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Introducing UK-grown dried beans into households in England: a practice-based analysis of a sustainable food intervention

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Introduction: Pulses are central to healthy and sustainable food systems, yet their incorporation into English diets remains challenging. Recent agricultural developments enabling common beans (*Phaseolus vulgaris*) to be grown in UK agro-climatic conditions create opportunities for locally adapted food production. However, their contribution to sustainable transformation depends on becoming meaningful, accessible and practical within everyday household practices.
Methods: This in-depth qualitative study used a household intervention within the wider BeanMeals' schools project setting to explore how participants with varied pulse-related experience learned about, experimented with and incorporated UK-grown dried common beans into family meals. Ten households participated in three bean-based Cook and Eat sessions and two household visits, alongside school-based activities. Visual ethnographic methods including photography, video and participant-generated documentation supported observation of everyday food practices. Data were analysed guided by a Social Practice Theory (SPT) framework, focusing on materials, competences and meanings.
Results: Using a novice-to-expert typology, the study identified "bean experts" who drew on established pulse-related culinary traditions, embodied know-how, preparation routines and supportive kitchen infrastructures to easily incorporate UK-grown dried beans into food practices. It also identified "bean novice" and "bean competent" households who developed new skills, confidence and strategies for incorporating beans into family meals through structured learning, repeated exposure and experimentation. "Bean novices" focused on blending beans into familiar meals to address household selective eating. For "bean competent" households, the main barrier was the perceived time demands of dried-bean preparation.
Discussion: The SPT framework highlighted how differences in materials, competences and meanings between households enabled or constrained bean and dried-bean uptake. Although new cooking competence can develop through social learning and experimentation, sustaining practices perceived as inconvenient, e.g., soaking and boiling dried beans, may depend on longer-term changes in material and societal conditions. Bean experts, largely South Asian vegetarian households, illustrated practices supporting dried-bean use including bulk buying ingredients, meal planning, shared meals, batch cooking, freezing and pressure-cooker use. The study demonstrated positive associations and interest in UK bean consumption across households. For those less habituated to dried beans, this

could be supported through pre-prepared formats offering additional opportunities for the UK food system.

KEYWORDS

family meals, food systems, pulses, social practice theory, sustainable dietary change

1 Introduction

The UK food system faces complex interconnected challenges of promoting healthy diets, addressing food security, developing more sustainable food systems to meet climate and biodiversity targets, and ensuring the viability of food businesses, including farmers' livelihoods (Dimbleby, 2021). Growing and eating more UK-grown pulses is one proposed strategy that could simultaneously address these multiple challenges (Iannetta et al., 2021; Michaels et al., 2026).

BeanMeals was a UK-based systemic innovation project that used action research approaches to explore food-system change from "fork to farm" (Ingram et al., 2025). The project centred on two new pre-commercial common bean varieties (*Phaseolus vulgaris*), bred for UK growing conditions: "Capulet" (similar to navy beans) and "Godiva" (a blonde kidney bean). Common beans have not been grown commercially in the UK due to unfavourable agro-climatic conditions despite being the country's most widely consumed bean through "baked beans," a processed canned product made from navy beans in tomato sauce. BeanMeals introduced these UK-grown beans in dried form into school and household cooking, to explore how increased demand could stimulate value chain innovation alongside health, environmental and economic benefits. This paper reports findings from the household component of the project, examining how UK-grown dried beans were introduced, learned and incorporated within domestic food practices.

Pulses are a nutritious food source, containing plant-based protein, essential micronutrients and dietary fibre, which is significantly lacking in UK diets (Singh and Basu, 2012; Didinger and Thompson, 2020; Ferreira et al., 2020). Pulse-based meals can increase satiety and displace consumption of less healthy foods (Ferreira et al., 2020). The 2019 EAT-Lancet Commission's guidelines for a sustainable health-promoting diet recommend consuming 50 g of dried beans, lentils, and peas per day (Willett et al., 2019). However, current pulse consumption in Britain is substantially below this at approximately 8.5 g per person per day (Ingram et al., 2025). Increased pulse production also confers agronomic and environmental benefits, including crop diversification, nitrogen fixation and especially reductions in greenhouse gas emissions (Horril et al., 2024; Li et al., 2024). The BeanMeals study supplied the UK-grown Capulet and Godiva beans in dried form, with potential economic and environmental advantages associated with minimal processing and packaging (Jones and Cottee, 2024; Ingram et al., 2025).

The following sections outline the literature and theoretical framework, describe the household study and methodology, present the findings, and discuss how a practice-based analysis of the BeanMeals household intervention advances understanding of household food learning and sustainable dietary transitions.

2 Literature review: understanding barriers and facilitators to pulse consumption

Research on pulse consumption primarily focuses on barriers to uptake in contexts where they are not routinely eaten in everyday cuisine, including parts of Europe and the USA. Commonly reported barriers include limited awareness of nutritional and environmental benefits, insufficient knowledge of practical cooking methods, and negative perceptions of pulses as inconvenient, tasteless, associated with poverty, or exclusively vegetarian foods (Doma et al., 2019; Melendrez-Ruiz et al., 2019; Duarte et al., 2020; Winham et al., 2020; Palmer et al., 2018; Kuosmanen et al., 2023; Didinger et al., 2023). The literature thus focuses on educational approaches, such as highlighting the versatility, sustainability and health benefits of pulses (Didinger et al., 2023), alongside introducing convenience-oriented strategies such as using pre-prepared or canned pulses, or batch cooking and freezing beans or bean-based meals (Polak et al., 2015; Winham et al., 2020; Duarte et al., 2020; Didinger and Thompson, 2020).

Research also highlights sensory barriers to pulse consumption (Palmer et al., 2018; Melendrez-Ruiz et al., 2019; Doma et al., 2019; Winham et al., 2020; Didinger and Thompson, 2020; Appleton, 2024). Jallinoja et al. (2016) found that negative sensory perceptions of the taste and texture of pulses outweighed positive factors such as affordability and availability in willingness to consume pulses. These barriers are particularly significant for families given that food neophobia and selective eating are common among children, which can dictate household menus (Wolstenholme et al., 2020; Nas et al., 2024). A widely validated strategy to improve acceptance is to embed pulses within familiar, culturally appropriate and palatable meals (Polak et al., 2015; Palmer et al., 2018; Melendrez-Ruiz et al., 2019; Winham et al., 2020; Duarte et al., 2020; Whittall et al., 2024; Appleton, 2024).

Appleton (2024) notes a dearth of intervention studies focused specifically on pulses. Recent research has begun to address this gap. Didinger et al. (2023) combined recipe kits, online training and meal planning to support positive domestic experiences with beans in the USA. Dahmani et al. (2024) integrated bean-based meals and sensory food education within French school canteens, increasing children's willingness to taste and knowledge of pulses. Whittall et al. (2024) found that preparing pulse-based recipes at home helped UK participants overcome barriers through familiarity and experimentation.

2.1 Bringing a practice lens to dried bean uptake

These pulse-based interventions described above highlight the potential for supporting increased uptake but provide less insight into how competence develop in pulse preparation and how pulse-related practices become incorporated into household routines and are

sustained over time. To understand these dynamics, this study draws on Social Practice Theory (SPT) (Shove et al., 2012). Unlike approaches that focus primarily on individual attitudes, knowledge or behaviour, SPT treats practices as the primary unit of analysis, directing attention to how practices are enacted within specific contexts. People are viewed as "carriers of practices" and individuals are no more important than any other element that forms the practice (Reckwitz, 2002). Practices comprise three interconnected elements: materials (objects, infrastructures and technologies), competences (skills and know-how), and meanings (social and cultural understandings associated with practices).

SPT is emerging as a useful framework for researching sustainable food consumption (El Bilali, 2020; Röös et al., 2022). This is partly because it offers a means to understand food acquisition, preparation and consumption as routine, often tacit activities embedded within household life and shaped by home environments and wider domestic responsibilities, including childcare, employment and household management (Wills et al., 2015; Dickinson et al., 2021). SPT has also informed intervention studies designed to promote more sustainable household food practices. Devaney and Davies (2017), for example, applied practice theory in the design and analysis of the HomeLabs intervention which supported households to question and reconfigure everyday eating practices, such as sourcing food differently, adapting cooking routines and reducing food waste. Their findings show that change does not occur simply through increasing awareness, shifting attitudes or introducing uniform interventions, but through aligning and reconfiguring materials, competences and meanings within each household context (Hargreaves, 2011; Halkier et al., 2011; Shove et al., 2012).

Little attention has been paid to how pulses become incorporated into household food practices, despite their importance within sustainable dietary transitions. Several practice-based analyses using population-level survey data have highlighted the materials, competences and meanings associated with pulse uptake, but provide limited insight into how these practices are learned, negotiated and embedded in everyday household life (Jallinoja et al., 2016; Röös et al., 2022). An in-depth understanding of family food practices is therefore important not only for examining the "disruption" involved in introducing new sustainable foods, but also for learning from carriers of established practices and expertise. Dried beans warrant particular attention given the practical demands of preparation, including soaking and boiling to reduce naturally occurring lectins and antinutritional factors. These additional steps add time and complexity to preparation. This study thus uses a practice-theory-informed lens to examine a household intervention exploring how participants learned about, experimented with and incorporated UK-grown dried common beans into family meals.

In addition to SPT, the study was informed by Benner's (1982) novice-to-expert framework, originally developed to describe the development of professional nursing expertise through experience. Although the model is not directly transferable to domestic food practices and dried bean use, its distinction between rule-based and more intuitive, situated forms of practical knowledge provides a useful heuristic for examining variation in household bean-related expertise. Benner's framework focuses on the development of practical expertise through experience, including increasingly situated and embodied forms of knowing, whereas SPT locates competence within the wider configuration of materials, competences and meanings through which practices are sustained and transformed. These perspectives are therefore complementary but analytically distinct lenses (see further discussion below). Similarly, Sutton's (2001) work on culinary knowledge highlights how cooking skills are acquired and embodied through experimentation and adaptation in practice, and are often developed through social participation such as within family settings. Together, these perspectives support an understanding of competence as socially situated and context-dependent rather than as a linear progression that can be readily transformed through a short intervention.

2.2 Children, school and household food practices

Research suggests that simultaneous school and household-based dietary interventions can lead to positive changes in both children's diets and wider household food practices (Horne et al., 2004; Black et al., 2017). Given the opportunity of our child participants' involvement in the wider BeanMeals school-based intervention, the study also explored how children's experiences of learning, tasting and preparing beans at school might intersect with household food practices (Ingram et al., 2025).

2.3 Research questions

How do households incorporate UK-grown dried beans into everyday food practices?

1. How do materials, competences and meanings shape the incorporation of UK-grown dried beans into everyday household practices?
2. How did households with different levels of prior pulse-related expertise experience learning and experimentation through the BeanMeals intervention, and how did this relate to existing food practices?
3. How did children participate in and influence bean-related food practices across school and household contexts?

3 Materials and methods

3.1 Study design and setting

Families with children from two of the schools participating in the wider BeanMeals school intervention were invited to attend three Cook and Eat sessions, followed by two household visits. The study combined social learning through the Cook and Eat sessions with opportunities for independent experimentation at home (Benner, 1982; Sutton, 2001). It focused on how households experienced and incorporated beans into everyday food practices, rather than on changes in consumption before and after the intervention.

The wider BeanMeals project was conducted across six diverse primary schools in Leicester and Leicestershire. It included a four-month, bespoke bean-focused primary school educational intervention, developed by Food for Life, a school food education programme run by the Soil Association. The intervention comprised assemblies and lessons aimed at Year 5 (ages 9–10) and also introduced beans into

primary school lunches which are usually offered as limited or set meal choices. It included training for teachers, lunchtime supervisors and school cooks (The Soil Association Food for Life, 2023a; Ingram et al., 2025).

The two schools involved in the household component were in Leicester, which was selected for its higher-than-average rates of diet-related ill-health and culturally diverse population, including a large South Asian community with dietary traditions in which pulses feature prominently (OHID, 2026).

The schools provided contrasting socioeconomic and cultural contexts: School A was located in a culturally diverse area of north Leicester, while School B was located in a predominantly white, socioeconomically deprived area in the south of the city, within the most deprived 10% of neighbourhoods nationally (Ministry of Housing, Communities and Local Government, 2025). This variation enabled exploration of how new food practices may emerge within different household and community contexts, including under conditions of socioeconomic constraint (Briazu et al., 2024).

The research focus was household food practices involving dried beans, rather than a formal intervention-effectiveness study. The design therefore did not include a control group or systematic before-and-after measures of bean use, nor did it focus on the role of isolated intervention components. It was informed by action research principles, including working with participants and learning from their practical knowledge (Bradbury and Reason, 2003), but not specifically designed as participatory action research. For example, practical knowledge of dried-bean preparation shared by experienced users at the Cook and Eat sessions in School A was incorporated into later sessions at School B.

3.2 Recruitment

The study aimed to recruit 10–12 families. Eligible families included a child participating in the wider BeanMeals school intervention (Year 5) and an adult family member able to attend all three Cook and Eat sessions and participate in the household visits.

Families were initially recruited purposively, with an information leaflet and letter sent to the families of all children in Year 5 in both schools, alongside a screening questionnaire to identify variation in household familiarity with pulses. The low response to this approach reflected the challenges of engaging families in an intensive study involving repeated household visits. Recruitment therefore became more pragmatic: in School A, class teachers helped identify families who might be interested in participating, and researchers spent a day at the school meeting parents and grandparents; in School B, the household support worker identified families considered likely to value participation and available for the Cook and Eat sessions.

Eleven households initially consented to participate. One participant subsequently withdrew and did not complete the household component. The final sample therefore comprised 10 households: six from School A and four from School B. Since recruitment was conducted through direct engagement by school staff and researchers, the number of families approached was not recorded.

School A participants all had established pulse consumption practices, including South Asian vegetarian and Afro-Caribbean food traditions, while School B participants were less familiar with pulses, particularly dried beans. Families had between one and five school-aged children and included single-parent, grandparent-led, blended and intergenerational households. All adult participants were female.

3.3 Cook and Eat

Three two-hour Cook and Eat sessions were delivered in schools fortnightly over six weeks during the 2023 summer term. The sessions were taught by a professional cookery teacher employed by Food for Life and children and accompanying adults prepared bean-based recipes together. Sessions in School A took place immediately after school drop-off (9 a.m.) and at school pick-up time in School B (3.30 p.m.) to reflect availability of participants. All participants attended all sessions and were observed by researchers. The sessions took place alongside parallel BeanMeals school activities including classroom sensory activities and exposure to beans in the school dining room (The Soil Association Food for Life, 2023b).

The sessions aimed to develop bean-specific cooking skills. The first session followed a blended mixed bean soup recipe, providing a less visible format for participants and family members unfamiliar with beans. The second used the "Mean Bean burger" recipe. For the third session, recipes differed according to the experiences, cooking skills and food preferences observed across the two schools: School A participants prepared a bean and lentil chilli, while School B participants prepared a pizza with beans blended into the tomato sauce. Recipes are available through the BeanMeals resources and teachers' handbook (The Soil Association Food for Life, 2023a, 2023b).

Participants were introduced to the UK-grown dried beans in the first session, along with variety-specific guidance for safe preparation. Godiva and Capulet are quick-soaking varieties that can be prepared by soaking and boiling or in a pressure cooker. Pre-soaking reduces cooking time, while at least ten minutes thorough boiling reduces naturally occurring lectins. Cooking then takes approximately 30–40 min (Nurtural Food, 2021). Given the short sessions, dried beans were pre-prepared, allowing participants to add them during cooking and experience the texture of properly cooked beans. Preparation guidance was reinforced across sessions and, where necessary, during home visits by the researcher.

3.4 Household visits

The lead author conducted all household visits with participating families, with support from the BeanMeals engagement officer during interviews with one household. The same study protocol was followed across all household visits.

The first visit took place in the 2 weeks following the introductory Cook and Eat session and lasted approximately 2 hours. This included a semi-structured interview with the main adult participant, a participant-led "go-along" kitchen tour, and distribution of a household research pack containing a food diary, notebook, pens and a digital camera to document everyday food practices. Households were also provided with a 500 g sample of dried UK-grown beans for home experimentation and subsequent incorporation into meals. During discussion, the researcher repeated the preparation instructions and observed those unfamiliar with the process soaking beans. Participants also received printed versions of the Nurtural Food guidance for dried bean preparation (Nurtural Food, 2021).

The second visit took place 6–8 weeks later and lasted between 2 to 3 hours. It involved observing an adult and child preparing a

bean-based meal using dried beans, soaked in advance. The researcher observed the participants cooking the soaked beans either in a pressure cooker or stovetop boiling. Where necessary, the researcher supported this process by assessing when the beans were sufficiently cooked to be added to the meal. This was followed by discussion of participants' diaries, photographs, video clips and recipes. These participant-generated materials were used as prompts for discussion and clarification and given to the researcher. Follow-up engagement by email enabled participants to share additional materials.

Across both visits, the kitchen "go along" tour and cooking observations enabled the researcher to accompany participants as they moved through and interacted with their domestic food environment, rather than relying solely on participants' accounts of their practices (Wills et al., 2016; Kendall et al., 2017; Dickinson and Wills, 2022). Interviews were conducted in English and audio-recorded prior to transcription. In one instance, the participant's son assisted with translation and clarification.

3.4.1 Interview topic guides

The interview topic guides were informed by relevant literature and the research questions. Across both visits, participants were asked about their experiences of cooking and eating pulses, views on dried and pre-prepared beans, the Cook and Eat sessions and recipes, and the taste, texture and acceptability of the UK-grown beans. Children were also asked about their experiences of the BeanMeals school-based activities. The guides also explored factors potentially influencing bean use, including health, environmental and cost considerations, familiarity, preferred recipes, household preferences, access to equipment, preparation, storage, cooking time and energy use, and social influences.

3.4.2 Visual ethnographic methods

Visual ethnographic methods complemented observation and interviews. Researchers photographed and video-recorded household visits, while participants generated photographs and video in their own time to document food practices and routines. These materials had several purposes: they enabled attention to tacit and difficult-to-articulate aspects of practice and participant-generated materials were used during the second interview to encourage more in-depth discussion (Rose, 2007; Wills et al., 2015). These materials were included in the analysis to enable comparison between participants' accounts and observed practices (Wills et al., 2015).

3.5 Researcher reflexivity

Reporting researchers' characteristics and relationships with participants supports transparency in qualitative research (Tong et al., 2007). The lead researcher was Leicester-based and a mother of two primary school-age children, living within approximately 20 min' drive of both participating schools. She had no prior connection to the families or schools. Her familiarity with Leicester and the everyday challenges of family food practices, alongside her role as a researcher and involvement in the wider BeanMeals project, positioned her as both an insider and outsider in relation to participating families (Berger, 2015). Her interest in the project's aim of increasing pulse consumption also had the potential to shape interactions and interpretation.

The co-author, who was not Leicester-based and did not have children, brought a different perspective as well as prior expertise in the research approach. Both authors were keen home cooks and reflected throughout the study, in discussions with each other and the wider BeanMeals team, on their own experiences of cooking and eating UK-grown beans, including experimenting with recipes and purchasing pressure cookers to facilitate dried-bean preparation. Repeated household visits and participant-generated visual materials further provided opportunities to reflect on researcher assumptions and revisit initial interpretations.

3.6 Ethics, data handling and privacy

The project had ethics approval from the University of Hertfordshire Ethics Committee (see below). Written consent was obtained from participating adults and age-appropriate consent was obtained from children. Parental/guardian consent also obtained for children. Consent was revisited at each household visit for household observation and the collection and use of audio-visual and participant-generated materials. Sensitive personal and visual data were handled in accordance with University of Hertfordshire regulations to protect participant privacy. Given the small sample and the potentially identifying combination of demographic and household characteristics, participant descriptions were limited to characteristics relevant to the analysis and pseudonymised in reporting. See Table 1. Participants received a £100 shopping voucher or cash equivalent as a thank you for taking part, after the final household visit.

3.7 Data analysis

A practice-based interpretive approach was used to integrate interview transcripts, household fieldnotes, and participant- and researcher-generated photographs and video across households (Wills et al., 2016; Dickinson et al., 2021). Household summaries were developed using the three elements of practice (materials, competences and meanings) to support cross-case comparison and were refined through discussion between the authors.

For the purposes of analysis, *materials* referred to the infrastructures and resources involved in bean preparation and consumption, including kitchen space, storage, utensils, appliances and ingredients. *Competences* encompassed the skills and know-how involved in household food management, preparing dried and pre-prepared beans, incorporating beans into everyday meals and competences around consumption. *Meanings* referred to the social, cultural and affective significance attached to home cooking, family meals, recipes and bean-based dishes, as well as participants' views and associations surrounding pulses.

Coding was undertaken using NVivo 14. Both authors independently reviewed the data and developed initial coding ideas, after which the lead author undertook the primary iterative coding. The coding framework combined deductive and inductive approaches. Deductive codes reflected the three elements of practice, the research questions and interview topics, including barriers and facilitators to bean use, experiences of the Cook and Eat sessions, and children's accounts of school-based learning. Inductive codes were added to capture unexpected concepts and patterns emerging from the data,

TABLE 1 Characteristics of participating households *n*=10.

Adult participant	School	Household type (Single, Nuclear, Inter-generational)*	House-hold number	Housing	Cultural / food back-ground	Dried bean expertise	Kitchen appliances (in addition to fridge, freezer, oven, hob)
1a—"Neelam"	A	Single	1	Home-owner	*Indian diaspora*	*Expert*	Air fryer, pressure cooker, blender
1b—"Anjali"	A	Intergenerational	5	Home-owner	*Indian diaspora*	*Expert*	Air fryer, pressure cooker, blender
1c—"Nirmala"	A	Nuclear	4	Renting	*Sri Lankan*	*Competent*	Rice cooker
1d—"Marilyn"	A	Single	2	Social housing	*Afro-Caribbean*	*Competent*	–
1e—"Padma"	A	Intergenerational	5	Home-owner	*Indian diaspora*	*Expert*	Air fryer, pressure cooker, blender
1f—"Indira"	A	Single	1	Home-owner	*Indian diaspora*	*Expert*	Air fryer, pressure cooker, blender
2a—"Ellie"	B	Nuclear	7	Social housing	*English*	*Novice*	Broken oven.
2b—"Anna"	B	Nuclear	6	Social housing	*English*	*Novice*	Air fryer, blender
2c—"Sienna"	B	Single	5	Social housing	*English*	*Novice*	Slow cooker, Air fryer. No oven.
2e—"Faye"	B	Intergenerational	4	Social housing	*Chinese*	*Competent*	Air fryer, blender

*Single includes single-parent, single-grandparent and lone grandparent households.

TABLE 2 Benner's novice-to-expert framework: characteristics and interpretation for dried-bean practice, after Benner (1982).

Benner stage	Benner's practical expertise	Dried-bean expertise
Novice	Little prior experience; relies on rules and instructions	No dried-bean experience; relies on recipes and guidance.
Advanced beginner	Some experience; recognises recurring situations but still needs guidance.	Limited dried-bean experience; recognises and remembers preparation patterns.
Competent	Organised and deliberate; plans actions in relation to longer-term goals	Confident cooks; deliberately plans and adapts pulse-based meals. Some dried-bean preparation experience but remains deliberate.
Proficient	Sees situations holistically; adapts practice fluidly through experience	Anticipates preparation needs; adapts dried-bean use flexibly across meals and situations.
Expert	Intuitive, flexible and embodied; acts on extensive experience	Intuitive and embodied; dried-bean preparation and incorporation are routinised.

ranging from discussions of air-fryer use to reflections on the role of the kitchen.

Codes were progressively reviewed and refined through comparison within and across households and data types. The authors discussed emerging codes, interpretations and category assignments throughout the analysis, resolving differences through consensus. Analysis involved repeated movement between individual cases and the dataset as a whole, revisiting codes and interpretations to develop a coherent account of observed variation. Negative or discrepant cases were retained and considered in refining the analysis rather than excluded.

3.7.1 Application of Benner's novice-to-expert framework

Benner's (1982) novice-to-expert framework was used as a theory-informed framework for examining differences in practical competence and experience in cooking with dried beans. Benner adapted the Dreyfus model of skill acquisition to nursing, describing five levels of skill development: novice, advanced beginner, competent, proficient and expert. Broadly, the stages describe a progression from reliance on rules and limited experiential knowledge, through increasingly organised and experience-based practice, towards more holistic, flexible and intuitive performance. Their characteristics and an initial interpretation for dried-bean practice are summarised in Table 2.

The analysis did not assume that these nursing-specific stages would transfer directly to household bean preparation or that participants would progress sequentially through them during the limited timeframe of the intervention. During analysis, the five-stage framework did not map cleanly onto the household data. In particular, increased cooking competence did not correspond directly to increased expertise in dried-bean preparation, and the data did not provide clear cases corresponding to all five stages.

A three-category typology of "novice," "competent" and "expert" therefore emerged through iterative analysis. These categories were developed through comparison across households and data sources, informed by early observations. They captured differences across several dimensions of dried-bean practice, including prior pulse and dried-bean experience, cooking repertoire and routine, use of instructions and experimentation, materials and material space configured for dried bean preparation and dried-bean preparation practices (Table 3). These dimensions were understood as interconnected rather than discrete, with competences developing in relation to the materials and material spaces through which dried-bean preparation was enacted. The typology was used heuristically to describe variation in bean-related competence within this dataset; its applicability to other samples would require further empirical assessment.

3.7.2 Analysis of visual data and participant-generated records

Photographs and video were reviewed repeatedly alongside interview transcripts and fieldnotes rather than treated as conventional textual codes. They were used to clarify and elaborate interview accounts and to attend to tacit or difficult-to-articulate aspects of practice, including gestures, interactions and the organisation of kitchen activities (Bezemer and Mavers, 2011; Wills et al., 2016). Moving between visual and non-visual data and across households supported comparison of participants' accounts with observed practices (Wills et al., 2016).

Participant-generated records were intended to allow participants to represent aspects of household food practices during the study period, rather than systematically record bean usage. Their volume and detail varied across households, reflecting differences in engagement with the research materials. They were used alongside interviews and observations to understand household practices and changes as represented by participants during the study period.

4 Findings

4.1 Bean expertise across households: experts, competent users and novices

Households varied in their prior pulse experience, cooking repertoires, ability to incorporate dried beans into everyday meals and willingness to eat beans. Drawing on the novice-to-expert framework, we therefore grouped households descriptively as "expert" ($n = 4$), "competent" ($n = 3$) and "novice" ($n = 3$) (Tables 1, 2). The categories emerged through analysis and captured differences in experiential knowledge and the extent to which bean preparation and consumption were embedded in routine practice (see Table 3).

In households classified as "bean experts," bean preparation and consumption were embedded within routine practice, reflecting Benner's conception of expertise as intuitive, fluid and embodied. As Indira noted, *"It's just what we do"*. Dried pulses were incorporated into a diverse repertoire of dishes and adapted flexibly to different meals. As Neelam explained when preparing a new

TABLE 3 Empirically derived typology of dried-bean competence.

Category	Prior pulse experience	Cooking repertoire and routine	Materials/ material space configured for dried bean preparation	Use of instructions / experimentation	Dried bean preparation practices
Novice	Little experience cooking and eating pulses, particularly dried beans.	Limited repertoire; not routinely cooking from scratch; incorporating beans in recipes required conscious effort.	Limited materials, storage or kitchen arrangements to support cooking from scratch or dried-bean preparation.	Relied on recipes and instructions to add beans to meals; some confidence in experimenting to accommodate family preferences.	No established routines for preparing or incorporating dried beans; preparation required guidance.
Competent*	Extensive experience cooking and eating particular pulse-based dishes; occasional use of dried beans.	Wide repertoire, particularly within specific cuisines; routine cooking from scratch and confident in cooking.	Materials and kitchen arrangements supported cooking from scratch, but not specifically dried-bean preparation.	Confident and deliberate in adapting recipes; able to plan and experiment with beans but continued to rely on instructions for dried-pulse preparation.	No established routines for preparing or incorporating dried beans; preparation required guidance.
Expert	Extensive experience cooking and eating with dried pulses including beans.	Wide repertoire; routinely cooking from scratch and confident in cooking; routine incorporation of dried beans into meals.	Kitchens and dining spaces configured for routine shared meals cooked from scratch including dried bean preparation.	Flexible and intuitive; adapted recipes without written instructions.	Well-established routines for soaking, batch cooking and storage; preparation and incorporation were routinised.

*"Competent" refers to wider cooking and pulse-related competence, alongside limited routine experience of preparing dried beans; it is not intended as a direct equivalent of Benner's (1982) "competent" stage.

bean falafel recipe, *"It's not measurements, it's by sight, by intuition… I work the mixture with my hands to get it right."* Although all households were unfamiliar with the UK-grown bean varieties provided, bean experts could assess their distinct characteristics, such as soaking behaviour, texture and suitability for different dishes.

By contrast, households classified as "bean novices" lacked experiential knowledge across the interconnected practices of dried bean preparation, bean cooking and consumption. They approached preparation and cooking more deliberately, relying on recipes and written instructions. Consumption represented a distinct challenge due to limited familiarity.

"Bean competent" households occupied an intermediate position. They were confident and capable cooks who routinely prepared pulse-based dishes, mainly lentils, and had well-established cooking repertoires and routines. Their experience enabled them to plan and adapt meals and experiment with UK-grown beans, but dried-bean preparation remained more deliberate and reliant on established recipes and instructions. In this respect, the category reflected Benner's description of "competence" as organised, confident and consciously planned practice, while lacking the flexibility and intuitive, situated judgement associated with proficiency and expertise.

4.2 Bean experts

Bean experts ($n = 4$) had extensive and longstanding experience cooking and eating pulses, incorporating a range of beans, lentils and split peas into diverse dishes each week. All frequently ate baked beans, although flavoured with herbs and spices. For some, pulses were eaten daily. Across all four households, meal preparation was a central and highly routinised activity, supported by established cooking skills, material resources and meanings attached to home-cooked food. These interconnected elements of practice enabled participants to incorporate the UK-grown beans readily into existing meals and recipes.

4.2.1 Meanings

Bean experts were first-generation immigrants from food cultures rooted in Indian heritage, for whom cooking traditional food from scratch was closely connected to family, heritage and identity. Participants described learning to cook from their parents and valued transmitting these practices to their children and grandchildren. They had learned to cook and eat pulses from childhood and were habituated to soaking and boiling or pressure cooking them.

Although some cooked meat for their families, they all described themselves as vegetarians for cultural and religious reasons and spoke appreciatively of beans as supporting this way of eating. All considered eating dried beans alongside fresh produce to be healthy. Tinned beans were used occasionally for convenience but were regarded by some as 'cheating' and as containing undesirable chemicals.

Shared family meals were also important, reflecting meanings of family cohesion and care. One child echoed his father's favourite phrase: "*The family that eats together stays together.*"

4.2.2 Competences

Across the four households, preparation of dried pulses was habituated and embodied:

> *"Lives are busy, yeah and everything, but if you put it in your practice and if you do it, it comes in a habit, and it gets into your habit and you will do it."* (Anjali).

Meal planning routinely incorporated soaking and cooking, with weekly menus or designated days used to organise preparation:

> *"I only plan meals when I need to soak beans the day before – Mung dal on Mondays and Rajma curries on Thursdays."* (Padma).

In intergenerational households, preparation was also distributed across family members, helping to sustain these routines. Anjali valued sharing the mental load of pulse preparation:

> *"We always remember, me or my mother-in-law … to soak them overnight. Last night, I said, 'can you take the beans out so that I can remember to soak them?' And when I came home [from work] after midnight, I saw them on the counter and could remember to soak them overnight, which I did."* (Anjali).

Bean experts also demonstrated flexibility in adapting established recipes. They were not prescriptive about how traditional dishes should be prepared and readily incorporated ingredients and influences from other food traditions. This extended to the UK-grown beans: participants substituted them into familiar dishes and developed new recipes, including a Mexican-inspired "bean and Dorito" bhel and a beany-tomato paste used as a soup base or pizza sauce. This drew on their material understanding of beans, for example, as a thickener in sauces. They brought these dishes to Cook and Eat sessions and enjoyed showcasing their usually hidden cooking skills and inventiveness in a receptive public setting.

4.2.3 Materials

These competences were supported by material arrangements that facilitated dried-pulse preparation, including kitchen layout, counter and storage space, and cooking utensils and appliances. Expert households generally had stable housing and relatively well-equipped, well-maintained kitchens, with evidence of household investment in kitchens. Intergenerational living and shared household resources also supported these arrangements.

Cupboards provided organised storage for bulk-bought dried pulses and associated ingredients such as tinned tomatoes, alongside windowsill herbs. They all owned and routinely used typical Indian silver-plated powdered spice boxes with Indira noting that correct spice use was key to enhancing the palatability of beans. Participants valued the quality of pulses and special offers at supermarkets, although they occasionally visited international shops for specialist and bulk purchases.

Meals were mainly cooked on the hob, although experts also owned electric appliances such as blenders and air fryers. Stovetop pressure cookers featured prominently as the main appliance for cooking dried

pulses. Some owned several in different sizes, including preferred brands purchased in India. Bean experts used these confidently to reduce cooking time:

> *"I cook all my beans in a pressure cooker on the hob. It is quick and easy – takes 15–20 min. It's a game changer in the pressure cooker."* (Anjali).

Fridges and freezers also supported batch preparation and storage of cooked beans and meals.

Overall, bean experts could readily substitute the UK beans into their home cooking because they already had the competences and material resources to prepare familiar meals from dried beans. As Padma observed:

> *"We have red beans anyway every week … These [UK beans] definitely passed the test. Everybody liked them."* (Padma).

Beyond taste equivalence, all expressed the view that UK beans would be better quality than imported beans and believed that UK production would involve better environmental and working conditions.

4.3 Bean novices

Bean novices ($n = 3$) had no prior experience of cooking dried beans. They routinely ate tinned beans, mainly baked beans, and were familiar with beans in Mexican food, but were not familiar with beans in other formats, including the firmer bite of cooked dried beans.

All could cook from scratch, but family meals were predominantly oriented around convenience foods such as fish fingers, frozen pizza and pasta with jarred sauce. Their cooking practices and confidence varied: one was a versatile cook, while the other two had more limited repertoires and were wary of unfamiliar foods.

4.3.1 Meanings

Bean novices were from white working-class backgrounds. Like bean experts, they had learned to cook from scratch from their mothers and grandmothers, although they all expressed some shame about their current food practices. Sienna reflected, *"If my nan could see some of the stuff [I cooked] these days, she'd slap me. She'd be horrified!"* Although two of the bean novices enjoyed cooking when they had time, one stated that she actively disliked cooking due to physical disability, catering to "fussy" children and the poor repair of her kitchen.

All perceived beans to be healthy and nutritious, although they didn't have strong opinions on whether dried beans were preferable to pre-prepared formats. Like the bean experts, they had a good understanding of the drawbacks of processed convenience foods and thoughtful reflections on the ethics of food production. All aspired to grow some of their own food and compost, although meat remained an important part of family meals: all were willing to reduce rather than eliminate it. Unlike the bean experts, therefore, environmental and health concerns coexisted with established practices centred on convenience and meat.

They were also motivated to participate in BeanMeals to improve their own diets and feed their children better. Ellie described the project as an opportunity for a reset, noting *"…this is going to do me the world of good."*

4.3.2 Competences

Cook and Eat sessions provided new practical knowledge and recipes and built confidence. All three independently experimented with dried and tinned beans at home.

Eating beans was a key competence challenge. All three families included at least one self-described "picky eater" mainly a child, with limited diets and anxiety around unfamiliar foods. Households managed this differently: one prepared several meals, another expected children to eat what was provided, while a third accommodated different preferences.

Experimentation thus mainly focused on making beans acceptable within existing family repertoires. Ellie was proud to have prepared dried beans and made a Bolognese from scratch, but worried that it would not be sufficiently 'tomato-ey' for her children's tastes and added a jarred sauce, despite feeling the addition of a convenience product would *"spoil it a little bit."*

All found mashed or blended beans more acceptable than whole beans. Ellie explained, *"as long as they've not got the whole chunk of the bean in their mouth, the kids will go for it."* Attempts to incorporate beans could nevertheless be frustrating. Sienna described the experience of trying to conceal beans in familiar food: *"You feel defeated when they find out. Like you literally go above and beyond, and then they find out."*

For the second household observation, all adapted recipes from the Cook and Eat sessions rather than reproducing them exactly. Beans were blended or mashed into pasta and pizza sauces, while one family used an air fryer to make homemade beanburgers as an alternative to a more expensive processed product.

Ellie found the hands-on nature of the Cook and Eat sessions particularly valuable,

> *"If you'd just thrown the beans at me, I would have been a bit sceptical … I'm more confident, because we've done it altogether. I like when we do cooking courses, and I've actually done it myself … watching somebody else do it and actually doing it are totally different things."*

Sienna, on the other hand, found unobserved household experimentation the most valuable aspect for developing her confidence: "*Before the cookery sessions we'd never used beans before, but we've really enjoyed experimenting…*".

4.3.3 Materials

Material conditions significantly shaped how novices engaged with cooking. Kitchens were busy and multifunctional spaces, with cluttered work surfaces and cupboards stocked largely with convenience foods. Practically it also made it challenging to find free counter space for meal preparation and bean soaking. Although all bean novices owned spices, they were not widely used. For Ellie, the state of the kitchen directly influenced whether she cooked from scratch:

> *"I do cook from fresh when I feel organised and the kitchen's tidy and I've not got anything to do – otherwise, I'll stick something in the oven or a takeaway."*

Appliance access varied across households and both enabled and constrained routine cooking. For example, in one household, a broken oven door meant that food was mostly prepared on the hob. Appliance access could also support experimentation: two households had recently acquired air fryers which had facilitated more varied cooking. Another identified slow-cooker meals as a cheap and convenient way to add beans to stews, chillies and sauces. Pressure cookers, by contrast, were not familiar: one participant owned one but did not understand how to use it and had heard they could *"explode like popcorn."* One bean novice owned a blender, another was convinced to buy one by the Cook and Eat sessions, and the third was happy to mash the beans with a fork.

All the families owned large freezers. These mainly contained ready meals and frozen meat and vegetables to be added to chillies and Bolognese. None felt that batch cooking and freezing beans or bean-based meals would work for their families. The mother of the family of seven noted that when she cooked from fresh, there were rarely freezable leftovers.

Bean novices mainly shopped at supermarkets, prioritising discounted items. One relied on the bus, which limited how much she could carry. They all noted that they would only use vegetables bought on the day, given the poor quality of produce in local convenience stores.

4.4 Bean competent participants

Bean competent participants ($n = 3$) were first- and second-generation immigrants from ethnic backgrounds with strong food cultures. They were highly skilled in cooking from scratch and drew on culinary knowledge rooted in cultural food practices, but had limited experience of cooking with dried beans, so lacked competences and appliances to make them convenient.

Since these families were diverse, we combined and summarised relevant commonalities and differences in their food practices below. One family with Chinese heritage regularly prepared a traditional dish with fermented black soybeans. A family of Afro-Caribbean heritage routinely used dried lentils and prepared Jamaican rice and peas, usually with tinned kidney beans but occasionally with dried kidney beans. A third family was Sri Lankan and cooked with dried lentils, but not dried beans which are uncommon in Sri Lankan cooking.

Since bean competent participants were expert cooks and their households already enjoyed pulses, a key opportunity related to developing dried bean expertise. Despite their lack of experience, households were observed confidently soaking and boiling the beans on the hob since none owned a pressure cooker, reflecting their cooking confidence. One household noted, however, that remembering to pre-soak the beans, the forty five minute boiling time on the hob for softer beans and additional washing up made dried beans "inconvenient" especially given wider domestic pressures, *"It [the soaking and cooking] took too long. Too long for my life. …"* (Marilyn).

These households were highly competent at comparing food prices and budgeting, however, the low monetary cost of dried beans was not a sufficient incentive to overcome the inconvenience. One commented: *"It's just pennies difference for the convenience"* (Faye).

The Sri Lankan family were more enthusiastic, trialling beans with Sri Lankan spices. Food preparation was more central in their lives and their sons actively engaged in meal choices, cooking and preparation for nightly family meals.

All three bean competent participants developed creative meals with beans based on their cultural backgrounds. They enjoyed the UK beans and indicated that they would eat beans more regularly in tinned or frozen format. None were interested, however, in establishing convenience strategies to incorporate dried beans more frequently.

4.5 Children, school and household engagement

Children participating in the intervention actively engaged in cooking and food preparation across school and home settings (Ingram et al., 2025). They consistently reported enjoying the Cook and Eat sessions, particularly parental attention and missing lessons. That said, none of the children could recall basic factual information learned in school about the BeanMeals project although some shared informal and imaginative "bean facts".

Researchers observed that participating children engaged actively in household cooking activities, contributing to parental enthusiasm. Parents also highlighted that their participation overall had been a valuable way to spend dedicated time with their children.

Children from bean expert households had been exposed to pulses and spicy foods from infancy and were accustomed to tasting new foods at the dining table. One child participant independently offered improvements to a recipe trialled at the Cook and Eat session and appreciated the project focus on a familiar food, noting that this had given him positive social recognition at school during lessons. For children less familiar with bean consumption, participant data and observations illustrated that the intervention generated curiosity, increased willingness to taste beans and engage in home cooking. Children were also observed encouraging family members to try beans.

One detailed case illustrates this change. A child who initially described himself as "fussy" at first refused to taste food prepared in the first Cook and Eat session. By the third session, he was willing to taste a blended bean pizza. During a subsequent household visit, he actively participated in cooking, offered suggestions, made jokes about beans, and encouraged family members to try the food at dinner. Following this, he agreed to eat beans in school meals *"now that I've made it myself"*. His mother also reported increased willingness to try new foods and greater engagement in cooking at home.

5 Discussion

5.1 Intervention effects on bean-related practices

This study identified variation in expertise relating to the preparation, cooking and consumption of UK-grown dried beans, spanning novice, competent and expert users. For less experienced users, the BeanMeals intervention (Cook and Eat sessions, household visits and school-based exposure) supported the incorporation of UK-grown dried beans into family meals. This included developing cooking skills and know-how (competences), fostering positive meanings with pulses, including health benefits and shared family experiences (meanings), offering dried beans and all necessary ingredients for specific meals

(materials) and providing repeated opportunities for exposure and experimentation with new and familiar recipes. Consistent with wider literature, structured engagement, repeated practice, opportunities for experimentation both within supportive social contexts and independently, together with positive meanings associated with pulse consumption, strengthened confidence and acceptability for households during the observation period (Benner, 1982; Sutton, 2001; Jallinoja et al., 2016; Melendrez-Ruiz et al., 2019; Didinger and Thompson, 2020; Appleton, 2024). UK-grown beans were well received by all participants, with bean expert participants considering them a direct substitute and in some ways superior to imported dried beans.

That said, a practice-based analysis highlights why routine uptake of dried beans cannot be understood solely as acquiring knowledge and skills through a short intervention period. Although participants experimented with beans and developed new skills and confidence, learning and experimentation did not necessarily shift the established configuration of practices underpinning routine dried-bean use. While novices were exposed to beans, including dried beans, in ways they had not previously experienced, the heuristic categories of novice, competent and expert remained broadly stable. This discussion explores the wider elements of practice underlying these differences.

5.2 Pulses, meaning and identity

For bean experts, pulse consumption was connected to cultural identity and diasporic food traditions. Cooking and eating pulses were embedded in family, heritage and everyday home cooking, and had been learned from childhood, reflecting the role of food practices in continuity, belonging and family cohesion (Warde, 2016). These meanings were particularly salient to this specific sample rather than characterising bean expertise more generally. Dried beans were understood as an ordinary part of home cooking, rather than a novel food requiring justification, and were explicitly considered healthier than tinned beans.

All participants viewed beans as healthy and nutritious and associated UK-grown beans with perceived environmental and ethical benefits. Among less experienced households, however, these meanings were not necessarily specific to dried beans, and canned or other pre-prepared formats remained more attractive because they fitted existing routines and convenience-oriented practices (Doma et al., 2019; Whittall et al., 2024). For bean experts, convenience and cost-effectiveness were not additional drivers of dried bean use; because dried beans were already embedded in practice, their economic value appeared largely taken for granted.

Meanings therefore supported pulse use differently according to how they connected with existing practices. For experts, cultural and familial meanings, together with the perceived healthfulness of dried beans, reinforced an established practice; for less experienced households, positive perceptions of beans did not necessarily make dried preparation preferable to more convenient formats.

5.3 Interconnected material and competence configurations enabling (dried) bean use

Bean experts had configured material arrangements and competences to support routine dried bean consumption given the importance of pulses to their family food traditions. Meal planning, fixed family mealtimes and established preparation routines aligned with bulk purchasing and dedicated storage space for pulses and associated ingredients. Effective use of these ingredients, including spices, and appliances such as pressure cookers and freezers, helped to manage preparation time and resulted in enjoyable family meals. This competence-material configuration had been learned from childhood and had, over time, become habitual.

Bean novices and bean-competent households may have been highly motivated during the study, but their existing configurations of competences and materials did not support routine dried-bean preparation to the same extent. For example, meal decisions were more ad hoc, and kitchen infrastructures were less well organised for dried bean preparation. These material constraints did not prevent experimentation. For bean novices, effort focused on making bean-based meals acceptable to their families. They worked creatively to incorporate beans into familiar dishes, with available appliances key to "hiding" beans and making successful family meals. For bean-competent households, the challenge was different. They readily incorporated beans into a range of meals, and families were willing to eat them. However, they lacked the established routines and material arrangements that made dried-bean preparation relatively effortless for experts. Convenience pressures therefore remained salient. For them, canned or pre-prepared beans offered a straightforward and unproblematic route to increasing household consumption.

These findings suggest that routine dried-pulse use depended on aligned competences and material arrangements within established practices. Where these were mutually reinforcing, as among bean experts, new beans were incorporated with minimal disruption. For bean novice and bean-competent households, therefore, engagement with the study could strengthen competence and confidence without necessarily establishing the materials and routines that supported regular dried-bean use.

5.4 Expertise and the wider conditions of practice

Partly reflecting the pragmatic nature of recruitment, the novice, competent and expert categories overlapped with wider cultural, socioeconomic and material differences between households. This limits the extent to which variation in competence can be considered independently of these conditions.

All bean novices and one bean-competent participant recruited through the school support worker experienced wider material pressures that constrained dietary change. Material barriers observed during visits included poor kitchen conditions, insecure housing, broken appliances and limited access to affordable fresh ingredients. Limited dining facilities also meant that shared family meals were less frequent, while care responsibilities, disability and financial stress further shaped cooking practices, contributing to reliance on convenience foods that were not necessarily freely chosen (Briazu et al., 2024; Evans et al., 2025). It was therefore unsurprising that some of these participants described meal preparation, particularly cooking from scratch, as stressful or burdensome (Bowen et al., 2019). Expert households, in contrast, generally had stable housing, well-equipped kitchens and enjoyed routinely cooking from scratch; some were retired with more time to dedicate to the project.

The value of a qualitative, practice-based approach is not to isolate the effects of cultural, socioeconomic and material conditions, determine their individual contribution to expertise, or identify a set of conditions that would predict uptake across households. Rather, it allows examination of how materials, competences and meanings were configured differently within particular household practices, shaping what participants could learn, experiment with and ultimately incorporate into everyday life.

For example, Sienna and her son were motivated to eat more beans, which they considered healthy, and were among the most active experimenters during the study, trying both dried and pre-cooked formats and making creative use of available appliances. However, circumstances beyond their control meant that they were moved into temporary accommodation with no kitchen facilities beyond a microwave. Their case illustrates that developing competences and positive meanings did not necessarily translate into routine uptake where material circumstances were unstable. Conversely, Anjali was among the most consistent dried-bean users despite being one of the most time-poor participants, as a first-generation immigrant and parent working multiple jobs. Strong meanings attached to health, culture and family care, alongside intergenerational support, a well-organised kitchen environment and embodied know-how, supported the continuation of dried beans within her weekly routine. Together, these cases illustrate why the relationship between competence and uptake cannot be understood independently of the wider configuration of materials, competences and meanings in which practices are embedded.

5.5 Benner and dried-bean expertise

Benner's (1982) framework provided a useful starting point for distinguishing levels in practical competence; however, the household data did not map neatly onto Benner's five stages. In particular, "bean competent" households had considerable cooking competence and experience with particular pulses, but less competence in preparing dried beans. The category therefore captured broader household cooking and pulse-related competence alongside more limited competence in dried-bean preparation (Table 3). Although these households were more confident with dried beans than novices from the outset, increased experimentation during the intervention did not develop into the level of routinised, embodied and intuitive expertise exhibited by the bean experts.

This distinction highlights the domain-specific nature of dried-bean expertise. Being an experienced and confident cook, including with dried lentils, does not necessarily confer expertise in preparing and incorporating dried beans. The additional demands of soaking and boiling mean that developing dried-bean practice also depends on the kitchen infrastructures, time and routines through which preparation is organised. Thus, within the timeframe of the study, bean-novice and bean-competent participants could develop new competences, confidence and successful ways of using beans without developing the established practice configuration associated with expert dried-bean use.

The complementary use of Benner and SPT enabled attention to both the embodied and intuitive qualities of dried-bean expertise and the wider configurations of materials, competences and meanings that supported its development and routinisation. This highlights that expertise was not simply an accumulation of individual skill: competence and experimentation may develop without becoming routine where the wider configuration of practice does not support its continuation.

5.6 Children as influences on household food practices

These exploratory findings, based on limited observations, suggest that children can act as influences or conduits between school and household food practices. Influence was not through straightforward transfer of factual food knowledge, but through participation, familiarity and the legitimisation of new foods within family life. This supports previous findings that children's positive associations with a new food and repeated exposure across familiar settings can influence household food practices (Ramsay et al., 2017; Marty et al., 2018). Research often emphasises children's influence on unhealthy food consumption through "pester power" (cf. Huang et al., 2016; Studer-Perez and Musher-Eizenman, 2023). This study, however, suggests that children can also influence healthier household food practices.

5.7 Strengths and limitations

The study's strengths include bringing together Social Practice Theory and Benner's novice-to-expert framework to examine both the elements through which household food practices were constituted and variation in existing dried bean-related expertise. The visual ethnographic approach, combined with repeated household observations, provided rich insight into material, embodied and often unspoken dimensions of food preparation that may be missed in retrospective accounts. Embedding the household component within the wider BeanMeals project also enabled exploration of how learning across school and household contexts intersected. Finally, including households with different levels of pulse experience enabled examination of the varied configurations of materials, competences and meanings supporting or constraining the incorporation of dried beans.

In terms of limitations, the small sample of ten households necessarily limited the range of household contexts represented. The sample was also drawn from two schools in one city and comprised only female adult participants. The findings should therefore be understood in relation to the specific context in which they were generated.

Recruitment was challenging despite offering a "thank-you" payment and providing Cook and Eat sessions, cooked meals, dried beans and other ingredients, highlighting the practical difficulties of recruiting families to intensive household studies. Offering dried beans and cooked meals may have influenced participation, however not all families used all the dried beans or consumed the prepared food at home. We therefore cannot assume that these provisions were a strong incentive to participate.

Recruitment may also have favoured households with an existing interest in cooking, pulses, or healthy and sustainable diets, particularly among more experienced bean users. Conversely, recruitment through school support routes provided access to a harder-to-reach population, although the challenging circumstances experienced by some households made sustained participation more difficult, contributing to one participant's withdrawal.

The overlap between expertise and wider cultural, socioeconomic and material circumstances also limits the extent to which the development of competence can be examined independently of these conditions. The study cannot disentangle "expertise" from factors including cultural food traditions and household resources. Future research could use more homogeneous samples, for example novice

households with similar socioeconomic and cultural backgrounds, to examine more closely how dried bean-related competences develop when other elements of practice are more similar. That said, efforts to promote healthier and more sustainable diets need to work with households in all circumstances.

The 6–8-week intervention and follow-up period limits conclusions about the longer-term persistence or routinisation of bean practices. The absence of systematic before-and-after measures also means that claims concerning increased bean use are observational and cannot be attributed to any specific intervention component, as school activities, Cook and Eat sessions, household visits and provision of beans occurred concurrently.

Participants' knowledge that they were taking part in a research study may have influenced their accounts or practices, including through social desirability or changes in behaviour associated with being observed. However, repeated observations, visual methods and participant-generated materials providing multiple opportunities to observe household practices across different times and contexts.

5.8 Implications for the adoption of UK-grown common beans and future research

The findings highlight emerging food-system challenges for the scaling of UK-grown common beans, alongside priorities for future intervention research (Michaels et al., 2026).

At present, pre-commercial UK-grown bean varieties are only available in dried form through a small number of zero-waste stores, limiting accessibility, including for experienced pulse users unfamiliar with these retailers. Minimally processed UK-grown dried beans may offer economic and environmental advantages associated with their relatively simple supply and storage requirements, but these need to be considered alongside the energy and water required for cooking and the life-cycle impacts of alternative formats, including canned, frozen and imported products (Horril et al., 2024). Our findings also showed that the dried format posed a significant barrier for less experienced households, suggesting that more accessible alternatives requiring less preparation may support broader and more equitable uptake. Expanding UK pulse processing could create opportunities for domestic enterprises, including canning and meal-assembly products (Jones and Cottee, 2024). Until UK supply chains are established, imported pulses will also remain important for supporting healthy and sustainable diets in the UK, highlighting tensions between local production, accessibility and environmental goals.

Drawing on the collaborative learning observed during the Cook and Eat sessions, future interventions could bring together household cooks across the novice-to-expert spectrum and diverse cultural backgrounds to share recipes and practical know-how between peers (Sutton, 2001; Whittall et al., 2024). In addition, the proposed changes to the School Food Standards in England offer opportunities to increase children's exposure to pulses through school meals. This would require at least one portion of pulses (excluding baked beans) within or alongside all menu options on one day each week (Department for Education, 2026). For children whose household diets provide limited exposure to pulses, repeated school-based exposure may build familiarity and confidence, potentially influencing household food practices. Future research could examine whether school-based pulse exposure can increase acceptability of pulses in households where they are less familiar, given that selective eating, especially among children, was a key challenge to household consumption.

6 Conclusion

Increasing consumption of UK pulses, including common bean varieties in dried, canned, frozen or processed forms, can contribute to a healthier, more sustainable UK food system (Ingram et al., 2025). In the households studied in Leicester, the BeanMeals household intervention created opportunities to experiment with UK-grown dried beans, which were incorporated into meals acceptable to households across diverse cooking traditions and cultural backgrounds. Observations over 6 to 8 weeks, however, suggested that sustained incorporation needs to consider the wider material and social shaping of everyday food practices. Paying attention to the configuration of practices among bean experts gives valuable insights into routine use of beans, including dried beans, with some competences, materials and meanings readily transferable, but wider material circumstances and meanings less so.

Breeding common beans for UK agro-climatic conditions is thus only part of the challenge. As highlighted in wider debates on sustainable legume transitions (Ferreira et al., 2021), realising their environmental potential depends not only on technological innovation but also on whether they can become embedded in everyday household food practices. Supporting plant-based transitions will require both learning from existing bean expertise and culturally diverse culinary traditions, and developing a wider range of UK bean products that cater to the realities of everyday life.

Data availability statement

Anonymised data supporting the conclusions of this article will be made available by the authors upon reasonable request. Researcher- and participant-generated photographs and video recordings, and data relating to child participants, are not publicly available due to the risk of participant identification.

Ethics statement

This study was approved by the University of Hertfordshire Ethics Committee (protocol number aHSK/SF/UK/05277 (1), approved 16 March 2023). All participants' names were pseudonymised and identifying information removed for this paper. Written informed consent was obtained from adult participants. For participants under 18 years of age, written informed consent was obtained from a parent or legal guardian, alongside the young person's own informed assent/consent to participate.

Author contributions

LM: Project administration, Writing – original draft, Formal analysis, Investigation, Writing – review & editing, Software, Data curation, Methodology, Resources, Conceptualization. AD: Funding acquisition, Writing – review & editing, Writing – original draft, Software, Investigation, Resources, Formal analysis, Project administration, Supervision, Data curation, Conceptualization, Validation, Methodology.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that Generative AI was used in the creation of this manuscript. During the preparation of this work, LM used Microsoft 365 Co-Pilot for assistance with language editing. The author reviewed and edited the output and takes full responsibility for the content of the published article.

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