BU MATCH-FUNDED STUDENTSHIPS 2024 APPLICATION FORM

***Notes**: Recommended word lengths for each section are indicated in brackets.*

1. PROJECT DETAILS
Project Title
Reducing Free Sugar Intakes: A Role for Sweet Taste
Project Summary *[Up to 1000 words. Please state clearly the aims, rationale, methods, and outcomes of the project(s). Demonstrate clearly that the proposed research is: innovative, timely, and will lead to clearly defined research outputs.]*

Rationale: Free sugar intakes have been reliably associated with a number of poor health outcomes, including cardiovascular disease, diabetes and obesity (1), to result in current recommendations for consumers to reduce free sugar intakes (2,3). To facilitate adherence to these recommendations, various public health bodies also recommend reducing intakes of 'sweet foods', regardless of the source of the sweet taste (e.g. 3). However, low-calorie-sweeteners were developed with the primary purpose of providing sweet taste without the energy associated with sugar (4), and may facilitate adherence to recommendations to reduce free sugar intakes through the maintenance of a palatable diet (4).

Recent work of ours demonstrates the value of a single time-point dietary advice sheet for reducing free sugar intakes in UK high free sugar consumers (>5% total energy intake from free sugars) from ~10% total energy intakes to ~7% total energy intakes (5,6). Dietary advice sheets provided advice on sugar, high-sugar foods and substitutions for high-sugar foods in an additive manner, with some early benefits for the group receiving the advice on substitutions (6). Pilot work following this, funded by The Coca-Cola Company, demonstrates some benefit from providing substitutions intended to maintain the sweet taste of the diet (7). Evidence from the NDNS further suggests that the food groups contributing most to UK adult free sugar consumption are cereals and cereal products, including biscuits, cakes and pasties (26% free sugar consumption), sugar preserves and confectionary, including table sugar, confectionary and sweet spreads (24% free sugar consumption), and non-alcoholic beverages, including soft drinks, fruit drinks and tea and coffee (18% free sugar consumption) (8). Thus, advice specific to these foods may be of particular value.

Aim: This project will build on the previous work to investigate the value of a focus on taste for reducing free sugar intakes. Advice to substitute high-sugar foods will be provided to willing UK adult high sugar consumers (>5% total energy intake from free sugars (2)), and effects investigated for the following 12 weeks. The advice will focus on substituting high-sugar foods for 1) **sweet tasting low-sugar foods** or 2) **non-sweet, but high-taste low-sugar foods**, e.g. foods flavoured with herbs, spices, nuts and seeds, versus control, where no specific taste will be mentioned. The advice will stem from Public Health England (2), supplemented to target the three food groups known to contribute most to free sugar intakes in UK adults. Differential effects in intakes of these three food groups will also be investigated.

Methods: The work will be undertaken using a randomized controlled trial design. Healthy UK adult volunteers with high free sugar intakes (>5% total energy intake (2)), will be randomized to one of three dietary advice groups: 'Reduce your intake of free sugars by substituting high-sugar foods with':

- Low-sugar sweet foods, e.g. low-calorie-sweetened foods, fruits;
- Low-sugar foods high in a non-sweet taste, e.g. herb-flavoured crispbreads, spiced or nut yoghurts;
- Low-sugar low-taste foods, e.g., plain crispbreads, plain yoghurts.

In anticipation of a 2% difference in free sugar intakes as a % of total energy intake, between the two taste intervention groups and control, 60 participants per intervention group will be needed, resulting in a total sample size of 180 participants. Outcomes will be assessed using food diaries and laboratory test days at baseline, after 4 weeks and at the end of 12 weeks. Impacts on specific food groups and on participant diets will be investigated

using secondary analyses. Participant experiences will also be investigated throughout the study using study-specific questionnaires, based also on our previous work (6).

Outcomes: The project will provide knowledge on the role of taste, and specifically the role of sweet taste, while attempting to reduce free sugar intakes, and will demonstrate the value of each strategy for consumers. The knowledge generated will be of value to Governments and public health professionals around the world, and will provide evidence of a role (or not) for low-calorie-sweeteners, fruit, their products and other flavoured products for reducing free sugar intakes; knowledge that will also be of value for the food industry. The work will also further understanding of dietary advice for encouraging free sugar intakes, including the advice to target specific food groups.

References

1. World Health Organization. Geneva: WHO, 2015;
2. Public Health England. 2017. Website: www.gov.uk.
3. World Health Organization. 2015. Website: http://www.emro.who.int/nutrition/strategy/ policy-statement-and-recommended-actions-for-lowering-sugarintake-and-reducing-prevalence-of-type-2-diabetes-and-obesity-inthe-eastern-mediterranean-region.html.
4. Mattes, RD. Physiol Behav. 2016; 164: 429–31.
5. Boxall, LR, et al. Proceedings, 2023; 91: 425.
6. Boxall, LR, et al. Am J Clin Nutr, under review.
7. Appleton, KM, et al. Proc Nutr Soc., under review.
8. Public Health England. 2020. National Diet and Survey. Website: https://www.gov.uk/government/statistics/ndns-results-from-years-9-to-11-2016-to-2017-and-2018-to-2019

Academic Impact

[Up to 300 words. Please state clearly what the academic impact and output of this research will be beyond .]

This project will demonstrate the impact of different dietary recommendations for reducing free sugar intakes and specifically, the role of sweet taste and sweet tasting foods in the success, or not, of the different dietary recommendations. The project stems directly from a previous randomised controlled trial conducted here at BU by PhD student Lucy Boxall and combines the results from this trial with current interests in sweet taste to investigate an explicit role for low-energy sweet tasting foods, e.g. low-calorie sweeteners, fruit, in achieving reduced free sugar intakes. A pilot version of the proposed study has already been undertaken with the funder, to demonstrate feasibility and potential interest. As the largest trial of its kind, we anticipate publication of this work in one of the highest ranking Psychology, Nutrition or Medical journals, e.g., American Journal of Clinical Nutrition. The work lies at the forefront of current interests in reducing free sugar intakes. The previous trial by Boxall et al., was presented at the Federation of European Nutrition Societies 4-yearly meeting last November, and is currently submitted for publication. Lucy will also present her PhD work at a UK Nutrition Society meeting this summer. The pilot study funded by The Coca-Cola Company will be presented at the same meeting by myself, the PI on the previous project. The proposed work will be presented at a number of academic conferences during and following completion, in fields of Psychology, Nutrition, Medicine and Health e.g., Annual Meeting of the Society for the Study of Ingestive Behaviors, Annual Meeting of the British Feeding and Drinking Group. Presentation at these conferences is intended to increase exposure for the work, ensure appropriate contact with other researchers working in the field, and will result in the publication of conference proceedings.

Societal Impact

[Up to 300 words. Please state clearly what the non-academic impact (beyond that benefiting the specific funder) and output of this research will be.]

Of equal importance, the work directly addresses a huge current public health concern – the high consumption of free sugars in the UK and around the world, and the resultant negative impacts of this consumption on health. The work will be of direct value to practitioners, public health policy makers, and to the food industry. From a public health perspective, evidence of a role for sweet taste (or no role) in reducing free sugar intakes will allow the development of recommendations for consumers to limit (or demonstrate no need to limit) the consumption of sweet tasting foods for health benefit. The work will demonstrate an important distinction between sweet food intakes and sugar intakes, to result in evidence-based recommendations for reducing free sugar intakes while also

considering sweet food preferences and dietary palatability. The health risks associated with free sugar intakes contribute significantly to global mortality and morbidity, and consideration of preferences and dietary palatability will only aid adherence to dietary recommendations. For the food industry, the work will demonstrate the need (or no need) to reduce the sweet taste of foods, alongside the need to reduce their sugar content, and will demonstrate a role for sweeteners in product formulation and reformulation in the industry response to recommendations to reduce free sugar intakes. We anticipate considerable interest in this work from public health bodies and from the food industry. Since its publication in 2018, a review of ours on the role of sweet taste in the diet (Appleton et al., Am J Clin Nutr 2018; 107: 405-19. doi: 10.1093/ajcn/nqx031) has resulted in invitations to speak at over 10 international meetings for dieticians and health professionals, and for the food industry.

PGR Development Opportunities

[Up to 300 words. Please state clearly how this project will offer the successful candidate opportunities for development.]

The PhD candidate will have access to all training courses from Bournemouth University's Doctoral College. They will also undertake specific training as required for the work, e.g., training in food hygiene, training in RCT design and conduct, analysis of large data sets. Informal training will also be gained from undertaking all work. The project has been designed to give in depth experience of the running of an RCT, the collection and analysis of dietary data, and the analysis of large data sets, and the candidate will be proficient in these by the project end. The candidate will be housed in the Health and Clinical Research Theme in the Department of Psychology at Bournemouth University, and within this, in Katherine Appleton's research team. This team currently comprises two other PhD students working on sugar-related projects, two PhD students working on different topics, and we have additional external funding for work in the sugar-related area. The proposed project work will predominantly be independent in nature, but collaboration with study participants, with internal and external research support services and systems, and with other members of the research team will be required to facilitate success. The candidate will also benefit from the training provided through regular PhD events, regular research group meetings at Bournemouth University, from regular participation in both internal and external academic conferences and from contribution to meetings with the food industry funder.

Research Ethics / Health & Safety Considerations

[Up to 300 words. Please state clearly all Research Ethics / Health & Safety considerations in relation to this research.]

The work will be undertaken with human participants, thus all aspects of the work will require ethical approval. All work however, will pose only low ethical risk. The work will involve adults, with no health concerns and/or conditions, who are able to fully understand and consent to all procedures. Participants will be required to consume foods as part of the testing procedures for the study, but they will be entirely free to choose their own foods, and in fact food choice will be an outcome of the research, so needs to be flexible. Allergies will be investigated prior to inclusion in the study and all foods will be commercially available. All studies will be conducted in accordance with the Declaration of Helsinki, and current guidelines from the British Psychological Society. Ethical approval will be received from Bournemouth University, prior to the conduct of all studies. Strict inclusion / exclusion criteria will be adhered to to ensure participant safety and comfort. We do not anticipate any health and safety risks beyond those incurred in everyday life. Training in food hygiene for the provision of foods to others will be undertaken. We have considerable experience of undertaking this type of work, and have the facilities and resources necessary for running the proposed study.

BU Research Themes

[Max: 300 words. Please provide a short statement on how your project aligns to one of BU's Research Themes

☒ Helping people to live better for longer	☐ Helping protect and preserve a sustainable environment	☐ Preparing for and recovery from crisis
☐ Helping creative industries and cultural heritage to thrive	☐ Using our expertise to be a catalyst for growth, boosting skills and advancing the region	☐ Challenging marginalisation, misinformation and under-representation

Research Costs

[Up to 300 words. Please provide a breakdown of research costs specific to this project (e.g., fieldwork, laboratory work, insurance, specific

equipment, travel, etc.) and how these will be met.]
Costs for the full studentship have been taken from the website for Bournemouth University at https://www.bournemouth.ac.uk/study/postgraduate-research/postgraduate-research-fees-funding. These are for a studentship for 3 years, starting Sept., 2024, and include fees (UK student): £14,136; stipend: £57,935; research costs, inc. training £3,000; and additional research costs and meeting attendance costs for the supervisor £2,000. Research costs include costs for participant recruitment, all aspects of running the trial, including the need for printed materials, questionnaires, all test materials, and all study foods. These costs will be covered by the £3,000, which will also allow for costs for external training for the candidate as appropriate, and conference attendance. Additional research costs have also been requested primarily for meeting attendance for the supervisor to meet with the funders as requested, and to meet with other scientists in the field. Total cost requested from the funder: £71,077, approx. 89,400 USD.

2. SUPERVISORY TEAM DETAILS				
Lead Faculty	☐ FHSS	☐ BUBS	☐ FMC	☒ FST
Collaborating Faculty (or Faculties)* *priority will be given to projects demonstrating collaboration from two or more Faculties*	☐ FHSS	☐ BUBS	☐ FMC	☒ FST
Lead Department				
Psychology				
Collaborating Department(s)				
Psychology				
Unit(s) of Assessment (UoA)				
4				
Lead supervisor	Name	Katherine Appleton	Early Career Researcher[1]	☐ Yes ☒ No
	Qualified Supervisor *(*defined as having a current Certificate of Supervision)*	☒ Yes ☐ No	Status	☒ Internal ☐ External
	Number of current PGRs	4	Number of completions	9
Supervisor 2	Name	Betul Tatur	Early Career Researcher	☒ Yes ☐ No
	Qualified Supervisor *(*defined as having a current Certificate of Supervision)*	☐ Yes ☒ No	Status	☒ Internal ☐ External

[1] An ECR in this context is defined as an individual who is within eight years of the award of their PhD or equivalent professional training, or an individual who is within six years of their first academic appointment. These durations exclude any period of career break, e.g. for family care or health reasons. The 'first academic appointment' is defined as the first paid contract of employment, either full-time or part-time, which lists research and/or teaching as the primary functions. The award of PhD is defined at the point of successful PhD viva.

	Number of current PGRs	0	Number of completions	0
Supervisor 3	Name	Susan Roberts	Early Career Researcher	N/A
	Qualified Supervisor *(*defined as having a current Certificate of Supervision)*	N/A	Status	☐ Internal ☒ External
	Number of current PGRs	N/A	Number of completions	N/A
Please explain the rationale for the selection of the supervisory team	Professor Katherine Appleton has considerable expertise in the sweet taste area, with several pieces of research now contributing to reducing free sugar intakes. She has considerable experience of supervising research students and is a PGCE recognised research supervisor. Dr Tatar is a lecturer at Bournemouth University, she is an ECR who has been at Bournemouth University for her first academic appointment since completing her PhD, for only 6 months. She has a PhD in behaviour change in relation to eating behaviours from the University of Glasgow, offering valuable support for the project. Katherine Appleton is ideally placed to provide her with good training and mentoring in PhD supervision. Susan Roberts will act as our external contact for the funder. She is a senior scientist, with considerable understanding of the public health and food industry concerns associated with free sugar intakes, and plentiful experience of research projects. She will offer valuable guidance from the food industry perspective.			
Recent relevant publications by supervisors	- Tang CS, Mars M, James J, Appleton KM. Associations between attitudes towards and reported intakes of sugars, low/no-calorie sweeteners and sweet-tasting foods in a UK sample. Appetite, 2024, 194, 107169. DOI: 10.1016/j.appet.2023.107169 - Boxall LR, Arden-Close E, James J, Appleton KM. Protocol: The effects of nutrient- vs food-vs food-substitution-based dietary recommendations for reducing free sugar intakes, on free sugar intakes, dietary profiles and sweet taste outcomes: A randomized controlled trial. Nutrition & Health, 2024, 30, 269-278. https://doi.org/10.1177/02601060221111234 - Appleton KM, et al. No effects of sweet taste exposure at breakfast for 3 weeks on pleasantness, desire for, sweetness or intake of other sweet foods: A randomized controlled trial. Brit J Nutr, 2022; 127; 1428-1438. doi:10.1017/S000711452100235X - Tang CS, Mars M, James J, de Graaf K, Appleton KM. Sweet Talk: A qualitative study exploring attitudes towards sugars, sweeteners and sweet-tasting foods in the United Kingdom. Foods, 2021; 10: 1172. - Trumbo PR, Appleton KM, et al. Perspective: Measuring sweetness in foods, beverages, and diets: Toward understanding the role of sweetness in health, Adv Nutr 2021; 12: 343-54. - Rogers PJ, Appleton KM. The effects of low-calorie sweeteners on energy intake and body weight: a systematic review and meta-analyses of sustained intervention studies. Int J Obesity 2021; 45: 464-78. - Appleton KM, et al. Sweet taste exposures and the subsequent acceptance and preference for sweet taste in the diet: Systematic review of the published literature. Am J Clin Nutr, 2018; 107: 405-19. - Papies EK, Barsalou LW, Claassen MA, Davis T, Farrar ST, Gauthier E, Rodger A, Tatar B, Wehbe LH, Werner, J. Grounding motivation for behavior change. In *Advances in experimental social psychology 2022,* Vol. 66, pp. 107-189. - Tatar B, Glandorf HL, Papies EK. A brief decentering mindfulness induction to modulate the link between eating simulations and desire for attractive food–Does domain specificity matter?. *PsyArXiv. Preprint, 2022, July*, *27*. - Tatar B, Glandorf HL, Papies EK. A brief decentering mindfulness induction to modulate the link between eating simulations and desire for attractive food–Does domain specificity matter?. *PsyArXiv. Preprint, 2022, July*, *27*.			

3. MATCH-FUNDER DETAILS

Name of Match-Funder
The Coca-Cola Company, US.
Relevance of Match-Funder to the Research Project *[Up to 300 words. Please explain the link between, and appropriateness of, the match-funder and this project.]*
Funding for the project will be provided by The Coca Cola Company (TCCC). TCCC is an American multinational corporation founded in 1892. It is a major drink industry company which manufactures, sells, and markets Coca Cola, other non-alcoholic beverage concentrates and syrups, including water and hydration products, and some alcoholic beverages. The vision of TCCC is to craft the brands and choice of drinks that people love, to refresh them in body and spirit, and in ways that create a more sustainable business and better shared future that makes a difference in people's lives, communities and our planet. TCCC funded the pilot work on which the proposed project is based.
Due Diligence Review *[Please complete a due diligence review in line with the process set out in the Due Diligence for Studentship External Match-Funder and indicate the result below]*

☐ ***Due Diligence is NOT Required***	☒ ***Minimal Risk***	☐ ***Above Minimal Risk*** – *but has UET approval*	☐ ***Category 1***

Attachments	☒ Due Diligence Report and supporting information. Final approval of the project will be subject to satisfactory Due Diligence checks on the proposed match-funder	☒ Letter of support from the match-funder clearly indicating the amount of funding available, acknowledgement of terms and conditions and details of the approximate costs of in-kind contributions

4. FACULTY SUPPORT COMMENTS & SIGNATURE
• *I confirm that the level of risk identified by in the Due Diligence Report has been identified correctly.* • *I acknowledge that the faculty will support any research costs associated with the project and not covered by the match-funder.* • *I acknowledge that if a match-funder withdraws support at any point after a candidate receives an offer, the lead faculty will be responsible for matching the central contribution.*
This studentship has my full support.

Signature of Faculty DDRPP	Tiantian Zhang	Date	04.06.24