

Food Aid Inequality Rectified (FAIR-food)

Programme Protocol

PRINCIPAL INVESTIGATOR	
Name:	Professor Dianna Smith
Address:	School of Geography & Environmental Science, University of Southampton
Email:	D.M.Smith@soton.ac.uk
CO-INVESTIGATORS	
Dr Jenny Baverstock (University of Southampton)	
Prof Behzad Hezarkhani (University of Southampton)	
Prof Craig Hutton (University of Southampton)	
Ian Waldock (University of Southampton)	
Prof Janis Baird (University of Southampton)	
Prof Jason Sadler (University of Southampton)	
Prof Mary Barker (University of Southampton)	
Prof Nisreen Alwan (University of Southampton)	
Prof Peter Shaw (University of Southampton)	
Dr Claire Thompson (University of Hertfordshire)	
RESEARCH TEAM	
Dr Sarah Shaw	
Dr Bethan Prosser	
Dr Annabelle Fisher	
Cara Black	
Chris Emberson	
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Summary

Food pantries and similar schemes such as food larders, food clubs and social supermarkets, help people access affordable food. These schemes often operate like small shops and are usually accessed via a modest membership fee or pay-per-visit, allowing people to receive heavily discounted food, as compared to retail pricing. A proportion of food in these venues is often from surplus sources and public donations. In recent years, the food pantry model has grown as a popular alternative to traditional food banks. While food banks remain an important resource for people experiencing severe food insecurity, they often require referrals and typically offer limited choice in the food provided. By contrast, food pantries are generally open to a wider range of people, are less likely to require referral, and are viewed as a more dignified form of support. They give individuals greater choice and independence in meeting their food

needs. However, many pantries face challenges such as limited supplies and poor-quality food, making it difficult to consistently meet local demand and having negative impacts on health. To bridge these gaps, many pantries increasingly purchase additional stock, particularly during times of reduced donations or when essential items are in short supply.

We will work with multiple organisations who contribute to the food aid system in the regions of Southampton, New Forest and Isle of Wight. We aim to create a new online platform to connect local food suppliers and retailers with food pantries. This platform will prioritise healthier options, keep surplus food within local regions, and reduce food waste during transit. We will also work with community members to understand the changes they want in their food pantries in order to co-design and implement smaller, practical interventions to improve the services provided by food pantries. With these changes, we aim to help pantries offer healthier food choices to their customers while building more sustainable and efficient ways of operating.

Introduction

Access to sufficient nutritious food is important for health and wellbeing. According to the Food Foundation, in January 2025 14% of households in the UK were affected by food insecurity (1). Households most affected were those with children, single-parent families, and those in receipt of Universal Credit or living with disability (1).

Food pantries, larders and food clubs (henceforth, 'food pantries') help people access affordable food. These schemes often operate like small shops and are usually accessed via a small membership fee, allowing people to receive food worth a much higher value, as compared to retail pricing. The food in these venues is often received from surplus sources and public donations. In recent years, the food pantry model has grown as a popular alternative to traditional food banks, however, many face challenges such as limited supplies and poor-quality food, making it difficult to consistently meet local demand and having negative impacts on health and well-being as well in resulting in the waste of edible food.

The Food Aid Inequality Rectified (FAIR-food) study has been funded by UKRI BBSRC over a 3-year period and aims to improve the quantity and healthfulness of food that is available in food pantries, larders and food clubs in the regions of Southampton, the New Forest and the Isle of Wight.

Study aims

To enhance the nutritional quality of food aid, specifically in food pantries, by strengthening logistics, eliminating access barriers for disadvantaged populations, and implementing targeted interventions that address the root causes of dietary health inequalities.

Study objectives

We will address six objectives across the four interconnected work packages:

- 1: Collect and analyse data on population health outcomes and food aid nutritional quality to explore health inequalities and support modelling.
- 2: Map the food aid system to identify gaps in provision and consider enhancements to pantries.
- 3: Engage with communities and stakeholders to understand challenges in accessing a 'healthy' diet via food pantries, then co-develop and deliver new deployable interventions.
- 4: Build a logistics platform to optimise allocation of healthy food options into pantries.
- 5: Evaluate the impacts of new interventions on food aid partnership working, population health outcomes and assess implementation challenges.
- 6: Work with food aid, stakeholders and communities to capture and model plausible future states of improved food aid on population health, demonstrating the potential impact of interventions on health inequalities.

Study design

This project has four interlinked work packages (WPs) carried out over 36 months. Ethical approval for all primary data collection will be gained from the ethics committees from the Faculty of Life Science and Environment or Faculty of Medicine at the University of Southampton.

Work Package 1: Measuring health outcomes

In this work package, we will combine secondary data with primary data, collected by our team, to explore health outcomes and inequalities across the regions of Southampton, New Forest and the Isle of Wight, and among the people who use food aid services. We will analyse the nutrient profile of the food available in food pantries as well as the food chosen by food pantry users, and assess how these factors change over the course of the project as we work to get healthier food into the pantries.

Interviews will be conducted with food aid partners, food suppliers and local government representatives to understand their perspectives and experiences of the interventions that are implemented as part of the project.

Work Package 2: Optimising food supply chains

This work package will aim to understand how surplus food moves between suppliers (including retailers) and food aid providers. We will develop an online platform to

improve this supply chain while also prioritising healthier food options. The need for such a platform was highlighted in previous discussions with food aid providers.

Work Package 3: Redesigning food pantries: Community Participatory Action Research

In each study region, we will recruit and train six local community researchers (18 in total). These community researchers will develop research questions about issues with food aid that matter to them and will then be supported to collect and analyse data to better understand these issues and answer their research questions. Their research will identify local drivers of food aid and potential interventions to improve it.

On the completion of their research project, all community researchers will take the recommendations they have produced, based on their research, to a workshop with the food aid and local government project partners, and co-design implementation plans to improve the quality of food aid and support the health of those using it. Where possible, we will seek to introduce these interventions into food pantry settings and monitor the impacts through work packages 1 and 4.

Work Package 4: Modelling plausible future states of food aid provision

In this work package, we will aim to model the potential impacts of any interventions implemented through the FAIR-food project. We will work with food aid stakeholders and project partners to map how actions within the food aid system relate to health outcomes. We will then map anticipated future scenarios for health outcomes if no changes are made within the systems. We will also map anticipated future scenarios of introducing the FAIR-food interventions.

Finally, we will use data collected through work packages 1, 2, and 3 to quantify the relationships within the systems maps and identify which pathways may be most likely to achieve the desired health outcomes. This modelling activity will allow partners to explore the potential impacts associated with any changes they may make within the food aid system and to compare the population health outcomes associated with different scenarios.

Study setting

The work of the FAIR-food project will be conducted in three geographic regions in the South of England 1) The City of Southampton, 2) The New Forest and 3) The Isle of Wight.

We will work with food aid organisations such as food pantries, larders and social supermarkets; these are food aid location where individuals can access food for a reduced fee.

We are working with a total of 18 food pantry sites across 11 participating food aid organisations: four in Southampton; two in the New Forest; and five on the Isle of Wight.

Study activities and data collection

Work Package 1: Measuring health outcomes

Secondary data

We will use existing secondary data to understand population health outcomes across the three study regions: Southampton, the New Forest, and the Isle of Wight. We will map health-related outcomes, such as childhood obesity levels, mental health outcomes, food insecurity levels and free school meal eligibility, at both regional and smaller local levels (e.g., wards or LSOAs), where possible, using data from councils (e.g., Southampton Data Observatory (<https://data.southampton.gov.uk/data-and-resources/>)). This data will enable us to visualise health inequalities in local populations at baseline and annually as the project progresses.

Pantry user surveys

Food pantry user surveys will be conducted at 13 sites. For the organisations (food pantries) with multiple sites, we will conduct surveys at half of their locations meaning surveys will not be conducted at 5 sites. This decision was made for practical reasons due to research staff and financial constraints while still ensuring geographic variation across the study regions.

Participants will be asked to complete the survey in paper form. Due to the repeated cross-sectional design, no identifiable information will be collected as part of the survey because linking the surveys between waves will not be necessary. Participants will be asked to complete a paper consent form before moving onto the survey questions. Participants will receive a £5 voucher for a local shop (e.g. Tesco) as a thank you for their time.

Surveys will be conducted every six months starting in March 2026. At each site, we will aim for a minimum of 15 completed surveys in each wave of data collection.

The Food Pantry User Survey will consist of questions to assess:

- Food insecurity: USDA 6-item food security measure (2)
- Wellbeing: Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS) (3)
- Diet quality: A 20-item food frequency questionnaire to assess diet quality (4)
- Fruit and vegetable intake: 2 questions about average F&V consumption (4)
- Demographics: age, gender, ethnicity, household composition and income support

Food basket photographs

For the participants that complete a survey, we will also ask their permission to take photographs of their food baskets in order to understand what people are selecting from

the pantries. Photographs will not include any identifiable information or images of the users.

In some study sites, pantry users have limited choice over the items they receive. Instead, these pantries provide standardised baskets that vary according to household size. In these settings, we will photograph the different basket sizes available at each larder, as their contents are standardised and the baskets are typically prepared in advance.

Food basket photographs will be taken every six months starting in March 2026. We will aim to take food basket photographs for every participant who completes a survey.

Pantry management survey

Every six months, starting in March 26, we will ask a member of management at each food pantry to complete a survey about their experience of running the service including the number of households helped, main suppliers and ability to use surplus food. The pantry managers will be able to complete this survey using a paper copy or via an electronic Qualtrics link.

Pantry observations

The research team will conduct and record pantry observations to capture if and how the pantry settings changes over time; noting the introduction of interventions (introduced in via FAIR-food) as well as external factors that may influence how the pantries operate. Each time a member of the research team visits a pantry setting, they will record their observations using a structured proforma, which covers staff/volunteer and service user dynamics, changes to the food supply, engagement with FAIR-food community researcher programme (WP3) and details about data collection.

Researchers will also be able to record any other details they consider relevant to the FAIR-food study. No identifiable information will be collected in the observations.

Pantry Inventories

Full food stock inventories of the participating pantries will be conducted in March each year; three inventories will be completed during the study period.

Inventories will be conducted by the research team who will collect details of the types and quantities of food available in the pantry. The inventories will be conducted after the pantry is stocked and before the pantry opens to users; this will typically be on the day or the day before the survey data collection. In the first wave of inventories (March 26), the detail collected include type of food, brand, weight and quantity for each item. This will be reviewed in subsequent waves to ensure this level of detail is appropriate and worthwhile, particularly with regards to the brand of single ingredient items. To provide consistency across pantries, only items that are on the shelves and accessible

to pantry users will be included in the inventory, surplus stock in storage areas will not be included.

Inventories will be conducted in all 18 food pantry sites.

Pantry Stock Snapshots

Every three months, we will photograph the food available in participating food pantries in order to capture the diversity, but not the quantity, of food available across the study period and between full inventories. We will conduct the first wave of snapshots in March 2026 and aim to conduct nine waves in total.

Photographs will be taken just before or immediately after the pantries open for the day, both to ensure that the stock available to pantry users on the day is photographed, and to make sure researchers do not get in the way of pantry users. After training, pantry managers/staff/volunteers may collect these photographs on behalf of the FAIR-food project for subsequent waves.

Process evaluation interviews

We will conduct process evaluation interviews with food pantry stakeholders, suppliers and local government representatives to aid the evaluation of food aid optimisation interventions implemented as part of WP2 and 3. Through these interviews we will explore the context, implementation and mechanisms of impact of the new interventions (5).

Work Package 2: Optimising food supply chains

Food system stakeholder mapping

We will identify areas in the pantry supply chain that function well and areas prone to issues such as delays and capacity limitations. We will then work with our project partners to build and enhance our network of food suppliers, such as local growers and supermarkets. Through this food supplier network, we will work to increase the amount of nutrient-dense foods (e.g., fresh fruit and vegetables, milk, eggs) that are supplied to local food pantries, taking into consideration the availability of storage facilities for chilled and frozen foods.

Online platform development

We will conduct exploratory online focus groups with food pantry stakeholders to understand the logistics of food pantry operations and identify the features that should be included in the FAIR online platform.

We will then work with our food pantry partners to co-design and introduce an easy-to-use online logistics platform. The aim of this platform will be to increase the supply and make it easier to distribute food among food aid partners. The beta version of this

platform will be assessed and updated following user feedback. The platform will be online and linked to the website for data generation. The online platform will collect and use data from food pantries, such as food donation volumes, pantry inventory levels, unmet demand, transport availability, and historical allocation patterns.

Work Package 3: Redesigning food pantries: Community Participatory Action Research

In Work Package 3, we will work with community members (food pantry users) to understand what changes they would like in their food pantries. Together, we will co-design and test small, practical improvements.

We will use a collaborative research approach called Community Participatory Action Research (CPAR). This method involves community members in identifying issues, generating research questions, collecting and analysing data, and taking action to create change (6). Our CPAR approach has been developed and delivered by the LifeLab team since 2022 and is referred to as NxtGen Researcher Programme. This is a 14-session training course that supports participants to learn basic research skills that enable them to design and complete their own projects. The programme takes community researchers through the full research cycle, including data collection and co-design workshops with stakeholders.

Community Researchers will undertake 14 weekly 2-hour in-person sessions covering research concepts and methods, plus around two hours of independent work each week to apply learning to individual projects. Participants gain both research knowledge and practical skills while producing new research on topics that matter to them. In this case, they will be developing and answering research questions that concern food aid.

We will train and support three location-based cohorts of six community researchers (18 in total):

- Southampton Mar-July 2026
- New Forest Oct 2026-Feb 2027
- Isle of Wight Mar-July 2027

The community researchers will be employed by the University of Southampton for the durations of The NxtGen Research Programme. The programme will be delivered with minor adaptations to reflect the specific needs of each group and the practical requirements of the FAIR-food project. The training will incorporate a food aid-focused context, helping Community Researchers develop an understanding of food aid, wider food systems, and the role of food pantries within them. This tailored approach will support the development of individual research projects and generate practical ideas for food pantry redesign.

As part of the NxtGen Training Programme, Community Researchers will be supported to develop recommendations for action from their research findings. As the final stage of the programme, we host a Co-Production Assembly which has been designed to establish a bridge between researchers and decision-makers by creating the conditions to co-produce a series of recommendations, based on the researchers' individual research and produce implementation plans to put these recommendations into place within services or policies.

We will build in exchange between the cohorts and at the end of the three programmes, we will bring Community Researchers and partners together to evaluate and reflect on the changes made and impacts in “co-evaluation assemblies”.

Work Package 4: Modelling plausible future states of food aid provision

Systems mapping

Interviews and existing literature will be used to develop qualitative causal loop diagrams showing key associations and feedback between health outcomes, food pantry operations and the food redistribution supply chain. We will map the positive and negative associations between health outcomes and social and economic factors.

Interviews will be conducted with food pantry and food supply stakeholders to inform these causal loop diagrams which will also be reviewed and discussed by the Community Researchers. These interviews will be informed by Group Model Building methods that have previously been used to gather stakeholder input on building public health systems models. (7)

Modelling

This qualitative causal loop diagram, alongside data from WPs 1-3 will then be used to build a quantified systems dynamics model to explore pathways to achieving stakeholder health priorities whilst identifying unforeseen and unintended perverse outcomes or the need for trade-off within the scope of the project (8).

Data Analysis

Work package 1

Data collected in WP1 (secondary population characteristics data and food pantry user surveys) will be analysed quantitatively using descriptive statistics to monitor for any changes over time in the population health of those accessing food pantries.

The nutrient analysis in WP1 will be compiled using Nutritics based on the full inventories at each site, the pantry snapshots, and the photographs of client food baskets. The nutrient analysis will focus on macronutrients and other key nutrients of public health concern in the UK.

Process evaluation interviews will be coded using thematic analysis (9) and reported following the TiDieR guidance for interventions (10).

Work package 2

Logistics data from pantry inventories (WP1) will be analysed to understand the food supply chain, with each item characterised by key attributes including food name, food category (e.g. ambient), unit type (e.g. weight/tin/jar); unit size; quantity; perishability (e.g. best before); collection window. We will use existing datasets to calculate the environmental impact of the food offered in food pantries e.g. food miles, carbon emissions and water usage. The transportation patterns will also be analysed. Data on businesses/food pantries engaged with the study will be gathered and mapped.

Data collected through the online platform will be analysed throughout the study period to optimise the performance of the platform. Statistical modelling, real-time monitoring and pattern detection will allow us to identify emerging shortages, surplus clusters, and inefficiencies in routing or allocation. This level of analysis will allow us to optimise the platform and supply chain model with accurate data such as demand forecasts, cost estimates and fairness metrics.

Work package 3

The NxtGen evaluation has been developed using an evidence-based framework on deliberative action from Abelson et al. 2003 (11) as well as drawing on a Most Significant Change approach (12). This structures evaluation around 4 components: representation, process, individual and policy outcomes and in this way assesses impacts of the programme on the individual Community Researchers as well as on policy and practice as it concerns food aid.

The NxtGen evaluation framework being used in the FAIR-food project is sufficiently broad and open to capture a range of individual and policy outcomes, including FAIR project and food aid related data. Small revisions will be made to the evaluation schedules to make them more accessible and appropriate to this specific group of learners and the service providers.

- *Representation & Process: Community Researchers and staff facilitators will be asked consent for anonymised data generated during the training programme to be used for evaluation e.g. weekly anonymous feedback, written debrief summary notes*
- *Individual outcomes: Community Researchers will be invited to complete pre- and post-programme questionnaires and take part in post-programme interviews*
- *Policy outcomes: policy/decision-makers will be invited to take part in post-programme interviews; all community researchers, pantry providers and*

policy/decision-makers will be invited to take part in focus group discussion as part of “co-evaluation assemblies”

The written and transcribed qualitative data will be thematically analysed (13). Questionnaire data will be analysed by the NxtGen evaluation team and contribute to their larger data set with other cohort data.

Work package 4

Data from WP1, WP2 and WP3 as well as existing literature will be used for quantitative systems modelling. Quantitative systems modelling will be conducted using Stella software. This modelling will allow project partners to explore potential consequences and trade-offs associated with selected actions (e.g. healthier food with shorter shelf life may increase food loss) and compare population health outcomes across plausible pathways. The process also allows us to examine the impact of interventions through construction of modelled scenarios to gauge the viability of our deployable interventions to achieve the established priorities of stakeholders and consider associated trade-offs.

Ethics and study governance

Ethics approval will be obtained from the University of Southampton. The study will be conducted in accordance with the Declaration of Helsinki, Good Clinical Practice guidance, Research Governance Framework for Health and Social Care and Data Protection regulations.

An independent advisory group will provide strategic guidance, monitor progress and assess professional conduct throughout the study duration. Quarterly meetings will be held with collaborators including regional partners.

Dissemination

Findings from the FAIR-food project will be disseminated through academic papers and reports. We will also develop a number of practical tools that can be used nationally by other organisations to help improve access to healthy food and reduce health inequalities. These tools will be available for communities and councils across the country, including:

1. An online platform connecting local food suppliers with food pantries, making it easier to offer healthier food options.
2. A toolkit of resources to help councils and pantries collect information about diet and health, run new initiatives, and track their impact.
3. Step-by-step guidance on setting up food networks and using the online platform, based on our own experiences.

4. Videos and online resources to support anyone using the toolkits and platform in the future.
5. An adapted version of the NxtGen Researcher Training Programme that is adapted for use in food aid settings

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