Environmental Education Research

Routledge
Taylor & Francis Group

ISSN: 1350-4622 (Print) 1469-5871 (Online) Journal homepage: www.tandfonline.com/journals/ceer20

Learning to care in the food system: Education for Sustainable Development resources, food education and the farming of animals for food

Verity Jones & Christopher Bear

To cite this article: Verity Jones & Christopher Bear (16 May 2025): Learning to care in the food system: Education for Sustainable Development resources, food education and the farming of animals for food, Environmental Education Research, DOI: 10.1080/13504622.2025.2504532

To link to this article: https://doi.org/10.1080/13504622.2025.2504532

Published online: 16 May 2025.

ENVIRONMENTAL EDUCATION RESEARCH
https://doi.org/10.1080/13504622.2025.2504532

Routledge
Taylor & Francis Group

Learning to care in the food system: Education for Sustainable Development resources, food education and the farming of animals for food

Verity Jones[a] and Christopher Bear[b]

[a]University of the West of England, Bristol, UK; [b]Cardiff University, Cardiff, UK

ABSTRACT

Despite calls for curricula to be repurposed around environmental concerns, and the related significance of food-related emissions to global climate change, consideration of the wider impacts of the global food system (positive and negative) are frequently not well-integrated into education of 5–11-year-olds. This paper makes an important contribution to nascent research around the nature and role of learning resources for education for sustainable development, providing the first review of the place of animals in learning resources for food education. The 117 resources we drew on focused on those that were freely-available, directed at ages 5–11, and available to support those implementing the Curriculum for Wales. We reflect on the implications of these findings for the design of future learning resources, focusing specifically on how they could incorporate ideas from literature on more-than-human ethics of care and, through this, how they might prompt not only critical reflection but meaningful actions and engagement amongst learners.

ARTICLE HISTORY
Received 14 December 2024
Accepted 5 May 2025

KEYWORDS
Food education; values; care; food system

SUSTAINABLE DEVELOPMENT GOALS
SDG 2: Zero hunger;
SDG 4: Quality education

Introduction

In primary education (5–11 years), learners across the world are often taught how what we eat can impact our health (e.g. Fairclough et al. 2013; Pampaloni et al. 2015; Jang, Kim, and Lee 2021; Jones, Ruge, et al. 2022). However, despite calls for curricula to be repurposed around environmental (Whitehouse 2016) and ethical (Bleazby 2020) concerns, and the related significance of food-related emissions to global climate change (UNFAO 2024), consideration of the wider impacts of the global food system (positive and negative) are frequently not well-integrated into primary education. In contrast, children often want to know more about the food they eat. For instance, a recent study of 7–16 year olds found they craved greater knowledge about the treatment and care of animals in the food system, to make better-informed food consumption choices (Jones 2020); they called for the 'background conditions' (Young 2006, 103) of nonhuman animals within the food system to be made visible within their educational experiences.

CONTACT Verity Jones Verity6.Jones@uwe.ac.uk University of the West of England, Bristol, UK

In this paper, we examine resources designed to help teachers explore the place of animals in the food system with their pupils. The contribution of learning resources to educating children about socio-environmental issues, and their role in prompting actions and responses, has been a focus of discussion for more than a decade. Research has examined such resources in relation, for instance, to Fair Trade and social justice, climate justice and global citizenship (e.g. Bourn 2020; Eaton & Day, 2020; Huckle 2013; Pykett et al. 2010; Tallon and Milligan 2018). This work has reflected on resources produced by corporations, charities and non-governmental organisations (NGOs) for use in schools. We seek to extend this work into an area thus far overlooked: how care for non-human animals in the food system is positioned in educational resources. Consideration of how educational material might be designed to inform young people about the impacts of the global food system has, to date, tended to focus on food literacy—how food-related knowledge and skills can inform healthy food behaviours of adults and adolescents (Amin et al. 2018)—rather than on sustainable food behaviours that consider ethical questions around the place of nonhuman animals in the food system.

These concerns about nonhuman animals in the food system relate closely to broader debates about education for sustainable development (ESD). While there has been some debate around the extent to which animal welfare should be considered a component of sustainability (Wawrzyniak 2023), its relevance has increasingly been accepted. For instance, Richter et al. (2024) identify a range of publications from national scientific advisory boards, scientific publications on sustainable food system transitions, and guidance from the FAOthat 'acknowledge animal welfare as an important sustainability theme' (180). Blackstone et al. (2024, 818), meanwhile, argue that 'the social dimension of sustainable diets' encompasses 'the well-being of human and non-human animal populations along the whole food value chain'. They contend that the transition to sustainable diets involves '[b]ringing the people, *animals* and communities that are integral to food value chains to the same conversations as climate change and dietary contributions to human health' (822; emphasis added). Others have highlighted the inherent anthropocentrism of the UN Sustainable Development Goals (SDGs) which, despite calling for sustainable food production systems and resilient agricultural practices by 2030 (SDG targets 2.4 and 4.7; UN: https://sdgs.un.org/goals/goal4#targets_and_indicators), make only one explicit reference to farmed animals. Torpman and Röcklinsberg (2021) argue that SDGs should focus more holistically on both human and nonhuman animals. Here, then, we build on such scholarship to propose that critical consideration of nonhuman animals' place in the food system can play an important role in ESD.

In taking this forward, we focus on how educational resources portray responsibility for animals in the food system and their related environmental impacts, and on how the resources might engender particular ethics of care. Through qualitative content analysis of 117 learning resources, we build directly on Wheeler's (2023) recent study of general (i.e. not specifically about food) ESD resources.

We frame our analysis and critique in relation to interdisciplinary scholarship that understands organisms as constructed through relations, or 'entanglement' (Hollin et al., 2017), with others. Our analysis focuses on versions of 'care' promoted by the learning resources in relation to animals in the food system, drawing on Tronto's

(2013) framework for an ethic of care and more recent research that has extended this beyond humans (e.g. Beacham 2018; Krzywoszynska 2019; Cusworth 2023). Through this, we build on Wheeler's (2023, 454, citing Young 2006) call for greater attention to 'background conditions'—necessary, she argued, for empowering children as citizens against structural injustices - to include nonhuman animals.

We begin the paper by reviewing existing research around ESD and learning resources' role in supporting this, grounding our subsequent analysis through a brief outline of key tenets of the new Curriculum for Wales. We situate these issues in relation to emerging research on a more-than-human ethics of care. After outlining our methods, we provide a critical analysis of learning materials around animals in the food system. The paper concludes by considering the implications of a more-than-human ethic of care for the future development of learning resources for food education.

Education for sustainable development

Embedding ESD in curricula: current status

The embedding of particular aspects of sustainable development in curricula around the world remains uneven. While UNESCO (2021) reported that 69% of curricula mentioned sustainability, only 47% mentioned climate change, and 19% made reference to biodiversity. However, the past five years have seen a shift to the formal embedding of ESD within curricula. Following Italy's lead in 2019 (Hodal 2019), the European Commission (2024) note that France, Ireland, Norway, Spain and Belgium have adoptedcompetency frameworks to frame goals and experiences around sustainability, while Czechia, Denmark, Malta, Finland and Portugal have threaded sustainability through selected subjects. In Estonia, Slovakia and Hungary a whole school approach is supported through which connections are made between formal learning, the school and local communities. Beyond the European Union, Australia identifies one of the 'general capabilities,' which all students should develop, as *ethical understanding* (ACARA n.d.a), while one of its three cross-curriculum priorities is *sustainability* (ACARA n.d.b). In India, climate change and environmental issues are mentioned in the National Education Policy as part of work towards reading the United Nation's Sustainable Development Goals (Jones, Mitra, and Gupta 2022), while Owuondo (2023) notes the need for, and challenges (such as infrastructural deficiencies) of, customising educational curricula in the Global South to foster environmental consciousness. Meanwhile, the Curriculum for Wales has been aligned with the UN's Sustainable Development Goals and one of its four core purposes *is to support learners to become ethical informed citizens* (Welsh Government 2020)—in contrast to, for example, the primary curriculum for England (Department of Education 2013), which makes no reference to sustainability or climate change.[1]

Beyond the need to strengthen ESD's cognitive knowledge base, a substantial gap remains in the development of socio-emotional and action competencies for change (UNESCO 2021). Research has shown that young people feel an array of emotional responses to the current climate and ecological emergency including being worried,

anxious, scared, guilty and angry (see Jones and Podpadec 2023 and Hickman et al. 2021). Hicks, (2014) has argued that existing pedagogies encourage dissemination of knowledge about the climate and ecological emergency, but do little to provide learners with a route to engagement and positive change, while Whitehouse (2016) argued that pedagogies often fail to pay attention to learners' anxieties about the environmental crisis. In this paper, we suggest that such concerns could be extended to learners' potential interest—and resulting anxieties—around the treatment of livestock animals, which has to date not been studied in relation to educational resources.

Action orientated education practices have been identified as one way of supporting learners in navigating these emotions and positioning themselves as changemakers, with calls for learners to interrupt and alter their own actions to influence others (Trott 2021, 301). Leopold argued in 1949 that for people to feel responsible for Nature and then to engage in environmental stewardship, they first need to feel connected to Nature, to become entangled and recognise the connections. Since then, childhood has been identified as a critical time where Nature experiences and values develop (Lithoxoidou et al. 2017, O'Brien 2005). Primary schools (for 4-11 year olds) have been identified as being particularly critical in the development of these experiences and values as they tend to be more receptive and less constrained to innovate for sustainability in the curriculum (European Commission, 2022).

The aforementioned Curriculum for Wales represents an attempt to take many of these themes forward, placing ethics, active citizenship and sustainability at its core. We briefly summarise some of its key tenets here, both to illustrate a recent attempt to incorporate the ethics of food choices in a curriculum and the pedagogic challenges this raises. This helps to contextualize our subsequent analysis of learning resources, questioning how these could support teachers in the implementation and delivery of the curriculum.

The Curriculum for Wales was formally introduced in Welsh primary schools in 2022. It explicitly promotes socio-emotional and action competencies, moving beyond an exclusive focus on cognitive knowledge that many other curricula retain. It groups subjects in Areas of Learning and Experience (AoLE): expressive arts; health and well-being; humanities; language, literacy and communication; mathematics and numeracy; and science and technology. Each school is expected to design its own curriculum based on shared principles. For example, the topic of food may be integrated as a cross-curricular theme, or taken as a standalone topic delivered mainly through health and wellbeing and science and technology, always linking back to a local context. The health and wellbeing AoLE helps learners to:

> understand how decisions and actions impact on themselves, on others and on wider society, both now and in the future. It can also help learners understand the factors that influence decision-making, thus placing them in a better position to make more informed and considered decisions (Welsh Government 2022a [first published 2019; updated 2022]).

Integral skills include being able to 'create nutritious healthy meals' and 'opportunities to develop critical analysis, evaluation and appraisal skill' to support problem solving. (Welsh Government 2022a [first published 2019; updated 2022]). This AoLE further includes themes that could encourage critical reflection on food, by aiming to support learners' 'understanding of how individual and collective decision making

can support ethical and sustainable responses to challenges and opportunities that are faced by humanity'. As such, learners are positioned as potential actors in producing sustainable futures.

The active role of the learner is further emphasised in other AoLE. For example, the humanities AoLE positions learners as decision-makers. It aims to 'heighten learners' awareness of how the future sustainability of our world and climate change is influenced by the impact of…actions. It will also encourage learners to understand, as producers and consumers, their own impact on the natural world (Welsh Government 2022b). Tantalisingly, the AoLE states that learners should be helped to 'develop an awareness of their own rights…as well as their needs, concerns and feelings, *and those of others*, and of the role such an awareness plays in the creation of a sustainable and interconnected world' (emphasis added). It is noted that this will enable learners to take 'committed social action as *caring*, participative citizens' with a commitment to 'justice, diversity and the protection of the environment' (emphasis added).

The steer to consider the needs and feelings of others offers an intriguing route through which to reflect on the nonhuman components of the global food system (see Vision Line 2019), and around what caring for these might involve. The curriculum also presents significant challenges for schools and teachers—through, for instance, the expectation of cross-disciplinary teaching, learner-led approaches, a changing real-world context, and an engagement in complex topics that might challenge personal beliefs.

Learning resources to support ESD

The research literature around provision of learning materials by (for instance) NGOs and corporations has largely ignored ESD. The first review of ESD resources was conducted by Wheeler (2023), who explored to what extent 155 resources from public, private and third sector organisations were fit for purpose for 7-11 year olds. This review covered a range of ESD topics (including food) and activity formats (such as lesson plans, worksheets and videos). It analysed how resources represented sustainability, attributed responsibility to different stakeholders (including children), and encouraged children to become change makers. Acknowledging that sustainable education materials used by schools should do more than focus on knowledge, Wheeler (2023) argued that effective ESD should 'provoke normative questions about how humans should value and act upon the natural world'. She found that ESD learning resources for this age group do not equip children with an understanding of the political and moral economies that work to shape their (in)actions as global citizens nor do they allow for collaborative competencies to be developed. Instead, they tended to focus on how children's individual actions can make a difference to the current climate and ecological crisis. We argue that while this does not lay blame for current conditions on the child, it emphasises individual responsibilities for environmental care. In doing so, it denies the complexity of systemic and cumulative results of everyday behaviour across space, time and processes, amongst multiple species and within commonly accepted rules, laws and policies.

Wheeler's critique focussed on generic ESD resources from an anthropocentric position. In contrast, we take a more-than-human perspective on food-related ESD resources,

exploring how, and to what extent, they encourage critical thinking around animals' place in the food system, and around humans' responsibilities to those animals. This makes a significant contribution to the understanding of such resources, as their role in provoking and informing learning around (for instance) animal welfare has to date been largely ignored. Attending to the place of animals in the food system also raises additional issues. For example, encouraging children to think about animals' role in food provisioning, and about how (and which) humans should look after those animals, could involve critical consideration of what 'care' means and how it might be enacted at a distance. Giving consideration to animals can also introduce topics that are often sidelined, such as death. It has been argued that death should be addressed at all levels of education (Ramos-Pla, del Arco, and Flores 2021, Raccichini et al. 2023). Themes of death in the 5-11 year curriculum might be typically limited to Personal, Social and Health Education (PSHE) in relation to the death of friends, family or pets and how these circumstances may be navigated on an emotional level—rather than thinking about the necessity and nature of death in animal-based foods.

We develop this focus in the next section, through a review of recent literature that has aimed to explore and conceptualise different types of 'care' in relation to livestock animals.

Responsibility and a more-than-human ethics of care in the food system

The aim of engendering sustainable action, embedded in curricula such as that of Wales, is predicated on children developing interest in, and caring about, the topics about which they learn. We consider the meaning of 'care' in this section through reviewing literature that has developed around the nature of, and responsibility for, care for livestock—animals that are destined to become food for humans. This scholarship extends beyond animal welfare science to conceptualise 'caring' as an ethic, or ethos, rather than the implementation of rigid principles (Puig de la Bellacasa, 2017). Similarly, this work has considered ways in which those at a distance from the livestock animals—rather than only those who work with and farm them—are implicated in debates around the role and treatment of the animals. Much of this literature is predicated on what Haraway, (2016) refers to as 'sympoiesis' (p.58)—the entanglement of different species and beings in practices of 'becoming-with each other' (p. 59). The act of eating is one of the most immediate sympoieses, entangling humans in complex, sometimes harmful, ethical and moral relationships (Haraway 2008). We cannot eat without causing harm to that which we eat and so our plates, bowls and lunch boxes offer the possibility for interactions of care through an ethics of eating.

In this context, scholars have sought to understand how nonhumans come to matter (or not) in food production and consumption (e.g. Evans and Miele 2012). Piazza et al. (2015) note that meat eaters often justify their choice by framing their consumption as natural, normal and necessary, while Joy (2009) posits that a cultural system of unconscious norms and motivations allow consumers to deny the suffering of animals caused by meat production. Much of the current discussion around nonhumans in the food system stems from Fisher and Tronto (1990: 40) feminist reconceptualization of care as an ethic involving 'everything that we do to maintain, continue, and repair our "world" so that we can live in it as well as possible'. Rather

than relying on fixed moral codes, their framework emphasised the situated and emergent nature of caring practices. They initially proposed four phases of caring, involving caring about, taking care of, caregiving, and care-receiving:

> Caring about involves paying attention to our world in such a way that we focus on continuity, maintenance, and repair. Taking care of involves responding to these aspects – taking responsibility for activities that keep our world going. Caregiving involves the concrete tasks, the hands-on work of maintenance and repair. Care-receiving involves the responses to the caring processes of those toward whom caring is directed. (p.34)

Viewed thus, care is a practice that requires responsiveness—which, in turn, 'requires attentiveness, knowing what another needs and how to respond' (Pitt 2018: 260). To those original four, Tronto, (20132013: 23) added a fifth phase of care: 'caring with,' which 'requires that caring needs and the ways in which they are met need to be consistent with democratic commitments to justice, equality, and freedom for all'.

While Fisher and Tronto's work was about relations between humans, authors such as de La Bellacasa, (2010) have expanded the ethics of care framework to consider relations with nonhumans ranging from animals to soil. As Cusworth (2023: 58) notes, 'Food production is reliant on the wellbeing of a wide variety of bugs, bacteria, fungi, plants, critters, soils, etc.' Haraway's (2008: 205) attention to the 'contact zone' of more-than-human relations has resulted in a focus on proximate encounters, particularly through exploring how food producers learn to be 'response-able' (Haraway 2008: 71). Being response-able denotes an affective shift through which attentiveness—'of attending to the non-human other' (Krzywoszynska 2019: 664)—is central. For Krzywoszynska (ibid), 'Attentiveness…is inherent to care practices as a form of skill'. Such skill might involve forms of 'practical tinkering, of attentive experimentation' (Mol, Mosser, and Pols 2010: 13); viewed thus, practices of care are situated and ongoing.

However, Cusworth (2023) has argued that thinking around care in agriculture and food systems should be extended beyond these situated encounters:

> the agricultural care framework as it has so far been mobilized lacks some of the conceptual grammar needed to codify ethically significant outcomes that fall outside the bounds of affecting experience, multispecies encounter and local socio-ecologicaloutcomes (p.65)

He calls for 'conceptual developments' that would 'ensure that notions of agricultural care can produce salutary outcomes both near and far from the sites being studied' (p.60). Krzywoszynska (2019) had moved some way towards such a development through proposing a 'care network model' (p.662), involvning an 'assemblage of interconnected entities whose existence enables the well-being of the primary object of care' (p.664), shifting the focus away from encounters between two individuals towards a more complex network approach. However, in the case study Krzywoszynska (2019) develops, she focuses on relations around particular farms and the community of practice amongst nearby farmers. As such, her paper provokes questions around how an ethic of care might be extended to the wider food system—notably involving those who make decisions around which food to consume, and its potential impacts on the more-than-human actants involved in its production.

In the remainder of the paper, we examine one specific aspect of the issues raised by Krzywoszynska (2019) and Cusworth (2023), considering how children are

encouraged to take responsibility for, and care about, the animals that are involved in food provisioning through a selection of educational resources. While the majority of children in the UK are geographically or cognitively distant from practices of livestock farming, as well as without purchasing power, learning materials produced by retailers, farming organisations and charities aim to inform them about these practices and their impacts. Such materials can speak to the complex more-than-human entanglements embodied by the food system. Building on the literature discussed here, we consider the role that different modes of 'care' play in these materials and conclude by questioning how future learning materials could constructively build on a more-than-human ethics of care and work towards collective action of responsibility.

Methods

As Wheeler (2023: 458) notes, the range of ESD resources is 'huge' and includes 'environmental education, development education, education for sustainability and the UN-sponsored Education for Sustainable Development'. With this in mind, our sampling strategy aimed to capture a diversity of online resources accessible to educators in Wales (this being our context for subsequent analysis). No ethical approval was required for this work. We acknowledge that online resources are not readily available to those settings and locations where there is limited or no internet and/or a lack of hardware or infrastructure readily available to support the use of online materials. Data was initially sourced from the 155 generic ESD learning resources from non-government organisations (NGOs), private and public sectors listed and analysed by Wheeler (2023). These resources were presented in English and were all free to access online and to download without the need to register. During November - December 2023 we searched these general resources for reference to the theme of farming animals for human food. Of the 155 original resources/packs, 18 made explicit reference to animal farming (see Table 1). Wheeler (2023) limited the number of resources from each organisation to three, due to the scale of general ESD material produced by bodies such as Oxfam. As the range of material on farmed animals was far smaller, we extended the sample to include all relevant resources from these

Table 1. Number of resources referring to production of food derived from non-human animals explored by organisation.

Name of organisation	Private sector	Labelling organisation	Third sector	Government
Tesco (a supermarket)	7			
Eco-schools (Scotland)			6	
Oxfam			9	
World's Largest Lesson (UN)				10
RSPCA[a]			2	
PETA			21	
Meat promotion Wales	31			
National Farmers Union (NFU)	14			
Food for Life[b]			17*	
Total	52	2	55	10
Grand total = 117				

[a]The RSPCA is a charity focussed on promoting animal welfare. RSPCA Assured is a non-profit assurance programme, that labels products that have been certified as meeting its welfare standards.

[b]We recognise that Food for Life is a third sector organisation, but is an arm of the Soil Association which is a labelling and environmental campaign organisation.

organisations. A further three were added from World's Largest Lesson.[2] Its 'Every Plate Tells a Story' resource was included because, despite no direct reference to meat consumption, it is reasonable to assume that children may include this in mapping of food they consumed and therefore may make pledges to reduce meat consumption as a result. Following an online search using Google, we identified a further 59 resources that explicitly focussed on animal welfare education for primary school aged pupils (5–11 years). Seach terms included: 'teaching AND education AND resources AND food', 'teaching AND education AND resources AND food AND primary', 'Teaching AND education AND animal welfare'. Resources from farming organisations from the UK (National Farmers Union (NFU), Meat Promotion Wales and Food for Life), UK food labelling organisations (Royal Society of the Prevention of Cruelty to Animals (RSPCA)) and globally recognised animal welfare activist groups (PETA) and environmental charities (Greenpeace and Friends of the Earth) were identified. Resources relating to domestic or wild animals were not included as our focus was on the welfare of animals for human food (not including eggs). While Greenpeace offered a number of resources that mentioned 'industrial meat' this referred to rainforest clearance rather than animal welfare - apart from in one resource (Team Plant video; see Table 2 for link). Friends of the Earth produced relevant resources for older learners, but these were excluded from our analysis as they were not aimed at primary age children (5–11 years). NFU resources were the only ones that required (free) registration for access. The total number of resources analysed was 117.

Table 2 provides an overview of all resources analysed.

Our analysis was informed by Clarke and Braun's (2017) thematic analysis and latent content analysis. The former is helpful when interrogating 'patterns within personal or social meaning around a topic, and to ask questions about the implications of these' (2016, 297), while the latter aims to unearth the hidden meaning of words (Babbie 1992). We recognised that 'meaning is not always manifest and clear at first sight' (Schreier 2013, 13) and in our analysis therefore avoided summative content analysis, which involves 'counting and comparisons, usually of keywords or content' (Hsieh and Shannon 2005,); reporting on numbers of occurrence would reduce the ability to explore ideas of caring (or the omission of this caring) within the documents.

One of the authors familiarised themselves with the data through reading and re-reading the resources, drawing out excerpts that were saved into a spreadsheet. From this, codes (the smallest unit of analysis that captured potentially interesting features relevant to the research question/s) were generated. The second author went back to the data and rechecked these themes and associated codes to ensure accuracy of best fit. Through discussion, the authors agreed high-level codes:

- How human and non-human animals are framed in relation to climate change
- How human and non-human animals are framed in relation to well being
- How human and non-human animals are framed in relation to health
- How slaughter is/is not represented and/or imagined
- The distribution of a responsibility of care to non-human animals in the agricultural system
- The allocation of action
- The positioning of action as passive or active

Table 2. Resource collection by organisation.

Name of organisation	Name of resource / resource collection and link as of 17.11.23	Summary of units of analysis
Tesco	Eat Happy Project: sustainability trails https://www.eathappyproject.com/resources/videos/beef-from-farm-to-fork/	3 lesson plans, 3 videos, 1 learning resource
Eco Schools Scotland	Food and Environment www.keepscotlandbeautiful.org/eco-schools/topics/food-and-the-environment/	1 video, 5 learning resources
Oxfam	Global Food Challenge https://www.oxfam.org.uk/education/classroom-resources/global-food-challenge/	6 lesson plans, 3 learning resources
UN World's Largest Lesson	Every Plate Tells a Story https://worldslargestlesson.globalgoals.org/resource/plate-pioneerz-every-plate-tells-a-story/	1 lesson plan, 5 learning resources
UN World's Largest Lesson	Rise of the Plate PioneerZ http://cdn.worldslargestlesson.globalgoals.org/2018/04/Rise-of-the-Plate-PioneerZ-FINAL-COMIC.pdf	1 video, 3 learning resources
National Farmers Union (NFU)	Engineering Educators: Cattle Carers https://www.engineeringeducates.org/	5 lesson plans, 9 resources
Meat Promotion Wales	Fun on the Farm https://eatwelshlambandwelshbeef.com/fun-on-the-farm/	16 activities (KS1) 15 activities (KS2)
Food for Life	Food Origins https://www.foodafactoflife.org.uk/7-11-years/where-food-comes-from-7-11-years/food-origins-7-11-years/	3 lesson plans, 14 resources
Royal Society for the Prevention of Cruelty to Animals (RSPCA)	Farmyard Freedom https://education.rspca.org.uk/web/ed/education/teachers/primary/lessonplans/farmanimals/foodlabelling	1 lesson plan, 1 resource
People for the Ethical Treatment of Animals (PETA) Foundation	Share the World https://secure.peta.org.uk/page/24928/data/1	21 resources
Greenpeace	What might Team Plant Do? https://www.greenpeace.org.uk/all-resources/education-resources/#seven	1 video

Following this, the authors identified four interweaving themes through which livestock animals were represented: looking after animals in the context of sustainability, wellbeing of nonhuman animals, end of life, and young people's role as agents of change in relation to farming animals for human consumption. We discuss these themes through the following section.

Presentation of results

Looking after animals in the context of sustainability

In this first theme, we look at how learning resources discuss the implications of sustainability for how farm animals should be looked after. Despite global concern around greenhouse gas production related to livestock farming (Bačėninaitė, Džermeikaitė, and Antanaitis 2022), this was not a significant framing in the resources reviewed. Only one education pack—from the NFU—explicitly mentioned the term 'climate change'. In this, the lifecycle of cattle and their production of methane in 'burps' were noted as having implications for climate change—though in relation to cattle for dairy, rather than meat (Engineering Educates, Cattle Carers resources). On slides to be shared with learners, Amy, (a cattle farmer) provides a testimonial:

> The environment is a big concern with an increased focus on sustainability. We are looking for ways to give back to the environment as much as we can. (NFU 2022, session 1, slide 8)

However, the specific relationship between livestock animals and wider environmental concerns is not further discussed

Where environmental implications of meat production were acknowledged in learning resources, discussion of approaches to adaptation were often without consideration of implications for livestock animals themselves. NFU resources noted that the 'diet of cows might reduce the greenhouse gas emissions' (see Table 2 for links). Again, care for animals is not the framing strategy and no mention of how a change in diet may impact the health and wellbeing of the cow is considered; children are being encouraged to think about care for the environment, but the affected animals appear passive and manageable.

Resources from Meat Promotion Wales (see Table 2 for links to all resources]) do not refer to methane emissions, but instead refer to indirect pollution caused by transportation of meat for human consumption:

> If you live in Wales and eat meat from Welsh animals then it probably hasn't had to travel very far. This is called low food miles and it helps the environment by reducing pollution from transport.

Here again, cows' impact on the environment is highlighted, but potential benefits for animals, through less time on journeys to abattoirs are ignored. Living conditions were discussed more explicitly later in the NFU Cattle Carers resource. For example, it discusses the design of face masks for cattle to capture methane-rich cow burps, and a video shows cattle wearing masks that capture methane and convert it into water and carbon dioxide. Scientists and engineers are also seen working on other adaptations to help reduce greenhouse gas emissions by cattle—for example, in developing new feed and 'huge transparent domes up to three acres in size where gas, water and temperature can be easily controlled' (35). Again, the focus is on environmental impacts, though one explicit reference was made to the impact on animals, acknowledging that 'animal protection organisations object strongly to cows being fitted with face coverings from the age of six months' (p35). However, no explanation of the impact on welfare for younger or older cows is given.

The only other reference to sustainability, in the context of SDG 3 (Good Health and Well Being), was in the UN's resource *Rise of the Plate PioneerZ*, which focused on reducing consumption of ultra-processed foods, such as chicken nuggets. Here, again, the concern was anthropocentric, with no regard paid to animal-driven rationales for such reduction.

The lack of focus on sustainability (no other resources referred to sustainability either explicitly or implicitly) is significant in itself. It is in marked contrast both to: (1) general ESD resources' tendency to present an 'apocalyptic narrative' (Hannigan 2014) that illustrates nonhuman animals as—for example—turtles entangled in ocean plastic, or polar bears on melting icecaps (Wheeler 2023); and (2) wider media coverage, scientific research, and international policy that positions livestock farming at the centre of debate around global responses to climate change. In relation to this paper's focus, it is notable that when animals are mentioned, they tend to be framed

as incidental and/or passive—objects that can adapt through changes of diet or application of new technologies. They are, therefore, framed as being in the background of food provisioning rather than as key actors. Any notion of care relates to the wider environment, where responsibility for responding to a need for repair (a la Fisher and Tronto 1990) is portrayed as lying with farmers (e.g. NFU Cattle Carers resources). There is a clear opportunity for such resources to consider how this time of environmental crisis has implications for the treatment—e.g. housing, diet and transport—of animals, but this has not been explored.

Wellbeing of non-human animals

While care for livestock animals in relation to sustainability was downplayed in the resources reviewed, more attention was paid to the wellbeing of farmed animals more generally. However, resources from the private sector tended to avoid deeper ethical issues like animal welfare and health impacts, whereas third sector organisations discussed these topics more explicitly, sometimes using more vivid language about farming and slaughter. Resources from government organisations were generally more neutral, focussing on broad themes without addressing potentially sensitive topics

Four resource packs explicitly discussed 'welfare'. This was most prominent in material from the RSPCA, which noted that its goals include improving 'the welfare of as many farm animals as possible, at every stage of their lives'. Greenpeace, meanwhile, made one brief reference to animal welfare, stating that the production of 'industrial meat' is 'mean to animals'. This statement was accompanied by an image of fluffy chicks kept in cramped conditions. There was no indication of how chicks, or other livestock animals, could be kept in less mean ways.

The other two resources that discussed welfare focused (along with the RSPCA) on where responsibility for this lies. Worksheets from Food for Life and Meat Promotion Wales highlighted the role of farmers. For Food for Life, cattle farmers' 'most important job is to look after the health and welfare of the cattle' (or sheep and pigs in their other worksheets). Meat Promotion Wales, meanwhile, highlighted that the job of looking after farm animals is difficult. They refer to farmers 'being out every day in all-weather keeping an eye on [livestock]'. They state that farms have 'high levels of animal welfare,' though represent farmers' role with the passive language of 'keeping an eye on' livestock. The high welfare this 'keeping an eye on' affords is the precursor to 'tasty and high quality meat'. In contrast, the RSPCA's Lesson 4, on 'Farmyard freedoms', focuses instead on how RSPCA Assured farm assessors work towards meeting the needs of farm animals. Excepting for the Greenpeace resource, materials analysed presented animals as having high levels of care and did not allow for the possibility that such care might not be met.

Despite these references to animal welfare, relatively little detail was provided on what welfare might entail. The RSPCA's resources provided the clearest and most explicit information about what this, noting that 'farm animals have emotions and feelings, and to keep them happy and healthy' and that 'animals must have plenty of space, enough light, a comfortable rest area, things to stop them getting bored and shelter form the weather (slide 9). This theme of happiness is also evident in a resource specifically about pigs from Meat Promotion Wales: 'In Wales pigs are

generally reared in smaller herds which creates a happier environment for the animals to live'. The RSPCA takes such themes forward in its 'Key stage 2 animal welfare education' resources (https://education.rspca.org.uk/learningprogrammes/keystagetwo, accessed November 17, 2023], which aim to 'encourage children to develop compassion and empathy'. The emphasis is on introducing the concept of compassion and comparing what different animals—wild and domestic—need to be happy and healthy.

The RSPCA explicitly encourages learners to think about the needs of animals. Images of outdoor pigs, indoor pigs, caged hens, barn hens and free-range hens are provided for learners to think about 'which animals are not having their needs met?' (slide 4). A video invites learners to reflect critically on how higher welfare might be achieved, giving examples of chickens bred for meat that are kept in small spaces and fattened quickly leaving them bored and with painful joints, and sows kept in small cages when with piglets and not given enrichment activities. A similar approach is taken by PETA. Although PETA does not provide details in its resources about how animals *should* be treated, a learning resource on turkeys states that 'pupils should be taught to realise that people and other living things have needs, and that they have responsibility to meet them,' and proposes a research activity where learners should explore: 'How do turkeys live in the wild? How are they farmed? Is it right to farm them this way? How would you feel if you were a turkey kept in a factory farm?' (see https://www.peta.org.uk/misc/talking-turkeys/ [accessed November 17, 2023]).

While more prominent than animals' relation to sustainability, coverage of animal wellbeing in these resources was, therefore, limited. There is a tendency to present wellbeing as the responsibility of farmers, sometimes working alongside assessors (from the RSPCA), who can be trusted to work hard and ensure the high welfare of their livestock. Very little information is provided about what 'high welfare' might look like, or about what caring for animals might entail. While some resources encourage learners to empathise with animals, this could encourage anthropomorphic approaches, rather than understanding what the needs of animals are, or how they might respond to different treatments. In this sense, some of the resources—those which mention animal welfare and wellbeing in some way—might enable learners to begin to 'care about' (Fisher and Tronto 1990) livestock animals, but provides them with very little meaningful information on which to act; they do little to enable learners to move through other aspects of the ethics of care framework.

End of life

While the RSPCA has a web page dedicated to animal welfare and 'Farm animal Slaughter' (https://www.rspca.org.uk/adviceandwelfare/farm/slaughter accessed November 17, 2023] this is not part of the education resources presented for 7–11 year olds. Out of those resources reviewed, only two organisations made explicit reference to the death of livestock animals. Tesco referred to this with the term 'killing' being used once—though no detail was given as to how this was enacted. Indeed, the only two places where the death of nonhuman animals for human food is considered as an explicit act of killing by humans are in two poems in the PETA resources for Key Stages 1 and 2 (ages 5–7 and 7–11 respectively). In these, Benjamin Zephania's poem *Talking Turkeys* refers to Christmas turkeys having the 'cut of de knife', and not wanting

'the chop,' while Pete Traynor's poem, *How Would you Feel if a Cow ate You?* refers to what it would feel like if someone 'caught you and bopped you and chopped you in two' in order to then cook you as part of a stew. However, the activities for the latter only focus on recitation and rhyming words rather than discussion or exploration of the theme, while those for the former only explore aspects of turkey *life* (rather than death), as discussed in the previous section.

Elsewhere, the death of animals is only considered implicitly. Food for Life's Food Origins refers to beef cattle normally being sold 'between the ages of 12 and 30 months, when they are adults, for meat'. Any reference to the slaughter of sheep or pigs for food is seen in the reference to them being 'mostly kept to produce meat'. The term 'meat' implies an act of killing nonhuman animals for food but is not taken further. Similarly, Meat Promotion Wales refers to the cows developing so that they can 'produce a lot of meat, which is due to their lean muscled carcase'. Livestock animals are presented by their functional purpose rather than as sentient beings, and the process through which they become 'meat' and 'carcase' is ignored. This is reminiscent of what Joy (2009) refers to as carnistic beliefs; where meat eating is normalised and not questioned in order to ignore, overlook or disengage from the violence of what is being consumed. Whilst Monteiro et al. (2017) argue that denying the detrimental conditions of meat production on nonhuman animals in the food system is a powerful defence of meat consumption, we would argue that the neglecting to discuss practices and conditions of killing could be equally influential.

Change agents

General ESD resources identify consumers both as key contributors to sustainability problems but also as the key target for behavioural change to mitigate these problems (Wheeler 2023). However, in contrast to Wheeler's (2023) findings, and other research which found that representations of environmental issues were framed consistently to make student readers feel guilty about their own impacts (Tallon 2012), there is very little equivalent framing of the treatment of nonhuman animals in the food system. As such, the resources reviewed do little to inspire critical thinking about caring with/for animals, or practical responses to this.

While young readers of generic ESD resources are encouraged to feel empathy for the plight of wild non-human animals in a world being destroyed by climate change (Wheeler 2023), resources in our review present animals farmed for food as not needing the same sorts of protection, though some reference to the need for high welfare standards was noted in previous sections. As also noted previously, some learning resources that focussed on food positioned scientists and engineers as possible changemakers with innovative new technology (NFU). Farmers, while not portrayed as changemakers, are instead represented as the continuous custodians of wellbeing for non-human animals in their care.

Educational resources from Tesco, the UK's largest supermarket (Kantar's Grocery Market Share 2024), did not address any potential responsibility of retailers for animal wellbeing. Instead, their resources placed emphasis on labelling, shifting responsibility to consumers to choose how to support or show responsibility for caring about and for livestock animals. The RSPCA addresses this in the animated video accompanying

its Farmyard Freedoms lesson (How do the farm animals farmed for our food live? Found at https://www.youtube.com/watch?v=VjZCgV8ysss [accessed November 17, 2023]), noting that when 'rushing around a busy supermarket faced with hundreds of products and labels it's tricky to know which of the products we buy come from animals reared on higher welfare farms'. This resource also suggested that some labelling in supermarkets might be disingenuous in that they 'only meet the minimum legal welfare standards which often don't go far enough to protect the welfare of farm animals' yet are marketed as 'natural' or 'farm fresh'. As such, the RSPCA resources did invite people to be critical of labelling—though in doing so, the RSPCA continued to emphasise the role of consumers in identifying trustworthy labels.

Out of the resources reviewed, four of the education packs suggested actions that learners could take. These included choosing healthy options (e.g. grilled chicken instead of chicken nuggets) (Food for Life), considering the wellbeing of animals (RSPCA), looking for logos to help guide purchasing (e.g. Red Tractor logo as identified by Food for Life) and buying locally farmed animals (Meat Promotion Wales).

Conclusion

The stark conclusion of this study is that existing learning resources that incorporate or discuss the place of animals in the food system do little—and often nothing—to engender an ethic of care as proposed by Tronto and Fisher. Some of the resources we reviewed provide information that might help children to 'care about' these animals, but even this aspect was limited. More often than not, where livestock animals appeared, they were passive—objects for management rather than subjects tied into complex and contested ethical relations. In this conclusion, we reflect on the implications of these findings for the design of future learning resources, focusing specifically on how they could incorporate ideas from literature on more-than-human ethics of care and, through this, how they might prompt not only critical reflection but meaningful actions and engagement amongst learners.

It would be unrealistic to expect learning resources to engender every aspect of caring as presented by Tronto and Fisher—children generally could not be involved in the 'hands-on work' of caregiving. However, children can care about, and potentially even take care of and with, animals in the food system, and learning materials have the potential to support this.

An important first step in enhancing learning resources about animals in the food system is the provision of fuller information to help learners *care about* livestock animals. Key to this is making background conditions (both how farming is done and how animals live) visible. Some resources (e.g. from the RSPCA and PETA) already engage with this theme but encourage anthropomorphic thinking. While this can be a route to empathy and critique, the thematic and interdisciplinary approaches required by curricula such as the Curriculum for Wales offer an opportunity to combine such thinking with learning about (for instance) biology and animal welfare. At present, a key problem is the tendency of resources to represent particular, singular, worldviews (not least through the sidelining of the environmental impacts of livestock farming, and ethical questions about the rights and wrongs of consuming animals).

Most of the resources in themselves (other than those from the RSPCA and PETA) do little to encourage questioning of the status quo. Future resources on animals in food production, therefore, should aim to encourage the emergence and acceptance of pluriversal worldviews, enabling children to reach their own considered perspectives. Following the example of wider ESD research, this shift could be supported by creative pedagogies (e.g. using poetry, drama and role play) that enable the navigation of sensitive and complex issues (see for example: Keleş 2015, Kühtz 2022), encouraging children to think about what happens on farms, and about how the needs of different food system actors (e.g. farmers, livestock animals, retailers and consumers) are or could be balanced. Such approaches can help children to explore multiple perspectives and consider challenges in reaching a single endpoint.

This greater focus on learning to *care about* livestock animals, and the complex entanglements in which they are situated, would go some way towards developing 'intellectual and emotional responsibilities to distant more-than-human actors' (Cusworth 2023: 71) within an 'agricultural ethics of care'. However, attending to those responsibilities implies *taking care of* and *caring with* livestock animals, extending practices of care beyond the site of the farm, potentially through global networks (Krzywoszynska 2019). Resources would need to encompass being responsive to the needs of animals, and helping learners to find ways of taking some responsibility for the ways those needs are met, aiming to act in a just and equal way.

Although some resources do prompt learners to take action in aiming for more sustainable food provisioning, their recommendations (e.g. buying locally farmed products and being guided by labelling) appeared to be directed more towards adults than primary-age children. Elsewhere, farm animal wellbeing was most frequently depicted as the responsibility of farmers - and predicated on the basis of farmers working hard to look after their animals. We do not aim to contest such a claim here, but using this assumption as a basis for learning resources might work against critical consideration and discussion of what animal wellbeing is and who should take responsibility for it. We urge those using resources to note the differences in priorities and language used across the private, government and third sectors, which reflect their varying roles and target audiences.

The actions recommended in the resources we reviewed stand in marked contrast to those in Wheeler's (2023) review of generic ESD resources, which identified recommended actions such as eco-clubs, local campaigns, or targets and changes schools might aim for. Promoting such age-appropriate activities through learning resources can help raise wider awareness of the themes studied and discussed in class and can contribute to children gaining confidence in expressing their perspectives. However, these activities might also remain distant from spaces of production. How, then, might learning resources engender greater and more active links between learners and spaces of production?

One approach could involve the promotion—or even facilitation—of farm visits, which would support the important development of Nature connection considered earlier (Lithoxoidou et al. 2017, O'Brien 2005). Such visits have received some attention in existing research, though mostly involving arable farming or horticulture, rather than livestock. Farm visits have been identified as opportunities for correcting

misconceptions about the reality of livestock farming (Smeds, Jeronen, and Kurppa 2015), although another study (Mattu 2016) suggested that animals were often incidental to, rather than the focus of, such trips.

Active links between farms and schools need not be limited to farm visits (or, indeed, to farmers visiting schools, such as in the NFU's *Farmers for Schools* programme [https://education.nfuonline.com/SpeakersForSchools]—currently directed only at older age groups). Future research could usefully explore and design pedagogies that build a dialogic space, using learning resources as a basis for enabling learners to direct their questions to (or enter into some form of discussion with) a range of experts/practitioners (e.g. animal welfare scientists, environmental NGOs and nutritionists). Developing resources in this way extends considerably beyond a transmission model, wherein learners are educated about livestock farming, to a more exploratory approach where children are exposed to multiple—and sometimes competing—perspectives, which they have the opportunity to actively question and consider. The children would, in turn, have the opportunity to share their visions, hopes and concerns about future food production. As such, learners could take responsibility, through such direct connections, for livestock animals, building on their developing understandings—and potentially care—about them. Such approaches would not rely on physical visits to farms; they might, for instance, include online pre-recorded farm tours.

Such an approach would necessarily incorporate a shift to dealing with less 'comfortable' aspects of food provisioning, such as making the place of slaughter evident. Mattu (2016) noted the sometimes troubling nature of encounters with livestock animals during school farm visits, and especially the concerns of teachers around how to discuss animals' conversion to food; navigating slaughter and death within the food system is socio-economically, politically and culturally sensitive. Attending to such issues is an important opening to considering the complexity of animals' entanglement in the human food system, but learning resources need to provide teachers with appropriate pedagogical structures through which to approach them, supporting emotional responses (see Ramos-Pla, del Arco, and Espart [2023] call for teachers to have training in teaching about human death and bereavement).

This paper has made an important contribution to nascent research around the nature and role of learning resources for ESD, providing the first review of the place of animals in learning resources for food education. The resources we drew on were far from exhaustive—focusing on those that were freely-available online, directed at ages 5–11, and available to support those implementing the Curriculum for Wales. Future research would usefully build on this by exploring a wider range of materials across multiple curricula, including paid-for content. In addition, future studies would usefully examine the use of such resources within the classroom (by both teachers and children), the rationale behind their production, and how teachers find and choose what resources to use. Most significantly, the paper paves the way for further research around pedagogies for critical and active learning on animals' complex entanglement in the food system, and the role of learning materials in inspiring and encouraging learners to care about, take care of, and care with those animals.

Notes

1. The Welsh Government has the devolved authority to set education policies and allocate funding independently of the UK Government.
2. Resources relating to food but not focusing on meat were not included (e.g. resources on food waste were only included if they considered meat explicitly).

Author contribution

Both Verity Jones and Christopher Bear were involved in all stages of this project and the subsequent writing of this article. Both authors agree to be accountable for all aspects of the work.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Verity Jones http://orcid.org/0000-0002-2451-8651

References

ACARA. n.d.-a. "Ethical Understanding (Version 8.4)." https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/ethical-understanding/

ACARA. n.d.-b. "Sustainability (Version 8.4)." https://www.australiancurriculum.edu.au/f-10-curriculum/cross-curriculum-priorities/sustainability/

Amin, S. A., C. Panzarella, M. Lehnerd, S. B. Cash, C. D. Economos, and J. M. Sacheck. 2018. "Identifying Food Literacy Educational Opportunities for Youth." *Health Education & Behavior: The Official Publication of the Society for Public Health Education* 45 (6): 918–925. https://doi.org/10.1177/1090198118775485.

Babbie, E. 1992. *The Practice of Social Research*. MA, Wadsworth.

Bačėninaitė, D., K. Džermeikaitė, and R. Antanaitis. 2022. "Global Warming and Dairy Cattle: How to Control and Reduce Methane Emission." *Animals* 12 (19): 2687. https://doi.org/10.3390/ani12192687.

Beacham, J. 2018. "Organising Food Differently: Towards a More-than-Human Ethics of Care for the Anthropocene." *Organization* 25 (4): 533–549. https://doi.org/10.1177/1350508418777893.

Blackstone, Nicole Tichenor, Kyra Battaglia, Edgar Rodríguez-Huerta, Brooke M. Bell, Jessica L. Decker Sparks, Sean B. Cash, Zach Conrad, et al. 2024. "Diets Cannot be Sustainable Without Ensuring the Well-Being of Communities, Workers and Animals in Food Value Chains." *Nature Food* 5 (10): 818–824. https://doi.org/10.1038/s43016-024-01048-0.

Bleazby, J. 2020. "Fostering Moral Understanding, Moral Inquiry & Moral Habits through Philosophy in Schools: A Deweyian Analysis of Australia's Ethical Understanding Curriculum." *Journal of Curriculum Studies* 52 (1): 84–100. https://doi.org/10.1080/00220272.2019.1650116.

Bourn, D. 2020. "Fairtrade Schools and Global Learning in the United Kingdom." In J. Myers (Ed.), *Research on Teaching Global Issues* (pp. 71–92). North Carolina Information Age Publishing.

Clarke, V., and V. Braun. 2017. "Thematic Analysis." *The Journal of Positive Psychology* 12 (3): 297–298. https://doi.org/10.1080/17439760.2016.1262613.

Cusworth, G. 2023. "Metabolic Agricultural Ethics: Violence and Care beyond the Gate." *Progress in Environmental Geography* 2 (1–2): 58–76. https://doi.org/10.1177/27539687231155224.

De La Bellacasa, Maria Puig. 2010. "Matters of Care in Technoscience: assembling Neglected Things. ." *Social Studies of Science* 41 (1): 85–106. 10.1177/0306312710380301. 21553641

Department of Education. 2013. "The National Curriculum in England: Key Stages 1 and 2 Framework Document." https://www.gov.uk/government/publications/national-curriculum-in-england-primary-curriculum

Eaton, E. M., and N. A. Day. 2020. "Petro-Pedagogy: Fossil Fuel Interests and the Obstruction of Climate Justice in Public Education." *Environmental Education Research* 26 (4): 457–473. https://doi.org/10.1080/13504622.2019.1650164.

European Commission, Directorate-General for Education, Youth, Sport and Culture. 2022. "Whole School Approaches to Sustainability – Key Messages." Publications Office of the European Union. https://data.europa.eu/doi/10.2766/775485

European Commission, European Education and Culture Executive Agency. 2024. "Learning for Sustainability in Europe – Building Competences and Supporting Teachers and Schools – Eurydice Report." Publications Office of the European Union. https://data.europa.eu/doi/10.2797/81397

Evans, A. B., and M. Miele. 2012. "Between Food and Flesh: How Animals Are Made to Matter (and Not Matter) within Food Consumption Practices." *Environment and Planning D: Society and Space* 30 (2): 298–314. https://doi.org/10.1068/d12810.

Fairclough, S. J., A. F. Hackett, I. G. Davies, R. Gobbi, K. A. Mackintosh, G. L. Warburton, G. Stratton, E. M. van Sluijs, and L. M. Boddy. 2013. "Promoting Healthy Weight in Primary School Children through Physical Activity and Nutrition Education: A Pragmatic Evaluation of the CHANGE! Randomised Intervention Study." *BMC Public Health* 13 (1): 626. https://doi.org/10.1186/1471-2458-13-626.

Fisher, B., and J. Tronto. 1990. "Toward a Feminist Theory of Caring." In *Circles of Care*, edited by E. Abel and M. Nelson, 36–54. New York, SUNY Press.

Hannigan, J. 2014. *Environmental Sociology*. London Routledge.

Haraway, D. 2008. *When Species Meet*. University of Minneapolis, Minnesota Press.

Haraway, D. J. 2016, Staying with the Trouble: Making Kin in the Chthulucene. Duke University Press, Durham, NC.

Hickman, C., E. Marks, P. Pihkala, S. Clayton, R. E. Lewandowski, E. E. Mayall, B. Wray, C. Mellor, and L. van Susteren. 2021. "Climate Anxiety in Children and Young People and Their Beliefs about Government Responses to Climate Change: A Global Survey." *Lancet Planetary Health* 5.

Hicks, David. 2014. "A Geography of Hope." *Geography* 99 (1): 5–12. 10.1080/00167487.2014.12094385.

Hodal, K. 2019. "Italy to Put Sustainability and Climate at Heart of Learning in Schools." *The Guardian,* November 6. https://www.theguardian.com/global-development/2019/nov/06/italy-to-school-students-in-sustainability-and-climate-crisis

Hollin, Gregory, Isla Forsyth, Eva Giraud, and Tracey Potts. 2017. "(Dis)Entangling Barad: Materialisms and Ethics." *Social Studies of Science* 47 (6): 918–941. 10.1177/0306312717728344. 28914174

Hsieh, H.-F., and S. Shannon. 2005. "Three Approaches to Qualitative Content Analysis." *Qualitative Health Research* 15 (9): 1277–1288. https://doi.org/10.1177/1049732305276687.

Huckle, J. 2013. "Eco-Schooling and Sustainability Citizenship: Exploring Issues Raised by Corporate Sponsorship." *The Curriculum Journal* 24 (2): 206–223. https://doi.org/10.1080/09585176.2013.779286.

Jang, S., K. Kim, and Y. K. Lee. 2021. "Awareness and Practice of Sugar Reduction in School Foodservice and the Practice of Nutrition Education in Daegu." *Korean Journal of Community Nutrition* 26 (3): 167–176. https://doi.org/10.5720/kjcn.2021.26.3.167.

Jones, M., D. Ruge, and V. Jones. 2022. "How Educational Staff in European Schools Reform School Food Systems through 'Everyday Practices'." *Environmental Education Research* 28 (4): 545–559. https://doi.org/10.1080/13504622.2022.2032608.

Jones, V. 2020. "Just Don't Tell Them What's in It: Ethics, Edible Insects and Sustainable Food Choice in School." *British Educational Research Journal* 46 (4): 894–908. https://doi.org/10.1002/berj.3655.

Jones, V., S. Mitra, and N. Gupta. 2022. "Climate Change and Sustainability Education in India and the Place for Arts-Based Practice: Reflections from East Kolkata Wetlands." *London Review of Education* 20 (1). https://doi.org/10.14324/LRE.20.1.48.

Jones, V., and T. Podpadec. 2023. "Young People, Climate Change and Fast Fashion Futures." *Environmental Education Research* 29 (11): 1692–1708. https://doi.org/10.1080/13504622.2023.2181269.

Joy, M. 2009. *Why We Love Dogs, Eat Pigs, and Wear Cows: An Introduction to Carnism*. United States, Conari Press.

Kantar's Grocery Market Share. 2024. https://www.kantarworldpanel.com/grocery-market-share/great-britain/snapshot/04.08.24/

Keleş, Ö. 2015. "Creative Drama in the Teaching of Education for Sustainable Development: Sample Activity about Sustainability and Sustainable Production." *Journal of Environmental Sustainability* 4 (4): 1–15.

Krzywoszynska, A. 2019. "Caring for Soil Life in the Anthropocene: The Role of Attentiveness in More-than-Human Ethics." *Transactions of the Institute of British Geographers* 44 (4): 661–675. https://doi.org/10.1111/tran.12293.

Kühtz, S. 2022. "Sensoriality, Arts, Poetry, and Sustainability." In *Handbook of Sustainability Science in the Future: Policies, Technologies and Education by 2050*, 1–23. Cham: Springer International Publishing.

Lithoxoidou, I. S., A. D. Georgopoulos, A. Th Dimitriou, and S. Ch Xenitidou. 2017. "Trees Have a Soul Too!" Developing Empathy and Environmental Values in Early Childhood." *International Journal of Early Childhood Environmental Education* 5 (1): 68–88.

Mattu, L. M. 2016. "Farm Visits: Interdisciplinary Outdoor Learning for Primary School Pupils and Scotland's Curriculum for Excellence." Doctoral diss., University of Glasgow.

Mol, A., I. Mosser, and J. Pols. 2010. "Care: Putting Practice into Theory." In *Care in Practice: On Tinkering in Clinics, Homes and Farms*, edited by A. Mol, I. Mosser, and J. Pols, 7–25. New Brunswick, NJ: Transcript-Verlag.

Monteiro, B. M. A., T. M. Pfeiler, M. D. Patterson, and M. A. Milburn. 2017. "The Carnism Inventory: Measuring the Ideology of Eating Animals." *Appetite* 113: 51–62. https://doi.org/10.1016/j.appet.2017.02.011.

O'Brien, E. 2005. "Social and Cultural Values of Trees and Woodlands in Northwest and Southeast England." *Forest Snow and Landscape Research* 79: 169–184.

Owuondo, J. 2023. "Advancing Sustainable Development in the Global South: Aligning Education with the SDGs for Lasting Impact." Available at SSRN: https://ssrn.com/abstract=4585368 or http://dx.doi.org/10.2139/ssrn.4585368

Pampaloni, B., L. Cianferotti, G. Gronchi, E. Bartolini, S. Fabbri, A. Tanini, and M. L. Brandi. 2015. "Growing Strong and Healthy with Mister Bone: An Educational Program to Have Strong Bones Later in Life." *Nutrients* 7 (12): 9985–9998. https://doi.org/10.3390/nu7125510.

Pitt, H. 2018. "Questioning Care Cultivated Through Connecting with More-than-Human Communities." *Social & Cultural Geography* 19 (2): 253–274. https://doi.org/10.1080/14649365.2016.1275753.

Puig de la Bellacasa, M. (2017). Matters of Care: Speculative Ethics in More than Human Worlds. University of Minnesota Press

Piazza, J., M. B. Ruby, S. Loughnan, M. Luong, J. Kulik, H. M. Watkins, and M. Seigerman. 2015. "Rationalizing Meat Consumption. The 4Ns." *Appetite* 91: 114–128. https://doi.org/10.1016/j.appet.2015.04.011.

Pykett, J., P. Cloke, C. Barnett, N. Clarke, and A. Malpass. 2010. "Learning to be Global Citizens: The Rationalities of Fair-Trade Education." *Environment and Planning D: Society and Space* 28 (3): 487–508. https://doi.org/10.1068/d14908.

Raccichini, M., G. Biancalani, L. Franchini, S. Varani, L. Ronconi, and I. Testoni. 2023. "Death Education and Photovoice at School: A Workshop with Italian High School Students." *Death Studies* 47 (3): 279–286. https://doi.org/10.1080/07481187.2022.2052206.

Ramos-Pla, A., I. del Arco, and A. Espart. 2023. "Pedagogy of Death Within the Framework of Health Education." *Heliyon* 9. e15050

Ramos-Pla, A., I. del Arco, and O. Flores. 2021. "University Professor Training in Times of COVID-19: Analysis of Training Programs and Perception of Impact on Teaching Practices." *Education Sciences* 11 (11): 684. https://doi.org/10.3390/educsci11110684.

Richter, S., L. Scherer, M. Hegwood, H. Bartlett, L. Bossert, A. Frehner, and C. Schader. 2024. "Conceptual Framework for considering Animal Welfare in Sustainability Assessments of Foods." *Sustainable Production and Consumption* 52: 179–209. https://doi.org/10.1016/j.spc.2024.10.004.

Schreier, M. 2013. *Qualitative Content Analysis in Practice*. London, SAGE.

Smeds, P., E. Jeronen, and S. Kurppa. 2015. "Farm Education and the Effect of a Farm Visit on Children's Conception of Agriculture." *European Journal of Educational Research* 4 (1): 1–13. https://doi.org/10.12973/eu-jer.4.1.1.

Tallon, R. 2012. "Emotion and Agency Within NGO Development Education: What Is at Work and What is at Stake in the Classroom?" *International Journal of Development Education and Global Learning* 4 (2): 5–22. https://doi.org/10.18546/IJDEGL.04.2.02.

Tallon, R., and A. Milligan. 2018. "The Changing Field of Development and Global Education Resource Provision in New Zealand." *International Journal of Development Education and Global Learning* 10 (1): 59–71. https://doi.org/10.18546/IJDEGL.10.1.05.

Torpman, Olle, and Helena Röcklinsberg. 2021. "Reinterpreting the SDGs: Taking Animals into Direct Consideration." *Sustainability* 13 (2): 843. https://doi.org/10.3390/su13020843.

Tronto, J.C., (2013) Caring Democracy: Markets, Equality, and Justice. New York, New York University Press.

Trott, C. D. 2021. "What Difference Does It Make? Exploring the Transformative Potential of Everyday Climate Crisis Activism by Children and Youth." *Children's Geographies* 19 (3): 300–308. https://doi.org/10.1080/14733285.2020.1870663.

UNFAO. 2024. "The State of Food Security and Nutrition in the World." https://openknowledge.fao.org/server/api/core/bitstreams/ffb79f08-bf03-404a-9ad3-f8ef9c3c9e6b/content/state-food-security-and-nutrition-2024/executive-summary.html#gsc.tab=0

Vision Line. 2019. "Welsh Government Urged to Incorporate Animals into New Curriculum." https://visionline.co.uk/en/news-story.php?id=18566

Wawrzyniak, D. 2023. "Animal Husbandry and Sustainable Agriculture: Is Animal Welfare (Only) an Issue of Sustainability of Agricultural Production or a Separate Issue on Its Own?" *Animal: An International Journal of Animal Bioscience* 17 Suppl 4: 100880. https://doi.org/10.1016/j.animal.2023.100880.

Welsh Government. 2020. "The Curriculum for Wales." https://hwb.gov.wales/curriculum-for-wales/introduction

Welsh Government. 2022a. "Health and Well-Being." https://hwb.gov.wales/curriculum-for-wales/health-and-well-being/designing-your-curriculum

Welsh Government. 2022b. "Humanities Area of Learning and Experience." https://hwb.gov.wales/curriculum-for-wales/humanities/statements-of-what-matters/

Wheeler, K. 2023. "Educating Children as Sustainable Citizen-Consumers: A Qualitative Content Analysis of Sustainability Education Resources." *Journal of Moral Education* 52 (4): 453–473. https://doi.org/10.1080/03057240.2022.2159344.

Whitehouse, H. 2016. *Education in Times of Environmental Crises*. London, Routledge.

World Health Organisation for Animal Health. 2024. *Animal Welfare: A Vital Asset for a More Sustainable World*. Paris: WOAH. https://doi.org/10.20506/woah.3440.

Young, I. M. 2006. "Responsibility and Global Justice: A Social Connection Model." *Justice and Global Politics* 4 (4): 102–130.