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Stakeholder perceptions of primary school education about food sustainability and farm animal welfare in England

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ABSTRACT

Background: There is growing consensus on the negative impacts of food production on the natural environment and planetary viability. UK society is also increasingly concerned about the impact of intensive farming systems on the billions of sentient farmed animals within them. In liberal democracies and capitalist economies, enlightened citizens and informed consumers are key to the solution to environmental crises, such as anthropogenic climate change. Despite this, there is minimal provision for food sustainability and farm animal welfare in England's National Curriculum.

Purpose: To investigate the views of stakeholders on the provision of food sustainability and farm animal welfare education in English primary schools.

Sample: Ten stakeholders selected for their knowledge or interest in food sustainability and farm animal welfare education.

Design and methods: In-depth, semi-structured interviews, analysed naturalistically within an interpretivist framework.

Results: Barriers to teaching food sustainability and farm animal welfare reported by stakeholders were restraints caused by the curriculum, the need and lack of funding, a lack of teacher knowledge about the topic, and concerns about its controversy. Best methods identified for teaching were teaching from an early age and throughout all of schooling, adopting a cross-curricular approach, facilitating learning in a hands-on way, and not waiting for change from government reform.



Conclusion: This research informs the debate on the provision of food sustainability and farm animal welfare education in English primary schools. Given that the environmental crisis is a global one, and that sentient animals are farmed across the world, the research may also inform discussion on inclusion of food sustainability and farm animal welfare outside of the English education context.

KEYWORDS

Animal protection NGOs; English National Curriculum; farmed animal welfare; food sustainability; primary science education

Introduction

There is a growing consensus that modern food systems are negatively impacting the natural environment (FAO [Food and Agriculture Organisation of the United Nations])

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2018). Food production is now one of the largest contributors to climate change (IPCC [Intergovernmental Panel on Climate Change] 2019), while also responsible for large amounts of damage through biodiversity loss, water extraction, pollution and deforestation (Garnett 2013). At the same time, there is growing concern about the impact of intensive farming systems on sentient animals (Cornish, Raubenheimer, and McGreevy 2016), with over 70% of the world's farmed animals now being intensively (factory) farmed (CIWF [Compassion in World Farming] 2022). Today, of all land used for agriculture, fully 78% is for livestock (Ritchie and Roser 2019). This places animal agriculture at the centre of any discussions about our planetary food system.

Enlightened citizens and informed consumers are a key element of solution in market economies. The UK is widely seen as a global leader in both food sustainability (FS) and farmed animal welfare (FAW). Despite this, there is almost no provision for education on FS and FAW in the National Curriculum in England (cf. Reiss 2020). As such, consumer knowledge about FS and FAW is limited (Educawel 2016; BEUC [Bureau Européen des Unions de Consommateurs] 2019; Kause et al. 2019). Schools are increasingly being seen as important for promoting education for sustainable development (ESD) (Weitkamp et al. 2012). Educating about FS and FAW in a school environment can help ensure that a high proportion of citizens are equipped with the necessary knowledge to make sustainable purchasing choices (Blodgett and Feld 2023). Primary school specifically has been identified as a stage of childhood when food habits and behaviours are formed for life (Oostindjer et al. 2017).

Education not only needs to provide children with the knowledge to make informed, sustainable decisions, but to also prepare them for the significant global challenges that they will face in the imminent future (Reid 2019). Considering that food is an absolute necessity of life, understanding our food system should have a prominent place in education.

This research therefore investigates the views of stakeholders about the provision of FS and FAW education in primary schools in England. Given that the environmental crisis is a global one, and sentient animals are farmed across the world, the research may also inform discussion on inclusion of FS and FAW outside of the English education context.

Literature review

The place of agriculture in school education

A recent systematic review of the agricultural literacy of school students noted that in Africa, Australia, China, Indonesia and the United Kingdom, the 'curriculum is consistently claimed to be the core vehicle for agricultural literacy development throughout the years of formal schooling' (Cosby et al. 2022, 1–2). Such literacy requires 'knowledge and understanding of agriculturally related scientific and technologically-based concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity' (Meischn and Trexler 2003, 44). However, while it has been argued that 'Developing agricultural literacy in school-aged children through formal education is critical' (Cosby et al. 2022, 1), a systematic review found that 'students demonstrated low levels of agricultural literacy at both the primary school and high school age levels' (Cosby et al. 2022, 6).

However, agricultural literacy is not like molecular biology literacy, where the only demands on students are likely to be conceptual ones. Agriculture can be considered as a socio-scientific issue, with aspects that are sensitive, even controversial. It is well-known that many science teachers are reluctant to teach about controversial and sensitive issues (e.g. Levinson and Turner 2001). More generally, there is a perennial debate as to what should be included in the school science curriculum. In recent years, the approach of Wynne Harlen and colleagues of 'Big Ideas of science education' (Harlen et al. 2010) has provided the nearest thing to a consensus, with this approach having by now been incorporated into the science curricula of a number of countries, including Australia, Chile and South Korea (Bravo González and Reiss 2023). This approach emphasises enabling every individual 'to take appropriate actions, that affect their own wellbeing and the wellbeing of society and the environment', the role of science 'in society', and studying 'topics of interest to students and relevance in their lives' (Harlen et al. 2010, Preface).

Food system and environmental crisis

Most of today's food system threatens the natural environment and planetary viability (FAO 2018). Accounting for 21–37% of total GHG (greenhouse gas) emissions, food production has become one of the biggest global contributors to climate change (IPCC 2019, 439). Food production is also the single biggest driver of habitat loss globally, with the conversion of natural ecosystems for crop production or pasture (IPBES [Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services] 2019). As such, we are now in a situation where farmed animals account for 60% of all mammals by mass (Bar-On, Phillips, and Milo 2018), with the collective mass of wild mammals having declined by 80% since 1970 (IPBES 2019). Agriculture is a huge drain on the planet's freshwater resources, lakes and rivers, consuming up to 92% of freshwater worldwide (Hoekstra and Mekonnen 2012). One third of this is directly linked to animal agriculture (Gerbens-Leenes, Mekonnen, and Hoekstra 2013). Very large quantities of animal waste, excessive nutrients and pesticides also pollute the atmosphere (Defra [Department for Environment Food & Rural Affairs] 2018), and run into waterways, leading to eutrophication (Withers et al. 2014), and ammonia and nitrogen pollution are harming 60% of UK land (Defra 2018). Globally, most farm animals are reared intensively (CIWF CIWF, 2022). In addition to environmental concerns, there is increasing evidence that intensive farming causes suffering to sentient animals (Broom 2019). Society is increasingly concerned about this, and therefore these food production systems (Lagerkvist and Hess 2010).

Public knowledge of FS and FAW

A growing proportion of consumers are showing a desire to purchase food that is sustainable and FAW friendly (BEUC 2019; European Commission 2005). This is made challenging by confusion over the impacts of food and where to focus purchasing power. Research by Kause et al. (2019) confirmed that UK consumers are unaware which foods have the most environmental impact. Participants were unable to identify the most effective strategies to reduce GHG emissions through food purchasing, and oblivious to

the high levels of GHG produced by livestock. An EU-funded report across 11 EU countries similarly observed that consumers lack an understanding of sustainability and underestimate the impact of their own eating habits (BEUC 2019). Despite this, over half claimed that sustainability concerns influenced their purchasing. Lack of knowledge had prevented them from doing this more effectively.

This pattern is reflected in studies on consumers and FAW. A Eurobarometer survey found that EU citizens were concerned but felt ill equipped to do something positive, with 90% claiming they did not receive enough information (European Commission 2005). Furthermore, 51% of the 24,708 citizens interviewed could very rarely or never identify from a label whether the product was animal welfare friendly. A 2016 study across eight member states identified the same pattern. The general public, students and consumers typically showed only limited levels of knowledge about FAW, with 39% correct answers for each category (Educawel 2016). The welfare concern for most species, however, was significant and all categories of respondents felt poorly informed.

The National Curriculum

The National Curriculum in England is centrally planned by government, under the responsibility of the Department for Education (DfE) and remains relatively prescriptive compared to most countries (N. Roberts 2021). Since its introduction in 1988, statutory topics have been arranged into core and foundation subjects. At the same time, National Curriculum assessments were put in place, originating from a political desire to standardise education and hold schools accountable (Whetton 2009). This, along with a strengthened school inspection regime (Ofsted [Office for Standards in Education, Children's Services and Skills] 2019), has led to an increasing focus within schools on students' test and examination results.

There is currently no explicit reference to FS and FAW within the primary National Curriculum. A search for 'sustainability', 'food production', 'animal welfare' and 'farm animal' returns no results. Analysing topics around 'food' and 'animals' highlights some room for provision, principally, as might be expected, within the science curriculum. In years 1 and 2, pupils are expected to understand how animals gain their food from plants and other animals, a basic food chain, and the basic needs of animals (DfE 2013). There is opportunity to learn about growing food (thus *potentially* farming) through exploring the conditions plants need (DfE 2013, 152). In years 3–6, pupils are expected to 'understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed' (DfE 2013, 183). Pupils are also expected to learn about animals' habitats, different animals and their basic needs, and processes of reproduction and growth. In theory, FS and FAW could be integral to all of these topics, and there are clear spaces for their provision. However, the lack of direct mention of FS and FAW means they are not likely to be covered, unless at the teacher's discretion. As such, it is possible for students to leave primary school with no knowledge of FS and FAW.

FS and FAW would also appropriately fit into geography, as well as Personal, Social, Health and Economic Education (PSHE) (FAWC [Farm Animal Welfare Committee] 2011) and the optional topic dedicated solely to food: cooking and nutrition. Despite cooking and nutrition's focus on food, the topic fails to consider food production, covering only a narrow range of issues, with health and nutrition at its centre. This focus on health and

nutrition is also apparent throughout the broader curriculum, emphasising the ongoing use of schools for health-related interventions for behaviour change (Ofsted 2018). JOFF [Jamie Oliver Food Foundation]'s (2017) evaluation of cooking and nutrition also found that implementation was inadequate, with problems around lack of facilities, time and resources.

England's current National Curriculum was determined in 2013. Since then, we have seen increasing consensus and concerns about food production and the environment. Alongside this is a growing desire to educate and inform the next generation, who will be living with the consequences of the current situation (Rousell and Cutter-Mackenzie-Knowles 2018). One reason why the primary phase is particularly appropriate for teaching about food sustainability and farm animal welfare is that these are interdisciplinary topics and it is typically the case in primary schools that any one teacher teaches a number of subjects. Another reason is that these topics are likely to benefit from discussion and it has been shown in school science that primary teachers are typically more successful than their secondary counterparts at managing class discussions (Abrahams and Reiss 2012). A further reason is that without wishing to give the impression that there is lots of space in the primary curriculum, it is the case that classroom teaching in secondary schools in England, especially in years 9–11, is frequently dominated by the specific requirements of GCSE (General Certificate of Secondary Education, the external examinations sat by 16 year-olds) specifications.

There is some evidence to suggest that introducing these topics in primary school may be successful. In a study of 12 schools in Korea, Jeong and Choi (2020) found that prior pupil experience with ecological activities, such as experiences with learning about plants, positively influenced agricultural literacy. In addition, a number of studies (reviewed by Cosby et al. 2022) have found that in-class teaching interventions are associated with increases in knowledge when teaching about the environment and food and fibre production.

NGOs

Most animal welfare organisations that operate in England work to fill this gap in the curriculum, putting effort into creating educational resources to be used informally in schools (Muldoon et al. 2009). A study of all AW Non-Governmental Organisations (NGOs) in the UK found that 15 out of 30 organisations were providing educational resources for school children to use, most including FAW as a component (Welfare Quality Report 2010). Despite these organisations recognising the importance of education, most state that they are unsure of the most effective methods and have never assessed their resources (Hawkins and Williams 2017).

Existing evaluations of one-off workshops have found that short-term experiences, the norm for most NGO work, may not be effective in promoting long-term attitude or behaviour change (Batz et al. 2020; Hawkins and Williams 2017; Jamieson et al. 2012). Age has also been a focus of research, with a consensus that education for AW should be age-specific (Welfare Quality Report 2010). Despite this, there is limited agreement on an optimum age, suggesting poor clarity and a need for further investigation (FAWC 2011; Irvine and Ellis 2010; Jamieson et al. 2015; Nicoll, Trifone, and Samuels 2008).

NGOs and schools are also working independently to teach about food production. The Food for Life Partnership (FFL) programme is pivotal in setting out a multi-component approach to educating about food for sustainable development within schools across the UK (Weitkamp et al. 2012). Schools with active farms on site have also had a resurgence in recent years, with over 120 now registered with the School Farms Network (Social Farms & Gardens 2021). Research suggests the potential of school farms to provide a direct resource for sustainable futures and food production education, whilst also providing cross-curricular learning potential (Joshi, Azuma, and Feenstra 2008; Saunders et al. 2013). School gardens are also receiving increasing attention and could clearly play a key role in FS education as well as nutrition more generally; however, their development and upkeep relies on the motivation and enthusiasm of teachers and volunteers. Teachers discuss lack of time (Passy, Morris, and Reed 2010), funding, capacity (Weitkamp et al. 2012) and staff knowledge (Saunders et al. 2013) as key barriers.

Methodology

Research questions

The aim of this research is to analyse stakeholder perceptions of FS and FAW education in primary schools in England, including views about barriers to their delivery and the best approaches for introducing these issues. The research questions for the study are:

- (1) What are the main barriers to educating about FS and FAW in primary schools?
- (2) How do stakeholders think that education on FS and FAW might be most effectively delivered in primary schools?

Research design

As the focus of the study is on the beliefs, attitudes and ideas of stakeholders, and questions about experience, meaning and perspective, in-depth semi-structured interviews were deemed to be appropriate. The research was informed by an interpretivist approach, due to its focus on how stakeholders 'think and how they form ideas' (Thomas 2017, 110) around FS and FAW education. This meant talking with participants in some detail and attending to the nuances in their responses, using a 'naturalistic' method of analysis (Thomas 2017, 112). This method was considered suitable for exploring a subject which is complex and multifaceted, providing an opportunity to consider attitudes and knowledge in depth, to gauge some clarity on the issues at hand.

Interviewees were identified based on their knowledge or interest in FS and FAW education and efforts were made to ensure a variety of voices were included. Various stakeholders were thought likely to hold different values, interests and assumptions that affect their understanding of the issues and how they should best be addressed (Dimitrovski et al. 2021). Potential interviewees, often known personally by one or more of us, were contacted to see if they would be willing to participate. Snowballing was also used, with some interviewees suggesting other key stakeholders (Streeton, Cooke, and Campbell 2004). Overall, some 33 experts were emailed and a total of 10 proceeded to interview (Appendix 1). Responses from NGOs, teachers, experts in education and the farming

industry were predominantly positive. The majority of those working in policy either failed to respond or stated they had no time to be interviewed. A further 13 DfE members of staff were messaged directly on LinkedIn, with no replies. This may indicate the time pressures within the DfE and perhaps that this topic is not high on the department's list of priorities.

Interviews were undertaken by the first author and followed a flexible agenda to allow for in-depth exchanges around pre-decided themes of interest (Jennings 2005). The interview schedule is provided in [Appendix 2](#). While some open-ended questions were prepared to ensure comparability, interviewees were encouraged to 'ramble' and raise unforeseen points, with the hope of gaining an understanding, rather than generalising (Bryman 2016). Probes were used when interviewees touched upon topics of interest, in order to obtain more specific or in-depth information (Given 2008). Interviews were carried out remotely using Zoom video conferencing software, partly due to the coronavirus (COVID-19) restrictions in place when the interviews were conducted (June and July 2021). This facilitated interviewing people from across the UK.

Ethics

The research gained ethical approval from the University of Winchester Ethics Committee in May 2021. Interviewees were initially sent a standard covering email and provided with a participant information sheet, giving details about what the project entailed. Upon agreeing to take part in an interview, they were sent a consent form to be completed before the interview commenced. All participants were interviewed as individuals with expertise and not as representatives of the organisations that they work for. They remain anonymous throughout.

Data analysis

After recording, the interviews were audio-transcribed using a 'naturalised' approach, allowing the transcript to be a 'relatively direct representation of the original discourse' (Bucholtz 2000, 1461). While some transcriber interpretation was necessary to select the most important details for analysis, this was done with self-awareness, and every effort was made to maintain accuracy around what and how views were expressed (cf. Bucholtz 2000). It was recognised that the researcher's position would likely affect interpretation, due to being an insider in the research rather than an outsider (Thomas 2017). However, this allowed the opportunity to respond appropriately during interviews and to gain a deeper understanding of the stakeholders' views.

NVivo 12 software was used for data management. Transcripts were reviewed and relevant extracts coded into 18 nodes, such as 'where in the curriculum to teach FS and FAW' and 'balance and controversy around FS and FAW'. After completing this first stage of coding, each node was reviewed to identify emergent, more specific themes. Two key nodes were identified: 'best ways to educate about FS and FAW' and 'barriers to educating about FS and FAW'. Core themes within each node were then identified, such as 'where FS and FAW fit into the curriculum', 'target age groups' and 'methods of learning'. This second round of coding allowed for excerpts from each theme to be analysed thoroughly alongside each other, to ensure that extracts best illustrating the variety of responses were reported in the findings. Interviewees were engaged and there was

a marked absence of discrepant events. Although the sample size is small ($n = 10$), there was a high degree of concordance in the responses so that something at least close to data saturation was reached.

Findings

This section presents the findings from the interviews, in two distinct sections. As outlined in the previous section, findings were mapped into two main categories, shaped around the research questions: 'barriers to educating about FS and FAW' and 'best ways to educate about FS and FAW'. These two categories do not exhaust the data. For instance, although we did not explicitly ask stakeholders what they believed needs to be known, understood or valued when teaching about FS or FAW, a number of respondents talked about these issues, for example: 'Children today need to know about sustainable ... they need to know where their food comes from' (headteacher); 'I think it's massively important to support local communities and also I fear about the carbon footprint' (headteacher); 'I think it's really important to connect kids not just to what the food does and how it functions but also where it comes from' (policy); and 'in my view it's important that people are educated in a sensible way, so you need to be honest, but you need to be careful how you deploy the message ... It's about an education journey throughout their lives, first finding out where things come from, what's good to eat, what's not good to eat. The balanced plate idea' (NFU).

Within each of the two main categories, core themes were identified, bringing out the key challenges and methods. These are presented below.

Barriers to educating about FS and FAW

Four core themes were identified: Curriculum; Funding; Lack of knowledge; Balance and controversy.

Curriculum

Stakeholders unanimously expressed frustration with the current curriculum and cited it as a core barrier for FS and FAW education being effectively taught within primary schools. Participants commented on an 'outcome focused, tick-box focused system' (policy expert) and an ongoing 'general tendency that you just need three Rs' (CIWF). As one interviewee put it:

I think if I'm honest, the biggest restriction right now is that people still feel they've got to meet standards for English and maths. And because it's competitive, they're always worried they're not going to do as well as other schools. So, they put a lot of time into that. And maybe sometimes too much time. (Harmony Project)

Most agreed that FS and FAW education are not taught in school at all. For example, the classroom teacher stated, 'No, I wouldn't say we do at all'. The Food for Life worker was the most optimistic, pointing to the fact that 'it's a requirement for everything to have a healthy eating element to it' and suggesting that FS would naturally fall within this. This optimism waned somewhat when they admitted a lack of take-up, with only 10% of schools currently meeting their curriculum requirements for cooking. Instead, the topic of food is predominantly seen as enrichment.

Those working in schools commented on the extensive nature of their workload and thus, even when willing or eager to teach FS and FAW, they found this a challenge, noting that ‘there’s already so much to teach and so much to cover’ (classroom teacher).

Ofsted (the non-ministerial department of the UK government responsible for inspecting a range of educational institutions, including state schools and some independent schools, in England) was noted as enforcing this attitude, due to its ongoing focus on the core subjects of English, science and mathematics, and failure to consider school meals and the subject of design and technology (where the topic ‘cooking and nutrition’ sits in the curriculum). Given the workload and pressures of the job, it was stated that teachers are often unwilling to focus on subjects outside Ofsted’s focus. One farming industry interviewee questioned ‘why would you prioritise teaching a subject that you know you’re not going to get Ofsted-ed on?’.

Funding

A further problem raised by interviewees was the lack of funding going into education, with an NGO worker stating that ‘there’s so many cutbacks, they’re so broke!’ (FFL). This is because FS and FAW are seen as enrichment topics, which prevents them being a priority for spending. This is furthered by a preference for hands-on learning as a method for teaching them. When considering taking children to farms, costs are a huge obstacle. The headteacher recognised that ‘to hire a coach is hundreds of pounds. If you’re doing that three times a year, parents get a bit annoyed’.

School meals were raised as a missed opportunity due to limited funding, with caterers moving towards unsustainable food sources as a way of saving money. Having worked directly with school caterers, the FFL worker stated that ‘an awful lot of them who would just import meat from absolutely anywhere as long as it’s above their bottom line’.

The issue of finances goes beyond the classroom to students’ home lives. As the classroom teacher put it:

And I think as well, when you think about the animal welfare. Say you were living on benefits, and you’ve got three children and you live in a council house in the middle of London. And you look at the cost of a diet if you’re trying to live sustainably and checking where all your meat and eggs come from. The reality is that some of those parents will say, actually I can’t afford to do that.

There was a concern among school workers that teaching FS could lead to classroom exclusion of children from lower income families and a kick-back from parents who felt unable to afford more sustainable options. This opened up wider issues with today’s food system where ‘bad food’s cheap and the good food’s expensive’ (FFL).

Lack of knowledge

Higher education, school and NGO workers also expressed concerns about the accessibility of the subject, due to a lack of training in FS and FAW, and primary teachers having to already cover so much:

This is the problem with primary schools, we’re not experts. You know, we deliver thirteen subjects that we know a lot about. If I said to somebody at school ‘I really need you to do me an assembly on sustainable farming’ they’d say, “oh God, I don’t know where you want me to start. (Headteacher)

Concerns were raised that the slow loss of cooking from the school curriculum has destroyed a fundamental understanding of food, making educating about FS and FAW much more challenging. The FFL official expressed concern that ‘we’ve had two whole generations now who don’t know how to cook. Because the skill is gone’.

It was noted that FS and FAW is not taught in Initial Teacher Education, and teachers simply don’t know how to do it (CIWF). The classroom teacher raised concerns that ‘it’s one of those things where there are so many facts and figures going around, we need to know “these are the important bits”, “these are the bits that should be taught”’. This highlighted the complexities of the topic and resulting challenges. There were concerns that teachers would not be well equipped to deal with ‘niche’ topics such as FAW, and suggestions that educating teachers so they can feel prepared to talk about it is a priority (farming industry).

Balance and controversy

Finally, there were concerns raised by all about the sensitivity of the topic. Discussions around food, predominantly FAW, were deemed by some to be a ‘very, very difficult area’ (education expert 1), with mention of it as a politicised subject. A number of higher education and school workers recounted stories of teaching experiences that had led to controversy with parents. One higher education lecturer faced challenges when taking his students to visit a butcher, as part of a theme around food and farming: ‘Unfortunately, the parents knew or discovered that I was a vegetarian. And so, I got all sorts of stick because lots of children were being exposed to some of those experiences’ (education expert 1).

There was a strong awareness of the need to remain impartial to avoid confrontational situations, with the headteacher stating that ‘I’ll have all sorts of parents saying, “You can’t tell us what to do!”’. As such, there was a recognition from both school workers that every word and message had to be thought out carefully. Identifying FAW as a political topic furthered these challenges, due to teachers being hyper-aware that they cannot express opinions within their job role. The classroom teacher stated that ‘There is a whole thing about political teaching at the moment and how we have to remain really neutral in everything’.

These concerns were confirmed by the response from those working in the farming industry, who raised frustration over a lack of balance in conversation:

They’ll have a discussion about battery cages for hens, for example, and all the information and resources that they’ve got will come from an animal rights organisation, where their view is clearly to stop production of farming altogether. (National Pig Association)

They expressed fears that such organisations will ‘simplify the argument’ and fail to cover all the facts (farming industry). The National Pig Association individual noted that ‘while I’m not against having a vegan animal rights group talk to children there should be the other side of it as well’.

Best ways to educate about FS and FAW

Four core themes were identified: Phase of education; Place in the curriculum; Teaching approaches; How to implement.

Phase of education

There was firm agreement among stakeholders that education about FS and FAW must begin at primary level. Education expert 2 stated that ‘we need to do it as early as absolutely possible’. People viewed the primary years as paramount and where all important topics should be introduced, especially those that will prepare children for the challenging future they will face (policy expert).

One farming industry person expressed concern that by secondary level children would have ‘heard all this other stuff about climate change and animal welfare, especially with social media’ and have built negative preconceptions about farmers. Concerns about external influences were also raised by NGO workers. Conversely, they were worried that misinformation might hinder the change needed to prevent the climate emergency as was education expert 2. Either way, the education system was seen as a place for accurate, unbiased information to be disseminated. With unanimous agreement about the importance of introducing the topic early, everyone discussed a need to integrate FS and FAW throughout all of schooling. Education expert 2 stated that we should ‘be drip-feeding children right from the first go’, and not introducing FS and FAW as a stand-alone subject later down the line.

There was some disagreement about the potential delicacy of the subject. Education expert 1 commented that ‘you need to be careful with our age group, because you don’t want to frighten them’. Interestingly, this was mostly raised in the context of FAW. Others felt less concerned about difficult conversations. For example, the classroom teacher commented that ‘if anything, it would probably just empower them. They’d probably end up talking about it in a much more mature way than grownups do’.

Place in the curriculum

Despite recognition that FS and FAW are not explicitly present in the curriculum, stakeholders pointed out key places where there is ‘wriggle room’ (headteacher). Some listed topics where it could already be discussed, for example: ‘Part of the geography curriculum is your local area. And it is in history as well’ (headteacher); ‘A lot of the food sustainability stuff fits nicely into the plant bits in science’ (classroom teacher) and ‘science . . . there are so many obvious links to sustainability, to food, to growing’ (farming industry).

Others went further, suggesting that FS and FAW should be central to learning and used as a tool for teaching about other topics. It was noted that it shouldn’t be seen as an additional thing to add in (Harmony Project official) but rather that ‘You’ve got to integrate it, that’s the whole point!’ (education expert). NGO workers noted how easily this could be done with food: ‘honestly, food covers everything, it really does’ (FFL official).

You can plant some beans. And then, whilst the beans are growing you can count the leaves, you can draw them, you can see what happens when you take the light away. You can do science experiments, you can do maths, you can do literacy, you can do creative writing. All having grown this pea. And at the end, you can eat the pea shoots, you can eat the peas. (FFL official)

It was agreed that placing ‘food at the heart of the curriculum’ (policy expert) means that children can be familiarised with food and that conversations about FS and FAW would follow naturally (classroom teacher).

Teaching approaches

The overarching judgement as to best practice in teaching about FS and FAW was to make it as practical as possible. This was due to a belief that ‘children learn best when they don’t realise they’re learning’ (CIWF), with teaching about food offering the perfect opportunity for kinaesthetic education:

You could easily stand at the front of the room with a PowerPoint and go ‘this is what food sustainability is, this is why you need to do this and this’ but it needs to be taught in a way that children learn, it needs to be practical. You could be so hands on with it, you could visit farms, you could go on little supermarket trips and see which food comes from where. (Classroom teacher)

Many references were made to learning about FS through growing, such as ‘you’ve grown your own carrot, you know its environmentally friendly because you know what that carrot required’ (CIWF). But there were also ideas of using a school council for food (FFL), cooking and talking about the journey of food (education expert 2) and analysing the elements of food (education expert 1), to name a few.

Those working with farmers mentioned their preference for including food producers, stating ‘the farmers I know, they absolutely see, they have a passion for and a belief that they need to engage with young people’ (policy expert). When discussing the barriers around this, suggestions were given to use technology such as FaceTime (education expert 2) or to approach allotments (Harmony Project).

School meals were also seen as an essential tool. People made reference to school meals as the first place that you come into contact with food, and thus where education about FS begins (policy expert).

How to implement

There was an overriding view that the addition of FS and FAW to primary school education is not going to come from government level soon. The policy expert staunchly noted ‘is this government going to redesign education in that way? No. Not in a ... never’. Methods that would bring some level of change, notably the enforcement of food education through its addition to Ofsted inspections, were suggested (FFL official, education expert 1). Despite this, there was ultimate agreement that government was not moving fast enough to make the level of change needed.

As such, focus was predominantly on working from the bottom-up, with a hope that this would eventually force change from government. The policy expert suggested that ‘the onus is on NGOs to come up with really good ways of doing things’, a rhetoric that mirrored the opinions of others.

The dominant theme was therefore on working with what we currently have. As noted, many expressed confidence at the potential to link and integrate FS and FAW throughout the curriculum. Thus, as pointedly stated by one, ‘I think the silver bullet is to look at the National Curriculum, work from the National Curriculum’ (farming industry). People raised the importance of training teachers rather than NGOs taking classes themselves (farming industry) and providing effective, clear resources, to prevent additional teacher workload (FFL). It was recognised that:

If you teach a teacher to teach about farming, and you resource them effectively with high quality resources, they can do those same projects year after year. They can come back, you can tweak. (Farming industry)

Importantly, this mindset relies heavily on NGOs as well as seeing change from individual schools. The importance of a forward thinking headteacher, or other motivated individuals, was recognised as essential (Harmony Project). Concerns were still raised about how far we can go without seeing FS and FAW mapped into the curriculum, with one interviewee stating that ‘there are going to be big gaps’ (education expert 2).

Discussion

Overall, our interviewees favoured the inclusion of food sustainability (FS) and farm animal welfare (FAW) in the primary school curriculum. Both those in the farming industry and those who worked in NGOs were positive about the role that schooling could play, seeing the education system as a place where information could be disseminated that was accurate and unbiased. It was also held that the lack of teaching in recent decades about food was deeply regrettable.

It was felt that teaching about FS and FAW needed to be done from early in primary school and that a number of school subjects, including geography and history, could be involved. Nevertheless, there was agreement that science had a particular role to play. There was strong agreement that the topics of FS and FAW afforded the opportunity for a range of practical activities, including visits to farms and supermarkets. In terms of the broader school environment, school meals were seen as important though it was felt that providing meals that took account of FS and FAW would be more expensive.

There was agreement that changes to the National Curriculum or to the school inspection system in England are not likely to lead soon to the requirement for FS and FAW to be included in the curriculum. However, the more recent announcement (Department for Education DfE 2021) by the UK government that climate change education is to be included in schools – which represents a major change in policy – suggests that FS might soon find a place in the formal curriculum.

At the same time, despite the enthusiasm for the inclusion of FS and FAW in the primary school curriculum, a range of barriers to this were identified in the interviews. Although science occupies a somewhat privileged place in the National Curriculum in England, being one of the three core subjects, along with English and mathematics, the assessment arrangements for state primary schools in England give more weight to attainment in English and mathematics than in science. Teachers were also hesitant, in the absence of this being a requirement, to spend much time on FS and FAW on the grounds that the curriculum was already perceived to be overloaded, and because of the belief that formal school inspections (by Ofsted) would not reward schools that spent time and effort on FS and FAW.

Although primary schools in England are well resourced compared to those in many other countries, it was also felt that it was unrealistic (on the grounds of expense) to expect many visits by students to be arranged as part of teaching FS and FAW. Additionally, there was a realisation that there would be implications for teacher education if FS and FAW were to be required teaching. Finally, there was concern, particularly from those who worked in schools, in teacher education and in the farming industry, about whether teaching in this area could be balanced and impartial.

In fact, primary schools already teach issues where balanced and impartial teaching is required, for example when teaching certain topics in history (such as those to do with colonisation) and when teaching Relationships and Sex Education. In addition, there is a growing literature in science education about how controversial and sensitive issues might be taught (e.g. Garrecht, Reiss, and Harms 2021; Reiss 2019).

Whether FS and FAW should be taught in science raises the fundamental question as to the aims of science education. Traditionally, school science education has had a particular focus on ensuring that students who choose to study science once it is no longer compulsory have the knowledge to do so. Increasingly, there has been a move in many countries for school science to be for all students and to have a broader focus on scientific literacy (D. A. Roberts and Bybee 2014). Still more recently, there have been arguments for a humanised science education that aims at critical scientific literacy and socio-political action (Sjöström and Eilks 2018). These visions for science education can be related to more general arguments about education, including whether it is about providing access to powerful knowledge (Young 2008) or enabling human flourishing (Reiss and White 2013) and, we would argue, flourishing beyond humans too.

Clearly, teaching about FS and FAW fits into approaches to school science that focus on scientific literacy and a humanised science curriculum. Indeed, given the widespread consensus that the school science curriculum is overloaded and recent and on-going moves towards curricula based on Big Ideas of science education, there is an argument that the topics of FS and FAW may best be dealt with, at least in part, when ideas about ethical thinking and climate change education are taught. However, there is much teaching about FS and FAW that also aligns with traditional understandings of the aim of school science and the organisation of the primary school science curriculum.

Limitations

A sample size of 10 is small. A larger sample size would, in particular, have allowed more primary practitioners to be interviewed as well as those in the DfE and other relevant parts of the school ecosystem (including those in Awarding Bodies, Ofqual [The Office of Qualifications and Examinations Regulation] and Ofsted). There would clearly also be value in looking at the situation in other countries, in other subjects (e.g. geography) and in the secondary phase. If substantial revisions to the primary science national Curriculum are made at some point, it would be good for this research to be repeated to see what, if anything, has changed.

Conclusion

It is widely agreed that our present intensive food system is unsustainable (Gaffney et al. 2019). At the same time, very large numbers of farmed animals experience suffering as a direct consequence of their breeding, rearing and housing (e.g. Rowe and Mullan 2022). Relatively few people understand the effect that the production of food, including that which comes from farmed animals, is having on our planet, nor the realities of different methods of farming on animal welfare. Education in schools has been identified as a pivotal place to educate about these important issues. Despite this, FS and FAW in England currently sit outside of the primary school curriculum and are at each teacher's discretion to teach.

While some NGOs work to promote education about FS and FAW, literature around these topics remains limited. This project sought to determine the key barriers to FS and FAW being taught within primary schools, and the best ways to introduce and teach them.

Several important barriers were identified within this study. Stakeholders also identified key points for their successful teaching. Importantly, while the core barriers were seen to exist at the level of the state education system, stakeholders identified ways that NGOs and schools could work around these. Change was deemed most likely to come from the bottom-up, rather than relying on developments at government level.

It is hoped that the identification of these barriers and methods for teaching can aid future work in integrating FS and FAW within school education, particularly science education. From a research perspective, next steps might include work into the effectiveness of existing approaches to FS and FAW education in primary schools, whether in science or cross-curricular, through the evaluation of projects such as FFL, or individual school approaches.

The awareness of the importance of FS and FAW education is growing but there is still a long way to go. The on-going danger of the climate change crisis and the role of the food system in this means that there is an urgency to the development of appropriate, effective education. Equally, consumers need to be able to understand the various methods of animal farming and the power that we hold as consumers today.

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Data availability statement

The data are not publicly available. Reasonable requests may be made to the first author.

Ethics statement

This research was approved by the University of Winchester Ethics Committee (approval number AWSEL21AJ).

Geolocation information

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Appendix 1: Interviewee details

Individuals with senior positions in the below organisations were interviewed. Permission was provided for their organisations to be named in this way. In addition to the primary school headteacher and primary school classroom teacher, a number of the other interviewees had previously worked as classroom teachers.

NGOs

Compassion in World Farming (CIWF)
Food for Life (FFL)
Harmony Project

Farming industry

National Pig Association (NPA)
National Farmers Union (NFU) of England and Wales

Policy experts

Farmwel

Higher education

University of Winchester lecturer – Primary Initial Teacher Education (Education expert 1)
University of the West of England lecturer – Initial Teacher Training (Education expert 2)

School workers

Primary school headteacher
Primary school classroom teacher

Appendix 2: Interview schedule

- (1) What are your views concerning education on food sustainability and farm animal welfare?
- (2) Do you think there is currently sufficient education around food sustainability and farm animal welfare? Examples of when and how this is taught?
- (3) Do you think there is a demand for education here?
- (4) Do you think there is potential for that such education would in turn improve food sustainability and farm animal welfare issues?
- (5) How do you think that teaching about food sustainability might be most effectively delivered? What about farm animal welfare?
- (6) Is there a certain age group that might be best suited for learning about these topics, or do you think it should be taught throughout schooling? Why?
- (7) Where do you think it might best fit into the curriculum?
- (8) Why do you think that education on food sustainability and farm animal welfare is not currently a mandatory part of the curriculum in England?
- (9) What do you perceive to be the main barriers to food sustainability entering the national curriculum? What about farm animal welfare?
- (10) If you were able to make the decision, would you like to see more education in these areas? Why?