www.gov.uk/government/publications/sugar-reduction-from-evidence-into-action (last accessed 09/05/2018). The finding comes from a Kantar World Panel subsample of 4000 homes completing the online consumption diary.

[43] Nguyen and Powell (2014) The impact of restaurant consumption among US adults: effects on energy and nutrient intakes. http://www.ncbi.nlm.nih.gov/pubmed/25076113 (last accessed 09/05/2018)

amount people consume when eating food made outside the home needs to be a significant part of efforts to tackle childhood obesity.

35. In the Food and You survey, roughly three quarters of respondents said they would like to see more information displayed about how healthy different options are. Around half of respondents wanted to see this information in restaurants (52%) and takeaway outlets (48%), with around 40% wanting to see it in fast food outlets (40%), pubs (39%), and cafés and coffee shops (38%). About eight out of ten households with children (82%) said they would like to see more information on healthy options.

36. The Local Government Association (LGA), which represents more than 370 councils, is also supportive of mandatory out-of-home calorie labelling. In February 2016, the LGA urged pubs, restaurants, and cinema chains with 20 or more sites to display the energy content of food and drink served, so consumers and parents have a more informed choice and better understanding of the healthiness of a particular snack, meal or drink. The LGA states that food and drink with high calorie content is a factor behind obesity and the subsequent health problems it can cause, and that mandatory calorie labelling would help people become more aware of how many calories they are eating and drinking[44].

Aligning the retail and catering sectors

37. Trade associations and businesses have also suggested that they would prefer a level playing field between the retail and out-of-home sectors.

38. Proposals to mandate calorie labelling in the out-of-home sector are the start of work to bring caterers more in line with retailers. Energy (kJ/kcal) information is already provided on most food packaging in the UK in the back of pack nutrition labels. In contrast, there are currently no regulations on nutritional labelling at the point of purchase in out-of-home settings, although any labelling provided voluntarily should follow the Food Information to Consumers (FIC) format.

39. There are several papers looking at the effectiveness and understanding of front of pack labelling. A review paper by Grunert et al. (2007)[45] showed widespread consumer interest in front of pack nutritional information and found that most consumers understand the most common signposting formats. However, this review did not find any insight into how labelling information affected consumers' dietary patterns. Another review paper by Cowburn et al. (2005)[46] found that most consumers will look at nutritional labels if they are there, and that labels will most commonly influence food choices for unfamiliar foods. Some studies in this review did suggest that consumers look at nutritional information, but do not process the information any further. Further research[47] suggests that there is little effect on how front of pack labels are displayed, and any presentation of key nutrient information is sufficient to enable consumers to detect healthier food options.

40. Feedback from the consultation showed that out-of-home calorie labelling is supported by retailers with many highlighting that this policy supports a level playing between the out-of-home and retail sectors. Research has shown that front of pack labelling has driven reformulation of existing products[48,49]. Also, the Knai et. al. evaluation of the Responsibility Deal[50] references multiple natural experiments which suggest that nutritional labelling influenced industry to product reformulation to reduce salt, saturated fats, added sugars and trans fats.

International context

[44] https://www.independent.co.uk/life-style/health-and-families/health-news/pubs-and-restaurants-urged-to-display-calories-on-their-menus-by-council-leaders-10397571.html (last accessed 10/05/2018)

[45] Grunert et al. (2007). A review of European research on consumer response to nutrition information on food labels. Journal of public health, 15(5), 385-399.

[46] Cowburn et al. (2005). Consumer understanding and use of nutrition labelling: a systematic review. Public health nutrition, 8(1), 21-28.

[47] Hodgkins et al. (2015). Guiding healthier food choice: systematic comparison of four front-of-pack labelling systems and their effect on judgements of product healthiness. British Journal of Nutrition, 113(10), 1652-1663.

[48] Vyth et al. (2010). Front-of-pack nutrition label stimulates healthier product development: a quantitative analysis. International Journal of Behavioral Nutrition and Physical Activity, 7(1), 65.

[49] Mhurchu et al. (2017). Effects of a voluntary front-of-pack nutrition labelling system on packaged food reformulation: The health star rating system in New Zealand. Nutrients, 9(8), 918.

[50] Knai et. al. (2015) Has a public-private partnership resulted in action on healthier diets in England? An analysis of the Public Health Responsibility Deal pledges. http://www.sciencedirect.com/science/article/pii/S0306919215000391 (last accessed 06/08/2018)

41. Calorie menu labelling is mandatory in the US and parts of Australia, and similar regulations are being considered in Ireland and Canada.

42. Since May 2018, chain restaurants in the US with 20 or more establishments are required to display contextual energy information on menus as part of the Patient Protection and Affordable Care Act (2010)[51].

43. In Northern Ireland, Calorie Wise is a voluntary scheme that encourages businesses to display calories on menus[52]. It is targeted at small and medium sized businesses in partnership with the 11 District Councils. By joining the scheme, businesses receive help and advice on how to calculate and display calories, guidance on how to offer healthier options, and window stickers displaying the Calorie Wise logo to enable customers to look out for the scheme.

44. In Ireland, a national consultation by the Food Standards Authority Ireland (FSAI) in February 2012[53] found that over 95% of consumers were in favour of calorie labels on menus in some or all food outlets. Following FSAI recommendations, voluntary calorie menu-labelling was introduced with technical guidance published for businesses[54]. The FSAI developed a free online calorie calculator tool to assist SMEs in assessing calorie content of products. MenuCal launched in 2014[55]. In February 2015, the Irish Government agreed to draft proposals to mandate calorie labelling[56].

45. Food Standards Scotland ran a small pilot on the use of MenuCal between November 2016 and June 2017[57]. 22 small and medium businesses were recruited as part of the pilot, although only 10 of these businesses went on to use MenuCal to calculate the number of calories in their menus. Businesses that used the MenuCal tool found it easy to use, and those that did not use the tool cited lack of time or other business reasons. The findings also showed that some of the businesses that participated went on to reduce portion sizes and reformulate recipes as a response to the pilot.

46. In 2018 the Scottish Government published their paper 'A healthier future – Scotland's Diet and Health Weight Delivery Plan' which committed Food Standards Scotland to consult on an out of home strategy[58]. Food Standards Scotland have since consulted on their out of home strategy which explored the introduction of mandatory calorie labelling in out of home settings in Scotland. The results from that consultation were published in August 2019 as well as recommendations to the Scottish Government which included the introduction of mandatory calorie labelling for out of home food businesses in Scotland. Food Standards Scotland have not yet proposed details of how calorie labelling should be implemented however they have recommended that this work is developed, subject to the Scottish Government agreeing to introduce mandatory calorie labelling in principle[59,60].

47. The Government of Ontario, Canada's largest province, passed legislation in May 2015[61] to mandate calorie labelling on menus and displays in restaurant chains and other food service providers with 20 or more outlets. This came into effect on the 1st January 2017. This followed a voluntary programme which Restaurants Canada, a trade association, originally promoted in chain restaurants in the province of British Columbia and then expanded nationally.

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[51] FDA, Menu Labelling Requirements https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm515020.htm (last accessed 06/08/2018)

[52] FSA Calorie Wise https://www.food.gov.uk/business-guidance/calorie-wise (last accessed 20/09/2018)

[53] FSAI (2012) Calories on menus in Ireland http://www.fsai.ie/WorkArea/DownloadAsset.aspx?id=11419 (last accessed 06/08/2018)

[54] FSAI (2012) Putting calories on menus in Ireland http://www.fsai.ie/WorkArea/DownloadAsset.aspx?id=11421 (last accessed 06/08/2018)

[55] Department of Health (Ireland) (2014) https://health.gov.ie/blog/press-release/minister-for-health-launches-new-online-fsai-calorie-calculator/ (last accessed 20/09/2018)

[56] Department of Health (Ireland) (2015) Government approves Heads of Bill for calorie posting on menus http://health.gov.ie/blog/press-release/government-approves-heads-of-bill-for-calorie-posting-on-menus/ (last accessed 06/08/2018)

[57] Food Standards Scotland. An Evaluation of a Pilot on the Use of MenuCal within Small and Medium Scottish Food Businesses. Available online: https://www.foodstandards.gov.scot/downloads/MenuCal_-_Evaluation_-_Report.pdf (last accessed 11/02/19)

[58] Scottish Government (2018) A healthier future- action and ambitions on diet, activity and healthy weight https://consult.gov.scot/health-and-social-care/a-healthier-future/ (last accessed 06/08/2018)

[59] https://www.foodstandards.gov.scot/publications-and-research/publications/analysis-of-a-food-standards-scotland-public-consultation-on-improving-the (last accessed 02/09/2019)

[60] https://www.foodstandards.gov.scot/downloads/Diet_and_Nutrition_-_Recommendations_for_an_out_of_home_strategy_for_Scotland.pdf (last accessed 02/09/2019)

[61] Ontario (2015) Healthy Menu Choices Act. 2015, S.O. 2051, c.7, Sched. 1, https://www.ontario.ca/laws/statute/15h07 (last accessed 06/08/2018)

48. Discussion of the evidence assessing the impact of calorie labelling in the US and Australia can be found in the 'Health Benefits' section with a list of the key papers considered listed in Annex C – Previous research on impact of calorie labelling.

Rationale for Preferred Option

49. The options which were proposed in the consultation stage IA are outlined below. We also now include an additional option: Option 5. Option 5 has been added following analysis of the feedback received through the consultation process as well as discussions on the proposals with sector stakeholders. Non-regulatory options had been investigated but were not considered sufficient to achieve the policy objectives.

    - **Option 1** – Do nothing
    - **Option 2** – Mandate calorie labelling (kcal / KJ per portion) for all standardised food and drink products sold in all out-of-home settings at the point of choice.
    - **Option 3** – Mandate calorie labelling (kcal / KJ per portion) for all out-of-home businesses except micro businesses.
    - **Option 4** – Mandate calorie labelling (kcal / KJ per portion) or all out-of-home businesses except micro and small businesses.
    - **Option 5** – Mandate calorie labelling (kcal / KJ per portion) for only large out-of-home businesses, exempting micro, small, and medium businesses.

50. Following the consultation process, Option 5 has been chosen as the preferred option. While micro, small, and medium businesses account for the clear majority of out-of-home businesses, combined they still only account for around 51% of the sector's turnover[1]. Therefore, Option 5 delivers substantial public health benefits, ensuring consumers receive energy information in around half of their out-of-home meals.

51. Consultation feedback suggested that micro and small businesses would find calorie labelling a more challenging requirement to implement. Some stakeholders suggested that medium businesses should also be exempt or that Government should confine mandatory calorie labelling to businesses with over a certain number of outlets to acknowledge the out-of-home sector is a particularly labour intensive environment. By requiring only large businesses (which have the largest turnover[62]) to calorie label it avoids the risk of disproportionately burdening those who might find the new requirement more challenging while delivering significant health benefits. It also greatly reduces the costs to businesses (a 70% reduction in costs is seen compared with Option 4, and a 97% reduction compared with Option 2).

52. Calorie labels will be displayed with contextual information on the recommended daily energy intake of an adult woman. Evidence suggests that including contextual labelling will increase the effectiveness of the policy. Further evidence on the effectiveness of contextual labelling is outlined in the benefits section. The Department will bring forward guidance at the start of the implementation period for businesses and local authorities detailing how calorie labels should be displayed.

53. As well as the costs discussed within the IA, there are various other unmonetised costs which may affect micro, small, and medium businesses more than large businesses which have not been considered. For example, extra staff may need to be employed for a small period during the transition process, and although we have estimated the costs of transition to businesses, we have not factored in the cost associated with hiring any new employees. There is a possibility that there are other unforeseen costs as a result of this policy which we have not been able to monetise.

54. Given Option 5 had been chosen as the preferred option, we will not discuss the other options in further detail. However, the NPV for each option is given in Annex B.

[1] Department for Business, Energy and Industrial Strategy (2018) Business population estimates https://www.gov.uk/government/statistics/business-population-estimates-2018 (last accessed 07/01/19)

62 49% of turnover- Department for Business, Energy and Industrial Strategy (2018) Business population estimates https://www.gov.uk/government/statistics/business-population-estimates-2018 (last accessed 07/01/19)

55. Excluding medium, small, and micro businesses now does not preclude their inclusion at a later stage. The analysis presented in this consultation highlights the significant health benefits of requiring micro, small, and medium businesses to provide calorie labels. The Department of Health and Social Care is committed to undertaking an evaluation of these regulations within 5 years of the policy coming into force. This evaluation will be used to consider extending the requirement to smaller businesses in the future, subject to consultation. Further information about the Post Implementation Review is in Annex D. In the meantime, we encourage smaller businesses to voluntarily adopt the requirement.

Current composition of the out-of-home market

56. The size of the out-of-home market is difficult to establish, with estimates varying depending on the source. This is due in part to the high level of business turnover in the catering market, and because different sources often cover different sections of the eating out market.

57. We are using BEIS business population estimates from 2018 (these have been updated from the 2017 figures used in the consultation IA) as the main data source for the number of out-of-home businesses[63]. The data provide a breakdown of enterprises in the "Accommodation and Food Service Activities" by number of employees as illustrated in Table 1.

Table 1: Enterprises in the "Accommodation and Food Service Activities" by industry and employment size band, England only (2018)

Micro (< 10)	Small (10-49)	Medium (50-249)	Large (250+)	Total	% micro	% small or micro	% SMEs
130,805	24,905	2,640	545	**158,895**	82%	98%	100%

58. For the total number of outlets, we are using estimates from ONS[64] on the average number of outlets for each business size. This data estimates that micro businesses each have 1 outlet, small businesses have 1.08 outlets, medium businesses have 2.43 outlets, and large businesses have 63.16 outlets. The estimated number of outlets belonging each business is illustrated in Table 2, resulting in just under 200,000 outlets in total. These figures have been updated since the consultation IA to reflect new data published following communications with ONS.

Table 2: Number of outlets in the catering sector in England (2018)

Micro (< 10)	Small (10-49)	Medium (50-249)	Large (> 250)	Total	% micro	% small or micro
130,805	26,897	6,415	34,222	**198,540**	*66%*	*79%*

59. There are various costs discussed which will vary depending on whether businesses already have calorie information or labelling in place. Recent research from Robinson et al.[65] considered calorie labelling in 104 of the biggest out-of-home businesses in the UK. As well as considering which businesses had in-store kcal labelling, their work also assessed how many businesses had calorie information available (either online or by request). This work showed that 59% of the businesses considered did have calorie information available.

60. For every business analysed in this paper, DHSC estimated the total number of outlets. A separate piece of literature by Robinson et al. (2018)[66] considered the energy content of meals in restaurants in the UK. The 2018 paper provided the number of outlets for just under half of the businesses in the 2019 calorie labelling paper. Given the 2018 paper provided the number of outlets in the UK, this was down-weighted to find the number of outlets in England. Without further information available, we

[63] Department for Business, Energy and Industrial Strategy (2018) Business population estimates https://www.gov.uk/government/statistics/business-population-estimates-2018 (last accessed 07/01/19)

[64] Sites and Enterprises in divisions 55 and 56 https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/adhocs/009736sitesandenterprisesindivisions55and56 (last accessed 13/03/19).

[65] Robinson et al. "Point of choice kilocalorie labelling in the UK eating out of home sector: a descriptive study of major chains" (BMC Public Health201919:649. Available online: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7017-5

[66] Robinson et al. "(Over) eating out at major UK restaurant chains: observational study of energy content of main meals." BMJ 363 (2018): k4982.

assumed the number of outlets would scale with population size, and hence the number of outlets was down-weighted by 16%.

61. For the remaining businesses, DHSC provided the best possible estimate of the number outlets using information collected online (again counting only England businesses where possible, or applying the same down-weighting where only UK numbers were available).

62. Out of the 104 businesses considered in the study by Robinson et al. (2018)[67], the minimum number of outlets for any business was 17. This evidence examines the proportion of major restaurant and takeaway chains in the UK that have calorie labelling at the point of choice and to what extent does the information adhere to labelling recommendations. We take on this evidence and consider that any business with at least 17 outlets would have over 50 employees, and hence be classified as either a medium or large business. It should be made clear that while we assume these findings are a good estimate for large businesses, we have no data to make the same certain assumption on medium businesses.

63. From the 104 businesses considered in the study[68], 61 of these businesses already have calorie information available. Therefore, in our calculations we assume 59% of large businesses already have calorie information available. To estimate the number of medium businesses that already have calorie labelling we use the percentage of large business that calorie label with a 50% down-weight applied. This results in an estimated 29% of medium businesses that already have calorie labelling. This has been done to ensure we don't over estimate the number of medium businesses with calorie labelling. We do not have any evidence to support the 50% down weight, nor did we receive any further evidence on medium businesses through the consultation and therefore have continued to use this assumption[69]. We will re-consider this assumption in the future, if we expand the scope of this policy to capture medium businesses. We would assume that no small or micro businesses already have calorie information available.

64. We are looking into the plausibility of gathering further evidence to more accurately estimate the number of medium and smaller businesses which voluntarily calorie label now and after implementation of the proposed regulations of calorie labelling for large businesses. This will help to improve the estimate of the number of smaller businesses that calorie label in the event the Government wishes to extend the requirement to smaller businesses in the future.

65. The catering service industry is characterised by large numbers of small and micro businesses (where small is defined as less than 50 employees and micro is defined as less than 10 employees), with approximately 98% of businesses being classified as small or micro. The turnover for each business size in the *accommodation and food services* sector[70] is shown in Table 3, with large businesses accounting for nearly half of all turnover.

Table 3: Turnover in the 'accommodation and food services' sector in England by business size[71]

	Micro (< 10)	***Small (10-49)***	***Medium (50-249)***	***Large (250+)***	***Total***	***Small or micro***	***SMEs (medium, small, micro)***
Turnover (£m)	18,321	17,080	11,792	45,350	**92,543**	35,401	47,193
% of '*accommodation and food services*' turnover	20%	18%	13%	49%	**100%**	38%	51%

Figures may not sum to 100% due to rounding.

[67] Robinson et al. "Point of choice kilocalorie labelling in the UK eating out of home sector: a descriptive study of major chains" (BMC Public Health201919:649. Available online: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7017-5

[68] Robinson et al. "Point of choice kilocalorie labelling in the UK eating out of home sector: a descriptive study of major chains" (BMC Public Health201919:649. Available online: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7017-5

[69] Although the down -weight percentage is not supported by further evidence, this will not affect the EANCB as medium business are out of scope from the preferred option.

[70] Department for Business, Energy and Industrial Strategy (2018) Business population estimates https://www.gov.uk/government/statistics/business-population-estimates-2018 (last accessed 07/01/19)

[71] Ibid.

66. Based on recent evidence[72], we estimate that 33% of turnover in out-of-home settings currently provide some sort of calorie labelling, though the quality of this labelling is known to be poor.

Other business types impacted by proposed regulations

Businesses whose primary function is not the sale of food

67. The consultation proposed that calorie labelling would 'apply to any outlet where food or drink is prepared in a way that means it is ready for immediate consumption by the person who buys it. Therefore, calorie labelling may apply to businesses which provide such food or drink items although the sale of food is not their primary function (e.g. bowling alleys, cinemas, museums). We have not identified any data source that provides a definitive list of businesses that provide food to the public. However, the Interdepartmental Business Register, which can be accessed using the ONS Nomis portal[73], does provide an estimate for this using SIC codes to identify the types of businesses which are likely to have cafes or restaurants within them which serve food. Table 4 below presents the number of enterprises for those SIC codes thought to fall into this group of businesses. There is no way of knowing which of these actually serve food, and whether or not it is contracted out to businesses, and in the absence of such evidence we have assumed that half of them have some form of food provision of their own for the public. This seems a reasonable assumption for large businesses but some of the smaller businesses may be too small to provide such a service.

Table 4: Businesses in England whose primary function is not the sale of food but may still provide food to the public.

SIC codes		**Micro (<10)**	**Small (10-49)**	**Medium-sized (50-249)**	**Large (>250)**
93110	Operation of sports facilities	2,750	865	205	80
93120	Activities of sport clubs	4,870	1,780	230	85
93130	Fitness facilities	2,470	210	35	10
93210	Activities of amusement parks and theme parks	275	90	30	15
91020	Museum activities	365	115	50	15
91030	Operation of historical sites and buildings and similar visitor attractions	195	95	40	5
91040	Botanical and zoological gardens and nature reserve activities	155	85	70	15
59140	Motion picture projection activities	140	60	15	10
90040	Operation of Art facilities	635	110	55	10
47190	Other retail sale in non-specialised stores	5,415	425	60	40
Total		**17,270**	**3,835**	**790**	**285**

68. The businesses captured in table 4 are those that we have identified as providing food to the public. In addition, we have identified other business types that may serve food to the public but are considered to be very unlikely to do so. These are captured in the sensitivity analysis. This is done to capture a number of businesses who could be in scope of the policy but would vary depending on the businesses itself and whether food provisions are contracted out or not. We have reviewed other SIC codes, and have excluded those who are not in scope of the policy.

69. It should be noted that not all of the businesses in Table 4 above will have cafes and restaurants which provide food and drink to the public. It seems unlikely, for example, that micro and small businesses would have the required number of staff to run their respective businesses as well as an onsite restaurant. Furthermore, it seems likely that many of the cafes and restaurants in the medium and large businesses will be contracted out to a catering company or operated by one of the large chain

[72] Robinson et al. "Point of choice kilocalorie labelling in the UK eating out of home sector: a descriptive study of major chains". Available online: https://osf.io/xy6q2/ combined with DHSC analysis.

[73] Nomis business counts https://www.nomisweb.co.uk/query/construct/summary.asp?reset=yes&mode=construct&dataset=142&version=0&anal=1&initsel= (last accessed 12/03/19)

businesses in the food service sector, e.g. a Starbucks café operating within a cinema or a large retail store.

70. Therefore, we have assumed that only medium and large businesses would provide food, and given the uncertainty surrounding the number of businesses with food providing facilities, as well as the uncertainty around how many of these businesses would have branded businesses within them rather than providing food themselves, we have down-weighted the number of medium and large businesses by 50%.

71. This assumption results in an additional 395 medium businesses and 143 large businesses which are likely to incur costs from this policy (though only the large businesses will incur costs in the preferred option). In order to estimate the number of outlets, we have again used Nomis data to estimate the total number of outlets. Given this data does not provide a breakdown of the outlets by business size, we assume the same number of outlets per business size will apply to micro, small, and medium businesses as with the out-of-home data. We have then assumed the remainder of outlets belong to large businesses. This results in micro businesses having 1.00 outlets, small businesses having 1.08 outlets, medium businesses having 2.43 outlets, and large businesses have 14.92 outlets.

Food retailers selling unpackaged on-the-go food items

72. Calorie labelling will also apply to on-the-go food items, sold by supermarkets and convenience stores, which are unpackaged or pre-packed for direct sale. Feedback from the consultation showed that out-of-home calorie labelling is generally supported by retailers with many highlighting that this policy supports a level playing between the out-of-home and retail sectors. Estimating the exact number of businesses and food items within this category requires some broad assumptions to be made, but we feel the additional analysis included helps provide illustrative costs for on-the-go items.

73. Our main data source used to look at the composition of the grocery retail market is the Grocery Retail Structure 2017 datasheet produced by the Institute of Grocery Distribution (IGD). We assume that business categorised under 'Traditional and Specialist Retail' are unlikely to sell products in scope, and thus we do not include businesses under this category in our analysis. We acknowledge that this sector may contain stores in scope, but upon further research found that estimating the proportion of traditional and specialist stores in scope was unfeasible, due to a lack of data in this niche market. Therefore, we have varied the number of stores and businesses in our sensitivity analysis to capture this uncertainty.

74. Broadly, we assume that independent stores are part of small or micro businesses, and that multiples and supermarkets are part of medium or large businesses. For medium and large businesses, we assumed that businesses with more than 25 stores were large (corresponding to 10 employees per store). Below this cap we checked businesses on Companies House to determine size. For independent stores, we use proportions derived from the interdepartmental business register data (ONS) from SIC code 4711: Retail sale in non-specialised stores with food, beverages or tobacco predominating. Under this SIC code, of the 44,735 small and micro stores, 32% are small and 68% are micro, with on average 5.16 stores per small business and 1.09 stores per micro business. We use these relationships to estimate the number of small and micro businesses/stores for each subsection in the IGD datasheet.

75. To estimate the proportion of stores in scope, we assume that all supermarkets will sell on-the-go food products. For convenience stores, we use data from the Association of Convenience Stores (ACS) split by store type about the proportion of stores that contain in-store bakeries, hot food counters/cabinets, customer operated coffee machines, and serve over coffee machines. For each different convenience store type, we average the percentage of stores that offer each service and use the resulting proportion to estimate the number of stores selling on-the-go food or drinks[74]. A population ratio of 84% was applied to capture stores in England only[75].

[74] To illustrate the calculations, figures in brackets refer to stores that are part of a independent forecourt businesses. Stores were assumed to have either customer operated coffee machines (46%) or serve over coffee machines (12%) so we assume that 58% of stores have some form of coffee offering. We assume that stores that have an in store bakery (17%) are also likely to have a hot food counter (22%), resulting in an average of 20% of stores having a food offering. Therefore, overall we estimate that an average of 39% of stores will sell products in scope. This calculation is repeated for each of the convenience store types as categorised by ACS. Data pulled from the ACS (2018) *Local shop report. https://www.acs.org.uk/events/local-shop-report-2018*

[75] ONS (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland, Table MYE1 https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland (last accessed 19/08/2019)

Table 5: Businesses and stores in England selling unpacked on the go food and drink items

	Micro	Small	Medium	Large	Total
Number of businesses	2264	271	20	73	**2628**
Number of stores	5150	2443	296	9107	**16996**

76. Evidence around the number of manufacturers providing products in scope of this policy to retailers is limited. In order to capture the number of manufacturers linked to these on-the-go food retailers, we assume that if a large business owns at least one supermarket, then they will manufacture and sell their own on-the-go products. To estimate the number of manufacturers linked to any other business, we assume that one manufacturer would provide products to either one large retail business, five medium retail businesses, ten small retail businesses, or twenty micro retail businesses (dependent on the retail business size in question). Note that this relationship does not depend on the size of the manufacturer itself. We recognise that supply chains are more complex than a simple manufacturer-retail setup, and thus assume that there is one 'middle man' organisation per manufacturer (often known as a wholesaler), whose role for the purpose of our analysis is merely to pass information along the chain. There may be cases where there is a direct relationship between the business and manufacturer, however without knowing how many businesses have this type of relationship, we have assumed all retail and manufacturer relationships have a 'middle man'.

77. For calculations, we will present the details of the out-of-home businesses, but businesses whose primary function is not the provision of food and premises likely to sell on-the-go food items will be included in the final NPV.

78. The calculations in this Impact Assessment use both the number of businesses (enterprises) and the number of outlets (local units), the choice of which depends on whether costs are most likely to fall at a business or outlet level.

Costs and benefits of the policy

79. The main categories of impact to be considered are set out below.

80. The benefits of introducing mandatory out-of-home calorie labelling are expected to accrue through:

- increased awareness and understanding of the energy content of their food enabling consumers to make more informed and healthier choices in out-of-home settings for themselves and their children;
- encouraging the out-of-home sector to reformulate existing products and design new products that are less energy dense;
- reduction in excess calorie consumption and obesity prevalence in children and adults;
- a reduction in obesity related morbidity and mortality, resulting in reduced costs for the NHS and an increase in economic output.

81. The main categories of costs to be considered are:

- the costs to businesses, including familiarisation costs, costs of calculating energy values for their food and drink items, and labelling costs;
- the cost borne by Government for enforcing the regulation.

82. The net present values of the policy is assessed over a period of 25 years. This is longer than the typical 10-year assessment period used in impact assessments. Ill health related to being overweight or obese tends to develop later in life, with the prevalence of type 2 diabetes, CVD, stroke, breast cancer, and colorectal cancer all increasing with age[76]. This means a shorter

[76] https://www.diabetes.org.uk/resources-s3/2017-11/diabetes-key-stats-guidelines-april2014.pdf (last accessed 31/01/19), https://www.bhf.org.uk/-/media/files/research/heart-statistics/bhf-cvd-statistics-compendium-2017.pdf?la=en (tables 2.8a and 2.8b; last accessed 31/01/19), https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/breast-cancer#heading-Zero (last accessed 31/01/19), https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/bowel-cancer/incidence#heading-One (last accessed 31/01/19)

assessment period would be unlikely to capture many of the benefits than can accrue by reducing the prevalence of this diseases.

Details of the Preferred Option (Option 5)

Costs to businesses

83. It is important to note that the costs estimated here are derived using the most relevant data available or via the consultation responses. However, where data or responses were not available, DHSC were required to make reasonable assumptions.

84. Businesses that are already voluntarily providing calorie labelling are likely to have reduced additional costs compared to businesses without since the regulation will follow the voluntary guidance that already exists. This is discussed in each section below.

Familiarisation

85. We assume that, on average, it would take one manager/food nutritionist/head chef one hour to read and become familiar with the regulations. The time taken for initial familiarisation with the scheme will vary between businesses depending on the size and scale of operations, but we believe that one hour serves as a reasonable average across all businesses, and this assumption was not questioned at consultation stage.

86. The median hourly wage rate for a *research and development manager* is £23.77, according to the 2018 Annual Survey of Hours and Earnings (ASHE)[77]. The wage of a food nutritionist and head chef is not available in the ASHE data, and therefore the wage of a research and development manager has been used[78].This has been updated from the 2017 figures used in the consultation IA. We have added 30% on top of this to account for non-wage employment on-costs such as pension contributions and National Insurance Contributions. The 30% cost uplift comes from the Better Regulation Executive Standard Cost Model[79]. This results in an hourly wage rate of £30.90. We recognise that the appropriate wage rate will vary by business depending on who undertakes the initial familiarisation; the median wage rate has been used to provide our best estimate.

87. To estimate the total familiarisation costs to businesses, the uprated average hourly wage rate is multiplied by the number of businesses affected, giving a best estimate of £7k. We have included all businesses in this estimate as even those which currently provide calorie labelling will need to familiarise themselves with the new regulations.

Table 6: Familiarisation cost by sector

	Best estimate	Lower estimate	Upper estimate
Hourly wage rate	£30.90	£19.90	£40.90
Across 545 businesses	£17k	£11k	£22k

88. To take into account some of the uncertainty surrounding wage rates, sensitivity analysis has been conducted using the maximum and minimum wage rate percentiles in ASHE. This indicates that familiarisation costs to business could range between £11k and £22k.

89. For businesses whose primary function is not the provision of food, we have used the salary hourly wage of *Managers and proprietors in hospitality and leisure services* (an uplifted wage of £15.16 per hour) to get a best estimate of an additional £2k. Sensitivity analysis provides a range of £2k to £3k. For businesses selling on-the-go items, we have used the hourly wage of *Research and development managers* (uplifted wage of £30.90 per hour). This provides an additional familiarisation cost of £2.3k (with sensitivity analysis giving a range of £1.5k to £3.1k).

[77] ONS (2018) Annual Survey of Hours and Earnings , Table 14.5 https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/occupation4digitsoc2010ashetable14 (last accessed 07/01/2019)

[78] Further desk based research on the salary of a nutritionist/head chef showed a similar salary to a research and development manager.

[79] 2 BRE – Cabinet Office. 2005. Standard Cost Model. Available from: http://www.berr.gov.uk/files/file44503.pdf (Last accessed 04/025/19)

90. We have used the number of businesses as opposed to the number of outlets to calculate the familiarisation costs. We feel this is more appropriate since it is likely that businesses with more than one outlet will appoint one individual to read the regulations initially and share the information with other employees at a business level, before sharing the information with individual outlets. We acknowledge that any further costs are more likely to be incurred per outlet and that this will affect larger businesses who operate more outlets than smaller businesses.

Distribution of knowledge

91. We acknowledge that more than one employee at the business level will need to understand the regulation. We therefore have assumed that the individual familiarising themselves with the regulation will inform two other employees in the businesses, before sharing this information with outlets. E.g. A food nutritionist sharing this information with other managers and directors.

92. The uplifted hourly wage rate for a *research and development manager* (£30.90) and a *corporate manager and director* (£29.40), is used to calculate the cost of distributing this information, assuming it takes an hour to do so. We recognise that the appropriate wage rate will vary by business depending on who undertakes the initial familiarisation; the median wage rate has been used to provide a best estimate of £49k. Sensitivity analysis provides a range between £26k and £577k. The upper estimate has been updated following RPC's opinion dated 20th December 2019, as a further sensitivity analysis on the number of staff information is shared with is added due to the level of uncertainty with this assumption.

93. For businesses whose primary function is not the provision of food, we have used the uplifted hourly wage of a *corporate manager and director* (£29.40) and *managers and proprietors in hospitality and leisure services* (£15.16) to get the best estimate of an additional £11k. Sensitivity analysis provides a range between £5k and £166k. For businesses selling on-the-go items, we have used the uplifted hourly wage of *Research and development managers* (£30.90) and a *corporate manager and director* (£29.40). This provides an additional distribution of knowledge cost of £4.3k (with sensitivity analysis giving a range of £2.8k to £80.4k).

Costs of calculating energy values for food and drink products

94. To implement calorie labelling, caterers will first need to assess the energy content of each of the items on their menus. To assist retailers with this assessment, various online calculator tools exist. These tools calculate the energy content of recipes based on inputs of ingredients, quantities, and number of portions created.

95. Although we expect large (and medium) businesses to choose to pay for a subscription to a calorie calculator tool which is most suited to their needs, DHSC is exploring how to ensure all businesses are equipped to calorie label effectively, even on a voluntary basis.

96. We assume that energy calculation will occur at business rather than outlet level, with larger businesses distributing centrally calculated energy values to individual outlets. In the case of the on-the-go food sector, we assume that this calculation will occur at a manufacturing level, and then the calorie information will be passed down the supply chain to the retailer.

Calorie calculator tool

97. Whilst we assume small and micro businesses are likely to use free tools, we assume that medium and large businesses will pay for access to a similar tool which may be best suited to their business. Many different tools are available online that calculate the calorie content of recipes. The costs of these tools vary substantially with monthly, yearly, or flat rate (depending on the number of recipes) fees. Based on cost of a year's access to eight different tools, we assume an average cost of £500 per business per annum[80]. We have conducted sensitivity analysis to account for the large differences in prices.

98. We assume that businesses which already have calorie information available will already be using a tool or other means to calculate the calories in their items, and hence will incur no additional costs. As

[80] Examples for calorie calculator tools can be found online at e.g. https://en-gb.nutritics.com/p/home, https://nutricalc.co.uk, https://www.alacalc.com/, https://www.menusano.com/, https://www.menucalc.com/, https://xyris.com.au/, http://www.nutritionistpro.com/ (Accessed 13/05/18)

mentioned previously, we assume 59% large businesses already have calorie information, leaving a total of 225 large businesses. This results in total costs of £0.1m per annum.

99. Without further evidence, we have assumed the findings from the research by Robinson et al. will also apply to the additional out-of-home businesses whose primary function is not to provide food as these premises will have menus in a similar style to other out-of-home businesses. Using the same methodology, businesses whose primary function is not the provision of food will result in additional costs of £29k per year.

100. In the on-the-go foods sector, we assume that all manufacturers will either already have a subscription to a calorie calculator tool, or they will choose to use a free online tool, as the number of products in scope per manufacturer is relatively small in comparison to the cost of a subscription to a calculator. Therefore, there is no additional cost.

Calculating energy values

101. The cost of calculating energy information will depend on the number of different items sold. This is affected by the size of the business, the sector it operates in and the type of cuisine served. Due to a lack of UK data on the range of items sold per out-of-home business, we have provided illustrative costs below.

102. The costs are based on the assumption that, on average, businesses have 50 menu items. This assumption was used at consultation stage and we received no evidence to refute it. We understand that depending on the type of business, the number of menu items will vary significantly, but assume this is a reasonable average across all businesses. This number is also in agreement with the average number of menu items reported in the evaluation of MenuCal used in Scotland[81].

103. Research by Zick et al. (2010)[82] suggested it took half a day to calculate the number of calories in 9 menu items. Based on this research and several consultation responses, we assume that it would take 25 minutes per recipe to weigh ingredients and use a calorie calculator tool to calculate and record the energy value. This is increased from the value of 7 minutes used in the consultation IA. We recognise that the time taken to assess products will partially depend on the form and content of information currently held by businesses. If electronic information on recipes is already present, this will reduce the time needed to input information into the tool.

104. As discussed above, we have assumed that 59% of large businesses (and 29% of medium businesses in other options) would already have calorie information available, and hence would not have any transition costs associated with calculating energy values.

105. Applying the uprated average hourly wage rate for *restaurant and catering establishment managers and proprietors* of £13.80 to the number of menu items per business and time taken per recipe, we have estimated that the total cost of calculating energy values is £65k.

Table 7: Transition costs associated with calculating energy values

No. of businesses*	Average number of menu items per business	Time per business (hours)	Cost per business (£)	Cost for all businesses (£'000s)
225	50	21	286.54	65

* This is the total number of businesses that would need to calculate energy values and hence excludes 59% of large businesses.

106. Further costs will be incurred from sharing this information with individual outlets. We will assume that all outlets of businesses that had calorie labelling displayed in store will not require the information to be shared (i.e. we will not assume that outlets from businesses with calorie information will have shared that information to all outlets as this may underestimate the costs).

[81] An Evaluation of a Pilot on the Use of MenuCal within Small and Medium Scottish Food Businesses. Available online: https://www.foodstandards.gov.scot/downloads/MenuCal_-_Evaluation_-_Report.pdf (last accessed 14/02/19).

[82] Zick et al. (2010). Nutrition labelling in restaurants: a UK-based case study. Nutrition & Food Science, 40(6), 557-565.

107. The research from Robinson et al.[83] combined with our estimates of the number of outlets suggests that 59% of outlets already have calorie labelling information displayed (and 29% medium outlets for other options) and hence will not need the information shared. Removing 59% of large outlets from the 34,000 large outlets leaves approximately 14,000 outlets that would require the information shared.

108. Assuming it takes 1 hour for a *restaurant and catering establishment manager or proprietor* to share the calorie content information with each outlet at £13.80 (including 30% on-costs), suggests that the distribution of this information would cost a further £195k. This brings the total cost of the initial calorie calculation to around £0.3m.

109. Caterers will further need to calculate energy values for any new menu items they introduce. Work published by Jones et al. (2001)[84] suggests that 15-20% of menu items in table-service restaurants would normally be replaced by new items or modified each year. Taking the upper estimate of this, we assume that 20% of menu items are normally either modified (changes to the recipe) or replaced each year. Following the same process used previously suggests the ongoing cost of calculating the energy values for new products will be around £13k per annum. These annual costs will be incurred from the second year onwards, with this being the first point at which new menu items can be introduced.

Table 8: Ongoing costs associated with calculating energy values

No. of businesses*	No. of new menu items per business	Time per business (hours)	Cost per business (£)	Cost for all businesses (£ '000s)
225	10	4	57.30	13

* This is the total number of businesses that would need to calculate energy values and hence excludes 59% of large businesses.

110. Again, businesses will need to share the energy values for new products with individual outlets. Following the same methodology used previously we estimate this will cost a further £195k. This brings the total ongoing costs to around £0.2m per annum.

111. Transition and ongoing costs are likely to be an over-estimate as in practice many food items are manufactured elsewhere and are delivered as complete products and so may already have energy information available – for example, soft drinks or pre-prepared items from distributers.

112. We recognise that calculating energy content of items represents a significant part of the upfront costs. As a result, we have varied the assumptions regarding the cost of the number of menu items and the time required per item. Using plausible input parameters, we estimate the transition costs associated with calculating energy values to range between £0.2m and £1.2m. Similarly, the ongoing calorie calculation costs may vary between £0.2m and £0.8m per annum. The calorie calculator tool cost varies from £34k to £700k per annum.

113. Regarding businesses whose primary function is not the provision of food, we expect the initial transition costs to be £47k including sharing (with sensitivity analysis providing a range between £22k and £179), whilst the ongoing costs will be £32k per annum (with sensitivity analysis providing a range between £21k and £120k per annum).

114. For on-the-go food items, we assume that this cost is borne by the manufacturer. We classify products in this sector likely to be affected by the proposed regulations into three broad categories: bakery products (hot or chilled), rotisserie products, and hot drinks. Moreover, we assume that all stores in scope will sell bakery and coffee products, whereas only supermarkets will sell additional rotisserie items. Therefore, only supermarket manufacturers will incur the cost of calculating the calorie content of rotisserie items.

[83] Robinson et al. “Point of choice kilocalorie labelling in the UK eating out of home sector: a descriptive study of major chains” (BMC Public Health201919:649. Available online: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7017-5

[84] Jones, P., & Mifll, M. (2001). Menu development and analysis in UK restaurant chains. Tourism and Hospitality Research, 3(1), 61-71.

115. Averaging figures found online, we estimate that there are 52 bakery products per bakery manufacturer, and by using the Kantar World Panel 2017 dataset we estimate that there are 16 rotisserie products per supermarket manufacturer. We assume that for hot drinks the manufacturer will already have the calorie information, as the ratio and quantities of ingredients in each drink is specific. Sandwhiches that are prepared in store are also in scope of the policy however there is lack of evidence on how many sandwhichs there could be, and therefore have not been able to capture this in our analysis. Without further evidence, we have assumed that it takes 25 mins to calculate the calories for each item, and that 20% of items are reformulated each year. It should be noted that some websites already provide calorie information online (presumably information coming from manufacturers), and hence many manufacturers are likely to have no additional costs. However, without any strong evidence on this, we will assume all manufacturers will incur the energy calculation costs, which come mainly from sharing the information with all businesses and stores through the supply chain.

116. For the on-the-go market, we expect the initial transition costs to be £172k, whilst the ongoing costs will be £172K p.a. with a lower bound of £100k in the initial transition, with ongoing annual costs of £100k, and an upper bound of £419k initially, and then £399k p.a. after that.

Labelling and other associated costs

117. All businesses will need to re-design menus to accommodate energy information. We assume this will be conducted at business rather than outlet level. We understand that the cost of designing a menu will vary between businesses, with some businesses choosing to spend more on design than others. In order to get a best estimate, we have used several sources and quotes[85] to get an average design cost of £135 per menu. All quotes were updated since the consultation IA to provide the most up to date estimates available. We will assume that all businesses may need to redesign their menus to adhere to the policy guidelines, regardless of whether they previously had menu labelling or not. Hence, the design costs for all 545 businesses would be £74k.

118. Implementation of calorie labelling should only require one re-design, with businesses being able to alter menus when new products are introduced or modified (changes to the recipe) without needing a significant re-design. We expect that as businesses update their menus, new designs would be carried out regardless of this policy and hence, we anticipate zero additional ongoing design costs.

119. In 2009, the Food Standards Agency (FSA) ran a formal consultation on "*developing a scheme to provide/promote a consistent approach to the voluntary provision of calorie labelling at point of choice*"[86]. The feedback to this consultation indicated that businesses undergo regular re-labelling cycles where materials are altered and/or redesigned, and hence we assume all medium and large businesses would not be subject to any additional printing costs in the 1 year implementation period.

120. Sensitivity analysis provided an estimated range for labelling costs of £0.01m and £0.2m.

121. For businesses whose primary function is not the provision of food we estimate design costs of £19k and no printing costs (again due to a 1 year implementation period). Sensitivity analysis provided an estimated range between £3k and £48k. For businesses selling on-the-go items, we assume any additional costs will be negligible as these businesses may simply choose to add calorie information onto existing pricing labels which are likely to be printed on a regular basis in store, and more likely printed within the year and a half implementation period. Hence, no further labelling costs for on-the-go businesses will be included in the NPV.

Non monetised cost to businesses

Composition and size of the out-of-home sector

122. We recognise that the composition and overall size of the out-of-home sector is not static, with new businesses forming and existing businesses folding each year. New businesses would incur costs arising from calculating energy values of products but would not experience any labelling costs, as calorie labelling would be factored in when first designing menus.

[85] Quotes found on: https://www.freelancer.com/job-search/restaurant-menu-design/ [21/01/19 using a conversion of 1 USD = 0.78 GBP].
https://www.menulane.co.uk/menu-design/ [21/01/19].
https://menu.designcrowd.co.uk/ [22/01/19 using a conversion of 1 USD = 0.78 GBP].

[86] Food Standards (2013) Front of pack Nutrition Labelling: Joint Response to Consultation
https://www.foodstandards.gov.scot/downloads/Front_of_pack_nutrition_labelling_joint_responses.pdf (last accessed 28/11/17)

123. Given the inherent difficulties of trying to incorporate the changing nature of the out-of-home sector into our calculations, we have not attempted to quantify these additional costs. Similarly, we have not factored in any change to the overall size of the sector. We consider this to be a proportionate approach given the uncertainty and complexity that such adjustments would introduce to the calculations, and that the estimates of costs to large businesses is so small compared with their turnover. We acknowledge that the estimated costs to business could be an underestimate if the size of this section of the market increases. Similarly, the estimated health benefits would also be an underestimate in this scenario.

Vending machines

124. It has not been possible to quantify the cost of providing out-of-home calorie labelling for products sold in vending machines because it is not clear how the labelling process would work in this context. It may be reasonable to assume that the cost of calculating energy information will be negligible as vending machines generally sell pre-packaged food and drinks which already have energy information on the packaging.

125. Vending machines do not have 'menus' as such and there may be limited options for displaying energy information at the point of choice. Therefore, we will explore how the calorie content of non-pre-packaged items is best displayed under the regulations.

Impact on profits

126. Evidence suggests that out-of-home calorie labelling results in a reduction in calories purchased (as discussed in the Health Benefits section below). However, it is not immediately clear whether this would be due to consumers switching to less energy dense products sold by the same business, deciding to eat in a different establishment which serve less energy dense products, or by simply purchasing and consuming fewer out-of-home food and drink products. To consider the impact on profits we have explored each of these scenarios in turn below.

127. **Switching to less energy dense products sold by the same business.** The impact of consumers switching between products sold by the same business would depend on the relative profit margins of healthier and less healthy items. For instance, if profit margins are low for lower calorie products, with price potentially being higher, then by switching it would be expected to reduce profits. A potentially higher price for the healthier option could lead to some consumers not switching. However, if the opposite is true (higher profit margins for less energy dense products and therefore business could reduce prices), out-of-home businesses would likely experience an increase in profits. This however would be dependent on the availability of less energy dense products by the same businesses, especially if it decides not to reformulate some of its products as a result of the policy.

128. **Switching to businesses which serve less energy dense products.** It is also possible that, after becoming aware of the calorie content of menu items, consumers might switch away from businesses which are perceived to be unhealthy to other healthier businesses. If this were to happen, there would be a loss of profits to some businesses but a resulting rise in profits for others. While it is unlikely the two contrasting impacts would result in no overall change in profits, there would be a degree of offsetting, the extent of which would depend on the relative profit margins of the businesses consumers are switching between. This is also dependent on how accessible it is for consumers to switch between businesses. For example, a consumer eating at its local takeaway on a high street with alternative options, may find it easier to switch to an alternative option compared to a consumer eating from a local takeaway which is the only takeaway in the local area. This is also relevant when looking at the growing online delivery market, where consumers have more options readily available to them making it easier to switch between businesses. In addition, there is a possibility that consumers may switch from businesses not providing calorie labelling to those that do. Polling data[87] data suggests that the majority of consumers would like to see calorie information and might prefer to go to businesses where they can access that information.

129. **Consuming fewer food and drink products out of home.** If consumers simply purchased fewer products when eating out, then this would lower sales and have a clear negative impact on profits for those businesses affected. Furthermore, it is also possible that over time, with the additional

[87] Diabetes UK. (2018). Public Views on food labelling survey. ComRes interviewed 2,121 UK adults online, aged 18+, between 12th -14th Jan 2018. Data were weighted to be demographically representative of all UK adults by age, gender, region and social grade. ComRes is a member of the British Polling Council and abides by its rules.

awareness of the energy content of items, consumers could choose to eat out less frequently. If this occurred, there would be a loss in profits to the out-of-home sector as a whole.

130. In order to quantify any loss in profits across the sector we would need to know which of the above factors were at play, which products or businesses faced a loss in sales, which products or businesses faced an increase in sales, the reduction or gain in revenue experienced by businesses, and the profit margins they generally achieve. As we do not have robust evidence on these parameters it has not been possible to estimate the impact introducing these regulations would have on the overall level of profit achieved by the out-of-home sector.

131. However, research by Bollinger et al.[88], which discusses the effect of mandatory calorie posting on profit, found that the introduction of calorie labelling had no statistically significant effect on average daily store revenue. The paper found that revenue per transaction was slightly down, but transactions per day were slightly up, leading to zero net impact. This suggests calorie posting causes customers to substitute products within stores as well as across stores. For example, the study finds for Starbucks with a Dunkin donuts nearby (one of the main competitors), the drink revenue increased by 5%, but food revenue fell by 5.5%.

132. Further evidence on the impact on profits does seem to be lacking, but results from the paper mentioned above suggests that although some switching between businesses may occur following the introduction of calorie labelling, this does not have an impact on the overall revenue of the sector.

Impact of reformulation on costs

133. Popular nutrition concerns at any time affect reformulation and may affect the nutritional outcomes for consumers differently[89]. For example, one study on consumer preferences and behaviour find that many people believe fat equals taste and may be willing to pay more for additional calories in the belief that it will improve taste[90], while another[91] suggests that although calorie labelling is effective in decreasing the number of calories ordered for those who are health-oriented, it may result in an increase in calories for customers who are quantity- and taste-value oriented.

134. Nevertheless, we expect many businesses to reformulate as a reaction to calorie labelling. Evidence from the packaged food industry, where mandatory labelling is widespread, shows that reformulation has taken place to reduce the calorie and sodium content of products[92].

135. In addition, interviews with food manufacturers have shown they reformulate products in response to labelling. Furthermore, restaurants seek to avoid the “veto vote” where a single member of a group vetoes a restaurant because its food is unhealthy.

136. Evidence from the US shows that labelling has influenced businesses to reduce the calorie content of meals. A study in Washington[93] investigating the impact of calorie labelling on entrées, found that chains had reduced the calorie content of these items by 41 kcal on average. Another study by Zlatevska et al. (2018)[94] found that on average, businesses reduced the calorie content of menu items by 15 kcal.

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88 Bollinger, B. et al. (2011). Calorie posting in chain restaurants. American Economic Journal: Economic Policy, 3(1), 91-128.

89 Variyam (2005) Nutrition Labeling in the Food-Away-From-Home Sector - An Economic Assessment, Economic Research Report Number 4, USDA

90 Malone & Lusk (2017) Taste trumps health and safety: Incorporating consumer perceptions into a discrete choice experiment for meat https://www.cambridge.org/core/services/aop-cambridge-core/content/view/4CB4027158AFA2059FED9B254C729F9F/S107407081600033Xa.pdf/taste_trumps_health_and_safety_incorporating_consumer_perceptions_into_a_discrete_choice_experiment_for_meat.pdf (last accessed 12/12/17)
or Harris (1997) The Impact of Food Product Characteristics on Consumer Purchasing Behavior: The Case of Frankfurters.” Journal of Food Distribution Research. 28, February: 92-97.

91 Berry, C. et al. (2019). Understanding the Calorie Labeling Paradox in Chain Restaurants: Why Menu Calorie Labeling Alone May Not Affect Average Calories Ordered. Journal of Public Policy & Marketing, 0743915619827013.

92 See e.g. http://www.mdpi.com/2072-6643/9/8/918/html (Last accessed 13/12/17)
or Bruemmer, B. et al. (2012) Energy, Saturated Fat, and Sodium Were Lower in Entrees at Chain Restaurants at Eighteen Months Compared with Six Months Following the Implementation of Mandatory Menu Labeling Regulation in King County, Washington. Journal of the Academy of Nutrition and Dietetics 112, no. 8: 1169–76.

93 Bruemmer, B. et al. (2012) Energy, Saturated Fat, and Sodium Were Lower in Entrees at Chain Restaurants at Eighteen Months Compared with Six Months Following the Implementation of Mandatory Menu Labeling Regulation in King County, Washington. Journal of the Academy of Nutrition and Dietetics 112, no. 8: 1169–76.

94 Zlatevska et al. (2018). Mandatory Calorie Disclosure: A Comprehensive Analysis of Its Effect on Consumers and Retailers. Journal of Retailing, Mar 1;94(1):89-101.

137. Costs incurred by out-of-home businesses here would be classified as indirect, with reformulation being a voluntary choice for individual businesses. The total costs would depend on the number of businesses deciding to reformulate and the speed with which they choose to do this. We anticipate that most businesses would reformulate in line with their normal cycles for refining recipes and introducing new dishes. It seems likely that businesses will only choose to reformulate outside of normal cycles if they feel the benefits of doing so would outweigh the extra costs they would incur. We have not attempted to monetise the cost of reformulation to businesses because of the large uncertainty in this and because no evidence came to light to help this estimate in the consultation. We would consider this to be an indirect cost as it will be a business decision not imposed through this regulation. The health benefits from reformulation is outlined in paragraph 194 onwards.

Costs to consumers

138. It is possible that businesses might pass on the costs of implementing calorie labelling to consumers by increasing prices. The Department acknowledges that there is little evidence available to determine whether the costs of the policy are likely to be passed onto the consumer. However, the estimated ongoing costs to large businesses represent 0.001% of total turnover for large businesses[95] (equivalent to 1p in every £1,000 turnover). If some businesses do pass on the cost to consumers, this would have a distributional effect but the overall NPV would remain the same, with the costs of implementing the policy being transferred from out-of-home businesses to consumers. If this happens, the EANDCB would be an over-estimate in this regard. There is a possibility that there are other unforeseen costs to the consumer as a result of this policy which we have not been able to monetise.

Costs to Government

Enforcement costs

139. We will consult further with local authorities and trade associations on proposals for how the policy is best enforced. To inform the overall cost benefit analysis presented in the IA we have monetised the proposed method of enforcement. However, this may be subject to change following consultation.

140. To enforce mandatory out-of-home calorie labelling, businesses would need to be inspected on the presence and accuracy of their labelling, which would likely be carried out as part of pre-existing routine inspection visits conducted by Trading Standards Officers (TSOs) or Environmental Health Officers (EHOs). Local authorities will have discretion to decide who is best placed in their local area to enforce mandatory calorie labelling. As we do not know how local authorities will allocate responsibility for enforcement we have assumed trading standards will be the primary enforcement department and used the average salary of a TSO on which to base our cost estimates.

141. There will be one-off transition costs to Local Authorities as officers familiarise themselves with the new regulations. According to the National Careers Service, a trading standards officer works around 39 hours per week[96]. Having contacted local councils[97], we assume an annual salary of TSOs to be £34,250. From this, we estimate an hourly salary assuming a 39-hour working week, 5 weeks holiday and 8 days of bank holidays of £19.34. Uplifting this hourly wage by 30% implies the hourly cost of Trading Standards Officer is £25.15. Wages are grown in real terms over time by projected GDP per capita growth which represents an increase in productivity and therefore opportunity cost[98]. Assuming familiarisation and dissemination of information to other TSOs will take a total of three hours per Local Authority, we estimate that familiarisation costs for all 326 Local Authorities would be around £25k.

142. Our estimates assume there are around 34,000 outlets in England. Assuming outlets are inspected every 3.5 years[99] suggests there will be 10,000 visits per year. We acknowledge that the frequency of

[95] This percentage is derived using the on-going costs of £0.54M per annum compared to the total turnover of £45,350M per annum.

[96] https://nationalcareersservice.direct.gov.uk/job-profiles/trading-standards-officer Accessed 22/01/19

[97] DHSC contacted local councils asking for the estimated wage of TSOs who would carry out routine checks on retailers. Ealing Trading Standards estimated £28-35k and another Trading Standards Service replied with an estimate of £24-50k

[98] Office for Budget Responsibility (2017, November). Retrieved from http://cdn.budgetresponsibility.org.uk/Nov2017EFOwebversion-2.pdf, Up to 2022 and WebTAG 2022-2066 from OBR FSR Jan 17, table 1.1, published 17/01/2017 (adjustment made to convert from FY to CY), from 2023- 2027

[99] This number was agreed following a meeting with Trading Standards, who suggested every 2-5 years. It's also in line with: http://www.tradingstandardswales.org.uk/help/foodinspect.cfm (last accessed 22/01/2019); https://www.eastriding.gov.uk/business/food-

visits may vary depending on the type and size of business, but once every 3.5 years may serve as a reasonable average. We estimated the additional time required at each outlet for paperwork-based checks to be 15 minutes per inspection. This estimate was an assumption, but no issues were highlighted with it during consultation. Multiplying visits by time required and the uprated hourly wage of £25.15, we estimate that total staff costs for enforcement are around £62k per annum. In the sensitivity analysis, our calculations suggest these enforcement costs may vary from £40k to £220k per annum. We have removed the assumption around lab testing since the consultation, assuming that enforcement will focus on the presence of calorie labels in the appropriate format and the methodology used by businesses to calculate them rather than directly testing the number of calories in menu items.

143. Using the same assumptions, enforcement of businesses whose primary function is not the provision of food will result in additional costs of £8k per year (with sensitivity analysis providing a range between £5k and £31k), and enforcement costs of businesses selling on-the-go items will result in a cost of £16k per year (with sensitivity analysis providing a range between £11k and £60 k per year).

144. We acknowledge that there will also be an additional burden on businesses in order to accommodate extra time during inspections. However, given the workload will fall predominantly on the TSO rather than an employee at the business, we have chosen not to monetise this potential cost to businesses.

145. If there are concerns that labels are misleading, additional costs may result from the need to spend time with the businesses to check how they have arrived at their figures or to support them in displaying accurate information. This is likely to be frontloaded to the initial years of implementation.

146. Since ongoing enforcement costs are based on the number of outlets subject to this regulation, any change to this number will impact on costs to local authorities. Furthermore, if businesses fail to comply with the regulation, then there may be additional costs through the issuing of sanctions.

147. It is proposed that local authorities will use improvement notices under the Food Safety Act 1990 (FSA) to enforce the policy. In instances of non-compliance with an improvement notice, it is proposed that local authorities will have the option of issuing fixed monetary penalties, as prescribed by the Regulatory Enforcement and Sanctions Act 2008 (RESA), as alternatives to penalties in the FSA. The Department will consult on its intention to use fixed monetary penalties under the RESA; details on how the policy will be enforced, including sanctions for non-compliance, will be confirmed at a later date.

148. We assume full compliance with the regulations for the purposes of these costs. This is an unevidenced assumption as we are unable to determine the level of non-compliance in advance of the regulations being in place. For illustration, we have identified data on the number of offences and prosecutions for non-compliance with existing allergen labelling rules. Using this rate of offences and prosecutions, and applying it to outlets for large businesses only, gives less than one offence per year and only one prosecution every 3 years. This illustrative calculation justifies that the total costs associated with offences and prosecutions are expected be very low for this policy.

Health Benefits

149. The health benefits generated by this policy will depend on several factors, including the level of awareness, comprehension and use of calorie labels by consumers. For the purposes of our calculations we have assumed full compliance, i.e. all out-of-home businesses meet the regulations.

150. To quantify the benefits, we have estimated an average reduction in calorie consumption per person per day. The calculations of the quantified benefits are done within the “DHSC Calorie Model”. This model simulates a “control” group of would-be overweight and obese adult population, compared with an “intervention” group. The “intervention” group has a lower average BMI, as calculated from the reduced daily calorie intake. The simulation is over 25 years.

services/food-safety-inspections/food-safety-inspection-process/ (last assessed 08/02/19); https://www.tendringdc.gov.uk/sites/default/files/documents/business/licensing%20%26%20legislation/food/food%20safety%20-%20food%20safety%20inspection/Food%20Law%20Inspections%20and%20your%20Business.pdf (last accessed 08/02/19)

151. The average BMI determines the likelihood of the following five conditions associated with obesity, which in turn have a fatality rate and a reduced utility following survival: diabetes, coronary heart disease, stroke, colorectal cancer, and breast cancer. The savings to the NHS are calculated from the reduced treatment of each disease. Reductions in mortality are used to calculate the impact on economic output from an increased workforce. The costs of social care savings are calculated due to a reduced proportion of overweight, obese, and morbidly obese individuals and hence fewer people needing social care in the treatment scenario. Changes in QALYs are calculated from the reduced number of deaths and the reduction of people living with the diseases. These are then converted into monetised values using a conversion of how much society values a QALY. For a full description of the calculations and the set of assumptions see Annex A and the DHSC Calorie Model Technical Consultation Document[100].

Evidence regarding change in calorie consumption

152. Studies investigating the impact of calorie labelling have found mixed results. Furthermore, it's important to note that the quality of some studies is questionable with many authors calling for further research to be conducted.

153. It should first be noted that recent research conducted in the UK[101] has shown that the interpretation of verbal labels (e.g. "high" and "low) in the context of nutritional labelling vary greatly between individuals, and on average the interpretation by individuals did not match the intended meaning. These findings suggest the use of numeric calorie labels may be more accurately understood by individuals.

154. Most evidence on the impact of calorie labelling comes from studies conducted in experimental settings, or is based on findings from the US where mandatory calorie labelling has already been introduced for chains with more than 20 outlets. Annex C lists the key papers considered when determining the benefits.

155. Studies using an experimental design, where individuals were presented with different menus and asked what they would hypothetically order, showed mixed results. For instance, one study[102] found that participants whose menus carried calorie labelling ordered 52 fewer calories and consumed 96 fewer calories than participants with no labelling. However, another study[103] found no significant difference in calorie consumption, portion size, or selection of food categories.

156. In a randomised controlled experiment in Seattle[104], parents of children aged 3-6 years choosing meals from a McDonald's menu with calorie labelling selected an average of 102 fewer calories for their children. In contrast, another randomised controlled trial[105] involving children aged 6-11 years and their parents showed no significant difference in the average number of calories selected. The authors suggested that this may have been due to the high proportion of children choosing their meals without parental involvement.

157. The introduction of mandatory calorie labelling in some areas of the US has allowed us to consider the impact of labelling in practice. Of these US-based evaluations, the Dumanovsky study (2011)[106] in New York City, found that 15% of customers used calorie information when making purchasing decisions. On average, customers who reported using the information purchased 106 fewer calories than those who didn't use it. After adjusting for demographics and purchase type, the calorie reduction was slightly lower at 78 calories.

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[100] DHSC Calorie Model Technical Consultation Document: https://www.gov.uk/government/publications/department-of-health-and-social-care-dhsc-calorie-model

[101] Liu et al. (2019). People Overestimate Verbal Quantities of Nutrients on Nutrition Labels (https://www.sciencedirect.com/science/article/abs/pii/S0950329319300849).

[102] Hammond et al. (2013) A randomized trial of calorie labeling on menus, Prev. Med. https://www.sciencedirect.com/science/article/pii/S0091743513003666 (last accessed 01/12/17)

[103] Harnack et al. (2008) Effects of calorie labeling and value size pricing on fast food meal choices: from an experimental trial. Int. J. Behav. Nutr. Phys. Act. 5, 63. http://www.ijbnpa.org/content/5/1/63 (Last accessed 28/11/17)

[104] Tandon et al. (2010). "Nutrition Menu Labeling May Lead to Lower-Calorie Restaurant Meal Choices for Children." Pediatrics, vol. 125(2), pp. 244-248, http://pediatrics.aappublications.org/content/125/2/244.full.pdf (last accessed 20/12/2017)

[105] Tandon et al. (2011) The impact of menu labelling on fast-food purchases for children and parents. Am. J. Prev. Med. 2011; 41(4), 434-438.

[106] Dumanovsky et al. (2011). Changes in Energy Content of Lunchtime Purchases from Fast Food Restaurants after Introduction of Calorie Labeling: Cross Sectional Customer Surveys, British Medical Journal. doi: 10.1136/bmj.d4464

158. A study in New York City (2007)[107] showed that 32% of Subway customers saw calorie information and that, on average, customers who reported seeing the labelling purchased 52 fewer calories than those who had not. Another US-based study[108] showed that on average 6% fewer calories were purchased by Starbucks consumers, with the reduction being sustained over the 10-month study period. This study also showed that customers consuming a higher than average number of calories experienced a greater reduction.

159. Away from New York City, a third study[109], this time comparing Philadelphia (which implemented mandatory nutrition labelling) with Baltimore (which did not) showed that on average customers of restaurants with labelling purchased 155 fewer calories (a relative difference of 9%) compared to customers of restaurants with no labelling. Customers who reported seeing and using the labelling drove the labelling effect: on average, they purchased 400 fewer calories than others (a relative difference of 20%).

160. In Oklahoma, a restaurant field experiment[110] looked at calories ordered on menus with either no calorie labels, numeric calorie labels, or symbolic calorie labels. When considering main meals ordered, both of the calorie label menus resulted in significantly fewer calories being ordered compared to the menu with no calorie labels. However, this difference was no longer seen when considering the total number of calories (sides, desserts and drinks) ordered.

161. A relatively small study in California[111] evaluated a calorie labelling intervention on hospital cafeterias. The study considered 3 situations: no calorie labelling, calorie and nutrient labelling on posters only, and calorie labelling on posters and at the point-of-purchase. Respondents from sites with calorie labelling at the point-of-purchase were significantly more likely to notice calorie information (69%) compared to respondents at the site with posters alone (58%). A third of respondents who noticed the calorie information stated it influenced their purchase, leading to a significant increase in the purchase of lower calorie side dishes and snacks at sites with calorie labels compared to those without. However, there were no significant changes in entrée dishes ordered.

162. Outside of the US, an evaluation of Australia's introduction of mandatory calorie labelling in 2012 showed that the median amount of energy purchased decreased by 15% between May 2011 and January 2013[112] (the mean value was also found to decrease but this was not significant).

163. In contrast to the studies noted above, three Elbel studies assessing the impact of mandatory calorie labelling (two in New York[113,114] and one in Philadelphia[115]) showed no significant change in calories purchased post-regulation. The two New York studies focused on low income and ethnic minority groups. There is also a study by Vasiljevic et al. (2018)[116] which considers the implementation of calorie labelling in worksite cafeterias, but only 1 of 6 sites considered showed a reduction in calories purchased once calorie labelling was introduced.

Systematic reviews and meta-analyses

164. An early systematic review paper by Swartz et al. (2011)[117] examined the available literature to determine whether calorie labelling on menus at restaurants and cafeterias has an effect on consumer purchasing and eating behaviours. The review flagged that a lot of evidence is of poor quality, and the

[107] Bassett et al. (2008) Purchasing behavior and calorie information at fast-food chains in New York City, 2007. Am. J. Public Health 98, 1457–1459.

[108] Bollinger et al. (2010) Calorie Posting in Chain Restaurants. Palo Alto, CA: Stanford University.

[109] Auchincloss et al. (2013) Customer responses to mandatory menu labelling at full-service restaurants. Am. J. Prev. Med. 2013; 45(6), 710-719.

[110] Ellison et al. (2013) Looking at the label and beyond: the effects of calorie labels, health consciousness, and demographics on caloric intake in restaurants. International Journal of Behavioral Nutrition and Physical Activity, 10(1), 21

[111] Webb et al. (2011) Menu labeling responsive to consumer concerns and shows promise for changing patron purchases. Journal of Hunger & Environmental Nutrition, 6(2), 166-178.

[112] Food Authority NSW, Evaluation of kilojoule menu labelling, http://foodauthority.nsw.gov.au/_Documents/scienceandtechnical/fastchoices_evaluation_report.pdf (last accessed 01/12/2017)

[113] Elbel et al. (2009) Calorie labeling and food choices: a first look at the effects on low-income people in New York City. Health Aff. 28, w1110–w1121.

[114] Elbel (2011) Child and adolescent fast-food choice and the influence of calorie labelling: a natural experiment. Int. J. Obes. 35, 493–500.

[115] Elbel et al. (2013) Calorie labelling, fast food purchasing and restaurant visits. Obesity; 21 (11), 2172-2179.

[116] Vasiljevic et al. "Impact of calorie labelling in worksite cafeterias: a stepped wedge randomised controlled pilot trial." International Journal of Behavioral Nutrition and Physical Activity 15.1 (2018): 41.

[117] Swartz et al. (2011). Calorie menu labeling on quick-service restaurant menus: an updated systematic review of the literature. International Journal of Behavioral Nutrition and Physical Activity, 8(1), 135.

results of those of fair or good quality were mixed (2 out of 7 studies reported significant reductions calories purchased among customers using calorie-labelled menus).

165. A review paper by Kitchlu et al. (2014)[118] looked at whether the presence of calorie labels on restaurant menus decreased calorie consumption. The findings of this paper were mixed: although the majority of studies considered showed a reduction in calories ordered in the presence of calorie information, only some of the studies found this reduction to be significant. It did find that around a third of individuals desired nutritional information on restaurant menus.

166. Nikolaou et al. (2015) performed a systematic literature review and meta-analysis on this topic[119]. Their meta-analysis showed no statistically significant effect of calorie labelling. However, meals ordered by customers who did notice labels (30–60% of customers) had 125 kcal less than was the case where no labels were provided.

167. In 2016, Hector[120] also conducted a review of studies investigating the impact of menu labelling. Evidence from 15 studies suggested that the average amount of calories ordered in real-world settings decreased by 78 kcal after labelling had been introduced. As hinted at above, studies usually find that there is a difference in calories purchased depending on whether the customers have seen the labelling or not. It's also important to note that some studies included in this review did not find a significant reduction in calories after labelling had been implemented.

168. Zlatevska et al (2017)[121] investigated evidence from the US by examining the effectiveness of the calorie disclosure legislation in the out-of-home sector. They found that calorie labelling leads to an average reduction of 27 kcal per meal. Moreover, the authors found that the calorie reduction was significantly stronger for overweight individuals, females, table-service restaurants and hypothetical choice scenarios, as well as for lunch meals. In addition to a change in consumer behaviour, the authors also found that retailers responded by reducing the energy content menu of items by 15 calories on average.

169. A review paper by Kiszko et al. (2014)[122] assessed the effectiveness of calorie labelling at the point of purchase. Findings from this review are mixed: there are some positive results, but the best designed studies do not show a reduction in total calories ordered at the population level. In the "real world" restaurant papers, the percentage of people who are influenced by calorie labels when they notice them varies from 9% to 88%. The laboratory-based studies discussed in this review again have mixed results. However, the review paper does highlight that for the laboratory-based studies that did not report overall differences in the nutritional content of items ordered and consumed, there were significant differences among specific populations. The findings of "simulated" food selections (studies where participants were asked to indicated what they would order from a menu) showed an overall positive influence of calorie labelling, with up to 44% of participants choosing lower calorie meals when calorie information was provided.

170. A Cochrane review into the impact of nutritional labelling on food purchasing and consumption[123] includes a meta-analysis of three US studies. The review states that calorie labelling leads to an average reduction in calories purchased of 47 kcal per person per meal. However, the authors note that the quality of evidence for the three included studies was low and that more research would be needed to be confident in the results. Still, the review 'tentatively suggests that nutritional labelling on menus in restaurants could be used as part of a broader range of interventions to increase the impact of efforts to support healthier food consumption across populations'.

Contextual labelling

[118] Kitchlu et al. (2014). Assessing the effectiveness of calorie labeling on restaurant menus. Environmental Health Review, 56(03), 73-82.

[119] Nikolaou et al. (2015) Calorie-labelling: does it impact on calorie purchase in catering outlets and the views of young adults? http://www.nature.com/articles/ijo2014162 (last accessed 13/12/2017)

[120] Hector (2016) Effectiveness of numeric energy menu labelling and potential alternative formats and/or content: An evidence review. Prepared for the Working Group to the Reference Group for Fast Choices Menu Labelling in New South Wales; under the auspices of the Centre for Population Health, NSW Ministry of Health; Physical Activity Nutrition & Obesity Research Group; Sydney, https://ses.library.usyd.edu.au/bitstream/2123/17008/1/ML%20review_Nov%202016_for%20PRC%20website.pdf (last accessed 12/12/2017)

[121] Zlatevska et al. (2017), Mandatory calorie disclosure: A comprehensive analysis of its effect on consumers and retailers, Journal of Retailing, online available at https://www.uts.edu.au/about/uts-business-school/marketing/news/calorie-counts-menus-make-difference (last accessed 19/12/2017)

[122] Kiszko et al. (2014) The influence of calorie labeling on food orders and consumption: A review of the literature. Journal of community health 39.6 (2014): 1248-1269.

[123] Crockett et al. (2011) Nutritional labelling for healthier food or non-alcoholic drink purchasing and consumption. Cochrane Database of Systematic Reviews, Issue 9 . Art. No.: CD009315. DOI: 10.1002/14651858.CD009315

171. In addition to calorie labels, we propose to also mandate the provision of contextual labelling, i.e. including the recommended daily calorie intake for an adult woman. According to the available evidence, including contextual labelling will increase the effectiveness of the policy.

172. A review paper by Sinclair et al. (2014)[124] aimed to identify all studies at the time that reported on the effect of contextual menu labelling. Their meta-analysis concluded that menu labelling with calories alone did not significantly reduce the calories selected or consumed. However, the addition of contextual or interpretive nutritional information did result in significantly fewer calories selected (67 kcal) and consumed (81 kcal) compared to situations with no calorie labelling.

173. Roberto et al. (2010)[125] compared the food choices and intakes of groups that chose their meal from menus with calorie labels, with both calorie and contextual labels or without either. Although participants in the contextual labelling group ordered and consumed fewer than those with simple calorie labels, these changes were not significant. However, when considering the total calories consumed during and after the meal, the contextual labelling group did consume significantly fewer calories compared with the simple calorie labels group.

174. Although a study in Canada[126] found no difference in snack calories selected with contextual labelling versus a calorie only condition, the paper did report that people preferred calorie labels including contextual information, and found them to increase their ability to understand and use the labels.

175. Likewise, a study among young adults in Canada (2016)[127] found that a higher percentage of respondents could correctly recall the number of calories in pre-packaged food when given contextual labels compared to calorie labels alone. Notably, the same study concluded that, in general, people can recall the calorie content better when the label doesn't contain too much additional information. Additional information may distract attention away from the calorie number, because it might be unfamiliar and hard to grasp in the short period when people are looking at the label.

176. Another study[128] also finds that contextual labels can lead to lower calorie purchases, but this study does state that no significant differences were seen between the contextual labelling and simple calorie labelling conditions.

Choice of evidence for this impact assessment

177. As outlined above, there is a considerable amount of evidence available in this area, with various individual studies and reviews investigating the impact of calorie labelling on restaurant menus. Despite this wealth of evidence, there seems to be little consensus regarding the overall effect on calorie consumption, with some papers not finding any evidence of a change. However, recent and extensive literature reviews have found a significant calorie reduction due to calorie labelling.

178. There is an intrinsic difficulty in designing studies with the power to identify small changes in the number of calories purchased or consumed. However, small changes are expected to add up and result in a substantial impact on obesity levels. It is worth noting that many papers do find a reduction in calories, but this reduction is not significant, suggesting studies with higher statistical power may need to be devised. So even if some studies find no statistically significant calorie reduction, the overall effect may still result in significant health benefits.

179. The consultation IA used evidence from the Cochrane review, and applied an uplift to this to account for effects of contextual labelling. We have now used the Sinclair review mentioned previously as the basis for our calculations. The Sinclair review takes into account the impact of contextual labelling on an individual's calorie consumption. As a result, the findings from this paper can be applied

[124] Sinclair et al. (2014). The influence of menu labeling on calories selected or consumed: a systematic review and meta-analysis. Journal of the Academy of Nutrition and Dietetics, 114(9), 1375-1388.

[125] Roberto et al. (2010) Evaluating the impact of menu labelling on food choices and intakes https://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2009.160226?journalCode=ajph (last accessed 06/08/2018)

[126] Pang & Hammond (2013) Efficacy and Consumer Preferences for Different Approaches to Calorie Labeling on Menus, Hournal of Nutrition Education and Behaviour, https://www.deepdyve.com/lp/elsevier/efficacy-and-consumer-preferences-for-different-approaches-to-calorie-0LKRwIhV0z (last accessed 06/08/2018)

[127] Acton et al. (2016) The efficacy of calorie labelling formats on pre-packaged foods: An experimental study among adolescents and young adults in Canada http://journal.cpha.ca/index.php/cjph/article/view/5513/3447 (last accessed 06/08/2018)

[128] Downs et al. (2015). Helping consumers use nutrition information: Effects of format and presentation. American Journal of Health Economics, 1(3), 326-344.

directly to our calculations without having to apply an additional uplift. This simplifies our analysis considerably. However, since the Sinclair review is based on studies from the US and Canada, we recognise that purchasing patterns and consumers responses to labelling may be different from England. Consumers reaction towards labels also depends on their education, meaning the Sinclair results may show some bias as many of the papers rely on university students as participants. Furthermore, the studies are short-term observations. Long-term changes in behaviour are possible and may not have been picked up by the studies. The Sinclair paper also considers both contextual and interpretive labelling in the same analysis, however the effect the labels had on calories consumed was found to be equally effective.

180. Consequently, we have decided to scale down the Sinclair results by 50%. This accounts for the uncertainties mentioned above and possible differences in the food offer. As mentioned previously, the Sinclair review finds that 81 fewer calories are consumed due to labelling. Reducing it by 50% leaves us with a calorie reduction of 41 kcal per meal consumed out-of-home.

Modelled impact of reduction in calorie consumption

Impact of introducing calorie labelling

181. As explained in paragraph 33, 18% of meals are eaten out[129] (meaning 0.5 meals are eaten out per day on average). Given we assume the number of meals eaten out will include meals eaten at places where the provision of food is not the main purpose, no further adjustment is needed to account for businesses whose sole purpose is not the provision of food and those selling on-the-go items. Some research does suggest that the number of meals eaten out of home is increasing, with a 5% increase in the number of meals eaten out between 2014 and 2015[130]. Given we do not know how this consumption will change over the next 25 years, and in order to simplify the modelling, we will assume it remains constant over the modelling period. However, if the number of meals eaten out does continue to increase, this would result in further calorie reductions per day meaning our health benefits would be an underestimation. This is discussed further in section "*Composition and size of the out-of-home sector".* We plan to consider changes in the out-of-home sector in the Post Implementation Review.

182. This policy will exclude in-house workplace canteens, including those of Civil Society Organisations (CSOs) where the provision of food is solely for the workforce as these options are not open to the general public. Education establishments are also exempt. Data from the MCA Eating Out Panel[131]on the participation rates, visit frequencies, and annual visits suggest that 2% of eating out occasions are attributed to college or school, and 4% of eating out occasions are in the workplace. A workplace report[132] suggests that 34% of canteens are run in house, meaning a total of 3.4% of meals eaten out would not be covered by this policy. Therefore schools or workplace canteens if they are in- house or run by a catering service that is catergorised as a micro, small or a medium business will not be in scope of this policy.

183. In addition to examples above, the policy will also exclude charitable food provision, such as charitable bake sales, galas, or soup kitchens. Food served to patients in hospital, people in care homes or similar health services is also exempt; however, any public canteen in these establishments, where the caterer is a large enterprise, would be subject to the requirements.

184. No additional benefits will arise from consumers purchasing packaged on-the-go items such as sandwiches. The same data from the MCA Eating Out Panel suggests that 14% of eating out occasions are attributed to Supermarket To-Go. Unpackaged items such as sausage roles which will be included in the policy are likely to also fall within this category, but we feel the majority will be made up of pre-packaged items with their own calorie labels. To ensure we do not overestimate the benefits, these on-the go products have not been included in the benefit calculations.

185. In total, this means 17% of meals eaten out will not be covered by the scope of the policy, and the benefits will be adjusted accordingly.

[129] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/470179/Sugar_reduction_The_evidence_for_action.pdf

[130] Ibid.

[131] https://www.mca-insight.com/

[132] https://www.lrdpublications.org.uk/publications.php?pub=WR&iss=1758&id=idp10120192 (last accessed 11/03/19)

186. Medium, small, and micro businesses account for 51% of turnover, meaning we assume 51% of meals consumed would not contribute to the estimated health benefits if these businesses are exempt from the policy. This does not include businesses whose sole purpose is not the provision of food and those selling on-the-go items as a large proportion of their turnover would be from products not in scope of this policy. Applying the number of meals eaten out per day, the percentage of meals not covered by the policy, and the exclusion a small and micro businesses to our calorie reduction assumption, we estimate that the average reduction in calorie consumption for all consumers is 9 kcal per day. Using the research by Robinson et al.[133] combined with the analysis on the number of outlets, we can assume that 59% of large outlets already have calorie labelling in place. However, the research by Robinson et al. also found that the quality of the calorie labelling already in place is very low: none of the chains providing calorie labelling met all of the seven quality criteria developed by the Department of Health and Social Care as part of the Responsibility Deal calorie labelling pledge. In order for customers to already be benefiting from calorie labelling in place, we assume a business would have to meet 4 of the 7 criteria.

187. Only 10% of large outlets met at least 4 of the 7 criteria. Reducing our estimated calorie reduction for the proportion of the market who already provide reasonable quality calorie labelling, we estimate that consumers calorie consumption will decrease by 8 kcal per day on average[134].

188. The calculations of the quantified benefits are done within the "DHSC Calorie Model" as discussed previously. The model was run over a 25 year period.

189. Over 25 years, discounted health benefits through reduced mortality and morbidity are estimated at around 94,000 QALYs, or a present value of £4.4bn at £60,000 per QALY. Lower levels of morbidity would also result in reduced cost pressures to the NHS; these are estimated to be worth around £409m over 25 years. Social care savings would amount to £454m and reduced premature mortality would be expected to deliver an additional £76m of economic output through additional labour force participation. All savings presented are on an England only basis.

190. In addition to this, there is the possibility that additional benefits could arise from reinvesting savings back into the NHS. This benefit is unquantified, but the latest evidence suggests that the NHS could purchase a QALY for £15,000, which in turn is then valued at £60,000 by society. Therefore, dividing the yearly NHS savings by this figure and multiplying by society's valuation of a QALY allows us to estimate additional health benefits these savings could generate. If NHS savings are reinvested back into the healthcare system, we would also be able to discount the savings at the health discount rate of 1.5% rather than the general discount rate of 3.5%. This would increase the NHS savings from £0.4bn to £2.2bn (i.e. additional benefits of £1.8bn) over the 25-year period. It is the Department's policy to consider the opportunity cost of the spending, as this could represent a displacement from the fixed NHS health budget and therefore we have included this potential benefit as part of our sensitivity analysis and will not be included in the final NPV or figures on the cover sheet.

191. These estimates are based on calorie labelling alone and do not consider the fact that businesses may reformulate their products. The additional benefits of reformulation are calculated below.

192. The reduction in calorie consumption is based solely on the reduction in calories purchased at the specific eating occasion where consumers do (or do not) read and utilise calorie labelling. It is possible that there will be a further impact on calories consumed during the rest of the day, as consumers may reduce their calorie consumption at later meals in response to noticing out-of-home calorie labelling at an earlier meal.

193. It is also possible that there will be additional long-term effects resulting from consumers' nutritional knowledge improving as their use of calorie labelling information becomes more prevalent.

Compensating behaviour

189. So far, the health benefits have been calculated on the basis that wider factors do not shift to partially or wholly offset the impact of the policy. It is possible, for example, that consumers might adjust their consumption or purchasing behaviour in response to consuming fewer calories.

[133] Robinson et al. "Point of choice kilocalorie labelling in the UK eating out of home sector: a descriptive study of major chains". Available online: https://osf.io/xy6q2/

[134] We have calculated the calorie reduction across all age groups as this is in line with the literature. Zlatevska et al. (2017) have found that calorie labelling doesn't have a different effect on children compared to adults.

190. The evidence of calorie compensation in the literature is mixed. Several experiments investigating the impact of adjusting the energy density of specific meals have found no evidence of calorie compensation at subsequent meals or during the short time period covered by the study[135]. In contrast, other investigations have found that subjects completely compensated for a change in calorie intake[136]. Furthermore, two other studies have found imprecise levels of calorie compensation, with subjects adjusting their food intake to compensate for 40% and 35% of the calories removed from their diets[137].

191. The rate of compensation is also likely to depend on the foods that are removed from people's diets, with some evidence suggesting individuals are less likely to compensate for changes in calorie intake from beverages than solid food[138]. Moreover, with many of these studies taking place in laboratory conditions or over relatively short periods of time it is unclear how people might adjust their behaviour over time in real world conditions.

192. The limited evidence available for the effects of calorie labelling only considers the impact of the policy on a specific purchasing environment and at a specific purchasing incident. It is not possible to say conclusively that behaviour does not adjust in other areas. However, two studies[139,140] have found that calorie labelling does lead to BMI reduction, with varying effects for different subgroups. This research points towards less than full compensation taking place.

193. Furthermore, it seems unlikely that individuals would compensate for consuming fewer calories after making a conscious decision to choose a healthier option. Because we can't be certain whether compensation will take place, we have decided not to adjust our estimates above. However, to capture the importance of this uncertainty in determining the NPV, we considered what proportion of the above benefits would need to be offset for the policy to impose a net cost to society.

Impact of reformulation

194. As mentioned previously, labelling will likely encourage businesses to reformulate their products, reducing the calorie content of meals and driving the creation of new heathier options. This would lead to further indirect health benefits for consumers. Reformulation is a particularly important aspect to consider as it does not depend on consumers' ability to understand or notice calorie labels. Evidence from studies in the US[141,142] show that labelling has influenced businesses to reduce the calorie content of meals and encourage the creation of new healthier products.

195. The small pilot study carried out by Food Standards Scotland[143] recruited 22 businesses to use the MenuCal tool to calculate the calories in their menu items. 10 businesses went on to use MenuCal to calculate calories, and of those, 8 businesses made modifications to their menu items including reducing the number of calories, and reducing portion sizes.

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135 Anton et al. (2010) Effects of stevia, aspartame, and sucrose on food intake, satiety, and postprandial glucose and insulin levels. Appetite. Aug 31;55(1):37-43;
Rolls et al. (2006) Reductions in portion size and energy density of foods are additive and lead to sustained decreases in energy intake. The American journal of clinical nutrition. Jan 1;83(1):11-7;
Kelly et al (2009). Increased portion size leads to a sustained increase in energy intake over 4 d in normal-weight and overweight men and women. British journal of nutrition. 2009 Feb;102(3):470-7.

136 Foltin et al. (1988) Compensation for caloric dilution in humans given unrestricted access to food in a residential laboratory. Appetite. 1988 Feb 29;10(1):13-24: Foltin, RW et al. (1990) Caloric compensation for lunches varying in fat and carbohydrate content by humans in a residential laboratory. The American journal of clinical nutrition. 1990 Dec 1;52(6):969-80.

137 Porikos et al (1982) Caloric regulation in normal-weight men maintained on a palatable diet of conventional foods. Physiology & behavior. 1982 Aug 31;29(2):293-300; Kendall A, et al (1991) Weight loss on a low-fat diet: consequence of the imprecision of the control of food intake in humans. The American journal of clinical nutrition. 1991 May 1;53(5):1124-9.

138 Mourao et al. (2007) Effects of food form on appetite and energy intake in lean and obese young adults. International journal of obesity. 2007 Nov 1;31(11):1688-95.

139 Restrepo (2014) https://www.ncbi.nlm.nih.gov/pubmed/27451966

140 Variyam & Cawley (2006) Nutrition labels and obesity. National Bureau of Economic Research.

141 Bruemmer et. al (2012). Energy, saturated fat, and sodium were lower in entrées at chain restaurants at 18 months compared with 6 months following the implementation of mandatory menu labeling regulation in King County, Washington. http://www.ncbi.nlm.nih.gov/pubmed/22704898 (last accessed 28/11/2017)

142 McKinsey Global Institute (2014) Overcoming obesity: An initial economic analysis http://www.mckinsey.com/~/media/McKinsey/Business%20Functions/Economic%20Studies%20TEMP/Our%20Insights/How%20the%20world%20could%20better%20fight%20obesity/MGI_Overcoming_obesity_Full_report.ashx (last accessed 06/08/2018)

143 Food Standards Scotland. An Evaluation of a Pilot on the Use of MenuCal within Small and Medium Scottish Food Businesses. Available online: https://www.foodstandards.gov.scot/downloads/MenuCal_-_Evaluation_-_Report.pdf (last accessed 11/02/19)

196. Zlatevska et al. (2018) conducted a meta-analysis of studies investigating retailers' response after calorie labelling had been introduced. The authors found that, on average, retailers reduced the calorie content of menu items by 15 kcal. The results from this study are used in the calculations below to estimate the further health benefits from reformulation.

197. Caution is necessary when estimating the benefits of reformulation due to the difficulty in judging whether it is in direct response to calorie labelling or influenced by other drivers. To account for the uncertainty we have weighted the calorie reduction estimated Zlatevska down by 50%, resulting in a reduction of 7.5 kcal per meal.

198. We assume that outlets that already have any quality calorie labelling in place would have already reformulated if they thought it would be beneficial for the business. 59% of large outlets currently have some form of calorie labelling in place and would therefore presumably already have reformulated their products if they deem it necessary. This means the remaining 41% of meals would be subject to potential reformulation. With an estimated 0.5 meals being eaten out of home per day, 17% of meals not covered by the scope of the policy, and 51% of turnover not covered by the policy, we estimate a further calorie reduction of 0.7 kcal per person per day because of reformulation.

Compensating behaviour

199. As mentioned previously, it is possible that consumers might adjust their consumption in response to consuming fewer calories. Reformulation may also lead to consumers buying and consuming more of the reformulated products, thus reducing or even reversing the reduction.

200. In contrast to the benefits discussed previously, reformulation does not require a conscious decision to be made by consumers, i.e. they can continue choosing the same menu items as before but benefit from reformulation lowering calorie content of those items. As a result, it seems possible that consumers might subconsciously adjust their intakes to compensate for consuming fewer calories either during the same or subsequent meals.

201. As discussed previously, experiments investigating the impact of adjusting the energy density of specific meals have found mixed results. We will assume a 40% compensation resulting in a calorie reduction of 0.4 kcal per day. Over 25 years, discounted health benefits through reduced mortality and morbidity are estimated at around 5,000 QALYs, or a present value of £222m at £60,000 per QALY. Lower levels of morbidity would also result in reduced cost pressures to the NHS; these are estimated to be worth around £21m over 25 years. Social care savings would amount to £23m and reduced premature mortality would be expected to deliver an additional £4m of economic output through additional labour force participation. All savings presented are on an England only basis.

Unmonetised benefits

202. There are a number of additional health benefits which we have either not been able to monetise and/or include in our assessment of the overall net present value of the policy. These are outlined in turn below:

- **Improvements to productivity are not included.** Furthermore, the economic output benefits are derived only from additional economic output from having a larger population in the treatment group, due to fewer obesity related deaths. However, preventing obesity related ill health will also result in a healthier workforce, which is likely to be more productive, take fewer sick days and reduce illness related to early retirement. This impact is not estimated quantitatively in the model due to the difficulties in putting in parameters to quantify this improvement in productivity. We currently do not have strong evidence to justify these parameters and as a result remains unmonetised.

- **Additional health benefits from reinvesting NHS savings back into the health service.** As noted above, lower levels of obesity related ill health are expected to reduce demand for NHS healthcare compared to the counterfactual, generating cost savings for the health service and additional resources which can be used to treat patients. Given there are waiting lists for NHS treatments and demand for care overall is expected to continue to increase as the population ages, it seems likely that any spare capacity in the system would be backfilled with additional treatments. The estimated monetised value of

the additional health benefits these treatments would generate is outlined in the sensitivity analysis section below in table 17.

203. The consultation on this intervention brought up the concern of potential negative impacts this policy could have on individuals with eating disorders. Anecdotal evidence in the consultation responses suggested those with eating disorders may find it more difficult to eat in establishments with calorie information displayed.

204. There is limited academic evidence surrounding this issue and the evidence that does exist is somewhat mixed. One paper[144] does report that participants with an eating disorder ordered significantly fewer calories when presented with a menu with calorie labels compared to a no-label condition, and another[145] suggests students with weight concerns were more likely to be influenced by food labels than those without. A paper by Larson et al[146]. found that using menu labels led to more weight-related concerns and unhealthy weight-control behaviours.

205. However, research by Lillico et al.[147] considered the effect of menu labelling on those at high risk for eating pathologies and found no significant change in calorie consumption in response to posting calorie labels. And although research by Christoph et al.[148] found that label use on packaged foods was related to engagement in some unhealthy weight behaviours, there was a larger likelihood of participants engaging with healthy weight control behaviours.

206. Although the Department acknowledges this concern, with more than a third of children leaving primary school overweight or obese, we need to equip people with the information to make decisions about their food intake; information on the energy content of food and drinkis already widely available in supermarkets and some restaurants. We are committed to striking a careful balance between informing and educating people to make healthier choices whilst not negatively impacting people with eating disorders or those in recovery from eating disorders.

Summary of benefits

207. The expected benefits from introducing calorie labels with contextual information and the reformulation this encourages are summarised in Table 9.

Table 9: Summary of benefits

Category	**Benefits**	
	Due to labelling	Due to reformulation
Health benefits (monetised QALYs) (£m)	4,371	222
NHS savings (£m)	409	21
Social care savings (£m)	454	23
Economic output (£m)	76	4
Total (£m)	**5,580**	

Summary of costs and benefits

208. The table below presents Net Present Values for different aspects of the policy, as estimated over a 25-year assessment period, on an England only basis. Again, it is important to note that the long-term health benefits require the direct impacts of the policy intervention not to be offset. The costs to

144 Haynos et al. (2017). The effects of restaurant menu calorie labeling on hypothetical meal choices of females with disordered eating. International Journal of Eating Disorders, 50(3), 275-283.

145 Fawkes et al. (2010). Female college students' attitudes about body image and food labels and how they affect purchasing behavior. Topics in Clinical Nutrition, 25(2), 165-171.

146 Larson et al. (2018). Calorie Labels on the Restaurant Menu: Is the Use of Weight-Control Behaviors Related to Ordering Decisions?. Journal of the Academy of Nutrition and Dietetics, 118(3), 399-408.

147 Lillico et al (2015). The effects of calorie labels on those at high-risk of eating pathologies: a pre-post intervention study in a University cafeteria. Public health, 129(6), 732-739.

148 Christoph et al. (2018). Nutrition facts use in relation to eating behaviors and healthy and unhealthy weight control behaviors. Journal of nutrition education and behavior, 50(3), 267-274.

businesses whose sole purpose is not the provision of food and those selling on-the-go items have been included in the NPV.

Table 10: Costs and benefits

Group affected	**Impact**	**Present Value (£m)**
Out-of-home businesses (including businesses whose sole purpose is not the provision of food and those selling on-the-go items)	Familiarisation with regulations	-0.09
	Product assessment tool	-2.4
	Initial calculation of energy content of products	-0.7
	Calculating energy content of new and modified products	-7.1
	Initial labelling and write off costs	-0.1
	Re-labelling costs	Unquantified
	Change in profits	Unquantified
	Total out-of-home business impact	**-10.2**
Wider society	Health benefits	4,593
	Economic output	80
	Total societal impact	**4,673**
Government	Familiarisation with regulations	- 0.02
	Enforcement	-1.6
	NHS savings	430
	Social care savings	477
	Total Government impact	**905**
	NPV	**5,570**

Equivalent annual net direct cost to business

209. All quantified costs to business are direct costs, with all activity occurring within the UK. It has not been possible to quantify all impacts to business - as such, we present only a partial estimate of the total EANDCB. The costs to Government have not been included in these calculations as they are not a direct cost to business. Our partial assessment of EANDCB is £0.5m in 2016 prices and discounted to 2017.

Sensitivity and risk analysis

Interaction of policy effects

210. Please note some changes were made to this section following recommendations within the RPC's final opinion dated 20 December 2019.

211. Due to the substantial number of policies, which are being consulted on as part of *Childhood obesity: a plan for action – chapter 2*, the potential interactions between options have not been quantified.

212. The central estimates above consider the impact of out-of-home calorie labelling in isolation to the other policies that have been announced, or any possible future actions by government. We recognise that there will be interactive effects between this policy and others being proposed or already enacted. This section considers what form these interactive effects are likely to take, and what impact this will have on reducing childhood obesity and on imposing costs to the food industry.

213. When considering the interactive effects with other policies, the reformulation programmes and the Soft Drinks Industry Levy (SDIL) are the most relevant strand of the childhood obesity strategy. These are considered in turn below.

214. PHE's reformulation programmes are challenging manufacturers, retailers and out-of-home food outlets to reduce the amount of sugar and calories in certain products. If successful in the out of home sector, the impact would be that fewer calories will be consumed per meal out-of-home. These are both 5 year programmes, and the outcome of these programmes is yet to come about: at the time of publishing this IA, the Calorie Reduction Programme has not yet fully defined the products in scope and the Sugar Reduction Programme only has Year 2 results published. These showed 4.9% reduction in the average sugar content of the products in the out-of-home sector; however the overall consumption of the products in scope increased by 1.8%[149]. The results are significantly below the target improvements expected at this time point, and the fact that overall consumption of these products has increased in out-of-home, further points to the uncertainty in the impact of these programmes.

215. The Soft Drinks Industry Levy[150] was introduced in 2018 and is a levy on manufacturers of soft drinks. Many soft drinks have already been reformulated and sales shifted to lower-sugar soft drinks as a result of this levy and the average sugar content of drinks subject to the Soft Drinks Industry Levy (SDIL) decreased by 28.8% between 2015 and 2018[151]

216. For these policies, we considered whether this warrants explicit adjustment within the estimate of calorie reduction from the policy in question. We decided it does not warrant explicit adjustment. This is because the original basis of the calories reduction as a result of contextual labelling, which is from the Sinclair review, is from studies in food settings where we do not have a detailed knowledge of the food offer and calorie content of individual items. How close the studies are to the average out-of-home food offer in the UK is uncertain, and this is one reason why we down-weighted this calorie estimate by 50%, as explained in paragraph 180. Therefore calorie reductions as a result of the

[149] Public Heath England, *Sugar reduction: Report on progress between 2015 and 2018.*(Accessed 08/01/2020). Available here: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/839756/Sugar_reduction_yr2_progress_report.pdf

[150] The Sugar Drink Industry Levy is a levy on soft drinks that are high in sugar. More information on the levy can be found here https://www.gov.uk/government/news/soft-drinks-industry-levy-12-things-you-should-know

[151] Public Heath England, *Sugar reduction: Report on progress between 2015 and 2018.*(Accessed 08/01/2020). Available here: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/839756/Sugar_reduction_yr2_progress_report.pdf

reformulation programmes and SDIL do not need a separate adjustment because of the wider uncertainty in the food offer which is accounted for in this 50% down-weighting.

217. There is another aspect to the interaction with this policy which is that the main cost to businesses of out-of-home calorie labelling arises from calculating energy values for products. These costs include writing down recipes, weighing ingredients and possibly using a calorie calculator tool to assess and record the energy values. For those businesses that engage with PHE's reformulation programmes, there may be some duplication of these costs. However, the extent of such overlap would be very difficult to assess, and as the reduction programmes are voluntary, it may be done in a different manner to what is required for this regulation. Therefore we decided not to adjust for any potential overlapping costs here.

218. Other interactions with future regulations are with: a possible ban on sales of energy drinks to children, restrictions on promotions of HFSS foods, and advertising restrictions. These are looked at below in turn:

- Any ban on energy drinks to children would result in fewer energy drinks being consumed by this age group. However, it is expected that purchases are largely made from retailers rather than out-of-home businesses and that these purchases will largely be replaced by soft drinks and confectionary. Some retailers who sell loose on-the-go items will be impacted by both the energy drinks age restrictions and simultaneously calorie labelling requirements. However, these will be additive to each other with no obvious over-lap or substitution effects. It is expected that there will be minimal impact on purchases in the out-of-home sector.
- The government consulted on restrictions on promotions of HFSS goods based on location and volume, and restrictions on advertising HFSS products. There is no anticipated interaction of the policy considered in this IA and these other policies. Some retailers who sell loose on-the-go items will be impacted by both the promotion restrictions and simultaneously calorie labelling requirements. However, these will be additive to each other with no obvious duplication or substitution effects.

219. In summary, the calculations have not attempted to quantify any interactive effects with other obesity policies, for reasons given above. That is not to say that there are no interactions expected, but that the strength of quantifiable evidence is too weak to justify adjustment to the costs and benefits presented in this IA.

Critical value analysis

220. As mentioned previously, it's possible that wider factors may shift to offset the calorie reduction expected because of this policy. While this is not considered to be the most likely outcome, this cannot be ruled out. To assess the impact of this, we have considered the degree of offsetting required to result in a neutral NPV.

221. The combined benefits are estimated to be worth £5.6bn and total costs are valued at £12m (£10m are direct costs to businesses) over the 25-year assessment period. This suggests that 99.8% of the direct benefits of the policy would need to be offset for it not be deemed socially beneficial. This is equivalent to an average reduction by 0.02 kcal per person and day.

222. If this policy is implemented and results in no calorie reduction, the full costs will still occur but without any of the estimated benefits. This would result in an NPV of -£12m.

Sensitivity analysis

223. We recognise that many of the cost calculations in this Impact Assessment are based on plausible assumptions. The specific choices of these assumptions can have a substantial impact on the final estimates. To assess the size of this impact we have varied some of the key assumptions used to estimate the costs to business. These variables are:

- The average wage of the individual carrying out familiarisation,
- The number of individuals familiarising themselves with the regulation,
- The average number of items on a menu or products per on-the-go foods manufacturer,
- The average labelling costs,
- The frequency of trading standards visits and additional time taken.
- The number of on-the-go businesses and stores
- The number of additional businesses whose primary function is not the sale of food but may still provide food to the public.

224. Similar uncertainties exist around the size of the estimated benefits. As a result, we have has varied some of the key assumptions used to estimate the benefits. These variables are:

- The size of the average calorie reduction experienced by consumers,
- The proportion of the market which already has calorie labelling,
- The additional benefits from reinvesting NHS cost savings back into the health service.

225. Calculations are performed below for the costs and benefits of our preferred Option (Option 5). The breakdown of results presented will be for out-of-home businesses, and the same methods have been applied to businesses whose primary function is not the provision of food and those providing on-the-go food and are included in the final values. Further sensitivity analysis has been carried out on a number of assumptions for the on the go food sector. There is a possibility that there are other unforeseen costs as a result of this policy which we have not been able to capture in the sensitivity analysis.

Option 5

Costs

Costs to Business

226. As detailed earlier, the estimated costs to businesses are associated with using a calorie calculator tool, familiarisation with the new regulations, the cost of calculating the energy content of products and labelling costs.

227. Calorie calculator subscriptions vary widely across providers. Some tools are available for free whereas others require monthly or yearly fees. In Table 11 we have varied the possible cost to businesses. For the lower and central estimates, we make the assumption that businesses which already have calorie information would not face any additional costs. For the upper estimate, we assume all medium and large businesses would incur a cost. When calculating final estimates, on-the-go businesses only varied the cost of a calorie calculator tool.

Table 11: Varying the costs of a calorie calculator tool

Assumption tested		**Lower**	**Central**	**Upper**
Fees for calorie calculator tool	***Input value (yearly subscription fee)***	***£150***	***£500***	***£1,350***
	Input value (number of businesses)	***225***	***225***	***545***
	Annual cost to out-of-home sector for using a calorie calculator tool (£m)	£0.03	£0.1	£0.7

189. Familiarisation costs were calculated by multiplying the number of businesses in the out-of-home sector by the average wage for a research and development manager by one hour. We have used the median, maximum and minimum percentiles for a manager's wage as detailed in the Annual Survey of Hours and Earnings[152] uprated for on-costs to perform sensitivity analysis on our estimates. In order to calculate the cost of distributing the knowledge within the

[152] ONS (2018) Annual Survey of Hours and Earnings , Table 14.5 https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/occupation4digitsoc2010ashetable14 (last accessed 07/01/2019)

businesses, we have assumed that the manager would take 1 hour to share information about the regulation with two staff members in the central scenario (used the average wage of a corporate manager and director). Following RPC's final opinion dated 20 December 2019, we have added in a sensitivity analysis on the number of staff information is shared with due to the uncertainty regarding the assumption. In the upper scenario we have assumed 1 manager would share the information with 20 other employees. This is multiplied by the number of businesses in the out of home sector. The potential range is given in Table 12 below. For the businesses whose sole purpose is not the provision of food and those selling on-the-go items, the upper and lower estimates for the appropriate employer was used.

Table 12: Varying the business cost of familiarisation with the regulations

Assumption tested		**Lower**	**Central**	**Upper**
Average hourly wage rate for research and development managers and corporate managers and directors	***Input value (hourly salary)-familiarisation cost***	***£19.90***	***£30.90***	***£40.90***
	Input value (hourly salary)-sharing information within the business cost	***£13.50***	***£29.40***	***£50.90***
	Input value (number of employees)-sharing information within the business	***2***	***2***	***20***
	Cost to out-of-home sector for familiarisation with regulations (£'000s)	£11	£17	£20
	Cost of out of home sector for sharing information within the business (£'000s)	£26	£49	£577

190. The assumptions made when estimating the costs of calculating the energy content of products are the average number of menu items per business, the average time taken by businesses to calculate each value, how many new menu items are introduced each year, and the number of businesses considered (as well as the wage mentioned above). We have varied these assumptions to estimate the potential range of these business costs in Table 13 below. Similarly, for the lower and central estimates, we make the assumption that businesses which already have calorie information would not face any additional costs, and outlets with calorie labelling displayed would not require the information shared. For the upper estimate, we assume all businesses would incur a cost. For businesses selling on-the-go items, only the minutes per item and wage were varied for an upper estimate, whilst a lower estimate of £0 was used to reflect the likelihood that bigger businesses will already have calorie information available.

Table 13: Varying the business cost of calculating energy values

Assumption tested		**Lower**	**Central**	**Upper**
Average time per item to calculate energy values	***Input value (minutes per item)***	***10***	***25***	***45***
	Input value (number of menu items)	***20***	***50***	***75***
Average number of menu items	***Input value (number of new menu items per year)***	***5***	***10***	***20***

Average number of new menu items *Number of businesses*	***Input value (number of businesses)***	***225***	***225***	***545***
	Transition cost for out-of-home sector to calculate energy values of products (£m)	£0.16	£0.26	£1.2
	Annual cost from year 2 for out-of-home sector to calculate energy values of products (£m)	£0.15	£0.21	£0.76

191. When estimating labelling costs, our lower and upper estimates for the design costs are based on the lower and upper range of costs from the web quotes from which the central estimate was obtained.

Table 14: Varying labelling costs to business

Assumption tested		**Lower**	**Central**	**Upper**
Average design cost	***Input value (design cost)***	***£23***	***£135***	***£302***
	Labelling cost for out-of-home sector (£m)	£0.01	£0.07	£1.0

For the on-the-go foods sector, each of the inputs below have been varied where applicable. For example, for the manager's wage we take the maximum, median and minimum percentiles as detailed in the Annual Survey of Hours and Earnings[153] and uprated for on-costs to perform sensitivity analysis on our estimates. Additionally, we also consider the uncertainty in the number of stores and businesses in this sector, and the number of products per manufacturer in a similar fashion to above. We assume under the low and central scenario that we have managed to capture all stores and businesses in the sector. Under the high scenario we acknowledge that there may be some specialist stores we have not accounted for, and thus uplift the number of stores and businesses by 5%. Following RPC's final opinion dated 20 December 2019, we also adjusted the number of staff information is shared with to account for uncertainty regarding the assumption.Table 15: Varying assumptions for the on the go sector

Assumption tested	**Lower**	**Central**	**Upper**
Input value (number of large businesses)	73	73	77
Input value (number of large stores)	9107	9107	9562
Input value (number of employees)-sharing information within the business	2	2	20
Input value (hourly salary)-sharing with outlets	£11.05	£16.50	£33.09
Input value (products per bakery manufacturer)	0	52	70
Input value (products per rotisserie manufacturer)	0	16	20
Familiarisation and sharing with business costs (£k)	4.2	6.6	83.6
Initial transition costs (calculating energy content) (£k)	102	187	439

[153] ONS (2018) Annual Survey of Hours and Earnings , Table 14.5 https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/occupation4digitsoc2010ashetable14 (last accessed 07/01/2019)

Cost of sharing information with outlets (£k)	102	152	320
Annual costs of calculating energy context (£k)	0	7	24

192. For the businesses whose primary function is not the sale of food, each of the inputs below have been varied where applicable. For example, for the manager's wage we take the maximum, median and minimum percentiles as detailed in the Annual Survey of Hours and Earnings[154] and uprated for on-costs to perform sensitivity analysis on our estimates. Additionally, we also consider the uncertainty in the number of businesses whose primary function is not to sell food. We assume in the low and central scenario, we capture all businesses in scope. Under the high scenario, we acknowledge that there may be some additional businesses whose primary function is not to sell food, but there is a possibility they do sell food for direct consumption. Given the likely nature that these businesses could have food provisions that are contracted out, and the possibility that not all of these businesses will provide food to the public, we have captured these businesses in the high scenario and down weighted the number of businesses by 50%. These businesses include: Other amusement and recreation activities (93.29), library and achieve activities (91.11/12), passenger rail transport (interurban (49.10), Sea and coastal passenger water transport (50.10) and inland passenger water transport (50.30). Following RPC's final opinion dated 20 December 2019, we have also adjusted the number of staff information is shared with to account for uncertainty regarding the assumption.

Table 16: Varying assumptions for additional businesses whose primary function is not the sale of food.

Assumption tested	**Lower**	**Central**	**Upper**
Input value (number of large businesses)	143	143	158
Input value (hourly salary)-Familiarisation cost	£10.83	£15.16	£21.67
Input value (number of employees)-sharing information within the business	2	2	20
Input value (hourly salary)-Sharing cost	£13.50	£29.40	£50.90
Familiarisation costs (£k)	1.5	2.2	3.5
Cost of sharing information within a buisnessess (£k)	5	11	166
Initial transition costs (calculating energy content) (£k)	22	47	191
Annual costs calculating energy content (£k)	21	32	132

Costs to Government

193. Since the enforcement costs are not an insignificant part of the final Net Present Value calculation, we have also performed sensitivity analysis on these costs. We have not included familiarisation costs to local authorities as these represent a very small proportion of the total enforcement costs.

[154] ONS (2018) Annual Survey of Hours and Earnings , Table 14.5 https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/occupation4digitsoc2010ashetable14 (last accessed 07/01/2019)

194. Enforcement costs arise from assumptions around the frequency of trading standard visits and the additional time required per location. This have been varied as shown in the table below[155].

Table 16: Varying enforcement costs to local authorities

Assumption tested		Lower	Central	Upper
Frequency of trading standards visits (visits per year) *Additional time required per visit (mins)*	***Input value (frequency of visits)***	***0.2***	***0.3***	***0.5***
	Input value (additional mins per visit)	***15***	***15***	***30***
	Annual enforcement costs (£m)	£0.04	£0.06	£0.22

195. The same sensitivity analysis has been performed for businesses whose primary function is not the provision of food, and for businesses selling on the go food items.

Benefits

196. The key assumptions made when calculating the benefits are:

- The average reduction in calorie consumption;
- The proportion of companies that already have calorie labelling in store;
- The estimated NHS cost savings are not reinvested back into the health service.

197. The central estimate for the average reduction in calorie consumption according to the down weighted Sinclair review value is 41 fewer calories per meal[156].

198. We have used a reduction of 0 kcal as the lower estimate, accounting for a case in which calorie labelling does not result in different meal choices. However, we will still assume benefits arise from reformulation, whereby customers receive the benefits of reformulation regardless of whether they notice labelling.

199. For the upper estimate, we have assumed a 61 kcal reduction in individuals consumption due to calorie labelling - this represents a 50% increase compared to our central estimate. Furthermore, we have also assumed 100% of meals are affected (i.e. this would consider the scenario where consumers do not currently notice any calorie labelling due to its poor quality). We have not varied the benefits from reformulation, and assumed the 40% compensation. The range of benefits this generates is detailed in Table 16 below.

Table 16: Varying the key paraments in the health benefit calculations

Assumption tested		Lower	Central	Upper
Average calorie reduction in consumption at that purchase *Proportion of meals affected*	***Input value: Fewer calories consumed at purchase***	***0***	***41***	***61***
	Proportion of meals affected	***0%***	***90%***	***100%***
	Average additional calorie reduction per person per day (before reformulation)	0	9	13
	Value of QALYs (£m)	£222	£4,593	£7,521

[155] As detailed in Option 2, enforcement costs have been uplifted to take into the opportunity of DHSC reimbursing local authorities.

[156] For the benefits in this sensitivity analysis, we have only considered benefits directly from labelling and not those due to reformulation, which only make up a much smaller fraction of the total benefits.

	Reduction in cost pressures to the NHS (£m)	£21	£430	£778
	Increase in economic output (£m)	£4	£80	£131
	Social care savings (£m)	£23	£477	£778

200. As mentioned previously it seems likely that any spare capacity in the NHS generated by lower levels of obesity related ill health would be backfilled with additional health treatments.

201. To calculate the health benefits to the population from reinvesting savings back into the NHS we adjust the NHS savings estimates produced by the modelling process outlined in Annex A. At the margin, it is estimated that the NHS can purchase a QALY for £15,000, which in turn is then valued at £60,000 by society. Therefore, dividing the yearly NHS savings by this figure and multiplying by society's valuation of a QALY allows us to estimate the additional health benefits these savings would generate. The additional health benefits are then discounted at 1.5% in accordance with the standard practice outlined in the HMT Green Book. It is the Department's policy to consider the opportunity cost of the spending, as this could represent a displacement from the fixed NHS health budget and therefore has been captured in the sensitivity analysis.

202. The potential benefits of reinvesting these health costs (without reformulation) compared with the base scenario are shown in Table 17.

Table 17: Varying the key paraments in the health benefit calculations

	Base Case (monetary value of NHS savings)	**High Scenario** **(value of NHS savings assuming they are reinvested in health care)**
NHS Cost Savings (£m) *Assume a calorie reduction of 41 kcal with 90% meals affected.*	409	**2,222**

NPV

203. By varying the key assumptions in calculating the costs and benefits detailed above simultaneously, we can estimate a range for the Net Present Value (NPV). In creating the lower NPV estimate, we have used the highest business cost estimate and the lowest benefits. In creating the upper NPV estimate, we have used the lowest estimate of costs incurred and the highest benefits.

204. It's not thought likely that these situations would occur, but they can give some indication as to the extremes of the expected outcomes. The table below presents the range of estimates for the NPV for Option 5, as estimated over a 25-year assessment period, on an England only basis.

205. As mentioned previously, we have included all monetary values for businesses whose sole purpose is not the provision of food and those selling on-the-go items in the final NPV.

Table 18: Costs and benefits – Sensitivity Analysis

Group affected	**Impact**	**Present value (£m)**		
		Lower	***Central***	***Upper***
Out-of-home businesses	Familiarisation with regulations	-1	0	0
	Calorie calculator tool	-16	-2	-1

	Initial calculation of energy content of products	-2	-1	0
	Calculating energy content of new and modified products	-20	-7	-5
	Initial labelling and write off costs	0	0	0
	Re-labelling costs	unquantified		
	Change in profits	unquantified		
	Total out-of-home business impact	**-38**	**-10**	**-6**
Wider society	Health benefits	222	4,593	7,521
	Economic output	4	80	131
	Total societal impact	**226**	**4,673**	**7,652**
Government	Familiarisation with regulations	0.0	0.0	0.0
	Enforcement	-5.6	-1.6	-1.1
	Social care savings	23	477	778
	NHS savings	21	430	705
	Total Government impact	39	905	1,482
NPV		**227**	**5,570**	**9,130**

Specific Impact Tests

Small and Micro Business Assessment

206. The Government has decided that calorie labelling should only be applied to large businesses, although micro, small, and medium businesses are encouraged to comply voluntarily. This option delivers substantial public health benefits, ensuring consumers receive energy information in around half of their out-of-home meals, while minimising costs to businesses. It also recognises consultation feedback we received from some, who urged a cautious approach to the new regulatory requirement. The rationale for the preferred option is explained on page 17.

207. The Government's decision to exclude small and micro businesses will mean they do not experience any administrative burden from this policy. This section considers the estimated impact specifically that would arise on small and micro businesses (SMBs) had they been included. We have not been able to exclude medium, small and micro manufactures out of this policy as in order to apply calorie labelling to large businesses, those manufactures providing the products in scope will be affected and will incur some costs (calculating calorie information for the products and sharing this with the larger businesses for it to be displayed).

Non-quantifiable impact on small and micro businesses

208. Small changes in their absolute costs or profit can affect SMBs sustainability and, therefore, there is a risk that even a small impact on them could cause some to go out of business. For example, a shortage of staff due to the time needed for familiarisation and implementation could lead to additional costs for SMBs, which naturally have fewer employees than larger out-of-home businesses.

Quantifiable Impacts

209. We have examined the impact of each of the following three categories of business costs on SMBs:

- Familiarisation with the regulations;
- Calculating the energy content of products;
- Labelling costs.

210. Table 19 provides estimates of the cost specifically to SMBs presented alongside the cost to all businesses in the out-of-home sector. All estimates have been calculated as described earlier, but applied to the total number of out-of-home SMBs as opposed to the total number of out-of-home businesses. All estimates are on an England only basis.

211. Unlike for small, medium and large businesses, it is assumed micro businesses will incur a printing charge associated with printing new menus. Following feedback during the consultation, we have included separate prices for micro businesses which are likely to have menus, and those which are likely to have menu boards/signs. Nomis business counts[157] imply that 33% of micro businesses belong to the category of "take-away food shops and mobile food stands". Applying this to our data, we assume 88,000 micro businesses would need to print new menus, whilst the remainder (around 43,000) would need to print new signs/menu boards.

212. We assume a print cost of 85 pence per menu (this was averaged over various online quotes to order between 20 and 50 menus[158]) and that each of the estimated 88,000 micro businesses has 25

[157] Nomis business counts: https://www.nomisweb.co.uk/datasets/idbrent (last accessed 05/03/19)

[158] Quotes received on 22/01/19 from:
https://www.vistaprint.co.uk/marketing-materials/menus?GP=01%2f22%2f2019+06%3a08%3a15&GPS=5293252762&GNF=1
https://www.instantprint.co.uk/folded-leaflets/a4#!?lamination=no&size=a4&paper=value-silk-150gsm&pages=4pp&sided=double&fold=half-fold&orientation=portrait
https://www.stressfreeprint.co.uk/shop/other-products/menus/flat-restaurant-menus/a4-restaurant-menus.html
https://www.helloprint.co.uk/halffoldmenucards-portrait-a4-135gsmgloss#printrun
https://www.digitalprinting.co.uk/products/menus/60/quote/#step3
http://www.menuprintingdirect.co.uk/print-a4-folded-restaurant

menus (the lowest number of menus available to order using the majority of printers. Based on consultation responses, we estimate the costs of producing menu boards/signs to be £600. These costs have increased since the consultation IA to account for more realistic numbers of menus being ordered by micro businesses, and the inclusion of separate costs for businesses likely to produce signs/menu boards.

213. We have included the costs to all out-of-home businesses as well as businesses whose sole purpose is not the provision of food and those selling on-the-go items separately to allow easy comparisons to be made. The percentages are given in relation to all businesses including those whose sole purpose is not the provision of food and those selling on-the-go items.

Table 19: Costs to small and micro businesses

Group affected	*Costs (£'000s)*	*Micros*	*SMBs*	*All businesses*	*All businesses (incl.* businesses whose sole purpose is not the provision of food and those selling on-the-go items *)*	*% Micros*	*% SMBs*
Out-of-home businesses	**Transition costs**						
	Familiarisation with regulations	£13,800	£19,090	£19,160	£19,530	71%	98%
	Transition calculating energy values for current products	£39,440	£46,980	£46,420	£103,830	38%	45%
	Labelling	£45,150	£48,520	£48,950	£49,020	92%	99%
	Total	*£98,400*	*£114,590*	*£171,330*	£172,380	57%	66%
	Annual costs						
	Ongoing calculating energy values for new and reformulated products	£7,630	£9,470	£10,040	£10,420	73%	91%
	Calorie calculator tool	£0	£0	£1,050	£1,190	0%	0%
Government	**Transition costs**						
	Familiarisation with regulations	£25	£25	£25	£25	100%	100%
	Annual costs						
	Enforcement	£240	£300	£360	£390	62%	77%

https://www.solopress.com/flyers-leaflets/folded/?gclid=Cj0KCQiAm5viBRD4ARIsADGUT25ZV9TXHC_6x-raMuS_aFRNms2jcWy5q2_9W8qwZz_HNwYBbp9bwxoaAidSEALw_wcB&gclsrc=aw.ds
https://www.optimalprint.co.uk/product/category/22/9lMfWBpf35Y

214. All assumptions regarding business costs have been applied to all out-of-home businesses due to a lack of evidence on whether these would vary by size of business. It is possible that the costs experienced by SMBs will be proportionately different to those costs experienced by medium and large businesses.

215. For instance, some costs, such as calculating energy values, are assumed to be incurred at a business level. For SMBs where the number of outlets per business is likely to be much lower, this may result in greater costs per outlet, especially micro businesses. However, as it is not clear whether SMBs introduce new and modified (changes to the recipe) products at a significantly different rate, we cannot be sure whether the overall cost will be greater than for larger businesses.

216. It seems likely that smaller independent businesses are more likely to have a greater proportion of seasonal products or 'specials' for which calorie labelling would not be required. However, it is also possible that smaller businesses rotate items more frequently than larger chains and so incur higher costs. Due to a lack of available evidence on any differences between smaller and larger businesses in rotating menu items (if these exist), we assume there is no significant difference due to business size.

217. Similarly, it is possible that SMBs will have less floor space and therefore fewer tables and menus. This could result in lower printing costs as fewer menus are printed, but it could also result in higher printing costs because costs are often based on bulk batches of menus, which may be higher than the number of menus an SMB needs.

218. Businesses whose sole purpose is not the provision of food, we think it's unlikely for micro and small businesses to have the required number of staff to run their respective businesses as well as an onsite restaurant. For SMBs selling on-the-go foods, it is likely that they currently do not calculate energy values and do not have regular labelling cycles like larger businesses, which may result in additional cost.

219. We have also estimated the benefits (due to calorie labelling and reformulation including 40% compensation) in SMBs and compared them with the benefits across the entire out-of-home sector, as presented in Table 20 below.

Table 20: Benefits SMB compared to all businesses

	Micros	SMBs	All businesses	% Micros	% SMBs
Average additional calorie reduction per person per day	4.0	6.5	18.4	22%	35%
QALYs	47,000	76,000	217,000	22%	35%
Value of QALYs (£m)	2,183	3,558	10,117	22%	35%
Reduction in cost pressures to the NHS (£m)	204	330	948	22%	35%
Increase in economic output (£m)	38	67	176	22%	38%
social care savings	227	374	1,045	22%	36%

220. The benefits detailed above do not include the following likely but unquantifiable benefits of ensuring the entire out-of-home sector is covered by regulation:

- the increased prevalence of labelling may increase the proportion of consumers noticing and using the labelling;
- calorie labelling across all businesses may reduce the likelihood of consumers switching businesses because one provides labelling demonstrating the healthiness of their products and one does not.

221. Most of the business cost falls on SMBs since they comprise 98% of all businesses in the out-of-home sector, roughly 158,000 SMBs. We estimated that around 35% of the benefits are a result of calorie labelling in SMBs, and implementing the same regulation across the entire sector levels the playing field. Micro businesses carry more the majority of the costs and are responsible for only 22% of the benefits.

Equality Test

222. A separate Equality Analysis[159] has been conducted to assess the potential impact of the policy on groups with protected characteristics as part of the Government's duties under the Equality Act 2010.

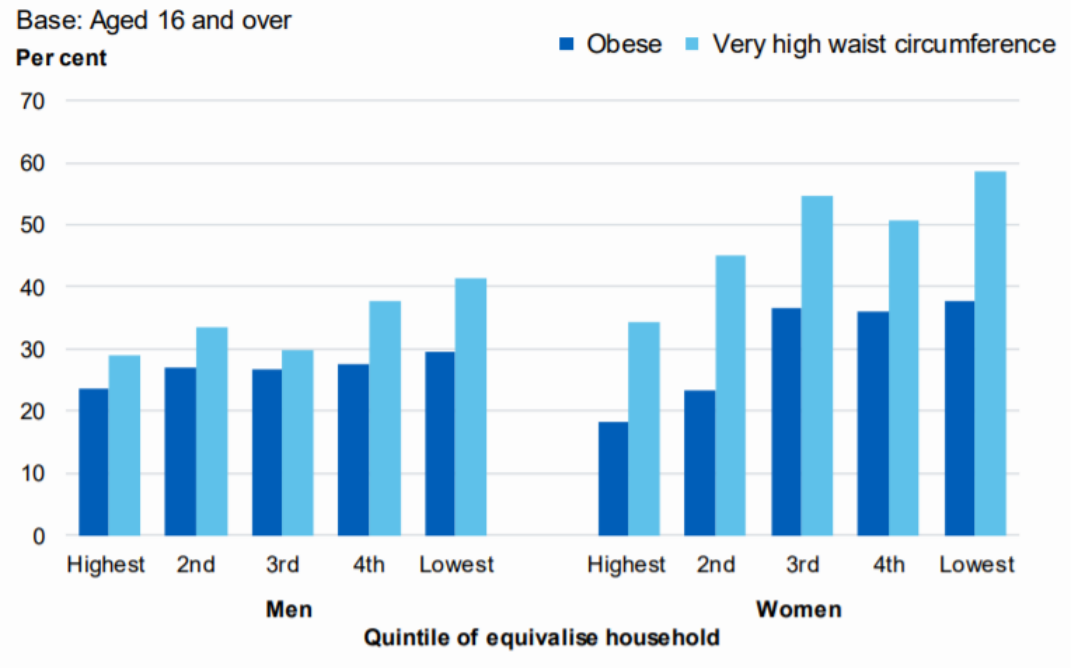
Inequality Test

223. Included in *Childhood obesity: a plan for action - chapter 2*[160], is a commitment to significantly reduce the gap in obesity between children from the most and least deprived areas. The best data source for inequalities in childhood obesity is the National Child Measurement Programme, which measures children in Reception and in Year 6. The latest data shows us that obesity rates are significantly higher in more deprived areas of the UK at Reception and Year 6. The obesity rate inequality gap grows as children move from Reception to Year 6 and both years' gaps in obesity prevalence have increased significantly over the last 10 years.

Obesity Rate Prevalence by IMD2015 Decile				
		Most Deprived	**Least Deprived**	**Gap**
4 - 5 years old	**2006/07**	12.3%	7.1%	5.1%
	2016/17	12.7%	5.8%	6.8%
10 - 11 years old	**2006/07**	21.5%	12.1%	9.4%
	2016/17	26.3%	11.4%	15.0%
Source: PHE analysis of National Child Measurement Programme				

224. The Health Survey for England collects data on adults BMI and waist circumference by equalised household income. Results from the 2017 survey suggest that those in the lowest quintile of household income have the highest mean BMI and highest prevalence of obesity. However, this trend was far more pronounced among women than men.

Figure 1: Prevalence of BMI defined obesity and very high waist circumference, by income and sex[161]



[159] Childhood obesity plan for action chapter 2: equality assessment: https://www.gov.uk/government/publications/childhood-obesity-plan-for-action-chapter-2-equality-assessment

[160] Childhood obesity plan for action chapter 2: https://www.gov.uk/government/publications/childhood-obesity-a-plan-for-action-chapter-2

[161] Health Survey for England 2017, NHS Digital. Available from: https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2017 (Accessed 22/03/2019)

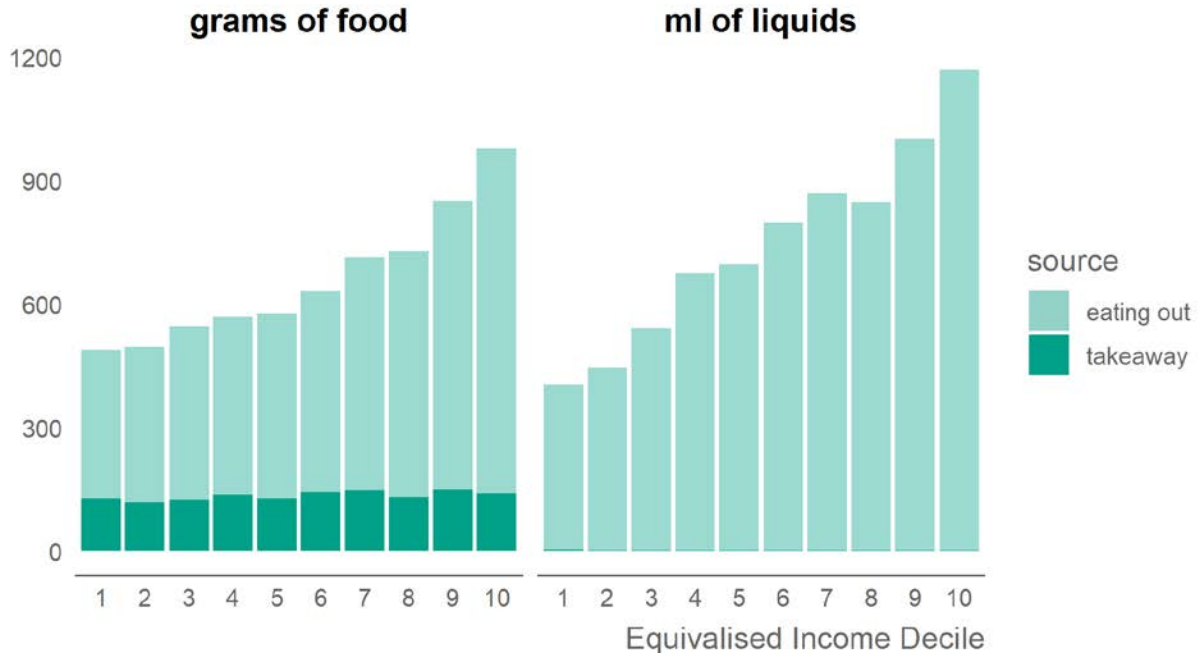
225. Evidence considering sociodemographic differences in the comprehension of nutrition labels suggests that individuals from lower income groups and with lower education are less likely to be able to identify nutritional labelling correctly[162]. This is supported by other studies[163,164] which suggest that calorie labels are more likely to be used and understood by higher income individuals. This suggest that health benefits from the policy would accrue disproportionately to those higher income individuals, which would worsen the inequality gap.

226. However, it's important to note that the policy aims to make calorie information as accessible as possible by providing consistent and contextual labels. Studies have found that contextual information increases individuals ability to understand and use the labels[165].

227. The impact of the policy on obesity inequalities will also depend on how out-of-home consumption varies by socioeconomic group and how the prevalence of out-of-home food and drink businesses varies by deprivation. If those in lower socioeconomic groups consume less out-of-home food and drink or out-of-home businesses are concentrated in more affluent areas, then this would also suggest that the benefits of the policy will accrue disproportionately to those from higher socioeconomic groups.

228. Evidence on the variation of out-of-home consumption by income decile can be found in the Family Food Datasets published by DEFRA[166]. Combining the information on individuals out-of-home consumption and takeaway consumption suggests that there is a clear trend, with those in lower income groups consuming less food and drink out-of-home than those in higher income groups. As a result, we may expect any effects on the obesity rate or health more generally, though uncertain in magnitude, to be concentrated in more affluent groups. This would increase the health inequalities gap.

Figure 2: Out-of-home purchases of food and drink by income decile[167].



[162] Sinclair, S., Hammond, D., & Goodman, S. (2013). Sociodemographic differences in the comprehension of nutritional labels on food products. Journal of nutrition education and behavior, 45(6), 767-772

[163] Campos, S., Doxey, J., & Hammond, D. (2011). Nutrition labels on pre-packaged foods: a systematic review. Public health nutrition, 14(8), 1496-1506.

[164] Green, J. E., Brown, A. G., & Ohri-Vachaspati, P. (2015). Sociodemographic disparities among fast-food restaurant customers who notice and use calorie menu labels. Journal of the Academy of Nutrition and Dietetics, 115(7), 1093-1101.

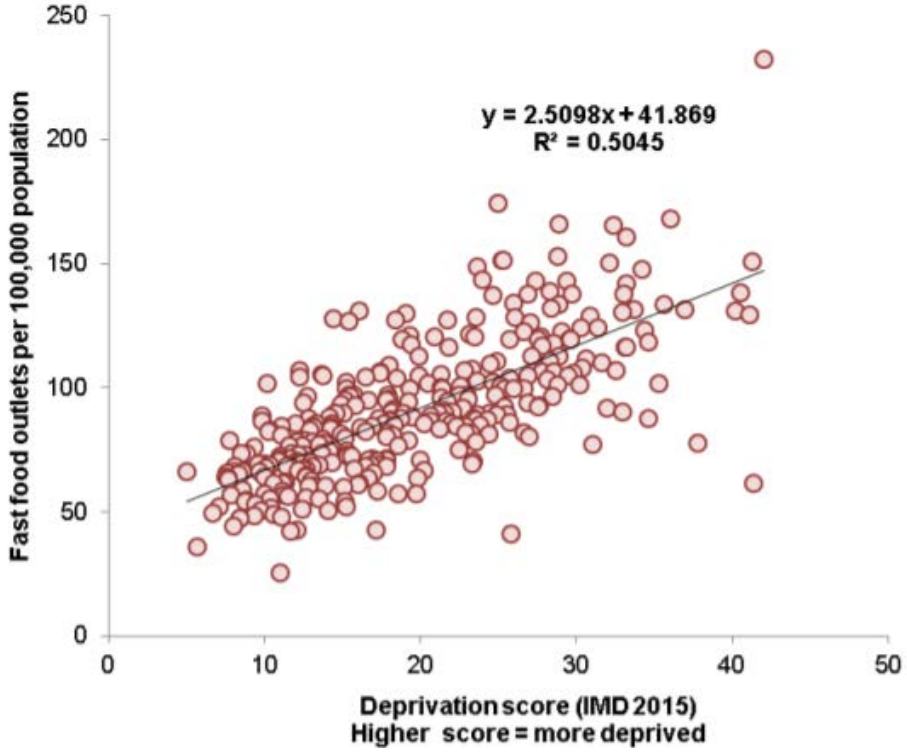
[165] Pang & Hammond (2013) Efficacy and Consumer Preferences for Different Approaches to Calorie Labeling on Menus, Journal of Nutrition Education and Behavior , Volume 45 (6) https://www.deepdyve.com/lp/elsevier/efficacy-and-consumer-preferences-for-different-approaches-to-calorie-0LKRwIhV0z (last accessed 06/08/2018)

[166] DEFRA Family Food Datasets are available from: https://www.gov.uk/government/statistical-data-sets/family-food-datasets (Accessed 21/03/2019)

[167] DEFRA Family Food Survey 2016/17. The datasets used to make the graph are available from: https://www.gov.uk/government/statistical-data-sets/family-food-datasets (Accessed 21/03/2019)

229. Analysis conducted by PHE suggests that fast food outlets are more concentrated in areas with higher levels of deprivation[168]. If this trend was repeated across all out-of-home outlets, then it would imply that individuals in more deprived areas would be more likely to be to be exposed to calorie labelling and possibly receive a greater share of the health benefits generated by the policy. However, it is not clear if this trend would remain the same after considering the impact of excluding small and micro businesses from the regulations.

Figure 3: Relationship between density of fast food outlets and deprivation by local authority



230. The post-implementation review will gather evidence of impact and will consider evidence of any differential impact by deprivation.

Competition Test

Does the proposal:

1. *Directly limit the number or range of suppliers?*
   - The proposal places no direct limit on the number of suppliers that can operate in the market.

2. Indirectly limit the number or range of suppliers?
   - The costs to individual businesses may vary, for example depending on the number of menu items on offer but these costs are unlikely to be prohibitively high for individual businesses so unlikely to limit the number of businesses operating.
   - Small and micro businesses could voluntarily provide calorie labelling if they believe it will benefit their business.
   - Under any option, the costs to businesses are unlikely to be prohibitive to entry, and the additional costs will be lower for new businesses since they will not have existing menus that need relabelling.

[168] Obesity and the environment: Density of fast food outlets at 31/12/2017, PHE. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/741555/Fast_Food_map.pdf (Accessed 21/03/2019)

3. Limit the ability of suppliers to compete?

- Currently there are businesses already providing voluntarily calorie labelling, which may be a form of product differentiation to compete with rivals.
- Businesses voluntarily providing calorie labelling account for around a quarter of the market, and this proposal will ensure a level playing field.
- The proposal does not limit businesses ability to compete on grounds of quality, geographic location, absolute price, advertisement and many other aspects on which businesses frequently compete.
- We do not know how consumers will respond to this proposal. They may substitute between menu items within business, or they may switch to rival businesses, which produce healthier products. By informing consumers of the energy content of products, businesses will also be encouraged to compete on these grounds (e.g. through reformulation of existing products and introducing healthier products).

4. Reduce suppliers' incentives to compete vigorously?

- The proposal does not exempt suppliers from general competition law, introduce or amend intellectual property regime or increase the costs to customers of switching between suppliers.
- The policy does require businesses to provide information on energy content, but it is not thought this would be of use to competitors. Businesses are already required to share this information on pre-packaged food, and we are not aware of any impacts on competition arising from this.

Sustainability Test

231. There is no evidence to suggest that mandating out-of-home calorie labelling will have an impact on sustainable development.

Environmental Test

232. There is no evidence to suggest that mandating out-of-home calorie labelling will have a significant impact on the environment. We expect businesses to adopt labelling within normal business cycles for re-labelling and so do not anticipate any impact on the environment through labelling waste. If there is a significant and unexpected change to the composition of supplied food, it is possible that a necessary labelling change with a short lead-in time could incur costs through wastage and re-labelling.

Justice Impact Test

233. A full justice impact test for this proposal will be conducted and agreed with MoJ.

Rural Proofing

234. We have considered the effects of the proposal on those living in rural areas. At present, there is no evidence to suggest that there would be a significant impact.

Human Rights Assessment

235. We have considered the policy against the European Convention and Human Rights and do not consider the policy raises any issues.

Annexes

Annex A – DHSC Calorie Model

1. This document aims to give a brief but high-level summary of the DHSC Calorie Model. The purpose of the DHSC Calorie Model is to estimate the health and NHS cost impacts caused by a change in excess calorie consumption. Further details are provided in the Technical Consultation Document.

2. The DHSC Calorie Model is a cohort-based model implemented in Microsoft Excel using an iterative approach on a yearly basis.

3. The model uses a yearly iterative approach to estimate the impact of polices on cohorts of adults grouped into ages 19-64 and 65-79, and children in two age groups: 4-10 and 11-18 years. It groups these broad age groups into different gender and weight categories. The affects are modelled for every year following the implementation of a reduction in calorie imbalance.

4. The impacts of a change in excess calorie consumption are modelled using a control and treatment scenario, with the control scenario assuming no policy implementation, and the treatment scenario assuming a calorie imbalance reduction. The effects of the policy are measured by comparing the two scenarios over a 25-year period.

5. Early results from modelling children and adults together and comparing it to modelling adults only showed that, in a 25-year period, the health benefits are predominantly in adulthood. As most impacts on children's health resulting from obesity occur later in life, it was decided that, in modelling terms, it was preferable to only include the impact during adulthood. This simplified the model significantly without compromising its quality. While impacts are not modelled in childhood, benefits for today's children are modelled when they become adults.

6. The input to the model is the calorie imbalance reduction per day set by the policy. Changes in weight and BMI caused by the reduction in excess calories are calculated and used as a starting point for the remainder of the analysis within the model.

7. The model then considers the implications of the calorie imbalance reduction on 5 diseases associated with obesity: diabetes, coronary heart disease, stroke, colorectal cancer, and breast cancer. This is done by considering changes in prevalence and mortality rates for each disease, and from this considers how many deaths are avoided due to the implementation of the policy in the treatment scenario. The savings to the NHS are calculated from the reduced treatment of each disease.

8. Reductions in mortality are used to calculate the impact on economic output from an increased workforce. This is done by considering everyone within a cohort to earn the median wage of a person of that age and gender, with a larger workforce present in the treatment scenario. The more people alive would result in more people in work, and hence a greater economic output.

9. The costs of social care savings are calculated due to a reduced proportion of overweight, obese, and morbidly obese individuals and hence fewer people needing social care in the treatment scenario.

10. Changes in QALYs are calculated from the reduced number of deaths and the reduction of people living with the diseases. An increase in QALYs is modelled by considering both the number of reduced deaths by the introduction of a calorie reduction, as well as the reduction of people living with disease. These are then converted into monetised QALY using a conversion of how much society values a QALY.

11. Discount rates are applied to monetary values in order to account for changes in the treatment of costs and benefits that arise over different periods of time. This allows future values to be considered at present value.

12. The underlying equations that determine each cohort average BMI trajectory[169] are valid even for very small changes in the average daily calorie intake between scenarios.

13. The calculations (which are carried out on a year-by-year basis) are summed to calculate overall changes over a 25-year period.

Limitations of the calorie model:

14. There are a number of key assumptions that affect the overall health benefit calculations, which are varied in the sensitivity analysis. In addition, the calorie model itself has uncertainty and limitations, both from the data it uses and the limitations in the modelling approach. These are explained below.

15. The calorie model uses are a number of assumptions that inform the overall health benefit calculations which involve a large number of separate parameters. The data inputs each have different levels of accuracy. Where possible, the data inputs, such as average height, population projections, mortality rates, and incidence rates, are based on the most recent official statistics or use published academic papers.

16. As well as uncertainties in the parameters, there are limitations to the modelling approach itself, as there are with any modelling approach. There are also uncertainties in the equations used, such as growth curves, for which we have used reputable methods adopted in published academic papers. There are three main limitations we have identified in our modelling approach: two result in the benefits being underestimated and one results in the benefits being overestimated. These are limitations based on what data is available and also a judgement of what is a desirable and proportionate level of complexity in the modelling approach.

Limitations that lead to health benefits being **underestimated**:

17. The DHSC Calorie Model only considers benefits from reducing five obesity-related conditions: namely, diabetes, stroke, chronic heart disease and colorectal and breast cancer. However, there are many more conditions related to obesity. Other conditions have not been included at this stage due to lack of data of equivalent accuracy to those included.

18. The DHSC Calorie Model only counts benefits from preventing one of the five obesity-related conditions per individual. In fact, there is a high level of co-morbidity whereby individuals who get one of the five obesity-related conditions then have an elevated risk of developing another of these conditions. This is particularly true of individuals who develop Type 2 diabetes, who have an increased risk of developing CHD or stroke.

Limitations that lead to health benefits being **overestimated**:

19. The calculations assume individuals would get an obesity-related condition would otherwise be in perfect health. Some may already have other health-related conditions which would reduce the impact of the overall benefit.

20. Future development of DHSC's calorie model will reconsider whether to address these limitations, partially or in full, depending on whether it is proportionate for the uses of the model.

21. Due to the sheer number of different elements of the calorie model, it was not deemed helpful to perform a sensitivity analysis on each of these. Instead, the best-case estimate is provided. This is deemed appropriate in light of the overall NPV of benefits being **five-hundred fold** larger than the estimated cost to business. Our judgement is that the uncertainties in the calorie model do not risk moving this policy to a negative NPV.

[169] Hall KD, Jordan PN. Modeling weight-loss maintenance to help prevent body weight regain. The American journal of clinical nutrition. 2008 Dec 1;88(6):1495-503

Annex B – Other Policy Options

22. Although no longer considered in the main IA, this annex will give the NPV of Option 2 (include all businesses), Option 3 (exclude micro businesses), and Option 4 (exclude small and micro businesses). It will also consider variations on the options that were considered.

23. The table below presents Net Present Values for different aspects of the policy for Option 2, as estimated over a 25-year assessment period, on an England only basis. Again, it is important to note that the long-term health benefits require the direct impacts of the policy intervention not to be offset. The costs to businesses whose sole purpose is not the provision of food and those selling on-the-go items have been included in the NPV.

Table 21: Costs and benefits – Option 2

Group affected	**Impact**	**Present Value (£m)**
Out-of-home businesses (inc. businesses whose sole purpose is not the provision of food and those selling on-the-go items)	Familiarisation with regulations	-19.5
	Product assessment tool	-20.7
	Initial calculation of energy content of products	-46.4
	Calculating energy content of new and reformulated products	-364
	Initial labelling and write off costs	-49
	Re-labelling costs	Unquantified
	Change in profits	Unquantified
	Total out-of-home business impact	**-500**
Wider society	Health benefits	10,117
	Economic output	176
	Total societal impact	**10,293**
Government	Familiarisation with regulations	- 0.02
	Enforcement	-7.2
	NHS savings	948
	Social care savings	1,045
	Total Government impact	**1,986**
	NPV	**11,800**

24. The table below presents Net Present Values for different aspects of the policy for Option 3, as estimated over a 25-year assessment period, on an England only basis. Again, it is important to note that the long-term health benefits require the direct impacts of the policy intervention not to be offset. The costs to businesses whose sole purpose is not the provision of food and those selling on-the-go items have been included in the NPV.

Table 22: Costs and benefits – Option 3

Group affected	Impact	Present Value (£m)
Out-of-home businesses (inc. businesses whose sole purpose is not the provision of food and those selling on-the-go items)	Familiarisation with regulations	-3.5
	Product assessment tool	-20.7
	Initial calculation of energy content of products	-8.8
	Calculating energy content of new and reformulated products	-74.6
	Initial labelling and write off costs	-3.9
	Re-labelling costs	Unquantified
	Change in profits	Unquantified
	Total out-of-home business impact	**-111.5**
Wider society	Health benefits	7,931
	Economic output	138
	Total societal impact	**8,069**
Government	Familiarisation with regulations	- 0.02
	Enforcement	-2.7
	NHS savings	743
	Social care savings	821
	Total Government impact	**1,561**
	NPV	**9,500**

25. The table below presents Net Present Values for different aspects of the policy for Option 4a, as estimated over a 25-year assessment period, on an England only basis. Again, it is important to note that the long-term health benefits require the direct impacts of the policy intervention not to be offset. The costs to businesses whose sole purpose is not the provision of food and those selling on-the-go items have been included in the NPV.

Table 23: Costs and benefits – Option 4

Group affected	Impact	Present Value (£m)
Out-of-home businesses (inc. businesses whose sole purpose is not the provision of food and those selling on-the-go items)	Familiarisation with regulations	-0.4
	Product assessment tool	-20.7
	Initial calculation of energy content of products	-1.2
	Calculating energy content of new and reformulated products	-12.8
	Initial labelling and write off costs	-0.5
	Re-labelling costs	Unquantified
	Change in profits	Unquantified
	Total out-of-home business impact	**-35.7**
Wider society	Health benefits	5,895

	Economic output	103
	Total societal impact	**5,998**
Government	Familiarisation with regulations	- 0.02
	Enforcement	-1.8
	NHS savings	552
	Social care savings	612
	Total Government impact	**1,162**
	NPV	**7,124**

Alternative Options

26. As part of the consultation, some additional options were considered, including exempting sides and extras, allowing for flexibility in the presentation of labelling, and extending the timeline for micro businesses if they were to be included in the policy. These options are briefly outlined below but have not been quantified.

27. Exempting sides and extras would result in lower costs to businesses. However, there is no evidence on the proportion of products comprised by sides and extras.

28. Allowing for flexibility in the presentation of calorie information may reduce the visibility of labelling, meaning the calorie reduction is likely to be lower. Some evidence suggests, labelling must stand out in order to be effective and standardisation seems to be preferred by consumers.

29. Extending the timeline for implementation for micro businesses would delay the introduction from one year to two years for micro businesses. This is no longer a consideration given the preferred option is to apply this policy only to large businesses.

Annex C – Previous research on impact of calorie labelling

The table below summarises the key academic papers considered in determining potential benefits of the proposed policy. These comprise a mix of randomised controlled trials (experimental designs) and evaluations of calorie labelling in practice in US cities where calorie labelling at the point of choice is already mandatory for restaurant chains with at least 20 outlets.

Title	**Study design**	**Key conclusions**
Auchincloss, A., et al., 2013. Customer responses to mandatory menu labelling at full-service restaurants. *Am. J. Prev. Med. 2013; 45(6), 710-719.*	Data collected outside restaurants (survey and till receipts) in August 2011, following Philadelphia's implementation of mandatory calorie, sodium, fat and carbohydrates labelling for full-service restaurant chains on all printed menus in January 2010. Two Philadelphia-based outlets which had labelling were compared with five outlets based outside of Philadelphia (control sites).	Use of labelling - 76% of customers at labelled restaurants reported seeing nutrition information. - 26% of customers at labelled restaurants (34% of customers who reported seeing the information) said that seeing the nutrition information affected their order. Calories purchased - On average, customers at labelled restaurants purchased 151 fewer kcals from food only (9%) or 155 fewer kcals from food and beverages (9%) compared to customers at unlabelled restaurants. - Customers who reported using the labelling purchased 400 fewer kcals from food compared to other customers (a relative difference of 20%).
Bassett, M.T., Dumanovsky, T., Huang, C., et al., 2008. Purchasing behavior and calorie information at fast-food chains in New York City, 2007. *Am. J. Public Health 98, 1457–1459.*	Analyses based on till receipts and a customer survey after exiting the restaurant. Whilst the study included a wide range of outlets, only Subway was included in the analysis.	Consumers that reported seeing calorie labelling: - 32% of Subway customers reported seeing calorie labelling - Customers who reported seeing the labelling purchased 52 fewer calories than those who did not report seeing the labelling. Consumers that reported that calorie labelling affected their purchase: - 37% of Subway customers reported that the labelling affected their purchases. - Customers who reported noticing and using the labelling purchased meals with 99 fewer calories than

		customers who saw the information but reported not using it.
Bollinger, B., Leslie, P., Sorensen, A., 2010. Calorie posting in chain restaurants. Working Paper No. 15648.National Bureau of Economic Research, Cambridge (MA) http://www.nber.org/papers/w15648	Transaction data from Starbucks loyalty cards from all 222 Starbucks outlets in New York City were analysed, with 94 Starbucks outlets in Boston and Philadelphia (where calorie labelling was not mandatory) was used as a control. Data was collected 3 months prior to the introduction of mandatory calorie labelling and for 11 months after. Only considers one chain where majority of sales are beverages.	Overall, a 6% decrease in calories on average per transaction. - Little effect on calories from beverages, but reduction in calories from food purchases of 14%. - For people averaging more than 250 calories before calorie posting (higher than average) calories reduced by 26% on average per transaction. - Effects were long-lasting with the calorie reduction consisting for the 10-month data collection period after calorie labelling was introduced.
Cantor, J. et al., 2015 Five Years Later: Awareness of New York City's calorie labels declined with no changes in calories purchase. *Health Affairs 34.11*	Study of 4 fast food chains in New York using till receipts from 7,699 consumers. Difference-in-difference study comparing levels of consumers noticing and using labelling pre-regulation to immediately afterwards (2008) and to three different points in 2013-14	Use of labelling - Consumers exposed to menu calorie labelling immediately after regulation in 2008 and consumers exposed to labelling at three points in 2013-14 reported seeing and using calorie information more often than consumers at fast food restaurants without labelling. - Over time, the proportion of respondents noticing and using calorie information declined. - At each time point post-regulation the proportion of respondents noticing and using calorie information was higher than the proportion pre-regulation. Calories purchased - No statistically significant change over time in levels of calories or other nutrients purchased. Visits to fast food restaurants - No statistically significant change over time in frequency of visits to fast food restaurants.
Crockett RA, King SE, Marteau TM, Prevost AT, Bignardi G, Roberts NW, Stubbs B, Hollands GJ, Jebb SA.	Systematic review and meta-analysis of 28 studies in research databases in October 2013. (Meta-analysis only included three RCTs in restaurants or cafeterias to estimate a	Calories purchased - significant reduction of 47 kcal in energy purchased - calorie labelling in real-world settings reduced energy purchased per meal by 7.8%

Nutritional labelling for healthier food or non-alcoholic drink purchasing and consumption. Cochrane Database of Systematic Reviews 2011, Issue 9. Art. No.: CD009315. DOI: 10.1002/14651858.CD009315	concrete calorie reduction due to labelling)	- meta-analysis of studies in artificial settings or laboratory studies did not conclusively demonstrate a reduction in energy consumed - No evidence that calorie labelling increased number of calories purchased or consumed
Dumanovsky, T., Huang, C.Y., Nonas, C.A., Matte, T.D., Bassett, M.T., Silver, L.D., 2011. Changes in energy content of lunchtime purchases from fast food restaurants after introduction of calorie labelling: cross sectional customer surveys. *BMJ 343, d4464.*	Study of 11 different fast food chains in New York City pre- and post- regulation (2007 and 2009) of mandatory calorie labelling, using till receipts and a customer survey when exiting the outlet.	Comparison pre- and post- regulation - Unadjusted data showed no significant change in calories purchased. - After adjustment for restaurant chain, demographics and purchase type, a reduction of 20kcal in purchasing found. Comparison between those who reported using calorie labelling in decision-making and those who didn't (2009) - 15% of consumers reported that they noticed and used calorie labelling when making their purchasing decision. - Unadjusted data showed customers who used labelling purchased 106 fewer calories at that purchase than customers who did not. - After adjustment (as above), customers who used calorie labelling purchased 78 fewer calories than those who did not. - No significant change in purchase price was found between those who used labelling and those who did not.
Elbel, B., Kersh, R., Brescoll, B.L., Dixon, L.B., 2009. Calorie labeling and food choices: a first look at the effects on low-income people in New York City. *Health Aff. 28, w1110–w1121.*	Data collected one month before and two months after the introduction of mandatory calorie labelling from 14 outlets of 4 fast food chains in New York City, with 5 outlets in Newark as a control group (where labelling was not mandatory). Consumers were asked to hand in receipts and answer a short survey when exiting the outlet.	Use of labelling - From self-reported data, 54% of fast food consumers noticed calorie labelling. - Of these, 28% said that it influenced their food choices. Of these 88% reported purchasing fewer calories in response to labelling. Calories purchased - However, after calorie labelling was introduced, no significant change in calories purchased was detected

	Focussed on low income and ethnic minority groups only.	from the receipts after calorie labelling was introduced in New York.
Elbel, B., Gyamfi, J., Kersh, R., 2011. Child and adolescent fast-food choice and the influence of calorie labeling: a natural experiment. *Int. J. Obes. 35, 493–500.*	Data collected before and after the introduction of mandatory calorie labelling from 14 outlets of 4 fast food chains in New York City, with 5 outlets in Newark as a control group (where labelling was not mandatory). Consumers were asked to hand in receipts and answer a short survey when exiting the outlet. Focussed on low income and ethnic minority groups only – and adolescents and children (via their parents) in these groups.	Use of labelling - 57% of adolescents reported noticing calorie labelling. Of these 16% said that it influenced their food choices. - In total, 9% of adolescents reported using calorie labelling when making purchasing decisions. - 72% of adolescents reported taste to be the most important factor in their meal selection. Calories purchased - No statistically significant differences in calories purchased before and after labelling regulation introduced in New York, or between New York and the control (Newark) for either adolescents' own purchases or parents' purchases for their children.
Elbel B., et al., 2013. Calorie labeling, fast food purchasing and restaurant visits. *Obesity 2013; 21 (11), 2172-2179.*	Study of fast food restaurants in Philadelphia before (December 2009) and after (June 2010) regulation on mandatory calorie labelling brought in, with Baltimore as the control group. Data collected both outside restaurants (survey and till receipts) and via a random digit dial telephone survey.	- 38% of Philadelphia consumers noticed calorie labelling compared to 9-14% of consumers who had seen calorie labelling before it was made mandatory in Philadelphia or in Baltimore in either time period. - No population level changes were noted in average calories per purchase either over time (once regulation introduced) or when compared with the control group (Baltimore) - No net impact was found on the purchase of just food or just beverage calories when considered separately.
Finkelstein, E.A., Strombotne, K.L., Chan, N.L., Krieger, J., 2011. Mandatory menu labelling in one fast-food chain in King County, Washington. *Am. J. Prev. Med. 40, 122–127.*	For one Mexican restaurant chain, transactions and average calories per transaction were analysed between two-time periods – January to July 2009 (pre-introduction of mandatory calorie labelling in Washington State) and August 2009 to January 2010 (post- introduction). A control group of restaurants from the same chain outside of Washington State was used.	- No effect was found on transaction trends or calories per transaction, with no significant difference between King County restaurants and the control group.

Hammond, D., et al., 2013. A randomized trial of calorie labeling on menus, *Prev. Med. (2013),* http://dx.doi.org/10.1016/j.ypmed.2013.09.020	Blinded randomised trial of Canadian adults in 2010-11 where participants were organised into four groups to order a 'sit down' meal from an experiment menu with (i) no labelling; (ii) calories only; (iii) calories in 'traffic lights'; or (iv) calories, fat, sodium and sugar in 'traffic lights'. No price information was included on the menus.	Calories ordered - Average number of calories ordered in the group with calorie labelling only was 52 kcal (or 6%) lower than in the group with no information (851 kcal compared to 903 kcal). - Average number of calories ordered was not significantly different between each of the three labelling groups. Calories consumed - Average calorie consumption in the group with calorie labelling only was 96 kcal (or 11%) lower than in the group with no information (744 kcal compared to 840 kcal). - Average calorie consumption was not significantly different between each of the three labelling groups.
Harnack, L., French, S., Oakes, J., et al., 2008. Effects of calorie labeling and value size pricing on fast food meal choices: from an experimental trial. *Int. J. Behav. Nutr. Phys. Act. 5, 63.* http://www.ijbnpa.org/content/5/1/63	A randomised experiment in which participants in four groups ordered a fast food meal from a menu with (i) calorie labelling; (ii) value sized pricing, where product price determined by weight/volume of product; (iii) calories plus value sized pricing; or (iv) no calories plus normal pricing.	Use of labelling - 54% of participants in the calorie only group and 59% of participants in the calorie plus price group noticed calorie labelling Calories ordered and consumed - No significant differences in the average number of calories consumed by participants in the calorie, value sized pricing, calorie plus value sized pricing and control menu conditions. - No significant differences found in the selection and consumption of major food categories (e.g. soft drinks, diet soft drinks, fries and salads) or in portion sizes.
Hector D,2016. Effectiveness of numeric energy menu labelling and potential alternative formats and/or content: An evidence review. Prepared for the Working Group to the Reference Group for Fast Choices Menu Labelling in New South Wales; under the auspices of the Centre for Population Health, NSW Ministry of	A comprehensive review of studies conducted on the effectiveness of menu labelling conducted between January and March 2016	Calories ordered - There is mixed evidence but moderately convincing evidence that there is a decrease in energy purchased among those consumers who see and use calorie labelling - Systematic reviews find an average reduction by 77.8 kcal Use of labelling - 25-60% are aware of labelling (in US)

Health; Physical Activity Nutrition & Obesity Research Group		- 10-58% use information to select a healthier meal option
Long, M. W. et al., 2015 Systematic review and meta-analysis of the impact of restaurant menu calorie labelling. *Am. J. Public Health 105.5*	Systematic review and meta-analysis of 19 studies in research databases in October 2013.	Calories purchased - Among all 19 studies, menu calorie labelling was associated with a statistically significant reduction of 18 calories ordered per meal. - Among a subset of 6 controlled studies in restaurant settings, labelling was associated with a non-significant reduction of 7 calories ordered per meal. Effectiveness of strategy - Menu calorie labelling is a relatively low-cost education strategy that may lead consumers to purchase slightly fewer calories. - Findings are limited by similarity among non-restaurant studies and the relatively few number of studies conducted in restaurant settings.
Nikoloau C K, Hankey C R, Lean M E J, 2014 Calorie-labelling: does it impact on calorie purchase in catering outlets and the views of young adults? *Int. J. of Obesity doi:10.1038/ijo.2014.162*	Systematic literature review of 7 studies on the effect of calorie labelling on calories purchased, of which 6 studies provided data allowing a meta-analysis. A questionnaire to gauge views on calorie labelling was devised and sent to young adults in higher education with 1,400 young adults completing the survey.	Limited evidence supports a valuable effect from clearly visible calorie labelling for obesity prevention, and it appears an attractive strategy to many young adults. Use of labelling - 30-60% of customers noticed calorie labelling. Calories purchased - Three studies reported statistically significant reductions in calories purchased, ranging for 12 to 38 calories per meal. - Meta-analysis showed no overall effect – a non-significant reduction of 6 calories. - Amongst customers who noticed labelling, a non-significant reduction of 125 calories per meal was found. Attitudes of young adults to labelling - 46% of young adults surveyed said they would welcome calorie information in catering settings.

Pérez, C, Enrione, J, Díaz-Calderón, P, Vicente, I, Rossi, M, (2017) Effect of calorie labeling on menu selection: a preliminary study in Santiago, Chile	Quantitative study following a cross-sectional survey design (participants were intermediate income employees)	People who had chosen a hypocaloric menu (≤450 kcal) - -16% (72 kcal) for men, -19% (87 kcal) for women - 82.5% value calorie information, 54.5% are willing to change their meal choice due to the information, 49% actually change their choice - - Women are more likely to be more interested in a healthier diet than men
Pulos E, Leng K., 2010. Evaluation of a voluntary menu-labeling program in full-service restaurants. *AJPH 2010;100:1035-9.*	6 full service restaurants in Washington added nutrition information (calories, fat, sodium and carbohydrates) to their menus. Entrée sales for 30 days before and 30 days after labelling were analysed. Other courses were not considered.	- 71% of customers reported noticing the nutrition information. - 20% of customers reported ordering an entrée lower in calories as a result of the information. - On average, each customer who reported ordering a lower-calorie entrée ordered about 75 fewer calories than they did before labelling. - This equates to a 15kcal reduction for all consumers on average).
Roberto, C.A., Larsen, P.D., Agnew, H., Baik, J., Brownell, K.D., 2010. Evaluating the impact of menu labeling on food choices and intake. *Am. J. Public Health 100, 312–318.*	Experimental design where participants were split into three groups; (i) presented with a menu without calorie labelling, (ii) presented with a menu with calorie labelling, or (iii) presented with a menu with calorie labels plus a label stating the recommended daily calorie intake for an average adult. No price information was included on the menus.	- Participants in the group with calorie labelling consumed 124 fewer calories than those in the group with no labelling (an 8% reduction). - Participants in the group with calorie labelling plus the recommended daily intake label consumed 203 fewer calories than those in the group with no labelling (a 14% reduction).
Robinson, E., Burton, S., Gough, T., Jones, A., Haynes, A. Point of choice kilocalorie labelling in the UK eating out of home sector: a descriptive study of major chains	Examines the presence and quality of calorie labels in 104 of the biggest restaurant chains in the UK. Considers both restaurants that have calorie labelling displayed, as well as those which have calorie information available.	- Only 17% of businesses were found to provide in-store calorie labelling and this was found to be of poor quality. - 50% of businesses which did not have calorie labelling did have calorie information available. - 75% of businesses which had signed up to the voluntary pledge were found to have calorie labels, but none were found to meet all 7 recommended guidelines.

Sinclair, S. E., Cooper, M., & Mansfield, E. D., 2014. The influence of menu labeling on calories selected or consumed: a systematic review and meta-analysis. Journal of the Academy of Nutrition and Dietetics, 114(9), 1375-1388.	A systematic review to determine the effect of calorie labelling, specifically considering studies with control groups. Considers the effect of contextual and interpretive labelling .	- Includes 5 studies relating to consumption of calories. - 3/5 of these studies were of a lower quality. - Menu labelling with calories alone did not have a significant effect on calorie consumption. - The addition of contextual or interpretive nutrition information on menus resulted in participants consuming 81 kcal fewer compared with no calorie labels.
Tandon, P.S., Wright, J., Zhou, C., Rogers, C.B., Christakis, D.A., 2010. Nutrition menu labelling may lead to lower-calorie restaurant meal choices for children. *Pediatrics 125, 244–248.*	Randomised controlled trial where parents of children aged 3-6 years were asked to order for themselves and their child using either a menu with calorie labelling or a menu without.	Meals for children - Parents of children aged 3-6 years who were given a menu with calorie information ordered on average 102 fewer calories for their children than parents who were given a menu without calorie information. Meals for parents - There was no significant difference between the groups in the choice of meals parents chose for themselves.
Tandon, P. et al., 2011. The impact of menu labelling on fast-food purchases for children and parents. *Am. J. Prev. Med. 2011; 41(4), 434-438.*	Till receipts collected from children aged 6-11 years and their parents before (2008) and after (2009) menu-labelling regulation in Seattle, compared with a control group in non-regulated San Diego County.	Use of labelling - 70-75% of children chose their meal with no parental involvement both pre- and post- regulation. - 87% of parents saw nutrition labelling after regulation, compared to 44% of parents seeing labelling before regulation in Seattle. - Of these, 13% said it influenced the choice for their child (post-regulation). Calories purchased - No change in average calories purchased for children from pre- to post- regulation in Seattle or San Diego (control). - Calories purchased by parents for themselves decreased by 100 kcals from pre- to post- regulation, but this occurred in both counties.
Zlatevska, Neumann, and Dubelaar (2018), "Mandatory calorie disclosure: A comprehensive analysis of its effect on consumers and retailers," *Journal of Retailing*	A comprehensive meta-analysis of 186 Calorie label intervention versus control (no intervention) comparisons and meta-regression on different study characteristics as well as a multilevel modelling estimation	Consumer behaviour - significant reduction of 27 calories selected by consumers following calorie disclosure - calorie reduction is significantly stronger for overweight individuals, females, table-service restaurant and hypothetical choice scenarios

https://www.uts.edu.au/about/uts-business-school/marketing/news/calorie-counts-menus-make-difference		- calorie reduction is more effective for lunch meals and marginally more effective for samples containing a mixture of males and females - marginally less effective for healthy meals - no significant trend pattern in reported effect sizes over the years and no significantly different consumer behavior for various food types across our data Retail behavior - response to labelling: 15 kcal less per menu item

Annex D: Post Implementation Review

1. Understanding the impact of any regulatory policy is a key responsibility for government and the Department of Health and Social Care will publish a comprehensive review of the policy within the first 5 years of the policy being enforced.

2. The aim of the PIR is to establish whether this regulation:

    a. Has achieved its original objectives
    b. Has objectives that remain appropriate
    c. Is still required and remains the best option for achieving those objectives, and
    d. Could be achieved in another way which involves less onerous regulatory provision to reduce the burden on business and/or increase overall societal welfare.

3. The objective of this policy is to develop a mandatory scheme which is adopted by large businesses across the out-of-home sector – that is any outlet where food or drink is prepared in a way that means it is ready for immediate consumption. The intended effect of providing consumers with consistent energy information is that it will help them make informed choices and identify healthier options when eating out. A further aim is that enforced calorie labelling will encourage caterers to reformulate existing products and design new recipes with lower energy content. A post implementation review would aim to establish if these objective have been achieved.

4. We aim to explore the current levels of calorie labelling (including compliance and accuracy) in large OHFO and large outlets selling on the go foods before and after legislation comes into force, in order to capture a basline and monitor the availability and use of calorie labelling after the introduction of the regulation. This could be done through selecting a sample of buisnesses to whom the new rules apply, using this to generate a list of eligible outlets operated by these businesses, and visiting outlets to assess their calorie labelling practice and survey customers before and after implementation.

5. We have also highlighted several wider points in this impact assessment which we would like to explore as part of a post implementation review. This includes looking at voluntary compliance of smaller buisnesses and looking at trends in the Out of Home sector as a whole. Use of calorie labelling when making purchases and the impact the policy has on portion size and calorie consumption may also be key aspects of the PIR. We also intend to re-engage with key stakeholders following the introduction of the ban to better understand the costs that businesses incur on adopting the regulations.