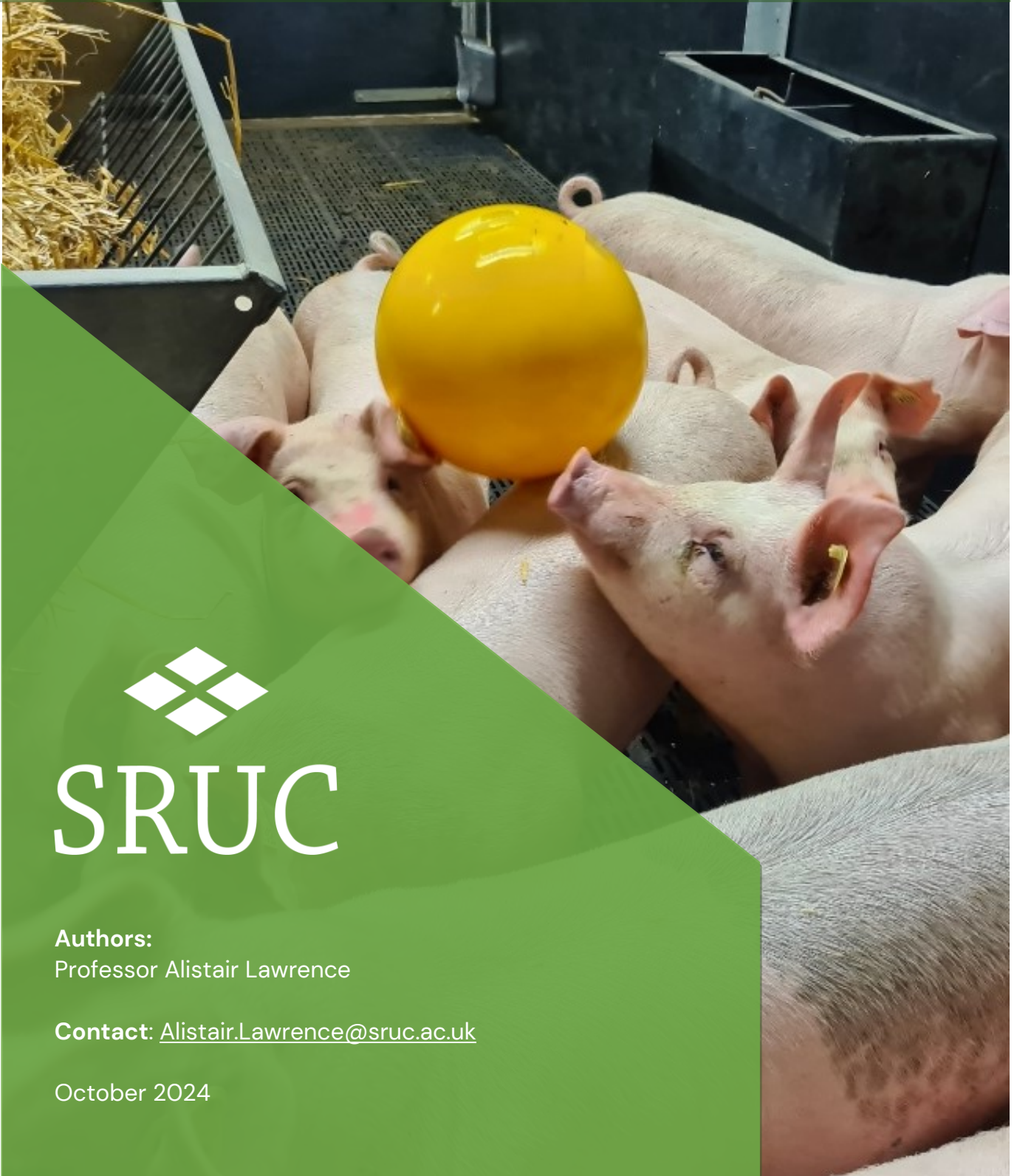


# Environmental Enrichment in Farm Animals: An SRUC Working Paper



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October 2024

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### Main Points

- Environmental enrichment aims to improve animal welfare by adding features to the simple and unfurnished environments created by humans to confine animals.
- Since the 1980s environmental enrichment in farm animals has become a major topic area in animal welfare science. There is no universally applied scientific rationale for enrichment; scientific ideas include use of enrichments to facilitate normal behaviour, to satisfy behavioural needs, to provide cognitive challenges and to reduce abnormal behaviour.
- Environmental enrichment for farm animals is governed by a complex of legislative and farm assurance standards. Legislation is seen as providing minimum standards; UK legal standards for enrichment remain largely the same as EU standards. The UK also has an established set of farm assurance schemes with standards which depending on the scheme place varying emphases on animal welfare and environmental enrichment.
- Currently there are some encouraging signs of environmental enrichment continuing to be a consideration in the development of UK animal production systems, partly through general trends in favour of less intensive systems and wider adoption of environmental enrichment policies by companies.
- There are areas of concern with large numbers of farm animals in the UK (and globally) still housed in intensive systems and requiring effective enrichment to counter the behavioural restrictions imposed by these systems. The general incompatibility of intensive systems with effective environmental enrichment remains largely unresolved.
- For the future it is proposed that the concept of positive animal welfare if adopted more widely, will change perceptions of environmental enrichment towards enrichment supporting animals living good lives, which would require more radical changes to animal production systems to accommodate this.

# Introduction

The concept of environmental enrichment seems initially to have arisen through observations that zoo and laboratory animals in confined conditions could behave abnormally, which is to say that their behaviour appeared unusual to human observers (Young, 2003). In the case of zoo animals, environmental enrichment was introduced to reduce occurrence of abnormal behaviour and to stimulate animals' '*special behavioral capabilities*' (Markowitz, 1978). In laboratory animals, enrichment became part of the systematic study of the effects of environment on behaviour (Chamove and Anderson, 1989; quoted in Young, 2003). The concept of enrichment has also been extended to farm animals (see below). Appendix A provides a selection of definitions of environmental enrichment applied to different types of confined animal.

Environmental enrichment has therefore come to mean adding features to environments created by humans for confinement of various classes of animals. The reasons for enrichment broadly fall into the use of enrichments to improve animal welfare or as an experimental approach to study the effects of environmental complexity on biological functioning (Würbel and Garner, 2007). It is important that the term environmental enrichment has been used inconsistently creating challenges in understanding the impact of enrichment on animal welfare (Ratuski and Weary, 2022).

*Approaches to environmental enrichment:* Young (2003) suggests that the scientific study and development of environmental enrichment in practice has been dominated by either of the 'naturalistic' or 'behavioural engineering' approaches, with advocates for each being influenced by their academic backgrounds.

The naturalistic approach seeks to replicate the animals' natural environment in captivity and has several influences including philosophy of well-being (Appleby and Sandøe, 2002), art (Young, 2003) and animal welfare science (Fraser et al., 1997). The idea of captive animals living natural lives also resonates with public opinion (Lassen et

al., 2006; Vigors, 2019). In animal welfare science the naturalistic approach is closely associated with ethology (the study of animal behaviour under natural conditions). It has been criticised within animal welfare science on the basis that it can lead to inaccurate interpretations of what benefits the welfare of confined animals (Dawkins, 2023).

The behavioural engineering approach to environmental enrichment seeks to '*restore the natural contingency*' between appetitive and consummatory elements of a behavioural sequence<sup>1</sup> (Young, 2003). Under confined conditions it is possible for animals to perform consummatory behaviour (e.g. eating) with minimal or no appetitive behaviour (e.g. foraging). It has been argued that this '*interference*' with the sequence of appetitive and consummatory behaviour could be a factor in development of abnormal stereotypic behaviour (Lawrence and Terlouw, 1993). With behavioural engineering, enrichment provides the animal with opportunities to complete sequences of appetitive and consummatory behaviour with less emphasis on the naturalness of the enrichment (Young, 2003). The approach has links to experimental psychology and experimentation on the causes of behaviour (Dickinson, 1985). Both these approaches to enrichment have been elaborated on with more recent research some of which will be covered under the farm animal section (see below).

*Classification of enrichments:* An early classification of enrichments for zoo animals distinguished between social, occupational, physical, sensory and nutritional enrichments (Bloomsith et al., 1991). This classification was followed in a GAP analysis of the wider scientific literature on enrichment, where it was noted that studies frequently did not state what type of enrichment was used (Azevedo et al., 2007). Outside of zoo animals where the emphasis has tended to be more on physical

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<sup>1</sup> Appetitive behaviours are the active, goal-seeking and exploratory phase of behaviour that precede the more stereotyped consummatory behaviour that the animal exhibits when it reaches its goal. Upon reaching the goal, appetitive behaviour normally ceases (McFarland, 2014).

enrichment to encourage normal behaviours there is a growing interest in other forms of enrichment (e.g. cognitive, sensory, auditory; Chou et al., 2024).

*Assessment of enrichment efficacy:* There has been a long-standing concern that some environmental enrichments maybe of little welfare benefit to the animal (Newberry, 1995). The term pseudo-enrichment has been proposed as a term to cover enrichments with no biological relevance to the animal (Würbel and Garner, 2007). Assessing the efficacy of enrichment is often influenced by the goals of enrichment, for example to reduce the occurrence of abnormal behaviour or to promote normal behaviour (Coleman and Novak, 2017). Azevedo et al., (2007) found that behavioural assessment was the most used approach to assessing efficacy of enrichment followed by neurological approaches (the latter being strongly influenced by the use of enrichment to study environmental complexity on brain mechanisms). A recent review has questioned the presumption that animals need to actively engage with enrichments when assessing efficacy arguing that enrichments that elicit little active engagement can still improve animal welfare (Decker et al., 2023).

*Summary:* Environmental enrichment is a complex and arguably confusing concept. Contributing to this complexity is the separate development and applications of enrichment in the major types of confined animals (zoo, laboratory, farm). Thus, environmental enrichment can mean different things ranging from the addition of any environmental feature to a home-cage environment in neuroscience to recreation of complex natural environments for zoo animals. Importantly enrichment is a relative concept in most cases based upon the baseline conditions that are being enriched. There is a concern that enrichment should lead to a significant improvement in animal welfare.<sup>2</sup>

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<sup>2</sup> See Colditz et al., (2024) who review the literature on the wider benefits of enrichment in relation to resilience.

# Enrichment in farm animals

The development of farm animal welfare has been well described; in the UK the starting point is typified by the publication of 'Animal Machines' and the subsequent Brambell Committee report in the mid-1960s (Brambell, 1965; Lawrence and Vigors, 2020). Despite environmental enrichment already being used in the context of zoo animals (see above), the term is not found in the Brambell Report (Brambell, 1965) and does not appear in the farm animal welfare literature until the early 1980s (Wood-Gush and Beilharz, 1983).

*Research:* Early papers on enrichment in farm animals reflected the recommendations of the Brambell Committee and subsequent legislation focused on providing for normal behaviour or behavioural needs in confined farm animals (see Box 1). For example, the Edinburgh Family Pen system, described as an enriched system, was designed to facilitate the behaviour of pigs in a semi-natural enclosure (Stolba and Wood-Gush, 1984). At the time there was also an interest in the role of stimulus poor (barren) environments giving rise to hyperexcitability and the potential for enrichment to correct this (Grandin, 1987; Stolba and Wood-Gush, 1980).

Since these earlier studies there has been a steady growth in research on environmental enrichment in farm animals (Freire and Nicol, 2019; Bachetti et al., 2024). Reviews suggest that the provision of enrichment for farm animals continues to be aimed at facilitating normal behaviour often concurrently with the aim of reducing occurrence of abnormal behaviours (Godyn et al., 2019; Orihuela et al., 2019).

**Box 1:** The importance of farm animals being able to **behave normally** can be sourced to the Brambell Committee. In the 1970s the term **behavioural need** emerged and became embedded in European legislation (Moss, 1980). UK law has continued to refer to normal behaviour (UK Animal Welfare Act, 2006).

Scientifically a distinction can be drawn between normal behaviour and behavioural needs. **Normal behaviour** is the behaviour that is typical for the species in question (taking account of processes such as domestication) and hence distinct from natural behaviour but synonymous with species-typical behaviour (Yeates, 2018). Thus, studies of farm animals living in semi-wild conditions demonstrate the potential range of normal behaviour for the domesticated species (Stolba and Wood-Gush, 1989). The term **behavioural need** has become closely associated with the concept of motivation and specifically strong motivations that if thwarted (e.g. by a confining physical environment) will lead to frustration and suffering (Weeks and Nicol, 2006). The term behavioural needs has been largely substituted with **behavioural wants** (Dawkins, 2008); it is not entirely clear why this transition has been made but potentially it reflects that animals' behaviour is directed towards goals (Dawkins, 2008; Gygax, 2017).

A distinction has also been made between high priority motivations (**needs or wants** such as nesting and fear) and lower priority motivations such as play, curiosity driven exploration and social grooming. These lower priority motivations have been variously referred to as **luxuries, opportunities** and **desires** (Fraser and Duncan, 1998; Lawrence, 1987; Lawrence et al., 2024; Yeates and Main, 2008).

Interestingly enrichment for farm animals is often placed in the context of incremental improvements to existing confining systems and the potential benefits to production parameters with no reference of the relevance of enrichment to the concept of positive animal welfare (see Box 2).



As stated earlier environmental enrichment is a relative concept starting from the premise of an existing (barren) confined condition that requires to be enriched. Almost invariably the comparison that is made in research is between barren and enriched conditions. Enrichment research in farm animals rarely makes a *'fully enriched condition'* the positive control against which reductions in environmental complexity can be assessed (see Chou et al., 2024, pg. 292). One exception is the Edinburgh Family Pen system which was designed to facilitate behaviour observed in the semi-wild conditions of the Edinburgh Pig Park (Stolba and Wood-Gush, 1984).

**Box 2:** Positive animal welfare (PAW) is a relatively recent concept that focuses on the welfare benefits of animals having opportunities for positive experiences on a regular basis. PAW is a reaction to there being too much focus on negative aspects of welfare but is also underpinned by increasing scientific evidence in support of animals having capacities for positive experiences (Lawrence et al., 2019) (<https://www.positiveanimalwelfare.net/>).

The PAW literature assumes that expression of normal behaviour can give rise to positive experiences (Mellor, 2015). Thus, while much of the literature on enriching farm animals is focused on using enrichment to reduce harms (e.g. harmful behaviours, aggression, 'stress'; (Orihuela et al., 2019)), a PAW perspective focuses on the positives to the animal of enriching its environment (e.g. positive experiences gained through performing rewarding behaviours). These different approaches to enrichment (reducing harms or promoting positive experiences) can potentially give rise to very different conclusions on what are appropriate levels of enrichment (Lawrence et al., 2024).

Furthermore, both higher and lower priority motivations (Box 1) can be argued to enhance PAW, whereas the environmental enrichment literature tends to refer to enrichment only as satisfying behavioural needs (e.g. Chou et al., 2024). In this sense PAW offers a more complete concept for enhancing overall welfare than the conventional use of environmental enrichment. As Chou et al., (2024) argue *'without careful consideration, providing enrichment can be used to perpetuate keeping animals in suboptimal conditions'*.

The distinction between PAW and enrichment in terms of scope for enhancing welfare is further emphasised when other ideas encompassed within PAW are considered including animals living good lives and being happy (Lawrence et al., 2019). For example, to quote the UK's Farm Animal Welfare Council writing about a Good Life for farm animals: *'The requirements for a good life go well beyond those for the lower level'* (FAWC, 2009) Paragraph 58, page 26).

*Legislation:* What follows is a combination of available literature (both peer-reviewed and web-based reports) and information taken from interviews with representatives of Red Tractor, RSPCA, RSPCA Assured, QMS, CIWF, BFAW, scientists, consultants and government veterinary advisors as indicated below.

Animal welfare legislation has been an important route to protecting animals, initially from poor treatment (cruelty) and more recently providing a legal basis for our wider responsibilities to animals (Lawrence, 2008). Legislation has also been the most important approach to establishing minimum welfare standards for farm animals (Weerd and Ison, 2019) although since the early 2000s there has been an increasing reliance on market-driven approaches (see below; Sandøe et al., 2020).

Legislation in relation to enrichment is somewhat complicated. Firstly, in the UK enrichment is not defined in legal terms; for example, in Scottish Government welfare guidance enrichment is introduced more as an idea with reference to the aims and benefits of providing enrichment<sup>3</sup>. Secondly, some features that could be regarded as enrichment are legislated for and others are not. For example, in comparison to battery cages laying hens kept in enriched cages must have access to nest boxes, perches, and substrate for pecking and scratching but the legislation does not make it a specific requirement to allow for dustbathing<sup>4</sup>. For broilers there is a legal requirement for litter but not for perches<sup>4</sup>. The space available per animal, which could be seen as essential to enrichment is dealt with separately as is the social environment. Thirdly, enrichment is legislated for mainly based on satisfying 'ethological needs' (highly motivated behaviours) and there is little or no reference to satisfying lower priority motivations (behavioural opportunities) which can be argued to be a core purpose of providing enrichment (see Boxes 1 and 2). Overall, there can be debate over the aims of legislation

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<sup>3</sup> Scottish Government, Guidance for the Welfare of Laying Hens and Pullet, 2020

<sup>4</sup> Welfare of Farmed Animals (England) Regulations 2007; The Welfare of Farmed Animals (Scotland) Regulations 2010

on environmental enrichment, and whether it is intended to provide minimum level of enrichment (say to prevent harms such as abnormal behaviour) or whether it has higher aspirations.

The UK issues codes of practice as recommendations to animal keepers on how to comply with legislation in practice (in Scotland recent versions are referred to as Guidance). Recommendations in the codes of practice are not direct legal requirements but failure to comply with them can be used in court proceedings to establish liability for breaches of legislation<sup>5</sup>. It is a legal requirement for those responsible for farm animals be aware of and to have access to the relevant codes of practice or Scottish Government Guidance. Two examples follow to illustrate recommendations in the codes of practice providing guidance on legislation on enrichment:

(a) Pigs: the legislation on enrichment states *'To enable proper investigation and manipulation activities, all pigs must have permanent access to a sufficient quantity of material such as straw, hay, wood, sawdust, mushroom compost, peat or a mixture of such, which does not adversely affect the health of the animals'*<sup>6, 7</sup>. This statement can be interpreted to allow for the array of explorative and foraging behaviours which have been described as making up a large part of the pigs' time budget in complex environments (Stolba and Wood-Gush, 1989). The statement also aligns with scientifically derived specifications for substrates that pigs will interact with and retain sustained interest in, namely substrates which are edible, chewable, investigable, and manipulable (Weerd et al., 2003). The Code of Practice for the Welfare of Pigs categorises materials into 3 classes according to how well they meet characteristics defined by Weerd et al., (2003): optimal materials possess all characteristics and can be used alone; sub-optimal materials possess some of the characteristics and should

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<sup>5</sup> <https://www.gov.uk/guidance/farm-animals-looking-after-their-welfare>

<sup>6</sup> Welfare of Farmed Animals (England) Regulations 2007

<sup>7</sup> Welfare of Farmed Animals (Scotland) Regulations 2010.

be used in combination with other materials; materials of marginal interest to pigs should be used with optimal or sub-optimal materials<sup>8</sup>; this approach was adopted from a European Commission report on tail-biting and enrichment<sup>9</sup>. Tabular information (page 24) provides further details giving examples of materials for each category and for sub-optimal materials indication of what other materials they should be used in combination with (e.g. wood-shavings may be complemented by edible/ manipulable materials).<sup>10</sup>

(b) Laying hens: legislation for laying hens is divided according to system<sup>6,7</sup>. Focusing on enriched cages legislation states that laying hens must have *'litter such that pecking and scratching are possible'*.<sup>6,7</sup> This legislation reflects the importance of foraging type behaviours in hens' time budgets (Dawkins, 1989). The Scottish Government guidance for the welfare of laying hens states (page 28) that *'hens should therefore have access to good quality litter suitable for the expression of natural behaviours, including dustbathing and scratching'*.<sup>11</sup> In relation to litter for foraging page 29 reads *'In enriched cages, layers' feed is an acceptable form of litter, when provided inside the cage'*. In relation to dustbathing (noting that this is not referred to in legislation) there are several mentions of the importance of dustbathing in the Scottish Government Guidance including *'The aim of different enrichment materials is to: a) Increase the amount of time the birds spend actively standing, walking, running, jumping and dustbathing'*.

There is further significance to this wording as it is used in the development of farm assurance standards which will be covered below. The wording also relates to the broader question posed for legislation on whether the aspiration is to significantly

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<sup>8</sup> <https://www.gov.uk/government/publications/pigs-on-farm-welfare>

<sup>9</sup> [https://food.ec.europa.eu/system/files/2016-12/aw\\_practice\\_farm\\_pigs\\_stfwrkdoc\\_en.pdf](https://food.ec.europa.eu/system/files/2016-12/aw_practice_farm_pigs_stfwrkdoc_en.pdf)

<sup>10</sup> In relation to the specific wording: for sub-optimal materials they *'should be used'* in combination with *'other materials'* (page 23); in the table the advice is that they *'may be complemented'* by specified other materials (page 24). For materials of marginal interest to pigs, they *'should be used'* in conjunction with optimal or suboptimal materials.

<sup>11</sup> <https://www.gov.scot/publications/guidance-welfare-laying-hens-pullets/>

enhance the welfare of confined farm animals through environmental enrichment (see Summary).

*Market-driven standards with a focus on farm assurance:* The term farm assurance was first used in Scotland in the 1980s with the aim of ensuring the quality of Scottish livestock products in an increasingly competitive market (FAWC, 2005). Since that time schemes to provide farm assurance have multiplied globally; for example, over 40 schemes globally set standards relating to broiler welfare<sup>12</sup>. For definitions of terms relating to farm assurance see Appendix B.

The potential advantages of market-driven approaches such as farm assurance schemes include being more agile than a legislative approach, being responsive to consumer demand, and inspiring a general increase in standards through leadership. Potential disadvantages include there being insufficient of a market for animal welfare to drive substantial improvements, commodification of the 'sellable bits' of the welfare market, only affecting segments of the farm animal population reared under the higher welfare standards and dilution of national standards by importation of products from countries with lower standards. (See (Buller et al., 2018; Buller and Roe, 2012; Christensen et al., 2019, 2012; Denver et al., 2022; Lawrence and Vigors, 2020; Lawrence and Stott, 2009; Lusk and Norwood, 2011; Sandøe et al., 2020).

The steps involved in farm assurance for welfare standards include:

*Setting standards:* The organisations (standard owners) that set UK welfare standards for the majority of farm animals are Red Tractor<sup>13</sup> and RSPCA<sup>14</sup>. Other standard owners for farm animal welfare include British Lion Code (laying hens)<sup>15</sup>, the Soil Association<sup>16</sup>,

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<sup>12</sup> <https://www.compassioninfoodbusiness.com/resources/broiler-chickens/how-welfare-schemes-compare-to-compassions-criteria-for-higher-welfare-broiler-chickens/>.

<sup>13</sup> <https://redtractorassurance.org.uk/>

<sup>14</sup> <https://science.rspca.org.uk/sciencegroup/farmanimals/standards>

<sup>15</sup> <https://www.egginfo.co.uk/>

<sup>16</sup> <https://www.soilassociation.org/our-standards/>

## Environmental Enrichment in Farm Animals

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Quality Meat Scotland<sup>17</sup> and Farm Assured Welsh Livestock<sup>18</sup>. Compassion in World Farming (CIWF) also publish 'better' and 'best' recommendations for welfare which are intended to encourage higher welfare standards with business partners and others (CIWF interview). The majority of pigs, poultry (other than laying hens) and dairy cows in the UK are reared and managed according to Red Tractor standards with a smaller proportion under RSPCA standards. Laying hens are covered by the Lion Code<sup>19</sup>; sheep and beef by several assessment schemes.

There are differences in the specifics of how standards are set across organisations, but the general approach is to establish standards through group or committee discussion of scientific evidence and other (e.g. practical) considerations. There can be an additional step within the organisation where standards are reviewed by an overarching standards committee. Standards will tend to be reviewed after a set number of years which varies across organisations; RSPCA will issue addendums if there is an urgent need to change a standard (this paragraph is based on interviews with Red Tractor; RSPCA; QMS).

Certification: Evaluation of standards on farms is carried out by independent organizations which are approved and accredited by UKAS following a rigorous process to set the approved standards. There are several farm assurance certification bodies operating in the UK. As examples, Red Tractor contract certification bodies (e.g. NSF<sup>20</sup>) to conduct farm visits and certify farms against Red Tractor standards (Red Tractor interview). The RSPCA create and own the standards, which are used by the scheme, RSPCA Assured<sup>21</sup>. Supply Chain Insights (SCI<sup>22</sup>) are the certification body for RSPCA Assured, ensuring that the scheme operates according to UKAS rules (RSPCA Assured interview). QMS have an association with the SSPCA whereby SSPCA inspectors attend

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<sup>17</sup> <https://qmscotland.co.uk/>

<sup>18</sup> <https://www.fawl.co.uk/>

<sup>19</sup> <https://www.egginfo.co.uk/sites/default/files/Lion-Code-Practice-Jan-18.pdf>

<sup>20</sup> <https://www.nsf.org/gb/en/food-beverage/red-tractor-standards>

<sup>21</sup> <https://www.rspcaassured.org.uk/>

<sup>22</sup> <https://www.scinsites.com/>

the majority of farm visits as a part of the validation of welfare standards (QMS interview). For Red Tractor, the certification bodies report back on various aspects of their assessments with a focus on where there is non-compliance (Red Tractor interview). See FAWC (2005, pg. 10) for a diagram illustrating the relationship between standard owners and certification bodies. In terms of ownership of data the assessment data (compliance or otherwise against each standard and documented objective evidence) detailed in the assessment report is owned by the Certification Body (Red Tractor interview). Some label descriptors (e.g. woodland eggs; happy eggs) lie outside specific farm assurance schemes (Bartlett et al., 2023).<sup>23</sup>

CIWF do not audit their 'better' and 'best' recommendations on-farm but intend to influence businesses in various ways to aspire to those recommendations (CIWF interview). For example, CIWF co-sponsor with Four Paws<sup>24</sup> the Business Benchmark on Farm Animal Welfare (BBFAW) which has been assessing companies on their farm animal welfare management, policy commitment, performance and disclosure since 2012<sup>25</sup>. The BBFAW approach involves scoring companies against objective criteria on the basis of published information only but does not involve any on-farm assessments (BBFAW interview).

There is relatively little information available on whether farm assurance schemes improve on-farm welfare. One study of official inspections to assess compliance with legislation found that membership of a farm assurance scheme significantly reduced the risk of non-compliance (KilBride et al., 2012). Analyses of data from the Real Welfare scheme<sup>26</sup>, participation of which was a requirement for the Red Tractor pig assurance scheme until 2023, found evidence of welfare improvements over its course until it was ended (F. Pandolfi et al., 2017; F Pandolfi et al., 2017; Pandolfi et al., 2022).

**Farm assurance and environmental enrichment:** As described above farm assurance schemes use legislation and the government's codes of practice as the

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<sup>23</sup> <https://www.ciwf.org.uk/your-food/know-your-labels/>

<sup>24</sup> <https://www.four-paws.org/>

<sup>25</sup> <https://www.bbfa.com/>

<sup>26</sup> <https://ahdb.org.uk/real-welfare>

starting point for animal welfare standards including for environmental enrichment. Scheme specific issues will determine the extent to which scheme standards exceed legal requirements for enrichment. For example, Red Tractor standards for pigs<sup>27</sup> align with UK legal standards, whilst their standards for broilers exceeds legal standards in relation to perches and pecking objects<sup>28</sup>. RSPCA Assured is welfare focused and is therefore more likely to exceed legal standards for enrichment. Other schemes including organic based assurance schemes and certain retailers (Waitrose; M&S) also aim to exceed legal standards for enrichment<sup>29</sup>.

Given this we can expect farm assurance standards for enrichment to be at least equivalent to legal standards as expressed in the codes of practice. For example, taking the two examples covered in detail above under Legislation (pages 8–9): (a) For pigs the most recent version of Red Tractor enrichment standards for pigs<sup>30</sup> do follow the legislation<sup>31</sup> and codes of practice closely. Under Animal Health standards AH.12 (page 34) the essentials of the codes of practice are laid out. There is a link to the AHDB webpages on enrichment<sup>32</sup> and an additional Appendix to the Red Tractor standards (Appendix AH.12) which provides more details from the codes of practice (page 65); (b) For laying hens the main assurance scheme for enriched cages is the Lion Code which for welfare standards refers to legislation but does not provide any additional information on enrichment within the enriched cage system.

*Implementation of enrichment standards on-farm:* Similar to legal standards, farm assurance schemes can be assessed on the extent to which they lead to more effective enrichment and significantly enhance the welfare of confined farm animals<sup>33</sup>. This question relates to the setting of the standards (i.e. how the standards relate to

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<sup>27</sup> <https://redtractorassurance.org.uk/wp-content/uploads/2022/08/Pigs-V5.1-Standards-FINAL.pdf>

<sup>28</sup> <https://redtractor.org.uk/our-standards/poultry/>

<sup>29</sup> Farm Assurance Schemes and Animal Welfare: How the standards compare 2012, CIWF

<sup>30</sup> <https://redtractorassurance.org.uk/wp-content/uploads/2022/08/Pigs-V5.1-Standards-FINAL.pdf>

<sup>31</sup> Welfare of Farmed Animals (England) Regulations 2007.

<sup>32</sup> <https://ahdb.org.uk/knowledge-library/environmental-enrichment-for-pigs>

<sup>33</sup> [https://www.bbfaw.com/media/2141/bbfaw-2022\\_briefing\\_environmental\\_enrichment.pdf](https://www.bbfaw.com/media/2141/bbfaw-2022_briefing_environmental_enrichment.pdf)



the scientific evidence on provision of effective enrichment), how the standards are being implemented in practice and what enrichment is being provided on farms. As farm assurance schemes start from the baseline of legal standards and codes of practice, they are based on the same scientific knowledge as legal standards, dependent on how well the wording in both reflects the scientific evidence (see below). Farm assurance schemes can of course elect to enhance legal standards and as we have seen there are examples where this has occurred.

Enrichment in pig production provides an example where the wording developed in the codes and translated into farm assurance standards, allows practices which can be argued to fall short of the legislation, to enable pigs '*proper investigation and manipulation activities*' (see also Mullan et al., 2011). One issue is that the codes of practice state that enrichments '*should ideally*' be all of edible, chewable, investigable and manipulable (page 23)<sup>34</sup>, thus allowing the interpretation that enrichments need only meet some of these characteristics. There is also a lack of clarity over use of materials defined as '*suboptimal*' or '*marginal interest*'. The codes state (page 23)<sup>32</sup> that suboptimal materials should be '*used in combination with other materials*' without being specific about allowable materials; marginal interest materials '*should be used with optimal or sub-optimal materials*'. Thus, the wording in the codes allows objects of marginal interest (e.g. a chain) in combination with suboptimal materials (e.g. wood) to be legally compliant. From available data, combinations of sub-optimal and marginal interest materials are used as legally compliant enrichment on pig farms. The Real Welfare Report (2018–2020) found that whilst 69% of pigs had access to a substrate which was usually straw, 32% of pigs on 53% of farms only had access to objects.<sup>35</sup> This data is consistent with the literature that finds continued use of 'point-source' objects including chains and wood often due to the incompatibility of substrates such as straw with slatted-floor systems (Weerd and Ison, 2019). RSPCA standards in addition to stipulating the need for enrichment materials such as long-straw to '*allow and*

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<sup>34</sup> <https://www.gov.uk/government/publications/pigs-on-farm-welfare>

<sup>35</sup> Real Welfare update report (2018–2020), AHDB

*encourage proper expression of rooting, pawing and chewing behaviours*, also require solid floors and suitable bedding for lying which can provide additional enrichment<sup>36</sup>.

For laying hens in enriched cages, legislation states that birds must have access to litter for pecking and scratching<sup>37</sup>; the main assurance scheme for enriched cages (the Lion Code) does not add to this<sup>38</sup>. In most cases the only available substrate is the food mash hens are being fed, some of which is directed to fall onto a scratch mat the size of which is unregulated; the result is that only a few birds can access this food/litter at a time with only a short window before it is pecked or disappears; this arrangement does not permit performance of fully functional dustbathing (SRUC poultry welfare expert interview).

A caveat to any interpretation of effective environmental enrichment provision for UK farm animals is the availability of data on the specific enrichments provided on farms and what use is made of enrichments. The pig-based Real Welfare scheme (no longer in operation<sup>39</sup>) was an example where provision of enrichments on farms was reported. In terms of standard farm assurance visits, the data available on enrichment provision varies by scheme. For the Red Tractor pig welfare assurance scheme, the detail of enrichment provision is collected by the assessor, detailed in the farm's audit report by the certification body, and provided to Red Tractor on request. In terms of analysis the detail against the enrichment standard is not routinely collated or analysed, but non-conformance data is analysed and inferences drawn with regards to compliance with enrichment requirements (Red Tractor interview). Both RSPCA and the Soil Association apply the AssureWel welfare outcome assessment protocol which for pigs includes assessment of enrichment use<sup>40</sup>. RSPCA Assured assessors do report back on the type of enrichment in use and this information can be used in feedback to farmers; currently

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<sup>36</sup> <https://science.rspca.org.uk/sciencegroup/farmanimals/standards/pigs>

<sup>37</sup> Welfare of Farmed Animals (England) Regulations 2007.

<sup>38</sup> <https://www.egginfo.co.uk/news/british-lion-launches-enhanced-code-practice-version-8-builds-25-years-eggs-you-can-trust>

<sup>39</sup> <https://ahdb.org.uk/real-welfare>

<sup>40</sup> <http://www.assurewel.org/pigs.html>

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this information is not available beyond RSPCA Assured although this data is under ongoing internal analysis and stakeholder discussions with the aim of publishing findings on laying hens and finishing pigs in the near future (interview with RSPCA Assured). For QMS there is no information available on specific enrichments used (QMS interview). As explained CIWF and BBAFW do not conduct their own farm-based assessments and report on standards for enrichment as set by schemes and as reported by companies but not the standards as applied on farms (CIWF and BBAFW interviews).

There are also more fundamental questions on how to assess effectiveness of enrichments on farms (see Decker et al., 2023 for a recent review on assessing effectiveness of enrichments). For example, there has been a long-standing debate on effectiveness of free-range conditions for laying hens in terms of the numbers of birds that access out-door areas (Campbell et al., 2020). Other examples where there is uncertainty over effectiveness of enrichments include the provision of foraging enrichments for laying hens in enriched cages (Sandilands et al., 2021) and free-range systems (Sandilands et al., 2022). The Real Welfare scheme did assess whether pigs have sufficient access to enrichment calculated as the ratio of:  $A / A+B$  where  $A$  = number of pigs interacting with the enrichment and  $B$  = number of standing or sitting pigs manipulating other pigs, pen fittings etc.<sup>41</sup> RSPCA Assured assessors are also required to assess this ratio for pigs only (RSPCA Assured interview).

This ratio illustrates the challenges of assessing use of enrichment as an indicator of effectiveness: (a) the short period of time to calculate the ratio (2 minutes in the original protocol), the lack of control over the time of day the assessments are made and the infrequency of farm assessments<sup>42</sup>, all pose challenges to ensuring that the ratio is a true representation of enrichment use. Using data on pigs' use of enrichment

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<sup>41</sup> Adapted from the Coordinated European Animal Welfare Network (EUWeINet)

<sup>42</sup> e.g. RSPCA Assured undertake to visit farms at least once a year under normal circumstances - <https://www.rspcaassured.org.uk/frequently-asked-questions/>

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we have shown that strong circadian trends in the calculated ratio make it unlikely for a single short sample to be representative<sup>43</sup> (see Box 3 below); (b) Accurate estimation of individual animals behaviour in pens with large group sizes in order to calculate the ratio is challenging; (c) The ratio is dependent on the classification of what is enrichment; in the case of Real Welfare they included in the ratio both optimal enrichments (substrates) and sub-optimal enrichments (toys). These constraints suggest that observation is not a reliable or practical approach for estimating enrichment use and effectiveness of enrichments. Note: However, this is not the intended use of this measure by RSPCA Assured. Instead, it's inclusion was designed to provide an indication as to the prevalence of enrichment use at scheme levels, as opposed to individual farm level (RSPCA Assured interview).

Finally, there are wider issues which can affect levels of enrichment experienced by animals entering UK supply chains. Infectious disease outbreaks can have significant effects on enrichment provision for example when straw is restricted to pigs due to it being seen as a potential source of infection (e.g. African Swine Fever) or laying hens are prevented from access to free range as a precaution against Avian Flu (interview with CIWF). There is also the issue of standards for enrichment applied to imported animal products. In general importation of animal products reared under lower standards reduces animal welfare standards in the UK at point of consumption (Sandøe et al., 2020). Currently there is no detailed analysis of this effect with respect to environmental enrichment and it is not always apparent what the standards are that apply to imported animal products. As examples, Sainsburys Annual Health and Welfare Report makes no mention of the standards that apply to their imported animal products<sup>44</sup>; Waitrose do publish information on imported animal products (e.g. these show the lower enrichment standards that apply to their imported EU reared pork<sup>45</sup>).

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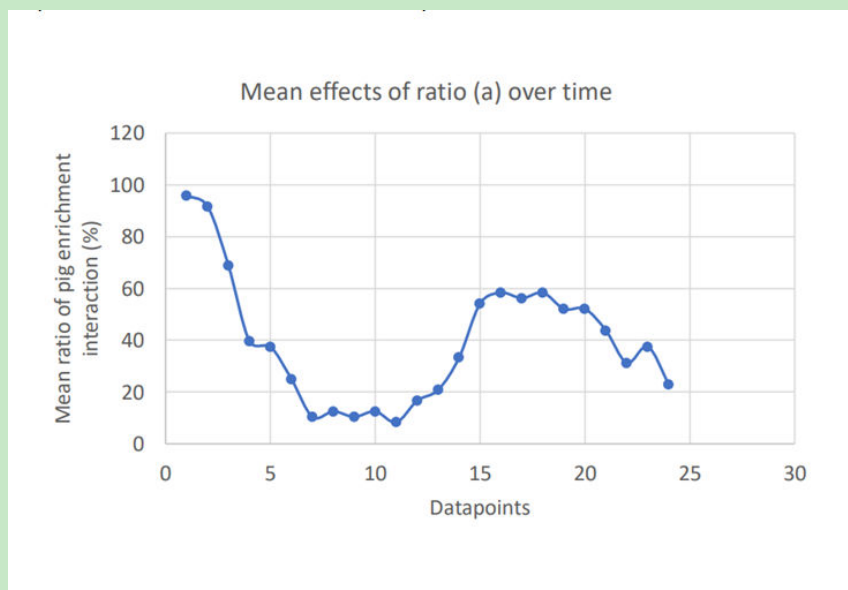
<sup>43</sup> Assessing the Effectiveness of Measuring Environmental Enrichment for Grower Pigs, *Sus Scrofa Domesticus* – MSc dissertation Jaya Abi- Habib 2023

<sup>44</sup> <https://www.about.sainsburys.co.uk/sustainability/better-for-everyone/animal-welfare>

<sup>45</sup> <https://www.johnlewispartnership.co.uk/content/dam/cws/pdfs/Juniper/ethics-and-sustainability/Our-Approach-to-Animal-Welfare-and-Livestock-KPIs.pdf>

**Box 3:** Time trend effects on enrichment use: Our data suggesting that short periodic visual assessments are likely to be unreliable as a measure of pigs' use of enrichment.<sup>25</sup>

The figure below shows an analysis of data on pigs' engagement with enrichment over time. Pigs housed in 6 groups (4/group) on straw bedding with an additional enrichment (plastic bag filled with straw) given at the start of observation. Each pen was watched from video recordings for 2 minutes in every 10 minutes before being scored; a total of 4 hours of video was watched over 2 days (this sampling was chosen to replicate what assessors are asked to do when scoring enrichment use on farms). The pigs were scored by one-zero sampling where they were given 1 for engagement with either the added enrichment or the straw bedding, or 0 for no engagement. A ratio of pigs engaging or not with the enrichment was calculated. The analysis shows a clear time trend in enrichment engagement ( $P < 0.000$ ) with 2 peaks of activity; one immediately when the enrichment bag was introduced and a second peak approximately 2 hours later. There were also significant differences between pens ( $P < 0.001$ ) but not across days. The results clearly indicate that any individual assessment will be unrepresentative of both time trends and pen effects.



### Overall Summary

The idea of enriching the environment of farm animals emerged in 1980s and has become a commonly used approach to improving their welfare. There is no universally applied scientific rationale for enrichment; scientific ideas include use of enrichments to facilitate normal behaviour, to satisfy motivations, to provide cognitive challenges and to reduce abnormal behaviour.

There are some indications that environmental enrichment for farm animals continues to have some influence on the development of animal production industries. The most recent BBFAW report finds 49% of companies surveyed had partial or universal policies on species-specific enrichment and that 46% had some level of commitment to provision of enrichment.<sup>46</sup> BBFAW find a small number of companies (3%) are leading the way with universal commitments to provide enrichment across all relevant species and geographical regions.<sup>40</sup> The advance in commitment to enrichment use is apparent in broiler production where BBFAW finds that 31% of companies that have broiler chickens in their supply chain have set some level of target to achieve the requirements for the Better Chicken Commitment (BCC) which includes enrichment provision.<sup>40</sup> Similarly in the UK Red Tractor is setting standards for enrichment use with broilers that exceed the legal minimum.<sup>47</sup> As noted the final Real Welfare survey found that the majority of UK pigs had some access to substrate which was usually straw<sup>48</sup> More generally current trends in UK animal production systems appear potentially positive with respect to enrichment including the trend towards sustainable and organic production<sup>49</sup> and a continued consumer demand for higher welfare products<sup>50</sup>.

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<sup>46</sup> <https://www.bbfa.com/media/2176/bbfa-2023-report-final.pdf>

<sup>47</sup> <https://redtractor.org.uk/our-standards/poultry/>

<sup>48</sup> <https://ahdb.org.uk/real-welfare>

<sup>49</sup> <https://www.clear-treasury.co.uk/insight/agriculture-industry-trends>

<sup>50</sup> <https://researchbriefings.files.parliament.uk/documents/POST-PN-0589/POST-PN-0589.pdf>

However, as a balance to these positives there are areas of concern. In terms of general trends in animal welfare, BBFAW finds that few companies have set targets for welfare improvements in species other than broilers.<sup>40</sup> In the UK the move away from intensive production systems that are behaviourally restrictive is only partial: a significant proportion of laying hens remain in enriched cages<sup>51</sup>; the majority of broilers are reared in systems that do not meet the BCC requirements; whilst 40% of sows give birth (farrow) outdoors it is estimated that only 3% of their offspring will be outdoors for their entire life<sup>52</sup>. These statistics emphasize the continued importance of environmental enrichment for farm animals housed in intensive and behaviourally restrictive systems. However, it is in intensive systems where the implementation of enrichment can come into conflict with other aspects of the system (e.g. provision of substrates such as straw to pigs on slatted floor systems; provision of litter to hens in enriched cages). The incompatibility of enrichment with intensive systems is likely an influence in the wording used in the codes of recommendations and farm assurance standards that allows use of sub-optimal enrichment materials.

Finally, it is relevant to consider the role of positive animal welfare (PAW) on the future development of environmental enrichment for farm animals. PAW is a relatively recent concept that focuses on the welfare benefits of animals having opportunities for positive experiences on a regular basis (Box 2). There is an increasing interest by livestock industry stakeholders in PAW and closely related concepts such as animals living a 'good life'<sup>53</sup>. It would seem that adopting concepts such as PAW and a Good Life should change perceptions of the purpose of enrichment towards maximising positive welfare rather than the rather common view of enrichment to minimise harms (e.g. tail-biting; abnormal behaviour); this change of perspective could result in very different

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<sup>51</sup> <https://committees.parliament.uk/writtenevidence/119296/pdf/>

<sup>52</sup> <https://www.rspca.org.uk/adviceandwelfare/farm/pigs/farming>

<sup>53</sup> [https://pure.sruc.ac.uk/ws/portalfiles/portal/46921180/Wemelsfelder\\_et\\_al\\_2022\\_SRUC\\_Research\\_Briefing\\_FINAL.pdf](https://pure.sruc.ac.uk/ws/portalfiles/portal/46921180/Wemelsfelder_et_al_2022_SRUC_Research_Briefing_FINAL.pdf)

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conclusions on the level of enrichment required (Lawrence et al., 2024; see also<sup>54</sup>). The following quotes from FAWC on the proposition that farm animals should live a good life help to illustrate this point (FAWC, 2009):

*'The concept of 'a good life' recognises the distinction that an animal's quality of life is over and beyond that of a life worth living.'*

(Paragraph 57, page 26).

*'The requirements for a good life go well beyond those for the lower level.'*

(Paragraph 58, page 26).

*'It is hard to conceive how certain systems of husbandry could ever satisfy the requirements of a good life because of their inherent limitations'.*

(Paragraph 61, page 26).



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<sup>54</sup> <https://www.positiveanimalwelfare.net/wp-content/uploads/2023/11/Jessiman-et-al.-iPAW-stakeholder-report.pdf>




# Documentation relating to provision of enrichments for UK farm animals

The following table provides a guide to information on enrichment provision for different species farmed in the UK:

	Link	Description
 Scottish Government Riaghaltas na h-Alba gov.scot	<a href="https://www.gov.scot/policies/animal-health-welfare/animal-welfare/">https://www.gov.scot/policies/animal-health-welfare/animal-welfare/</a>	Scottish Government provide a set of guides on the welfare of most farmed species at. These guides include information on legal standards for enrichment provision for the different species. They also provide additional information to increase understanding of the purpose of enrichment and how to maximise the benefits of enrichments.
	<a href="https://redtractorassurance.org.uk/">https://redtractorassurance.org.uk/</a>	Red Tractor provide information on their enrichment standards for the different species. For pigs as an example: the tab for Animal Health and Welfare takes users to the relevant standards which includes Standard PG.AH.12 specifying that ‘...pigs must have permanent access to environmental enrichment in order to satisfy their investigation and manipulation behavioural requirements.’ There follows a sub-set of points describing how this standard will be assessed: for example, PG.AH.12.c states that ‘Enrichment classed as ‘optimal’ may be used alone, while

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		'suboptimal' enrichment is used in combination with additional different enrichment from any category.'
	<a href="https://science.rspca.org.uk/sciencegroup/faranimals/standards">https://science.rspca.org.uk/sciencegroup/faranimals/standards</a> .	RSPCA Assured produce standards for all major farmed species including fish. The standards are laid out in a set of downloadable documents and the process of evaluating the science and arriving at the standards is also available.
	<a href="https://qmScotland.co.uk/integrity-assurance/quality-assurance/standards-schemes/">https://qmScotland.co.uk/integrity-assurance/quality-assurance/standards-schemes/</a>	Quality Meat Scotland have their own standards.
	<a href="https://www.soilassociation.org/our-standards/">https://www.soilassociation.org/our-standards/</a>	Soil Association have specific standards relating to organic production.
	<a href="https://www.waitrose.com/ecom/content/sustainability/animal-welfare">https://www.waitrose.com/ecom/content/sustainability/animal-welfare</a>	Waitrose publish an overarching statement of their animal welfare requirements
	<a href="https://corporate.marksandspencer.com/sustainability/reports-quick-reads/our-animal-welfare-standards">https://corporate.marksandspencer.com/sustainability/reports-quick-reads/our-animal-welfare-standards</a> .	M&S also publish a general statement on their standards.

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Standards are difficult to find. There are tables comparing CIWF standards to global farm assurance standards. These tables are available as downloadable PDFs but again they take a bit of finding.

<https://www.compassioninfoodbusiness.com/resources/dairy/how-welfare-schemes-compare-to-compassions-criteria-for-higher-welfare-dairy-cattle/>.

The table for dairy can be found here <https://www.compassioninfoodbusiness.com/resources/dairy/how-welfare-schemes-compare-to-compassions-criteria-for-higher-welfare-dairy-cattle/>.

The CIWF web-based material is not easy to find. For example, using Google to search for 'better level of welfare' recommendations was unsuccessful.

The easiest way to find this information may be to directly contact CIWF.

### Other relevant documentation

CIWF published a comparison of assurance scheme standards in 2012 (this has not been updated); the 2012 report is available at

[https://www.ciwf.org.uk/media/5231246/standards\\_analysis\\_exec\\_summary.pdf](https://www.ciwf.org.uk/media/5231246/standards_analysis_exec_summary.pdf).

The BBFAW have since 2019 included policy and reporting questions on provision of species-specific environmental enrichment reflecting '...growing recognition of the importance of providing animals with stimulating and complex environments that enable species-specific behaviours'; find the 2023 report at

<https://www.bbfaaw.com/media/2176/bbfaaw-2023-report-final.pdf>.<sup>55</sup>

BBFAW have also published a briefing on environmental enrichment which is available at [https://www.bbfaaw.com/media/2141/bbfaaw-2022\\_briefing\\_environmental\\_enrichment.pdf](https://www.bbfaaw.com/media/2141/bbfaaw-2022_briefing_environmental_enrichment.pdf).

<sup>55</sup> The questions posed by BBFAW are: "Does the company have a clear position on the provision of effective species-specific environmental enrichment?" And "Does the company report on the proportion of animals in its global supply chain that is provided with effective species-specific enriched environments?"

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The BVA have published their opinion on farm assurance schemes with a comparison across schemes with the aim of assisting consumer choice.

<https://www.bva.co.uk/take-action/our-policies/farm-assurance-schemes/#:~:text=Assurance%20schemes%20allow%20farmers%20to,and%20competencies%2C%20and%20environmental%20protection.>

## Acknowledgements:

We would like to thank all those who took part in initial interviews and subsequently commented on drafts of this report. The work was supported by grant-in-aid from the Scottish Government's Rural and Environment Science and Analytical Services Division (RESAS SRUC-A3-6).

## Appendix A: Selection of definitions of environmental enrichment with the background of the author(s) indicated

*'...a concept which describes how the environments of captive animals can be changed for the benefit of the inhabitants. Behavioural opportunities that may arise or increase as a result of environmental enrichment can be appropriately described as behavioural enrichment'* (Shepherdson, 1994). (welfare science – zoo animals)

*'...environmental enrichment is defined as an improvement in the biological functioning of captive animals resulting from modifications to their environment'* (Newberry, 1995). (welfare science – farm animals)

*'...the practice of modifying housing conditions in order to promote natural behaviour and ameliorate behavioural problems'* (Olsson and Dahlborn, 2002) (welfare science and ethics – laboratory rodents)

*'...it refers to items or practices that promote the expression of species-typical behaviors for captive animals'* (Coleman and Novak, 2017). (welfare science – laboratory primates)

*'...the combination of inanimate and social stimulation'*. (Mark Rosenzweig (Kempermann, 2019) (neuroscience – laboratory rodents)

## **Appendix B: Definition of terms relating to farm assurance taken from the FAWC (2005) Report on the Welfare Implications of Farm Assurance Schemes**

*Assurance*: the provision of dependable/certified information attached to a product, and relating to particular characteristics of interest about it.

*Farm Assurance*: assurance applied to products with a 'farm' origin and covering the conditions of their production, up to the point of slaughter for livestock products.

*Farm Assurance Scheme*: a formal framework to ensure the availability, validity and delivery of that assurance information.

*Accreditation and Certification*: the process of assessing and accrediting the competence, integrity and impartiality of independent evaluation by certification and inspection bodies.

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