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*UK citizen perceptions of food insecurity, food waste, cooking, safety, and animal welfare at the start of the COVID-19 lockdown –
How do we move towards healthy sustainable diets from here?*

A work in progress

Dr Christian Reynolds

Centre for Food Policy, City, University of London

 [@sartorialfoodie](https://twitter.com/sartorialfoodie)

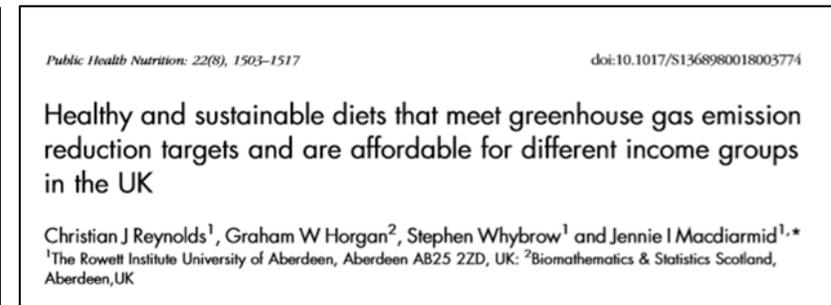
Tuesday 25th April 2020

Who am I? Christian Reynolds

Senior Lecturer at the Centre for Food Policy



Focus: healthy sustainable diets and food consumption (including waste)



Previously: Food waste politics/history, social sciences approaches

Just about to publish: Sustainability and cooking (16% of UK food GHGE!)

This work took place at the University of Sheffield, and was funded by the STFC food network+



The University
Of Sheffield.
Institute for
Sustainable Food.



STFC
Food
Network+

Specific named projects that funded this research include the STFC GCRF funded project “Trends in greenhouse gas emissions from Brazilian foods using GGDOT” (ST/S003320/1), the STFC funded project “Piloting Zooniverse for food, health and sustainability citizen science” (ST/T001410/1), and the STFC Food Network+ Awarded Scoping Project “Piloting Zooniverse to help us understand citizen food perceptions”. Funding was also supplied from Research England via the University of Sheffield QR Strategic Priorities Fund projects “Cooking as part of a Sustainable Food System – creating an wider evidence base for policy makers”, and “Food based citizen science in the UK as a policy tool”. This research project arose from the N8 AgriFood-funded project “Greenhouse Gas and Dietary choices Open-source Toolkit (GGDOT) hacknights.”

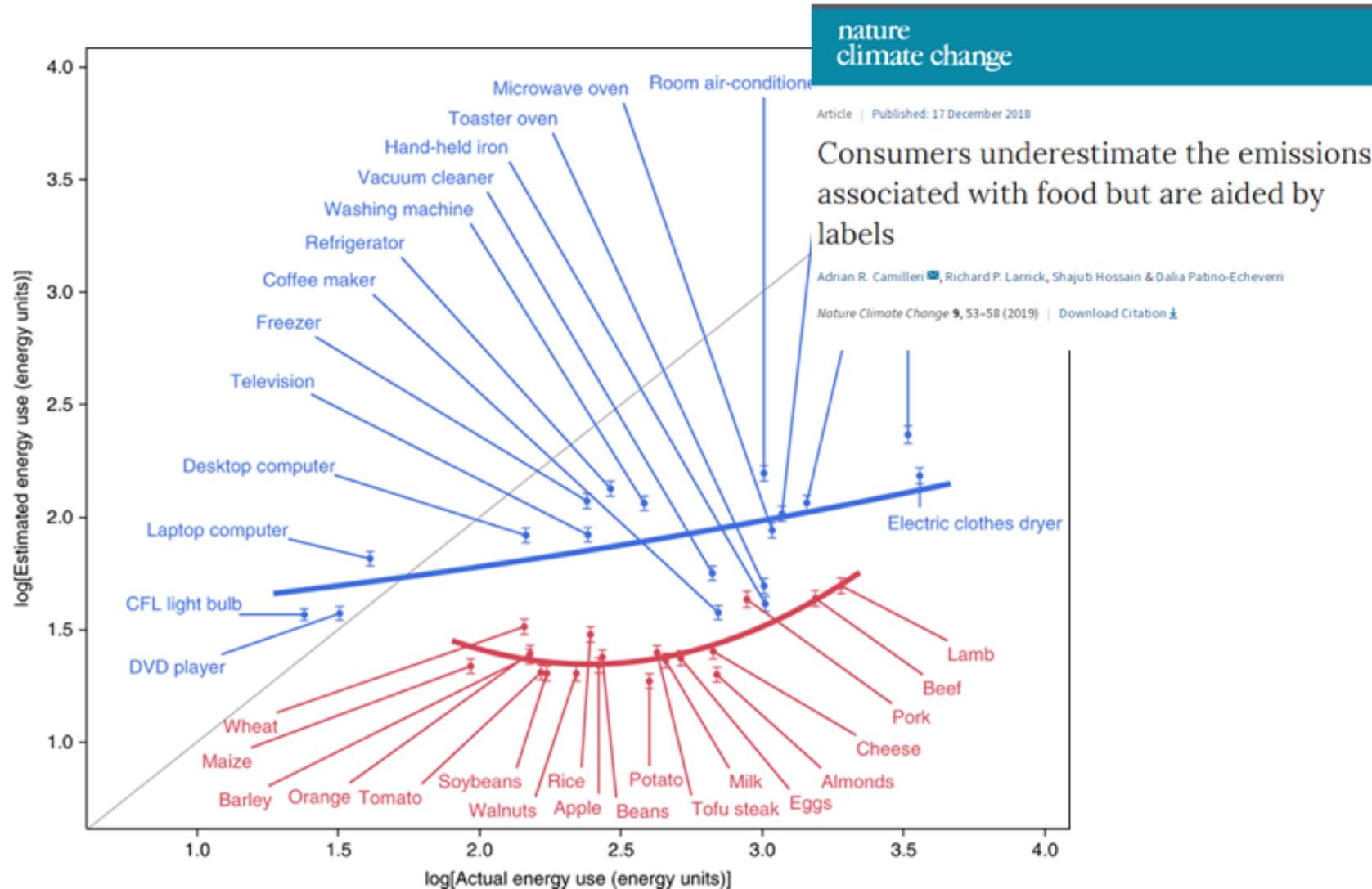
Thanks to my (many) collaborators...

- **Citizen Science; climate change, cooking and food habits:** Carla Adriano Martins; Marcelo Vega; Ian Vázquez Rowe; Gustavo Cediél ; Ximena Schmidt; Angelina Frankowski ; Sarah Bridle ; Carolyn Auma ; Jacqueline Silva ; Gemma Bridge ; Libby Oakden; Hibbah Osei-Kwasi ; Alana Kluczkovski ; Robert Akparibo; Tahir Bockarie; Daniel Mensah; Maria Laura Louzada; Changqiong Wang ; Luca Panzone ; Astrid Kause ; Charles Ffoulkes; Coleman Krawczyk ; Grant Miller; Stephen Serjeant; Fernanda Rauber; Renata Levy
- **FILES:** Professor Greta Defeyter, Professor Paul Stretesky, Dr Mike Long, Dr Sinéad Furey, Dr Christian Reynolds, Dr Alyson Dodd, Dr Debbie Porteous, Dr Emily Mann, Mrs Christine Stretesky, Ms Anna Kemp, Mr James Fox, Mr Andrew McAnallen

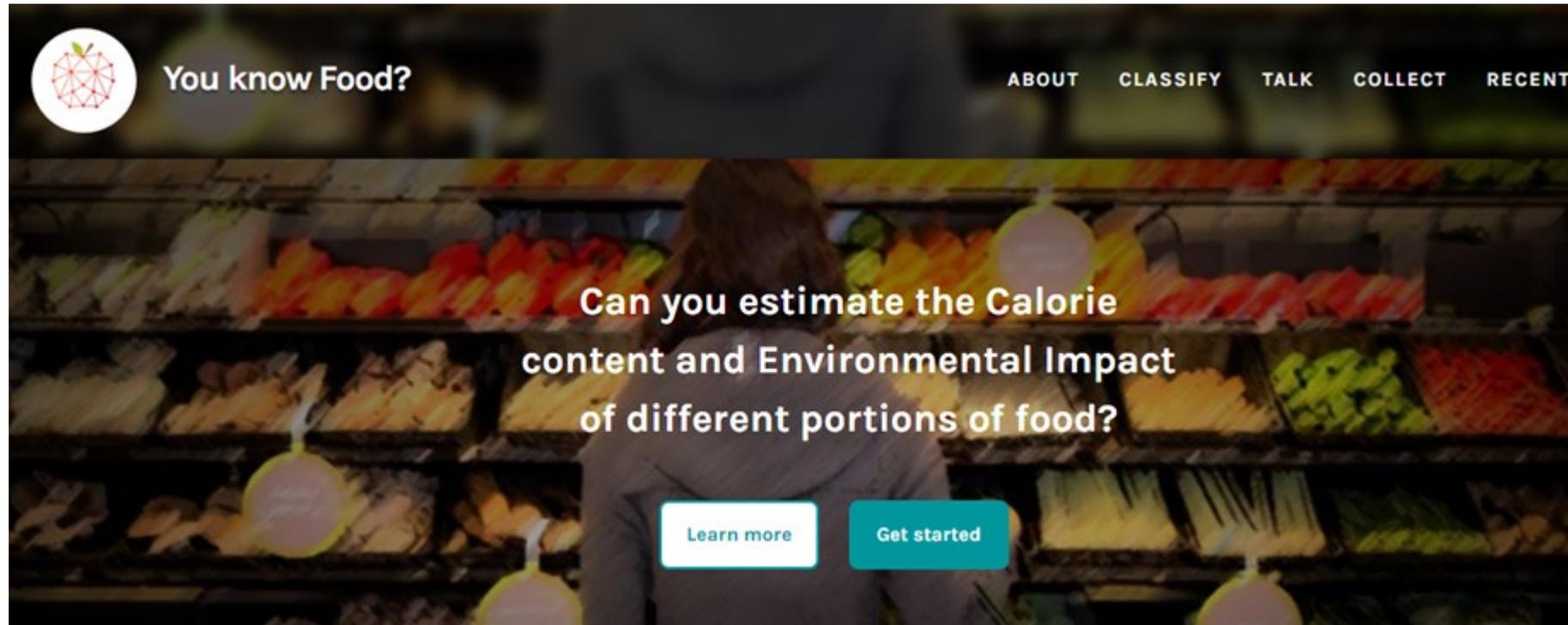
What will we be talking about today?

- Background to research - Citizen Science and Food
- Review of other COVID-19 food surveys
- Results from our work - A work in progress
- Fitting this into the healthy sustainable diets agenda

THE CHALLENGE – CONSUMER PERCEPTIONS SUCK



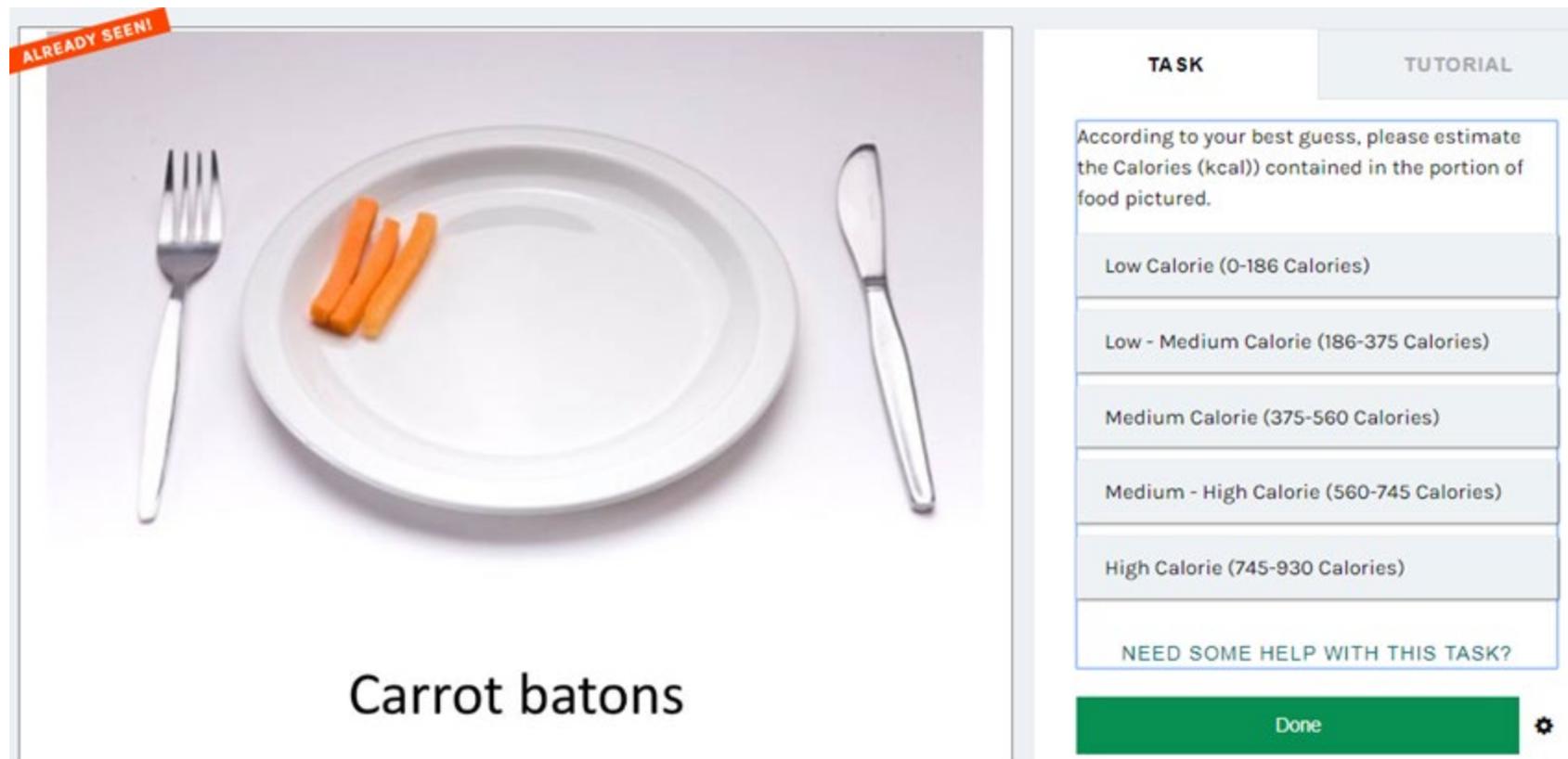
Citizen Science and Food (2019)



ZOONIVERSE

Zooniverse - You Know Food? (2019)

3 different question systems: Slider, Multiple choice, or text entry



ALREADY SEEN!

TASK | TUTORIAL

According to your best guess, please estimate the Calories (kcal) contained in the portion of food pictured.

- Low Calorie (0-186 Calories)
- Low - Medium Calorie (186-375 Calories)
- Medium Calorie (375-560 Calories)
- Medium - High Calorie (560-745 Calories)
- High Calorie (745-930 Calories)

NEED SOME HELP WITH THIS TASK?

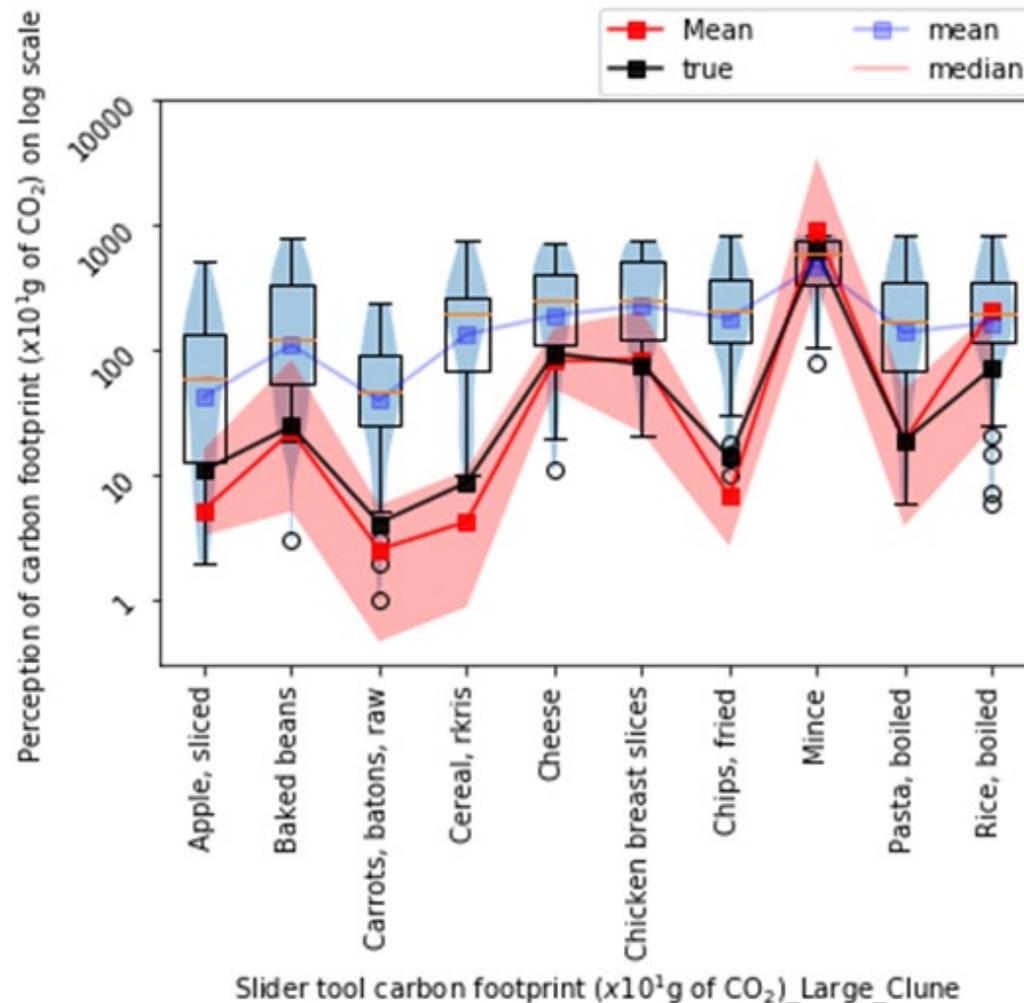
Done

Carrot batons

The screenshot shows a user interface for a Zooniverse task. On the left, there is a photograph of a white plate with three carrot batons, a silver fork to the left, and a silver knife to the right. An orange banner in the top left corner of the image area says 'ALREADY SEEN!'. Below the image, the text 'Carrot batons' is displayed. On the right side, there are two tabs: 'TASK' (active) and 'TUTORIAL'. The 'TASK' tab contains a text box with the instruction: 'According to your best guess, please estimate the Calories (kcal) contained in the portion of food pictured.' Below this are five radio button options for calorie ranges: 'Low Calorie (0-186 Calories)', 'Low - Medium Calorie (186-375 Calories)', 'Medium Calorie (375-560 Calories)', 'Medium - High Calorie (560-745 Calories)', and 'High Calorie (745-930 Calories)'. At the bottom of the task area is a link that says 'NEED SOME HELP WITH THIS TASK?'. At the very bottom of the interface is a green button labeled 'Done' and a small gear icon for settings.

Zooniverse - You Know Food?

<https://doi.org/10.3389/fsufs.2020.00120>



N= \sim 516, 8484 valid image classifications.

10 Foods types 3 portion sizes, with and without weights.

Results: Citizens are unable to accurately estimate carbon footprint and energy content, with the majority of citizens overestimating values. Portion size impacts perceptions, with estimations increasing alongside size. Weight information influences perception, but the direction varies by factor. Input method significantly affects citizen estimations. Citizen feedback confirms the lack of knowledge surrounding carbon footprint values.

Phase 2

Compare Zooniverse to “traditional” panel methods. 29/30 foods.



Qualtrics (N=397), Prolific (N=407), Zooniverse (N~601, based on unique IP addresses).

Defra - “can you ask about animal welfare?”

FSA - “can you ask about food risk?” , “what about frozen food?”

Phase 2 Results

The carbon footprint of all foods were overestimated, with the exception of beef and lamb which was underestimated.

The calorie content of fruits and vegetables are typically overestimated.

Perceptions of animal welfare and food safety differed by recruitment method.

Zooniverse citizens rated animal welfare standards to be lower for meat products and eggs, compared to Qualtrics and Prolific participants.

Overall, Qualtrics participants typically held the highest food safety perceptions, however this varied by food type.

FB vs Twitter?

Engagement (clicks) vs Participation - £1000 on both platforms

****Estimates between platforms were not significantly different****

Other things happening: Living labs and YouGov



The University Of Sheffield.
Institute for Sustainable Food.

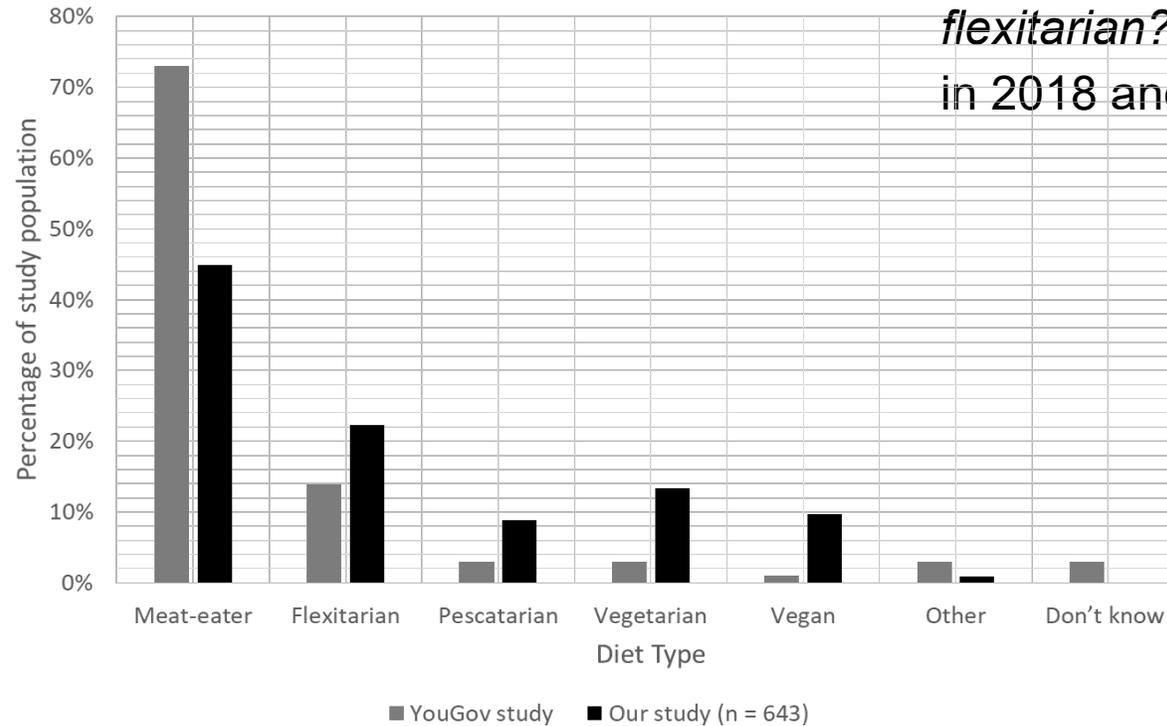


Living lab, September 2019 - University of Sheffield

57.9% (n = 372) staff

41.2% (n = 265) students

Yougov.co.uk. (2019). *Is the future of food flexitarian?* Data collected in 2018 and January 2019



Phase 3 - to Launch in late March 2020!

COVID-19 other reports and data



House of Commons
Environment, Food and Rural
Affairs Committee

COVID-19 and food supply

First Report of Session 2019–21

Report, together with formal minutes relating to the report

Ordered by the House of Commons to be printed 21 July 2020

HC 263
Published on 30 July 2020
by authority of the House of Commons

Vulnerability to food insecurity since the COVID-19 lockdown

Preliminary report

14 April 2020

Rachel Loopstra
King's College London





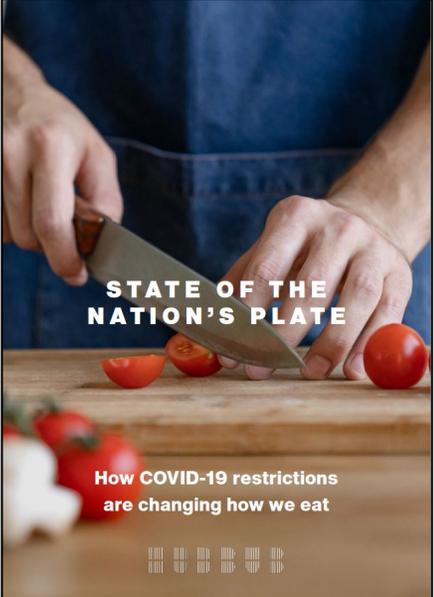
KEY FINDINGS REPORT

CITIZEN RESPONSES TO THE COVID-19 LOCKDOWN – FOOD PURCHASING, MANAGEMENT AND WASTE



Research date: April 2020
Publication Date: May 2020

Project code: CIT022-001



STATE OF THE NATION'S PLATE

How COVID-19 restrictions are changing how we eat



Key findings report

Food waste and Covid-19 - Survey 2: Lockdown easing



The second in a series of reports detailing how UK citizens' food habits, behaviours and attitudes have changed during the Covid-19 pandemic

Project code: CIT022-001
Research date: June 2020

Date: July 2020



Understanding Society
THE UK HOUSEHOLD LONGITUDINAL STUDY

Online survey of 4343 adults in Great Britain conducted on 7th-9th April by YouGov Plc

Online survey **06-09 April 2020** , 4,197 interviews, nationally representative sample of UK adults aged 18+

Online survey 2000 adults, 9th - 14th April 2020.

Online survey 17-23 June 2020 with a nationally representative sample of 4,000 UK adults aged 18+

Online 17,000+ 3+ waves, Food security Qs in April 2020, Food bank use in April and May.

Note: 23rd March UK lock down.

Vulnerability to food insecurity since the COVID-19 lockdown

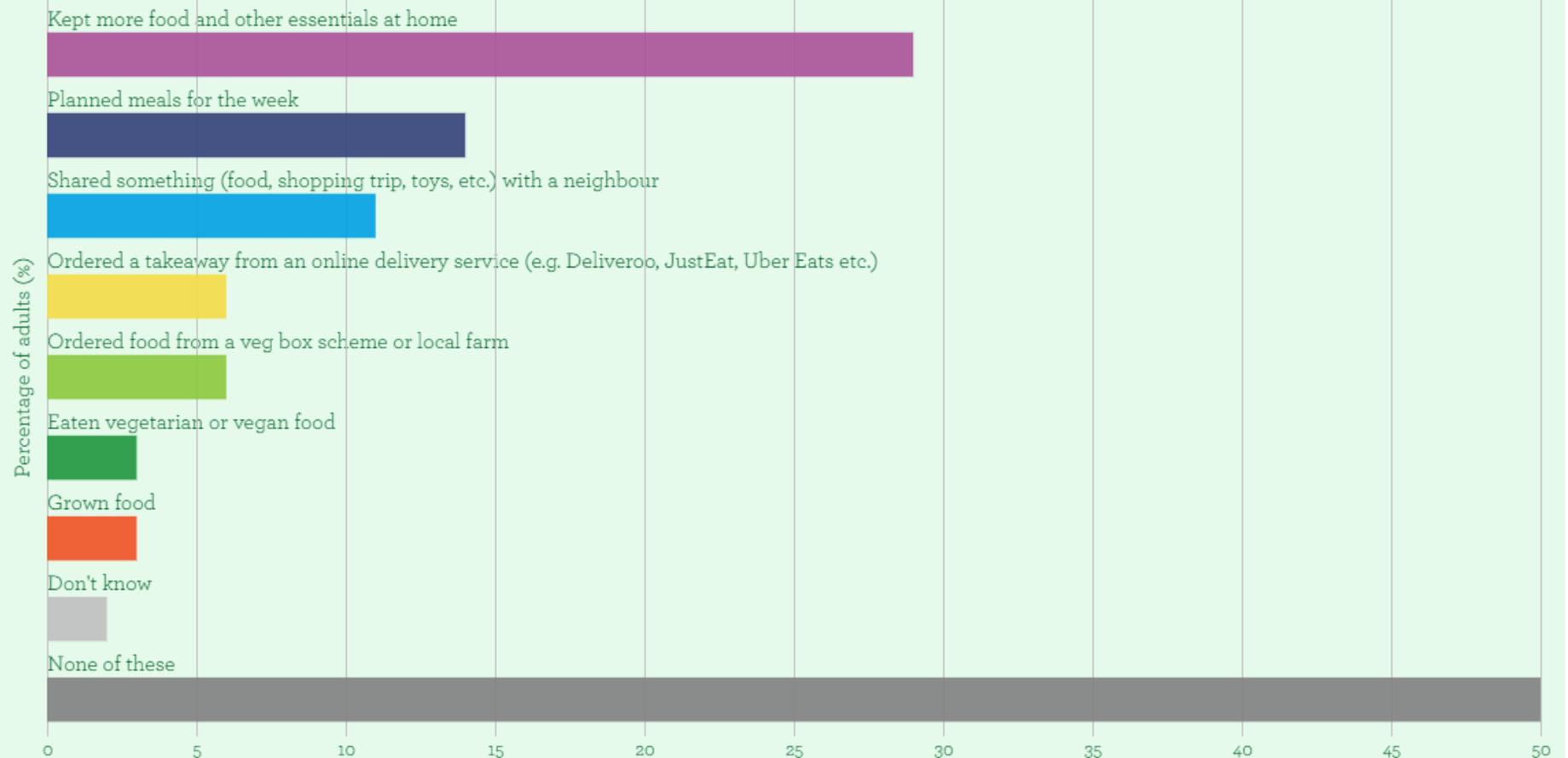
Preliminary report

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People are trying new things since the outbreak of Covid-19



Online survey of 4343 adults in Great Britain conducted on 7th-9th April by YouGov Plc

Vulnerability to food insecurity since the COVID-19 lockdown

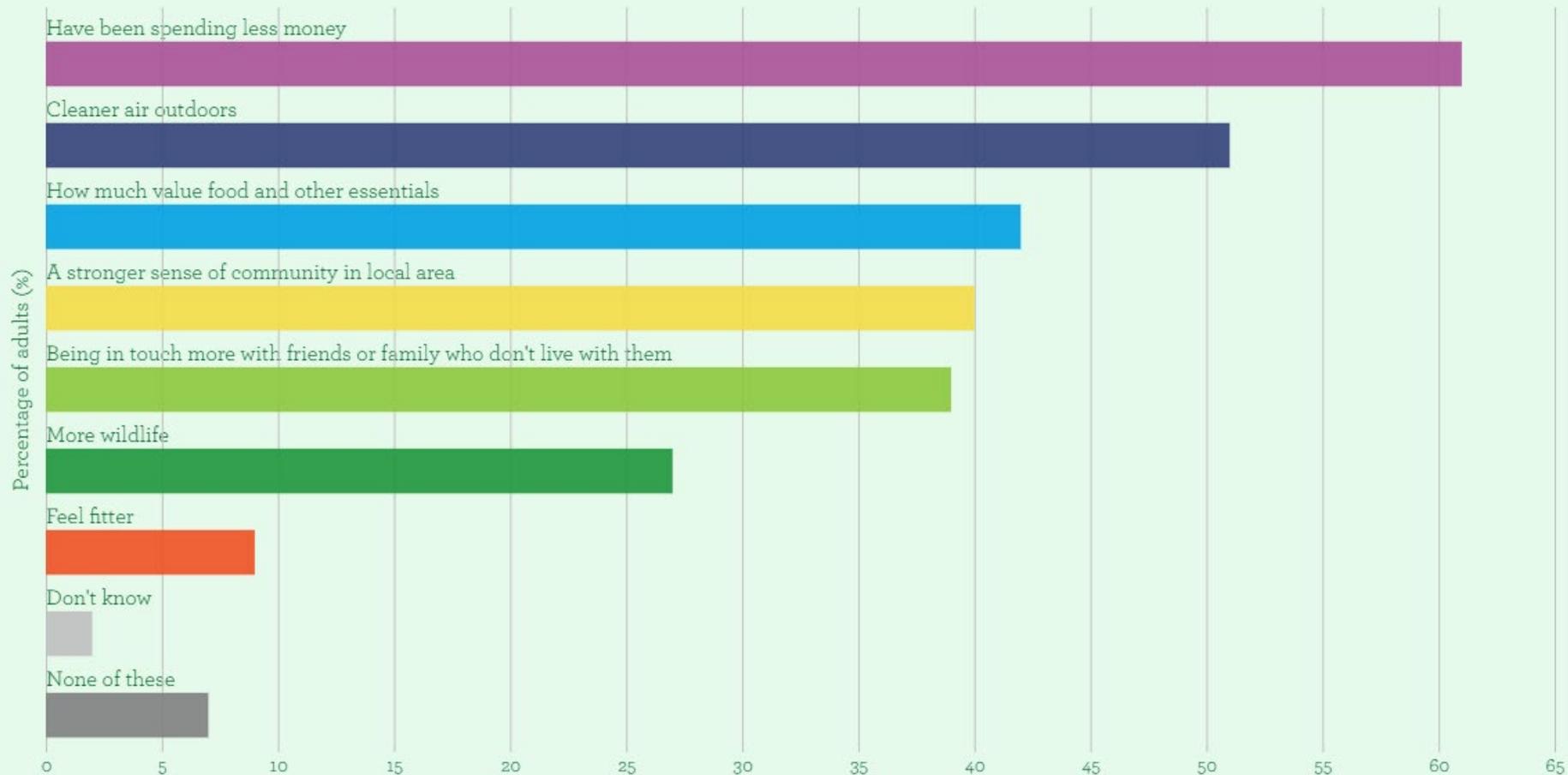
Preliminary report

14 April 2020

Rachel Loopstra
King's College London



People are noticing new things since the outbreak of Covid-19



Online survey of 4343 adults in Great Britain conducted on 7th-9th April by YouGov Plc

Vulnerability to food insecurity since the COVID-19 lockdown

Preliminary report

14 April 2020

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King's College London



Online survey of 4343 adults in Great Britain conducted on 7th-9th April by YouGov Plc

Changes in food and exercise since the outbreak of Covid-19

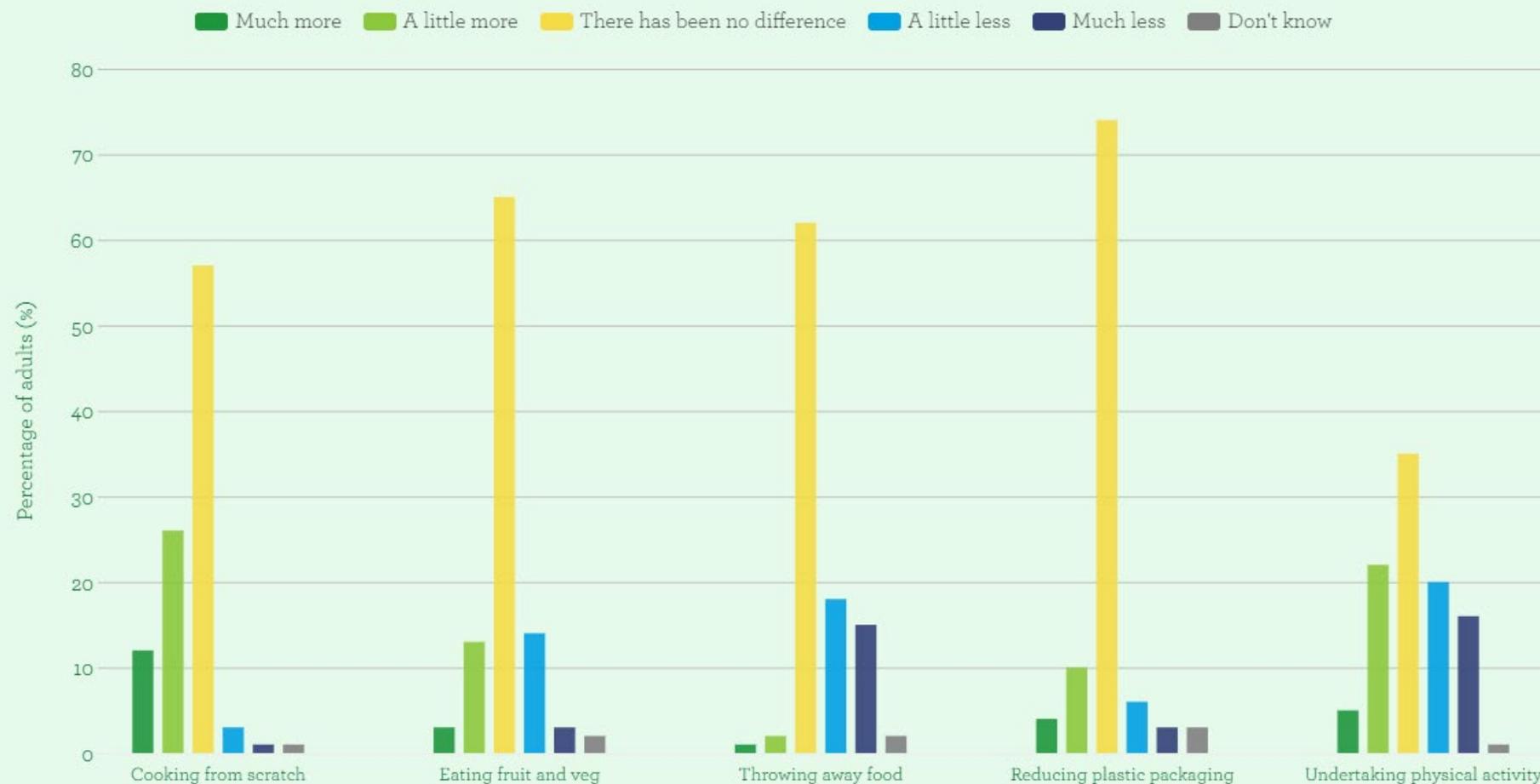
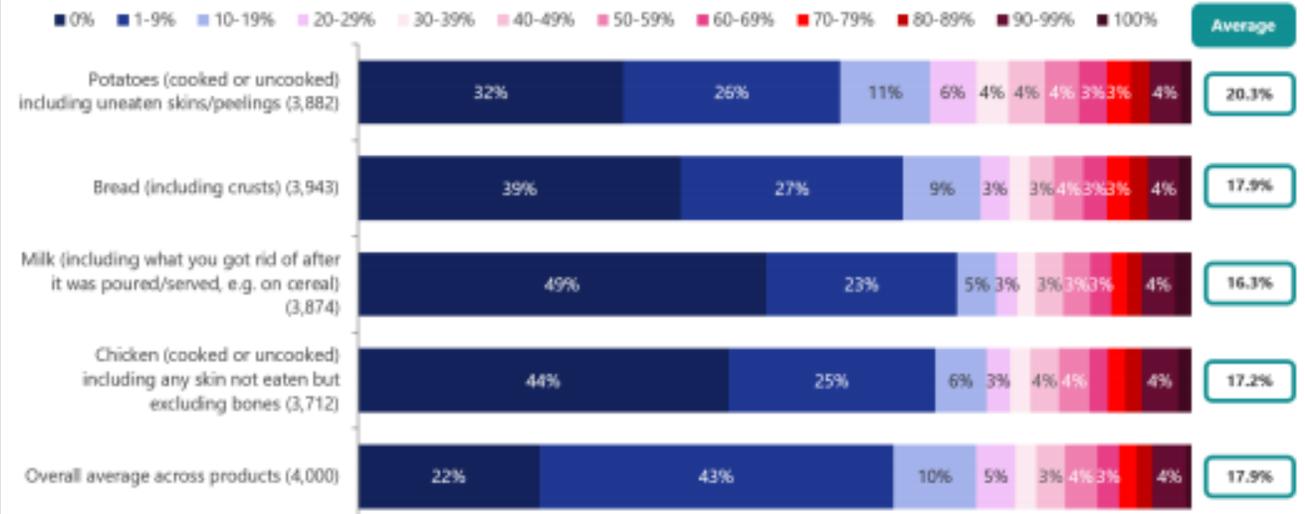


Figure 7 – Levels of food waste: by product

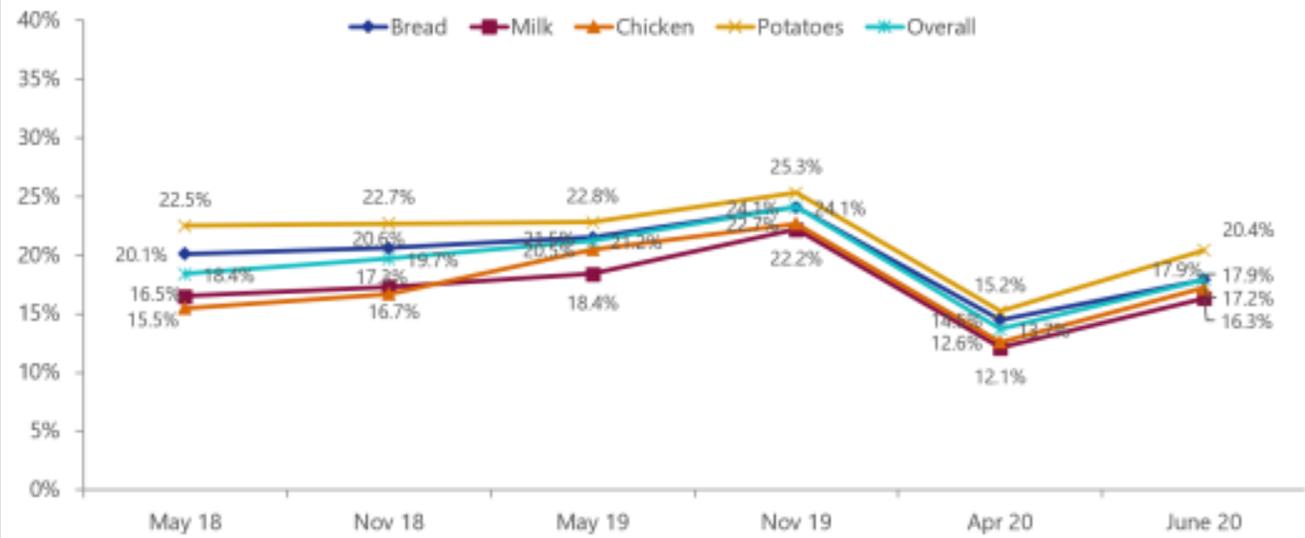
Q. Thinking about the last time you bought [food type], approximately what percentage ended up being uneaten and thrown away (whether in a compost bin, ordinary bin, council food waste collection, or down the sink)?

Base: UK adults aged 18+ with any responsibility for food shopping and/or preparation in the home – who buy and eat each item (base sizes in brackets). April 2020

June 2020



Over time



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Key findings report

Food waste and Covid-19 - Survey 2: Lockdown easing



The second in a series of reports detailing how UK citizens' food habits, behaviours and attitudes have changed during the Covid-19 pandemic

Project code: CFP22-001
Research date: June 2020

Date: July 2020

Online survey 17-23 June 2020 with a nationally representative sample of 4,000 UK adults aged 18+

Food Bank use and Food Security

Understanding Society survey ran waves in April and May of 2020

April 2020

2.3% were not able to eat healthy and nutritious foods in the last week,

2.9% of experienced times in the last week when the respondent or others in the household were hungry but did not eat.

1% had used a food bank, or similar service, in the last four weeks (0.76% less than four times, 0.23% more than four times)

May 2020

1.43% had used a food bank, (1.05% less than four times, 0.38% more than four times).

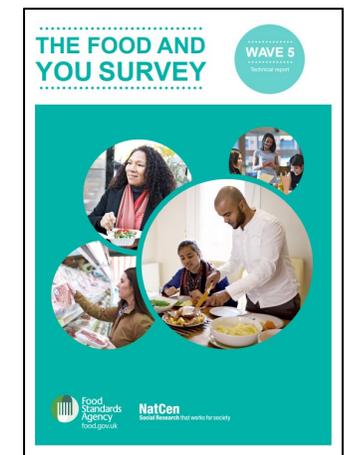
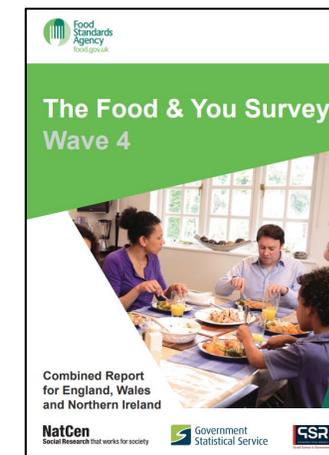


Online 17,000+ 3+ waves,
Food security Qs in April
2020, Food bank use in April
and May.

Food and You - estimated 21% (wave 4, 2016) and 20% (wave 5, 2018) of the UK population had some form of food insecurity.

~10% lived in households with low or very low food security.

Just under half of all respondents (47%) reported making at least one change in their buying or eating arrangements in the last 12 months for financial reasons.



My studies

“The Flag Study”, (n=701, 63% female) 25th and 30th March 2020

how consumer perceptions (food safety, animal welfare, deliciousness, purchase intention, energy density, carbon footprint) of three foods are influenced by information about the country of origin or ethical status information. Data was collected from UK-based consumers using an online survey (Prolific). <https://emeraldopenresearch.com/articles/2-35/v1>

“Phase 3” n=473, (62% female, uncleaned) 25th March to 7th April 2020,

How consumer perceptions, shopping and cooking habits, food waste, and food security status changed between 10 countries (10 foods+). Data collection from UK-based consumers was conducted using an online survey (Prolific)

“Food Insecurity and Lived Experience of Students” (FILES) (n=1,234, 72% female)

1st April to 30th April 2020

Surveyed higher education students, attending three universities in the UK and one in the USA using University and University Union email recruitment. Food insecurity, food access, ultra processed food, mental health.

<https://healthylivinguk.org/2020/06/11/university-students-facing-food-insecurity-due-to-pandemic/>



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Impact of flags and ethical logos on perceptions.

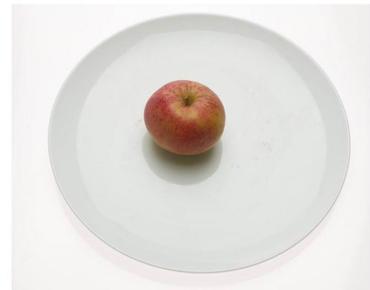
What did we investigate?



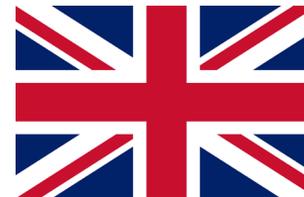
Chicken 112g



Pasta 238g



Apple 141g



+ Control (no label)

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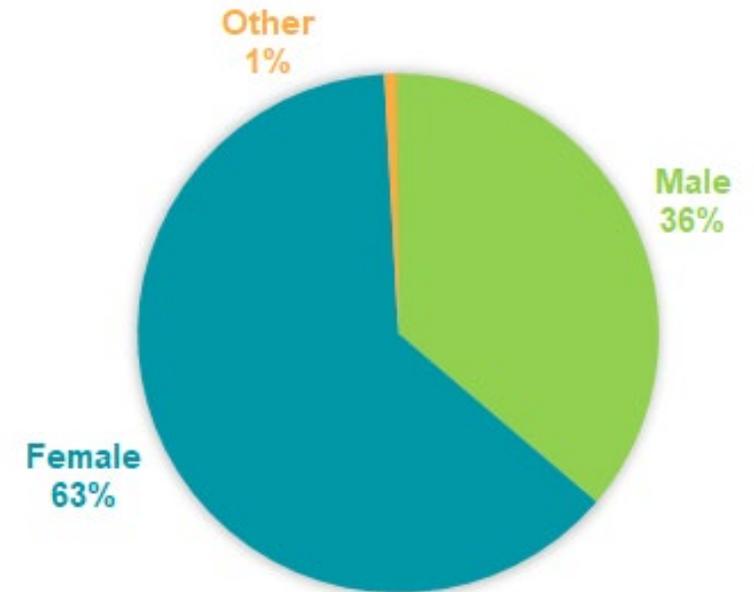
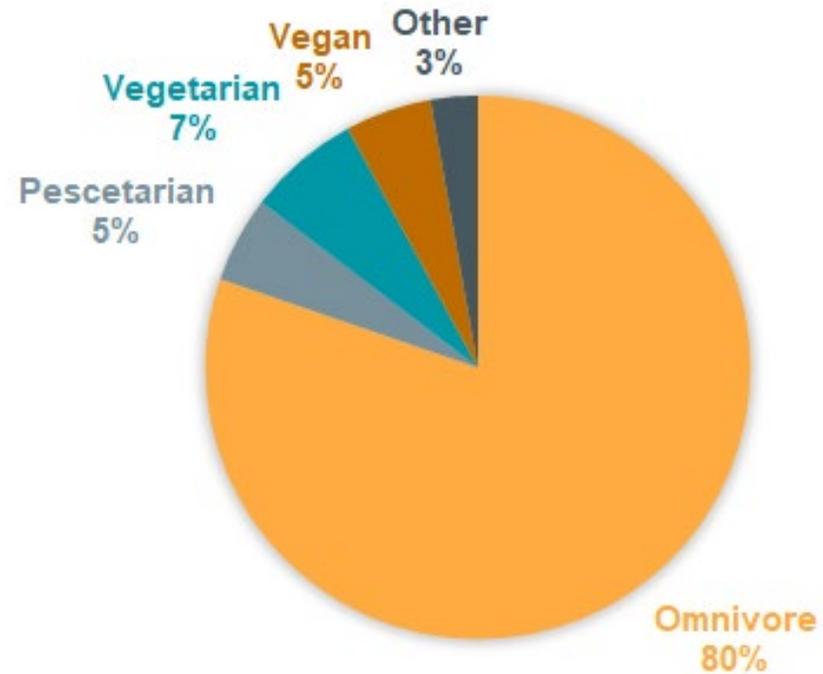
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- Calories
- Carbon footprint
- Deliciousness
- Purchase Intention
- Food safety
- Animal Welfare (chicken)
- Demographics
- BMI

- Prolific (online recruitment)

Who took part?

- UK sample
- 18-83 years (mean=34.68)
- N=698



Food Safety

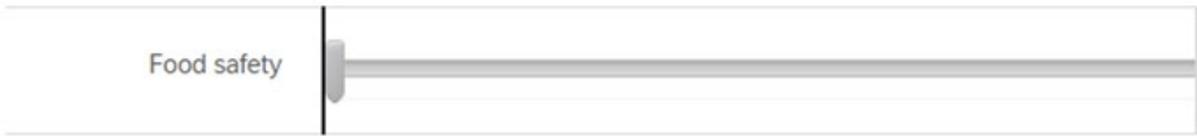
According to your best guess, please rate how safe to eat the foods listed below are? i.e. how likely is it that eating them will damage your health due to risks such as contamination, food poisoning, improper handling, food fraud, mislabeling etc.

We will ask many people the same question about these foods , so don't worry if you aren't absolutely sure. Just give us your best guess.

Low risk

High risk

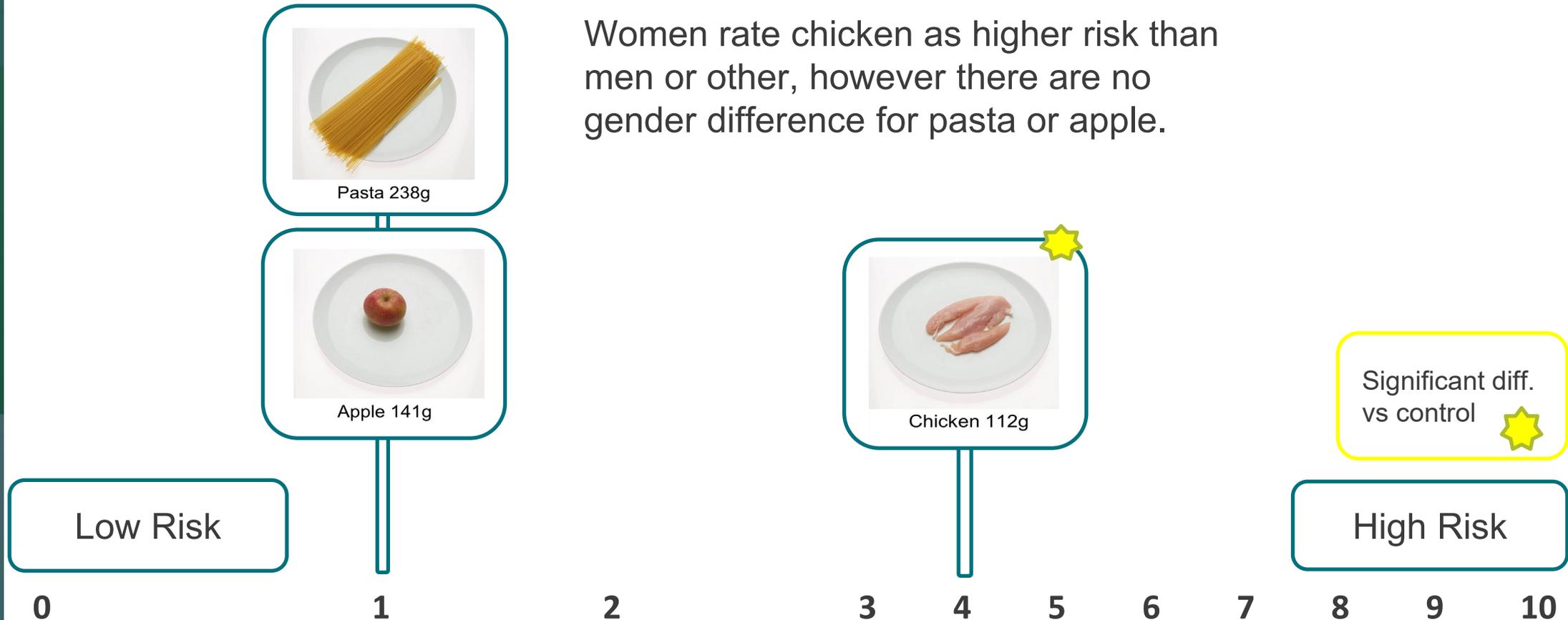
Food safety



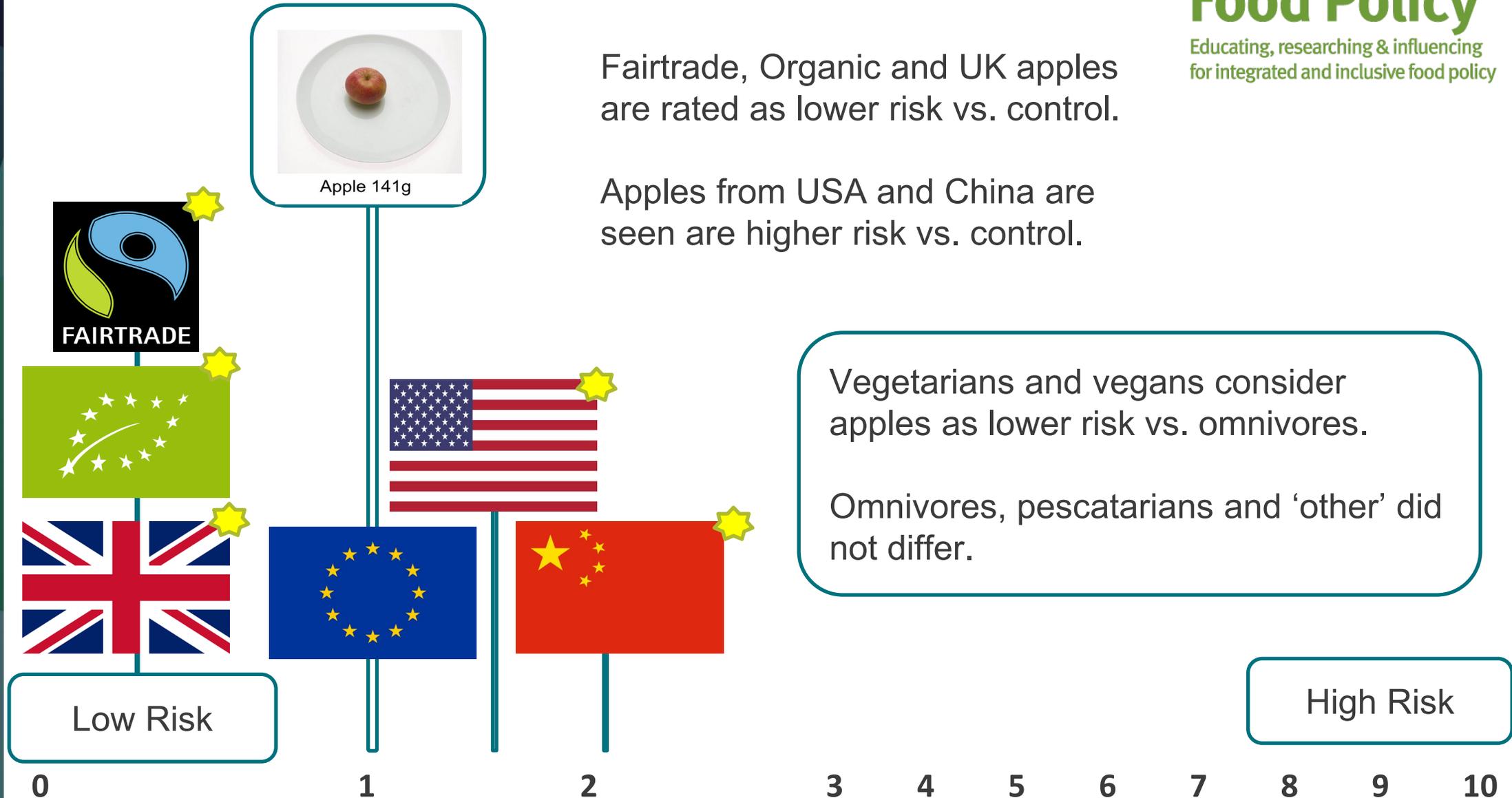
Food Safety: Controls

Chicken is rated as a higher risk food than pasta and apple.

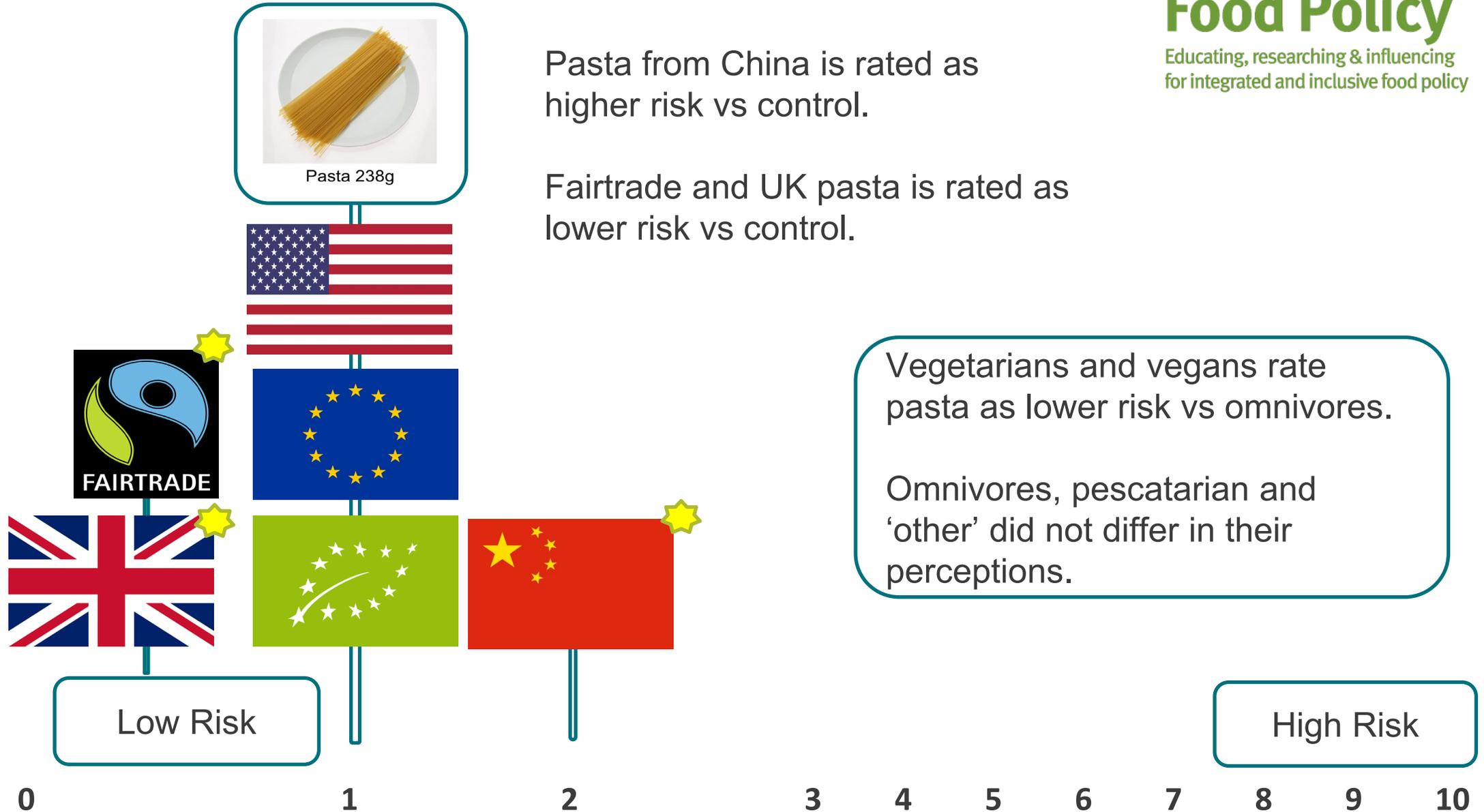
Women rate chicken as higher risk than men or other, however there are no gender difference for pasta or apple.



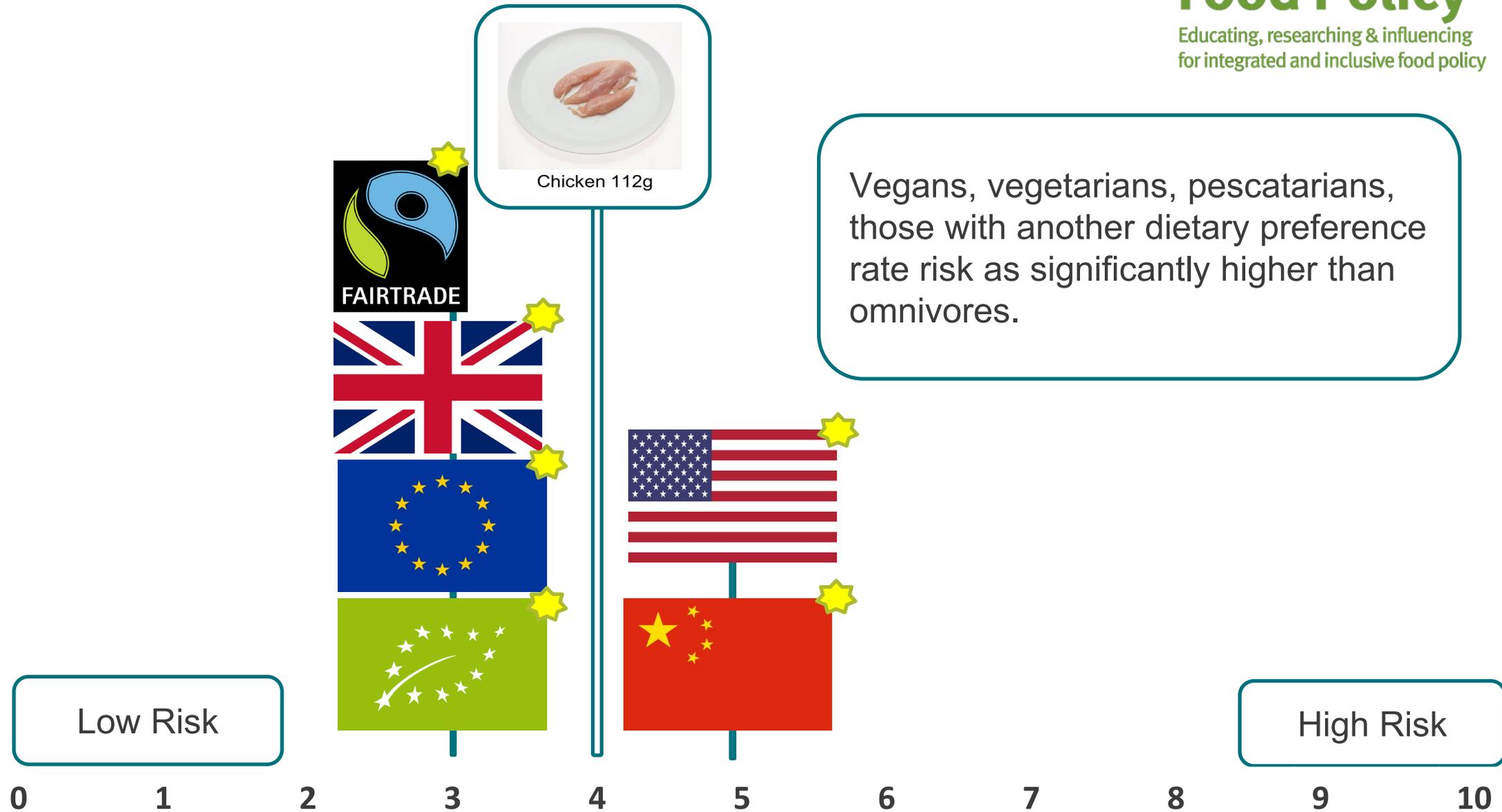
Apple: Food Safety



Pasta: Food Safety



Chicken: Safety



Chicken: Animal Welfare

According to your best guess, please rate how well animals are treated, and the quality in which they are kept to produce the foods listed below ? i.e. the quality of the conditions in which they are kept and how humanely they are slaughtered.

We will ask many people the same question about these foods , so don't worry if you aren't absolutely sure. Just give us your best guess

Low welfare High welfare

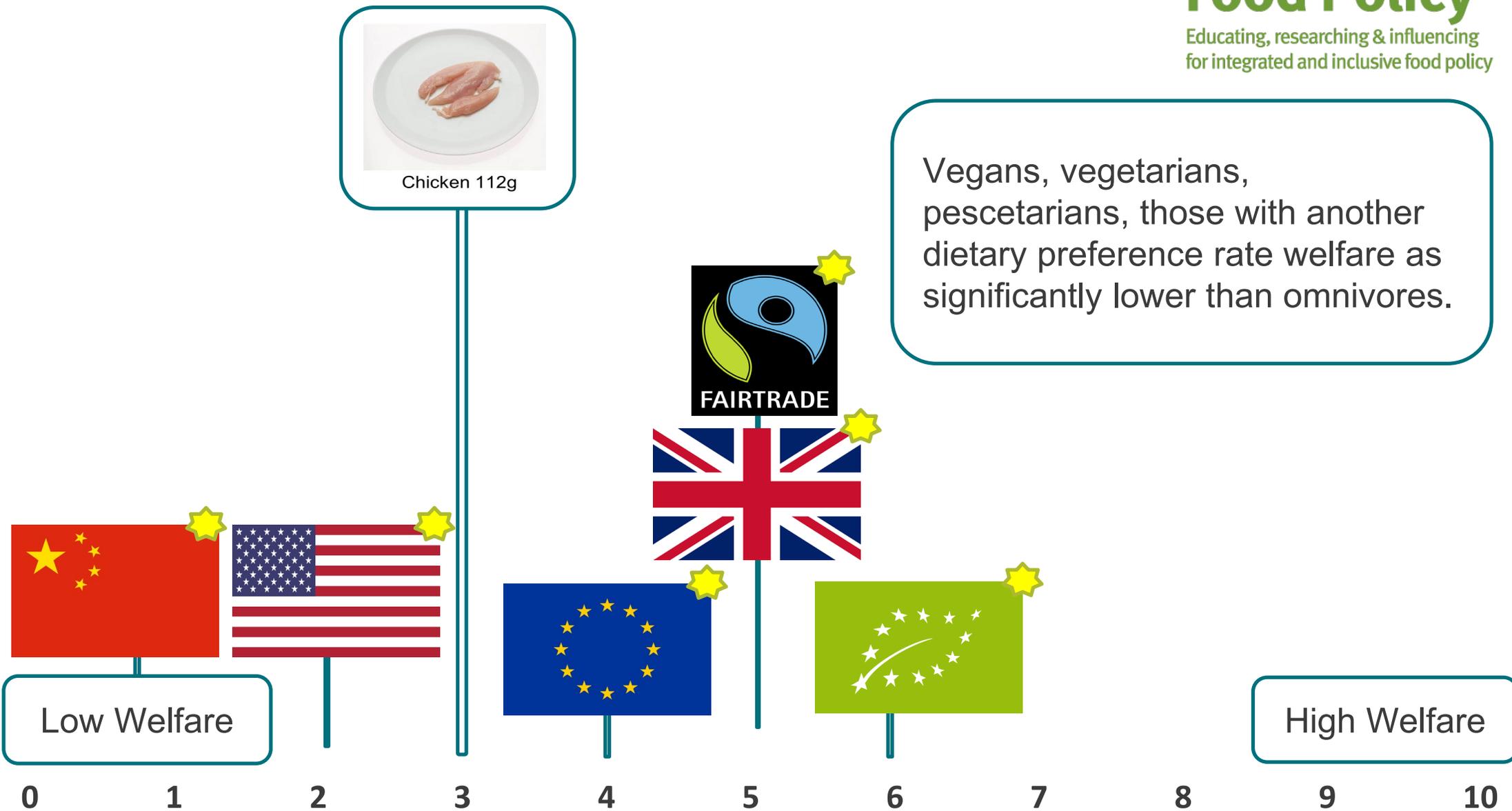
Animal Welfare



Chicken: Animal Welfare



Chicken 112g



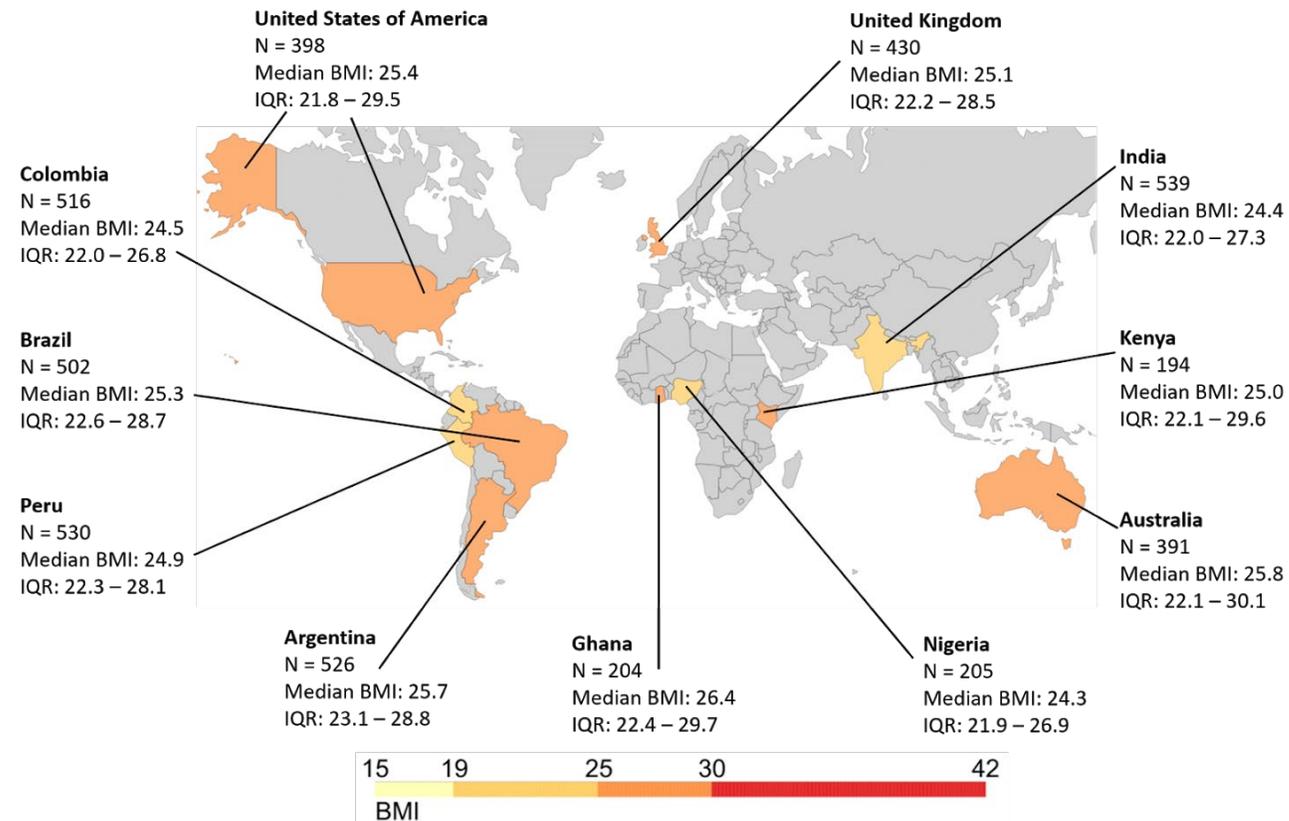
Chicken: Animal welfare- Food safety correlation

- Welfare and safety ratings are highlight correlated indicating consumers struggle to separate the variables.
- This relationship holds when flags or certification are considered.
- The correlation is strongest for vegetarians and vegans.

Conclusions

- Information about food origin and ethical status impacts animal welfare and food safety perceptions.
- Foods from the USA and China are considered to have lower animal welfare and food safety standards.
- The perception of some foods (pasta) are less susceptible to influence.
- Consumers struggle to separate the animal welfare and food safety.

“Phase 3” pilot



From the UK sample

39% of respondents have experienced food insecurity in the last 12 months.

Employment status, gender and number of children in the household were not associated with food insecurity. However being younger, a greater BMI and living in a smaller household were associated with experience of food insecurity.

These findings fit with the narratives presented in the other surveys of early lockdown.

Those who are food secure self-report throwing away a smaller percentage of uncooked and cooked foods compared to those who are food

insecure. We also identified differences in food waste behaviours and cooking confidence between the food secure and insecure consumers, and observe demographics associated with food insecurity.

Learning to cook at a younger age ($r(449)=-.27, <.001$) and being older ($r(448)=.25, p<.001$) are associated with greater cooking confidence.

Food (in)security was not associated with cooking overall confidence.

Food secure participants report greater cooking confidence with a range of cooking methods including boiling, stir frying, and roasting.

Sample too small to look at UPF/Food Security. We did not run the Food safety/GHGE/Calories analysis yet (waiting for the full 10 country comparisons)

FILES

Table 2. Frequency Distribution of Levels of Self-Reported Food Security by University Students during Covid-19 Lockdown (May 2020).*

Food Security	Frequency %
High Food Security	605 49.0%
Marginal Food Security	191 15.4%
Low Food Security	211 17.1%
Very Low Food Security	212 17.2%
Missing	15 1.2%
Total (n)	1,234

* Categories based on the Six-Item Food Security Scale developed by the U.S. National Center for Health Statistics in collaboration with Abt Associates Inc. See “by S.J. Blumberg, K. Bialostosky, W.L. Hamilton, and R.R. Briefel, 1999. “The effectiveness of a short form of the household food security scale,” American Journal of Public Health, 89, 1231-1234.

Table 10. How Students Prepare Food by Level of Food Insecurity

<u>Level of Food Security</u>	<u>Method of Preparation</u>		
	From Scratch - Minimally Processed Food	Semi-Finished - Minimally Processed	Ultra-Processed Foods
High Food Security	323 54.4%	251 47.5%	31 33.0%
Marginal Food Security	87 14.7%	88 16.7%	14 14.9%
Low Food Security	83 14.0%	109 20.6%	17 18.1%
Very Low Food Security	100 16.8%	80 15.1%	31 33.0%
Total n	593	528	93

*Missing Cases = 20

**Frequency (or number of students in each category) & (percentages)

33.0% of those who self-reported Ultra Processed Foods as their main type of food (from n=1,234), also experience very low food security - higher than that found in other dietary patterns. <https://www.researchgate.net/publication/341882323> Food Insecurity and Lived Experience of Students FILES

The link to sustainable healthy diets

Vulnerability to food insecurity since the COVID-19 lockdown

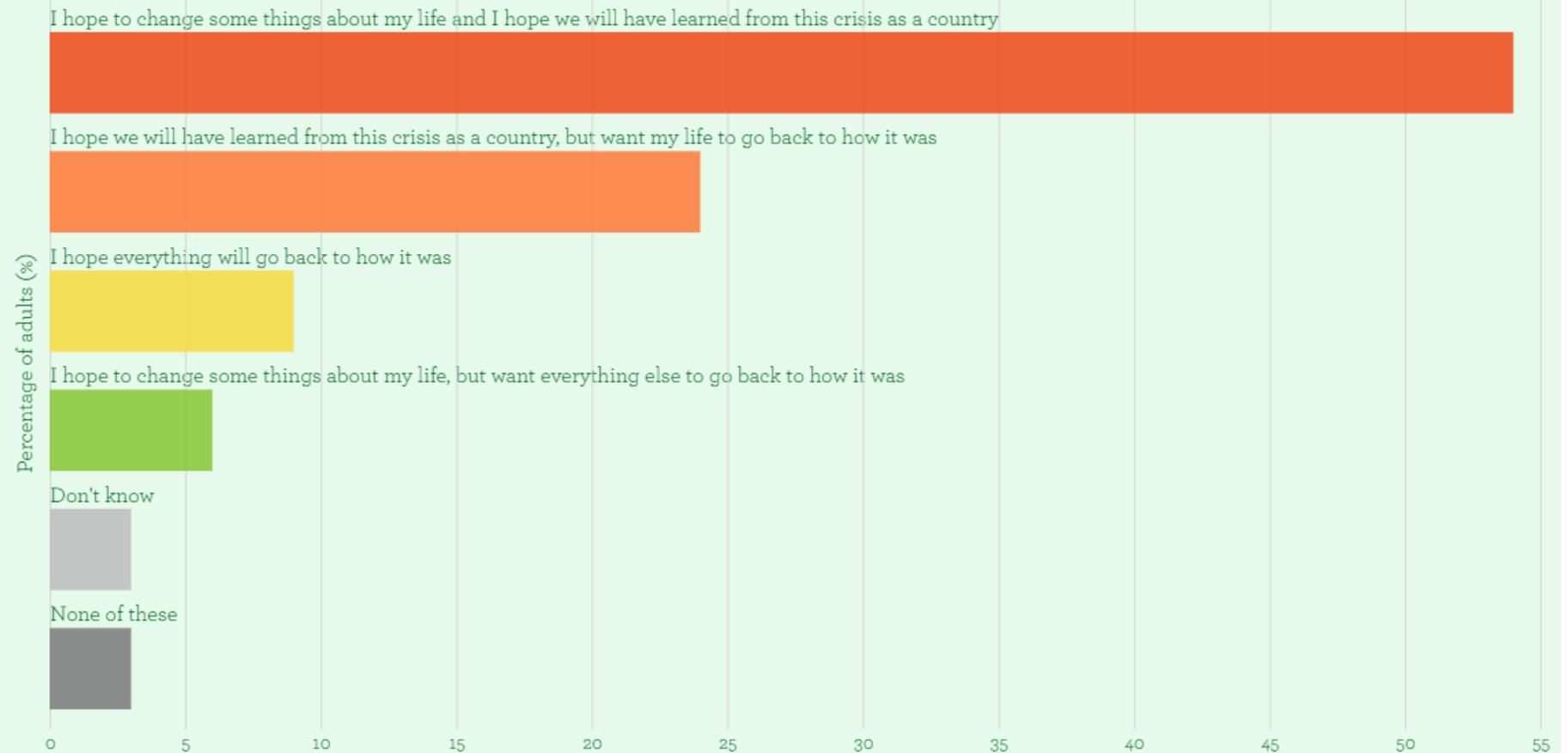
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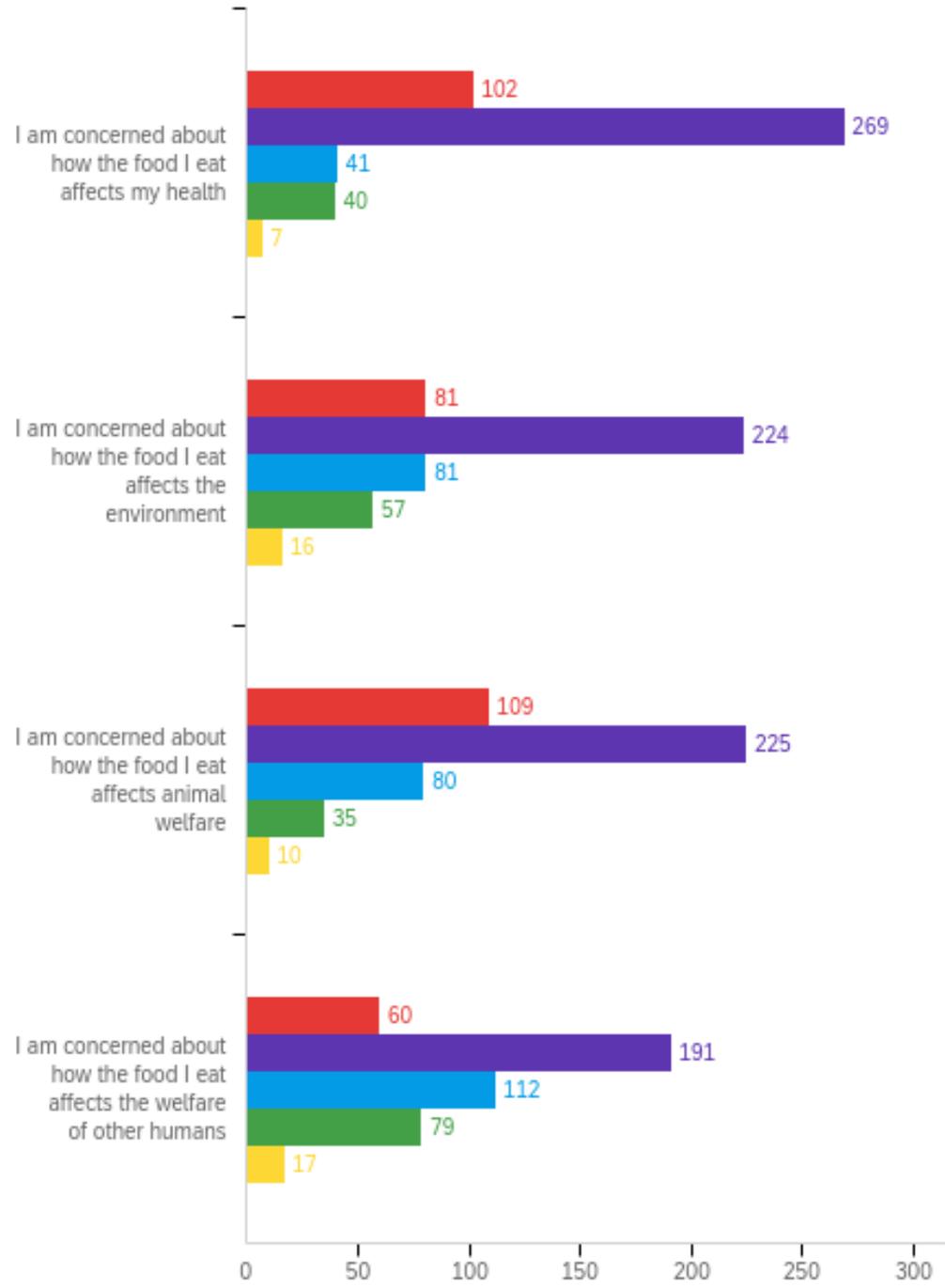
Rachel Loopstra
King's College London



Only 9% of adults want everything to go back to how it was before



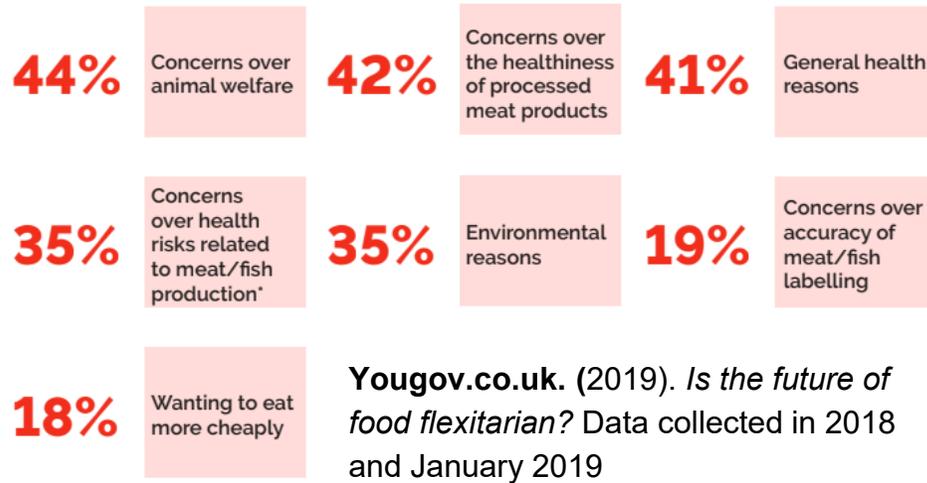
Online survey of 4343 adults in Great Britain conducted on 7th-9th April by YouGov Plc



- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

Phase 3 UK pilot, March 2020

Concerns that lead to reduced meat intake?



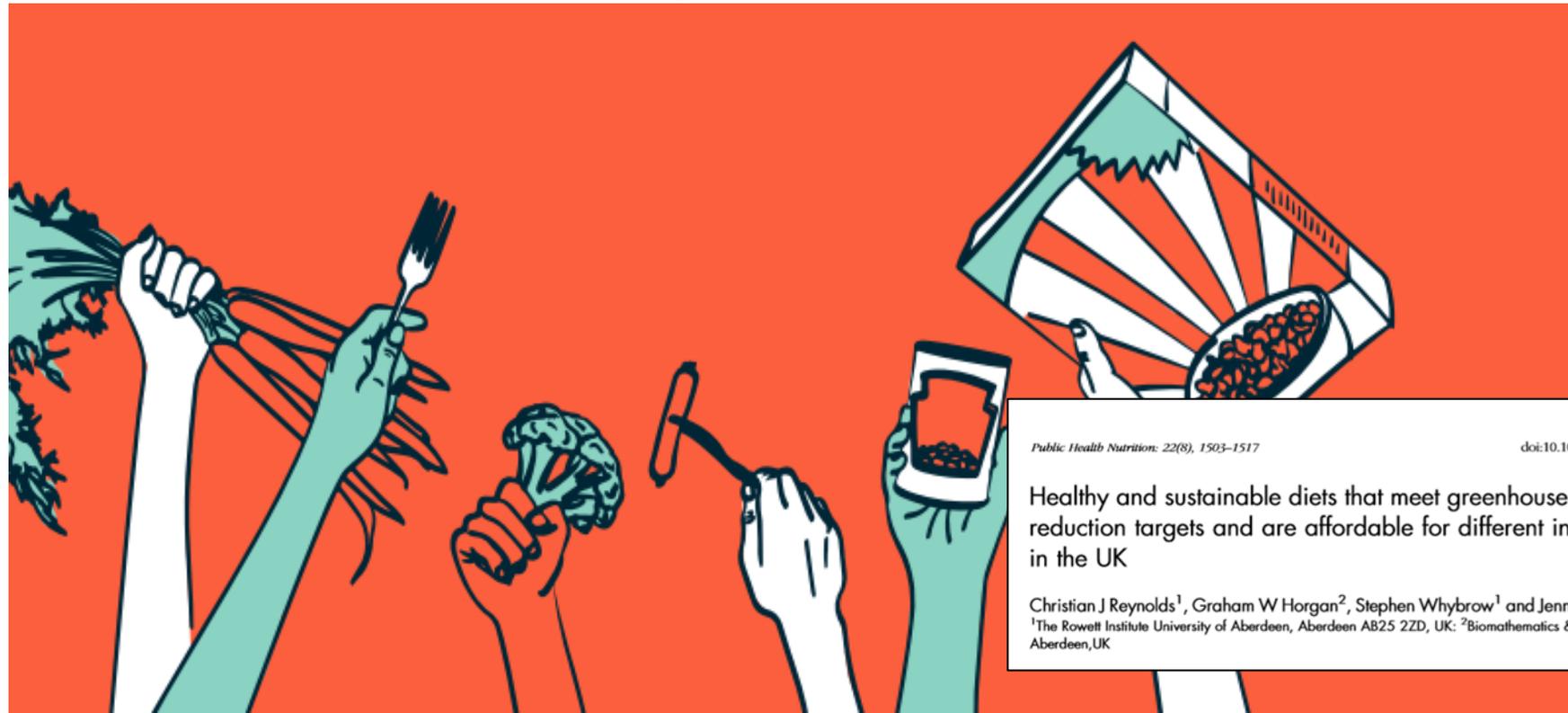
	I do not limit my meat intake	Concern for my health	It's expensive	Animal welfare concerns	Environmental concerns	I do not enjoy the taste of meat	Religious reasons	Other
Brazil	48.2	32.3	18.7	17.1	13.1	6.2	4.2	0.6
Ghana	20.1	65.2	23	10.8	14.2	9.8	17.2	2.5
India	14.8	42.7	12.6	28.9	29.7	13.7	29.9	10.6
Kenya	24.7	55.2	29.4	10.3	10.8	6.2	10.3	2.1
Nigeria	32.2	55.1	22.4	6.8	6.8	4.4	10.7	3.4
Argentina	44.3	29.5	24.5	15.4	11.6	7	3	1.3
Colombia	41.7	39	12.2	16.3	13.4	3.3	2.7	1.7
Peru	40	36.2	15.5	14.2	12.5	5.7	4.2	1.1
UK	37.7	28.4	18.4	31.4	32.1	11.2	1.9	4
USA	58.8	19.6	10.8	9.3	13.1	7	N/A	1
Australia	59.8	17.9	15.9	10.2	9.2	8.2	N/A	3.6

Phase 3 (2020) Multi county results – Reasons you limit your meat intake.

Start to personalise the narrative and the policy response

The UK population is fragmented in food practice, perceptions and beliefs.
To change the population we need to find the right foods to start the change.
This can be safety, convenience, price, moral, political or environmental reasons.
Each product is different.

COVID has provided us a moment of change – let's make the most of it!



Public Health Nutrition: 22(8), 1503–1517

doi:10.1017/S1368980018005774

Healthy and sustainable diets that meet greenhouse gas emission reduction targets and are affordable for different income groups in the UK

Christian J Reynolds¹, Graham W Horgan², Stephen Whybrow¹ and Jennie I Macdiarmid^{1,*}

¹The Rowell Institute University of Aberdeen, Aberdeen AB25 2ZD, UK; ²Biomathematics & Statistics Scotland, Aberdeen, UK



The University
Of Sheffield.
Institute for
Sustainable Food.

Comments?
Questions?

Dr Christian Reynolds

Centre for Food Policy, City, University of London



@sartorialfoodie

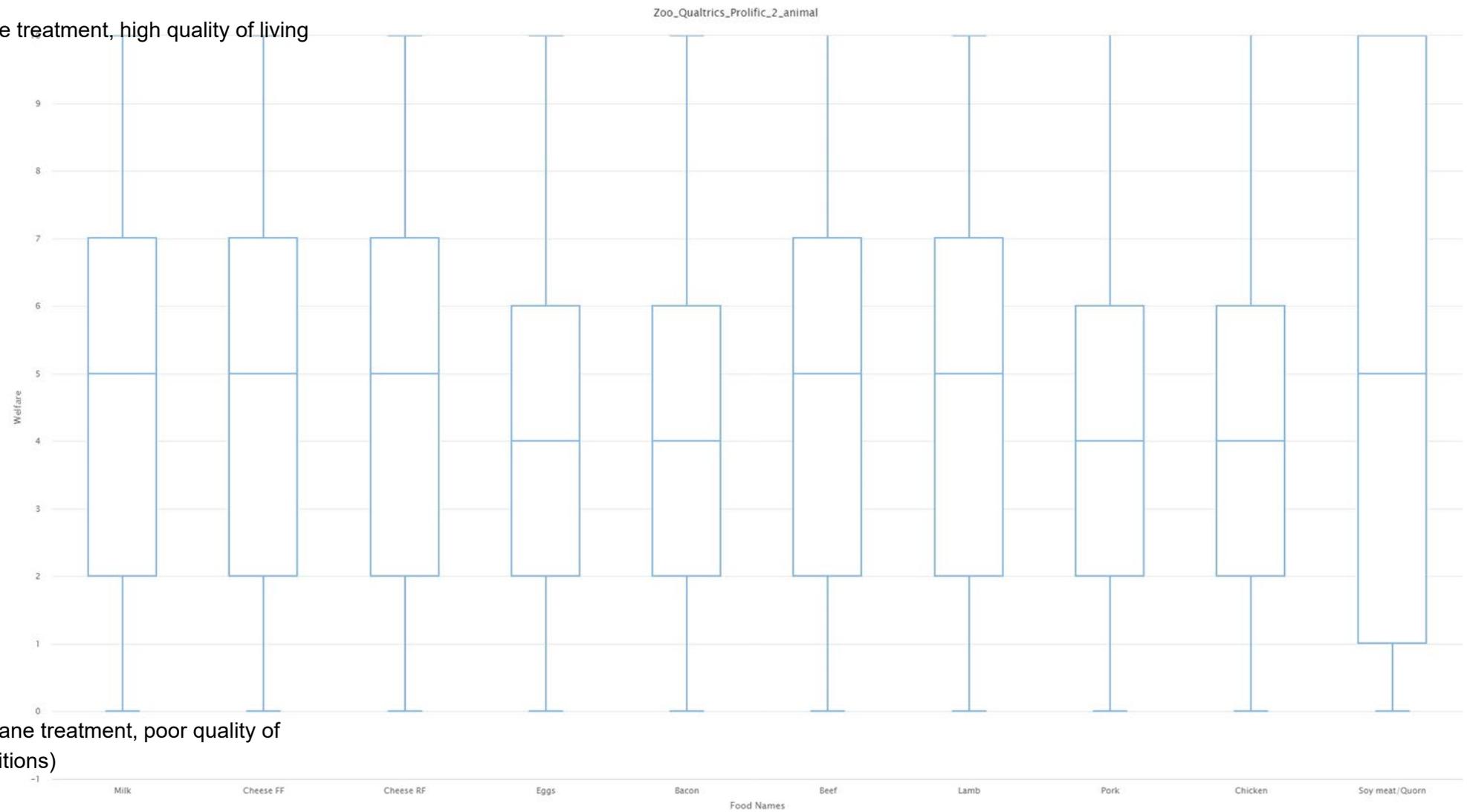
christian.reynolds@city.ac.uk

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Animal welfare - no “normal” distributions

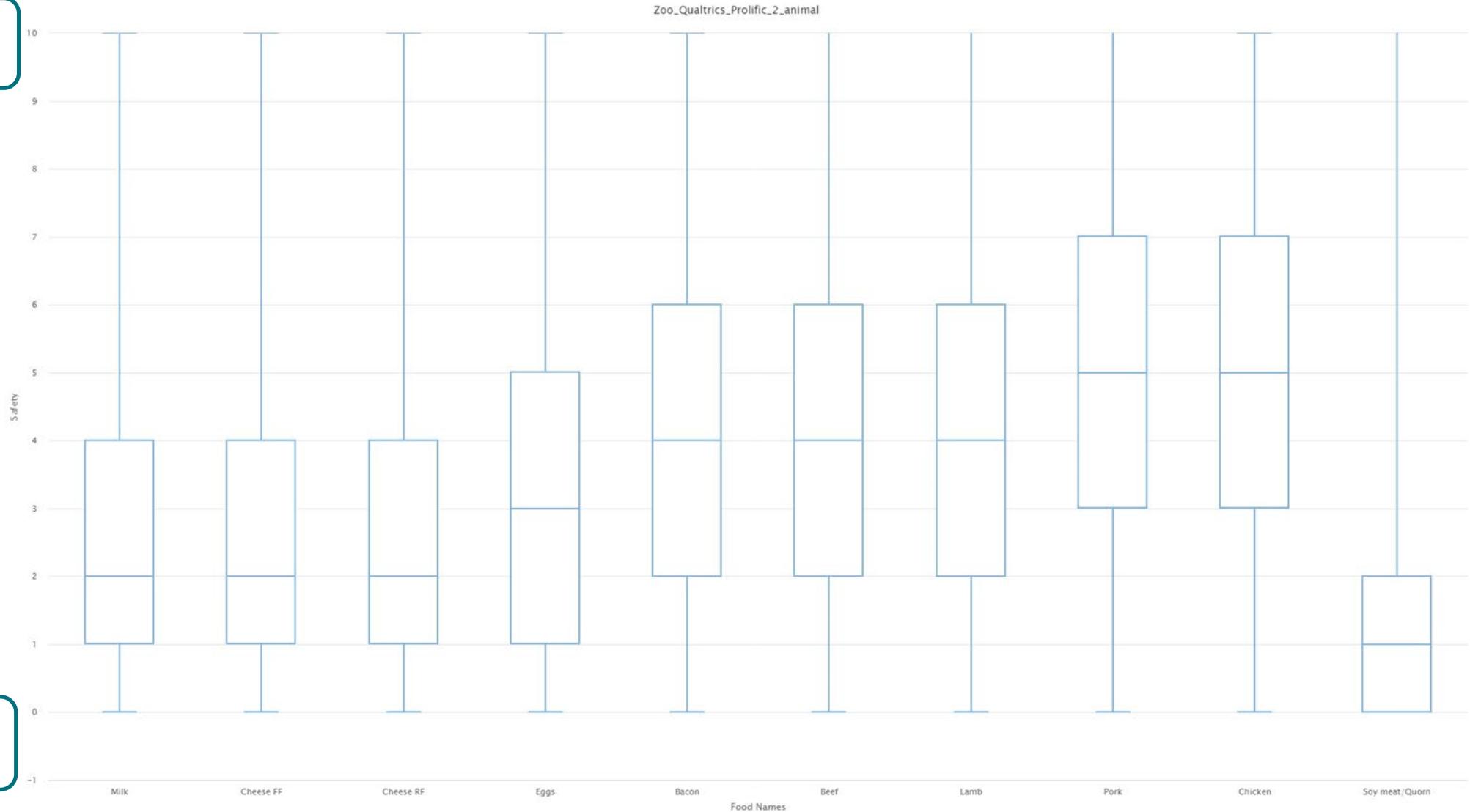
10 (humane treatment, high quality of living conditions)



0 (not humane treatment, poor quality of living conditions)

Food Safety - no “normal” distributions

High Risk

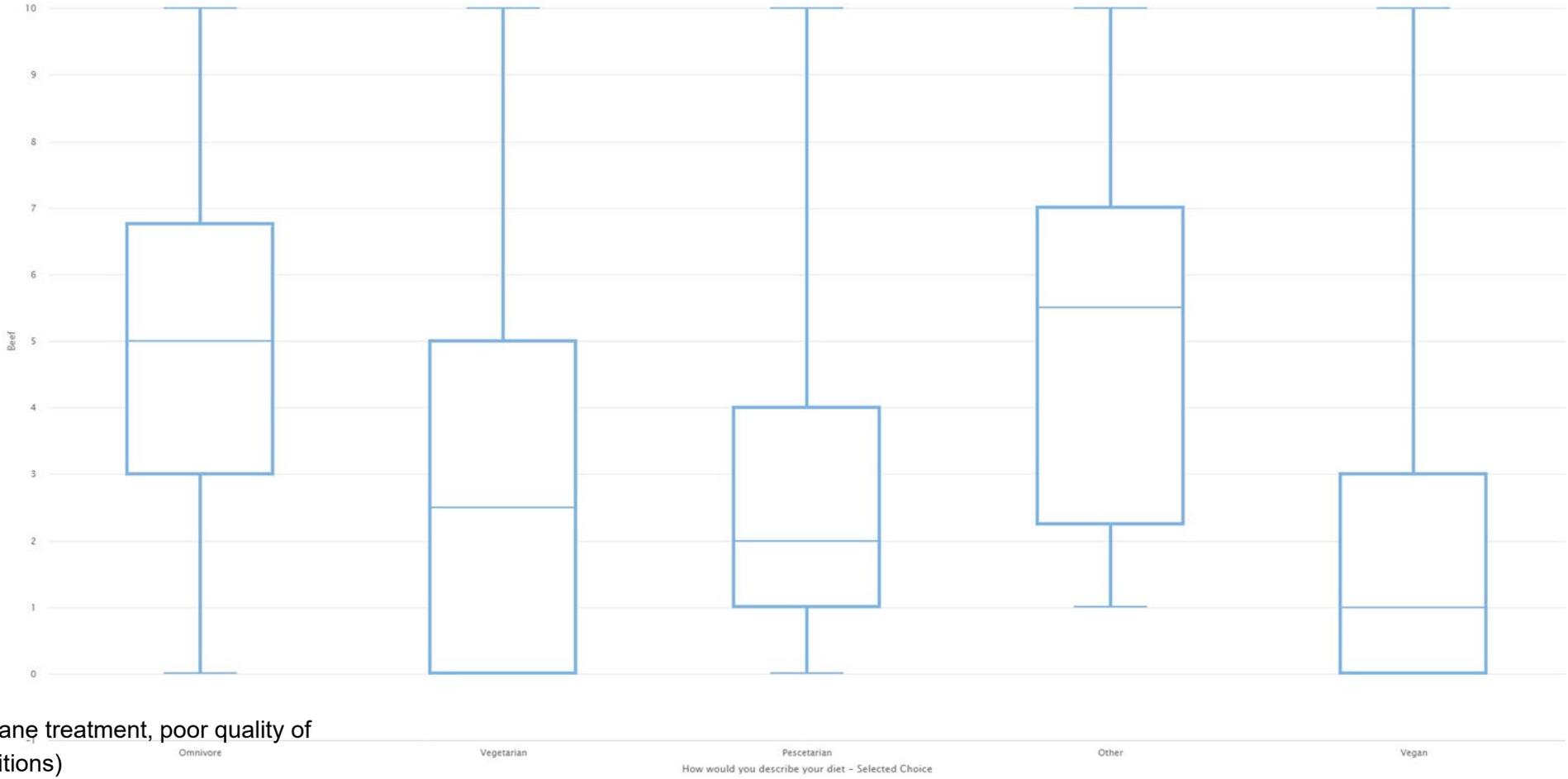


Low Risk

Animal welfare Beef

Animal Welfare UK

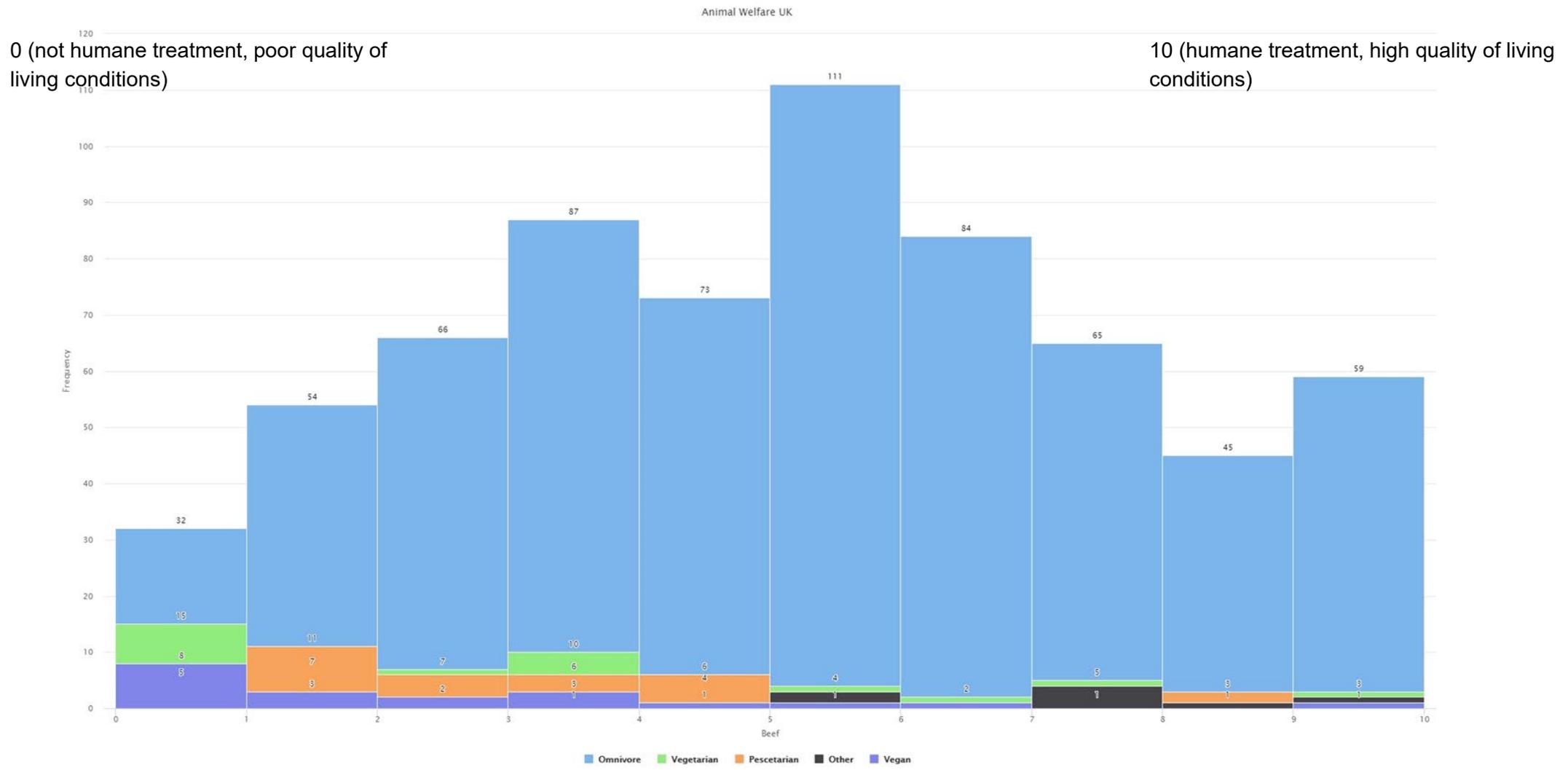
10 (humane treatment, high quality of living conditions)



0 (not humane treatment, poor quality of living conditions)

How would you describe your diet - Selected Choice

Animal welfare Beef



Animal welfare Milk

0 (not humane treatment, poor quality of living conditions)

Animal Welfare UK

10 (humane treatment, high quality of living conditions)

