

## Supplementary Information

### **Carbohydrate knowledge, dietary guideline awareness, motivations and beliefs underlying low-carbohydrate dietary behaviours**

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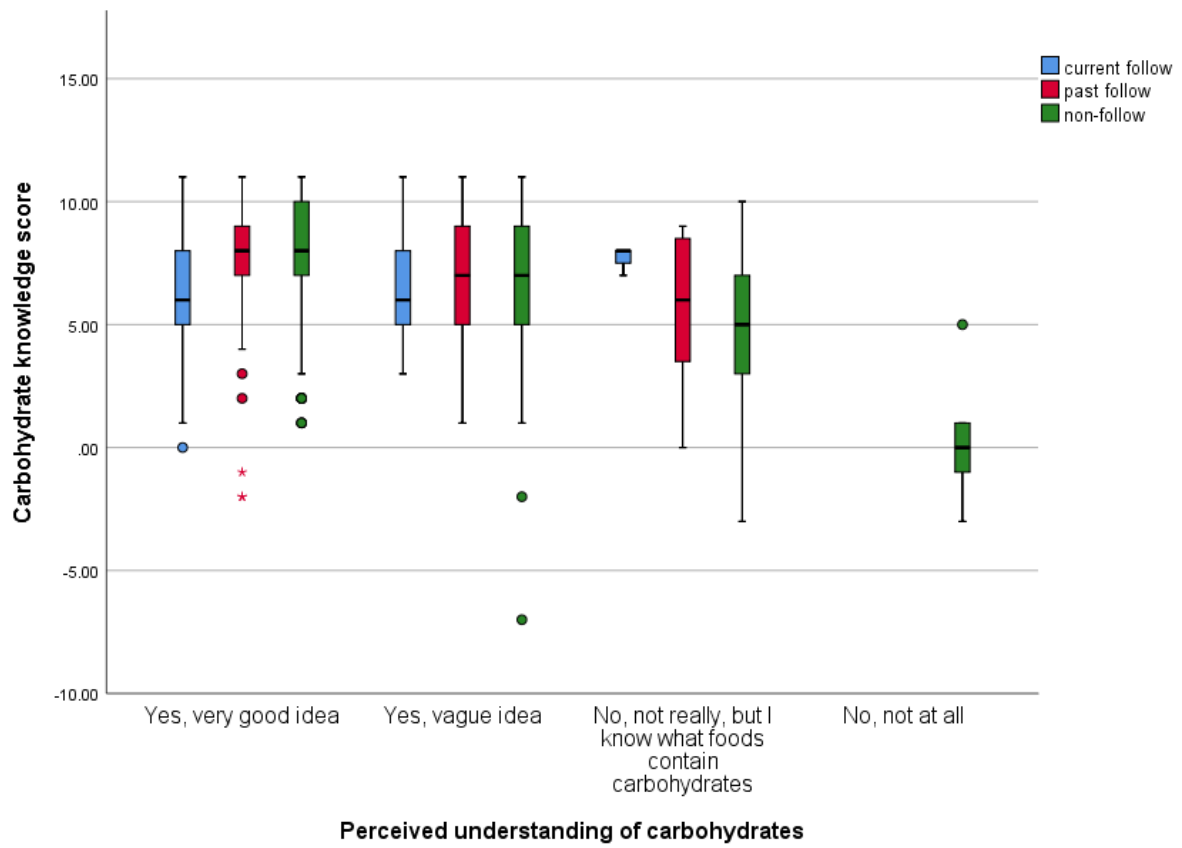
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**Supplemental Figure S1.** Boxplot of carbohydrate knowledge score by level of perceived understanding of carbohydrates stratified by low-carbohydrate diet status.

**Supplemental Table S1.** Theory of planned behaviour constructs (attitude, subjective norm, perceived behavioural control), carbohydrate knowledge, and dietary guideline agreement influencing intention to follow a low-carbohydrate diet, and the intention and perceived behavioural control predicting the LCD behaviour.

Dependent variables (outcomes)	Independent variables (predictors)	Standardized $\beta$ coefficient	t	p-value	
<b><i>Behaviour: frequency of starchy food consumption</i></b>	Intention	-0.38	-10.2	<0.001	adjusted R <sup>2</sup> 0.18, ANOVA p<0.001
	Perceived behavioural control	-0.10	-2.7	0.008	
<b><i>Intention (model 1)</i></b>	Attitude	0.60	21.5	<0.001	adjusted R <sup>2</sup> 0.58, ANOVA p<0.001
	Subjective norms	0.14	5.3	<0.001	
	Perceived behavioural control	0.24	9.5	<0.001	
<b><i>Intention (model 2)</i></b>	Attitude	0.53	18.3	<0.001	adjusted R <sup>2</sup> 0.60, ANOVA p<0.001
	Subjective norms	0.13	4.9	<0.001	
	Perceived behavioural control	0.23	9.1	<0.001	
	Carbohydrate knowledge	-0.09	-3.6	<0.001	
	Guideline agreement	-0.13	-4.7	<0.001	
<b><i>Attitude</i></b>	Behavioural belief composite score	0.72		<0.001	
<b><i>Subjective norm</i></b>	Normative belief composite score	0.46		<0.001	
<b><i>Perceived behavioural control</i></b>	Control belief composite score	0.15		<0.001	

## Section 1 - Carbohydrates and Guidelines

4. Do you understand what the term 'carbohydrate' means? \* Required

- Yes, very good idea
- Yes, vague idea
- No, not really, but I know what foods contain carbohydrates
- No, not at all

5. Please provide UP TO 3 words or groups of words that come to mind when thinking about 'carbohydrates' in relation to nutrition & health:

1.	<input type="text"/>
2.	<input type="text"/>
3.	<input type="text"/>

6. Please provide UP TO 3 words or groups of words that come to mind when thinking about 'low-carbohydrate diets' in relation to nutrition & health:

1.	<input type="text"/>
2.	<input type="text"/>
3.	<input type="text"/>

7. Please provide UP TO 3 words or groups of words that come to mind when thinking about 'high-carbohydrate diets' in relation to nutrition & health:

1.	<input type="text"/>
2.	<input type="text"/>
3.	<input type="text"/>

## Section 1 - Carbohydrates and Guidelines (cont)

These are examples of dietary guidelines/recommendations

- Eatwell plate or Eatwell guide (UK)
- MyPlate (USA)

**8. Have you heard about any of the above dietary guidelines/recommendations? \* Required**

- No, I have NOT heard about any of the above before.
- Yes, I have heard of these before

**8.a. If YES, which one? Tick all that apply**

- Eatwell plate or Eatwell guide (UK)
- MyPlate (USA)
- Other
- Not sure

**8.a.i. If you selected Other, please specify:**

**8.b. If YES. Are you following any of the guideline(s) above?**

- Yes
- No

**8.b.i. If YES, Which one?**

- Eatwell plate or Eatwell guide (UK)
- MyPlate (USA)
- Other dietary guideline

**8.b.i.a. If you selected Other, please specify:**

**8.c. Do you agree with their recommendations? Tick ONE**

- Strongly agree
- Slightly agree
- Neutral
- Slightly disagree
- Strongly disagree
- I am not sure.

**8.c.i. Why do you agree or disagree? Optional**

9. The following recommendations are outlined in the UK Eatwell Guide. What do you think about the following statement? Tick ONE for each statement.

	* Required		
	Agree	Disagree	I'm not sure
Base meals on potatoes, bread, rice, pasta or other starchy carbohydrates. Choose wholegrain where possible.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat at least five portions of a variety of fruit and vegetables a day.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choose unsaturated oils and spreads and eat in small amounts such as vegetable, rapeseed, olive and sunflower oils.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat foods high in fat, salt and sugar less often and in small amounts. These foods include chocolate, cakes, biscuits, sugary soft drinks, butter, ghee and ice cream	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9.a. \* If you disagree with any of the statements above -> why?

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# Carbohydrates

10. What do you think regarding the following statements? Tick ONE for each statement.

	* Required		
	True	False	I'm not sure
Carbohydrates are a food group which comprises sugars, starches and fibres found in grains, vegetables, fruits and milk products.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carbohydrates are NOT the body's main source of energy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carbohydrates include any sugars, including those coming from sweets, candy, syrup, honey and fruit juice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Added sugars are sugars that are added to foods and drinks. They include sugars such as glucose, fructose, sucrose or table sugar, syrup, as well as sugars naturally present in honey, fruit juices and fruit juice concentrates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Starch (from potatoes, bread, rice, pasta) is NOT a carbohydrate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fibre (dietary fibre) is found mostly in wholegrain as well as vegetables, pulses and fruits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Whole grain starchy foods (e.g. wholegrain bread, breakfast cereals, brown rice and whole-wheat pasta) are a good source of fibre, B-vitamins and minerals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Refined grains have been milled, a process that removes the bran and germ. This PROCESS can remove dietary fibre, minerals, and many B vitamins.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
White breads and pasta (made from white flour), and polished white rice are refined starchy foods (refined carbohydrates).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gluten is a protein found in wheat and some people are allergic to gluten.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High consumptions of whole grains and fibre may increase the risk of obesity, heart disease, diabetes and some cancer types.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## Low-carbohydrate diets

**11. Have you heard of a low-carbohydrate diet? Tick ONE \* Required**

- Yes
- No, I have not heard nor am I currently following this diet.

**11.a. If YES. Have you tried a low-carbohydrate diet before? Tick one**

- Yes, I am following a low-carbohydrate diet at the moment
- Yes, I have heard and tried this diet before, but I am not following it at the moment.
- I have heard about this diet but never tried it.

**11.b. If YES, what low-carbohydrate diets have you heard of or are you following? Tick all that apply**

	Now following	Followed in the past	Heard of	Never heard
1. Atkins Diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Zone diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Sugar Busters diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. South Beach Diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Harcombe Diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Paleolithic diet (Paleo diet)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Ketogenic Diet (Keto diet)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Gluten-free diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. a gluten-free diet plus any low-carbohydrate diets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. no specific named diet/my own variation of low-carbohydrate diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Do not know the name	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Other kind (please specify below)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**11.b.i. if you select 'other kind' please specify in the box below**

**11.c.** If **YES**, who are your main sources of advice/inspiration regarding your diet.

Rank TOP 3 sources by numerical order 1 to 3. (1 being your biggest influence, 3 being your lowest)

Please don't select more than 1 answer(s) per row.

Please select exactly 3 answer(s).

Please don't select more than 1 answer(s) in any single column.

	1	2	3
Family members	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friends/Peers/Colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Books/Magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet website (Blogs, online support web forums)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Media (TV, radio, press)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social medias (facebook, twitter, Pinterest, Instagram, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health care professionals (GP/doctor, nurse, dietitian, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisations (WHO, NHS, government, associations)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**11.c.i.** if you select 'other' please specify in the box below

**12.** What would you reduce in your diet, if you decided to follow a low-carbohydrate diet? Tick all that apply to you \*

Required

- Fried potato products (e.g. chips, crisps)
- All potato product/food including mashed/steamed/baked/fried potatoes or crisps
- all bread
- refined bread (e.g. white bread)
- all rice
- polished rice (e.g. white rice)
- all pasta
- refined pasta
- breakfast cereals / porridge
- gluten-containing starchy foods such as whole-wheat breads.
- bakery products (cakes, scones, or pastries, etc) and snacks (biscuits, crisps)
- items with added sugars including soft/fizzy drinks, sweets, chocolates, ice-cream.
- fruits and fruit juices
- alcoholic drinks including beer
- Other

**12.a.** If you selected Other, please specify:

If you are either following or have followed a low-carbohydrate diet in the past, such as the Atkins Diet or any of the diets stated in question 11b.

Click 'YES'

If not, click 'NO'

**13.** Are you following / have you followed a low-carbohydrate diet in the past? \* *Required*

- Yes
- No

## Low-carbohydrate diets practice

**14. Please rank the TOP 3 reasons, from 1 to 3, for opting to follow a low-carbohydrate diet (1 is the most important reason, 3 the least). \* Required**

Please don't select more than 1 answer(s) per row.



Please select exactly 3 answer(s).

Please don't select more than 1 answer(s) in any single column.

	1	2	3
For losing weight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For weight maintenance (if you have lost weight using other approaches)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For diabetes management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am allergic to gluten or wheat products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because it is better for my health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
no particular reason	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**14.a.** If you selected Other, please specify:

**15.** How long have you followed a low-carbohydrate diet until now (or from start to end of your dieting)?

	* Required
the date you have started:	<input type="text"/>  (dd/mm/yyyy)
the date you have stopped: (If still following the diet, enter today date)	<input type="text"/>  (dd/mm/yyyy)

**16.** How consistently (on average) do/did you follow a low carbohydrate diet? \* Required

Everyday, every meals

weekdays only

weekends only

4/5 days a week, depending on where I am / who I am with

up to 3 days a week, depending on where I am / who I am with

Other

**16.a.** If you selected Other, please specify:

**17. What is / has been your experience of following a low carbohydrate diet?**

	<i>* Required</i>					
	Not aware/I don't know	Much worse	Slightly worse	No change	Slightly improved	Greatly improved
1. Feelings of hunger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Mood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Concentration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Headache	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Tiredness, fatigue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Muscle cramps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Constipation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Blood sugar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Blood lipids (e.g. total cholesterol, LDL, HDL, triglyceride)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Happiness and confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**17.a. Other (please specify)**

**18. What was your weight before starting the low-carbohydrate diet?**

	<i>* Required</i>	
your weight before starting the low-carbohydrate diet	<input type="text"/>	Kilograms <input type="button" value="v"/>

**19. How much weight you have lost since you began following a low-carbohydrate diet (or from start to end of your dieting)?**

	<i>* Required</i>	
amount of weight loss	<input type="text"/>	Kilograms <input type="button" value="v"/>

**20. What is your current weight?**

	<i>* Required</i>	
your current body weight	<input type="text"/>	Kilograms <input type="button" value="v"/>

## Low-carbohydrate diets practice (cont)

**21.** While following a low-carbohydrate diet, how is / was the portion size or total volume of most of your meals, compared to what you ate before your low-carbohydrate diet? *Tick ONE \* Required*

- Much smaller
- Slightly smaller
- No change
- Slightly bigger
- Much bigger

**22.** Is (Was) your GP aware that you are following (or have followed in the past) a low carbohydrate diet? \* *Required*

- Yes
- No
- Not sure

**22.a.** If **YES**, is (was) he/she supportive of following a low-carbohydrate diet?

- Yes, he/she is supportive.
- No, he/she is not.
- He/she did not comment.

**22.b.** Has your GP made any recommendation to you regarding your diet?

- No.
- Yes, please specify in a space below.

**22.b.i.** If you selected Yes, please specify:

23. Have you seen a dietitian/nurse/nutritionist regarding your diet? \* Required

- Yes
- No
- Not sure

23.a. If Yes, who did you speak to?

- Dietitian
- Nurse
- Nutritionist
- Other

23.a.i. If you selected Other, please specify:

23.b. If **YES**, is (was) he/she supportive of following a low-carbohydrate diet?

- Yes, he/she is supportive.
- No, he/she is not.
- He/she did not comment.

23.c. Has he/she made any recommendation to you regarding your diet?

- No.
- Yes, please specify in a space below.

23.c.i. If you selected Yes, please specify:

24. Please use this space to add any comments on your low-carbohydrate diet plan. *Optional*







## Your DIET

**29.** What kind of bread do you usually eat? *Tick ONE*

- white
- brown, granary, wheat meal
- wholemeal
- no usual type
- do not know
- do not eat bread at all
- Other kind (please specify)

**29.a.** If you selected Other, please specify:

**30.** What do you usually spread on bread / toast / crackers? *Tick ONE*

- butter
- hard/block margarine
- soft margarine
- reduced fat spread
- low fat spread
- Nutella or chocolate spreads
- no usual type
- do not know
- Nothing
- Other

**30.a.** If you selected Other, please specify:

**31. What kind of milk do you usually use? Tick ONE**

- whole milk
- semi-skimmed
- skimmed
- dairy alternatives (e.g. soya, rice)
- no usual type
- do not know
- do not drink milk at all
- plant milk / milk alternative
- Other kind (please specify)

**31.a.** If you selected Other, please specify:

**32. Do you usually take sugar in:**

	Yes	No	I do not drink it	How much? (e.g. 1 teaspoon/sachet)
Tea	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Coffee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

**33. Which type of breakfast cereal do you normally eat?**

- high fibre (e.g. All Bran, Branflakes, Shredded Wheat, Muesli, Porridge, Weetabix)
- other cereals (e.g. Cornflakes, Rice Krispies, Special K, Sugar Puffs, Honey Snacks)
- no usual type
- do not eat breakfast cereals at all







## Attitude towards low-carbohydrate diets (cont)

38. In my opinion, following a Low Carb Diet is ... (1:most harmful to 7:most beneficial) \* Required

	1	2	3	4	5	6	7	
Harmful to health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Beneficial for health

38.a. Why? Optional



## Section 4 - About You

39. Gender \* Required

Male

Female

40. Date of birth \* Required

Dates need to be in the format 'DD/MM/YYYY', for example 27/03/1980.



(dd/mm/yyyy)

41. Body weight

	* Required	* Required
Weight	<input type="text"/>	Kilograms <input type="button" value="v"/>

42. Height

	* Required	* Required
Height	<input type="text"/>	Centimetres <input type="button" value="v"/>

43. Ethnicity \* Required

- White British (Scottish, English, Welsh, Northern Irish)
- African British
- Indian British
- Other Asian British
- Other Europeans
- Asian
- African
- Latin American
- American
- Hispanic
- Mixed ethnicity
- Other

43.a. If you selected Other, please specify:

44. Annual income (your total household income if living in a family setting or your personal income if living alone or non-family setting)

- No income
- < £15,000
- £15,001 - £30,000
- £30,001 - £50,000
- £50,000 – £80,000
- > £80,000
- Prefer not to say

45. Education: \* *Required*

- School leaver/standard grade/GCSE
- Highers/A levels
- Higher education HND/HNC/NVQs
- Bachelor's degree
- Master degree/PhD/Postgraduates
- Prefer not to say

46. Did your studies have a major focus on any of the following? \* *Required*

- Nutrition
- Dietetics
- Food science
- Medicine
- Other Healthcare Professionals (i.e. nursing, midwifery, pharmacy, physiotherapist)
- No, I did not study any of the above.

## Section 4 - About You (cont)

47. Is your job (or part of your job) related to health, nutrition or physical fitness (i.e. doctors, nurses, pharmacists, dietitians, fitness trainer, cooking book writer, working in a media relating to health/nutrition)?

- Yes, (please specify)
- No

47.a. if YES, please specify below

48. What kind of accommodation do you live in?

- own room in flat/house share
- student accommodation
- own rented flat/house
- own purchased house (mortgaged or owned outright)
- Other

48.a. If you selected Other, please specify:

49. Who do live with? (tick all that apply)

- Partner/husband/wife
- Children
- Parents
- Friends/Flatmates/Housemates
- Alone
- Other

49.a. If you selected Other, please specify:

50. Are you the main grocery shopper in your household?

- Yes, always
- Yes, sometimes/occasionally
- No



## Section 4 - About You (cont)

52. Do you regularly take any vitamin, mineral or other nutritional supplements? \* Required

- Yes
- No

52.a. if Yes, please specify which ones and dosage

	Supplements Name/Brand (e.g. Vitamin C Blackmore)	Dosage (e.g. 1000 mg/tab)	Frequency
1.	<input type="text"/>	<input type="text"/>	Please select <input type="button" value="v"/>
2.	<input type="text"/>	<input type="text"/>	Please select <input type="button" value="v"/>
3.	<input type="text"/>	<input type="text"/>	Please select <input type="button" value="v"/>
4.	<input type="text"/>	<input type="text"/>	Please select <input type="button" value="v"/>
5.	<input type="text"/>	<input type="text"/>	Please select <input type="button" value="v"/>
6.	<input type="text"/>	<input type="text"/>	Please select <input type="button" value="v"/>
7.	<input type="text"/>	<input type="text"/>	Please select <input type="button" value="v"/>

52.b. if Yes, please provide reason(s) why you take them

52.c. if NO, why not:

53. Do you smoke?

- Yes
- Ex-smoker
- No, I do not smoke.

53.a. if Yes, how many cigarettes per day

Please enter a number.

53.b. if Ex-smoker, how long have you stopped smoking?

54. Have you been told by your GP / doctor that you have any of the following? \* Required

Please select at least 1 answer(s).

- Type 1 Diabetes
- Type 2 Diabetes
- Other cause of diabetes
- High blood pressure
- Heart disease
- High blood cholesterol/ triglyceride
- Epilepsy
- Irritable bowel syndrome
- Inflammatory bowel syndrome
- Anaemia from iron deficiency
- Anaemia from other causes (Thalassemia, cancer, kidney disease)
- Other
- I have not been diagnosed with any disease

54.a. If you selected Other, please specify:

55. Are you allergic to wheat or gluten? \* Required

- Yes
- No

55.a. if YES, was this diagnosed by a GP / doctor?

- Yes
- No

56. How physically active are you? NB: 'raising heart rate' means unable to withhold a conversation at that intensity of physical activity. \* Required

- Fairly inactive (walking only)
- Moderately active (occasionally take exercise, that raise my heart rate, less than 3 times per week)
- Very active (regularly take exercise, that raise my heart rate, 3 times a week or more)

57. Are you playing sports or a member of fitness/exercise class?

- No
- Yes

57.a. if YES, What sports you play/classes you attend

57.b. How often do you play/attend?

- 1 day/week
- 2 days/week
- 3 days/week
- 4 days/week
- 5 days/week
- 6 days/week
- 7 days/week

57.c. How long do you play/attend for each session? in hour(s) or minutes per day