

A Practical Guide to Environmental Enrichment for Pigs



A HANDBOOK FOR PIG FARMERS

Introduction

This guide aims to give practical advice to pig farmers surrounding the complex issue of providing suitable environmental enrichment to pigs. It provides useful information from the knowledge of farmers, researchers and scientific literature on the different ways environmental enrichment can be provided for differing types of housing and systems. The information is set out in sections by housing type, and in each, the types of enrichments that are most suited to each system are discussed, including their properties, how to present the enrichment, quantities, and practical considerations too, such as ease of installation, maintenance and costs.

Although environmental enrichment is the primary focus of this guide, this is just one aspect of a pig's environment. It is important to get other aspects right too, including ventilation, nutrition, health, water provision and stocking density. All will contribute to improved production and reduce the risk of abnormal and injurious behaviours, like tail biting.

What is 'environmental enrichment'?

Environmental enrichment is the term used to describe the changes (modifications or additions to the pigs' surroundings) that are designed to improve the living conditions of the animals by encouraging the demonstration of a wider range of normal pig behaviours.

From a practical viewpoint, it is providing objects or materials for proper investigation and manipulation in order to keep pigs occupied in non-harmful behaviour.

Why is it important?

Pigs are naturally curious and social animals that, despite many years of genetic selection, are still highly motivated to explore their environment as they would in their natural woodland habitat. Pigs explore by rooting, biting, chewing and sniffing food and indigestible items. In semi-natural

surroundings, pigs spend 75% of their time in activities such as burrowing, foraging and exploring¹. Hunger is not the only motivation for this behaviour; even ad libitum fed pigs perform these exploratory activities.

There are many reasons to enrich the environment of pigs²:

- To reduce the frequency of abnormal behaviour (tail biting, biting, aggression);
- To increase the pigs' ability to deal with challenges in a much more normal way;
- To broaden the range of behaviours expressed;
- To improve animal performances (feed intake, ADG and FCR);
- To reduce stress in the animals.

Enrichment can impact significantly the productivity of pigs. The average daily food intake is higher for pigs living in an enriched environment, and their growth rate is higher; all of which translates to increased net weights of meat and higher back-fat levels³. Pigs raised in enriched housing also react less aggressively to changes in their surroundings⁴. In this respect they are less nervous and fearful when a change occurs in their daily lives, which in turn, makes for easier handling of the animals^{5, 6}. Thus, providing pigs with a sufficient quantity of suitable materials to enable them to fulfil their innate need to bite, root and manipulate is important for their welfare.

What happens if the enrichment is unsuitable or ineffective?

When suitable manipulation materials are not available to explore, pigs can become bored, stressed and/or frustrated, and sometimes direct their curiosity towards something else, often pen-fittings, such as their pen-mates, resulting in unwanted behaviours such as ear, flank vulva or tail biting.

Legislation

The welfare of pigs in the UK is governed by the **Animal Welfare Act 2006**.⁷ The need to provide environmental enrichment is laid down more specifically in **The Welfare of Farmed Animals (England) Regulations 2007 (as amended)**⁸ (and similar legislation in the devolved administrations). This makes it a legal requirement for pig farmers to provide pigs at all production stages, including sows, with ***permanent access*** to environmental enrichment materials in “...a sufficient quantity of material to enable proper investigation and manipulation activities...which does not compromise the health of the animals.”

In addition to the above, the **Council Directive (EU) 2008/120/EC**⁹ lays down minimum standards for their protection; recognising the importance of foraging and investigative behaviour for pig welfare, and the **Commission Recommendation (EU) 2016/336 of 8 March 2016** also sets out guidance to reduce the need for tail docking¹⁰. In particular it outlines key characteristics that environmental enrichment materials for pigs should have and how they should be presented. These key properties are covered in a later section of this guide.

Farm assurance schemes

All the main farm assurance schemes in operation within the UK include standards on the provision of enrichment for pigs. However, these standards may or not be set above compliance with minimum legal standards. It is important for farmers producing under farm assurance scheme standards to ensure that they familiarise themselves with the most recent requirements of the particular scheme to which they are part of.

Key characteristics of enrichment materials for pigs

When selecting the type of enrichment to provide for pigs, several points need to be considered. Firstly, the materials or objects chosen must be examined to ensure they will not cause any health problems, and are safe for both pigs and stockpersons. (A later section of this guide provides a list of items which are no longer suitable to provide to pigs as environmental enrichment, and should not be used.)

Enrichment materials should fulfill the following attributes:^{9,10,11}

- **Edible or Feed-Like** - so that pigs can eat or smell them, preferably with some nutritional benefits;
- **Chewable** - so that pigs can bite them, and also provides information on taste/odour;
- **Investigable** - so that pigs can investigate them, allowing pigs to root with their snout;
- **Manipulable or Deformable** - so that pigs can change their location, appearance or structure.

Enrichment objects or materials placed in pig pens will be more interesting to pigs for longer if they have some or all of the above properties. **Novelty** is key to maintaining a pig's interest in an object beyond it first being placed in the pen.

Therefore, in addition to the characteristics listed above, enrichment materials should be provided in such a way that they are:^{9,10,11}

- **Of sustainable interest** – enrichments should encourage the exploratory behaviour of pigs and be regularly replaced, replenished or rotated with different materials, to maintain this over time;

- **Accessible** - for oral manipulation to all pigs at all times and presented at a height that pigs can easily interact with them, yet be kept clean;
- **Given in sufficient quantity** – for any pig to gain access when they are motivated to do so, and so as not to generate competition between pigs;
- **Clean and hygienic** - or pigs will rapidly lose interest in enrichment materials that are soiled with dung, to ensure enrichments do not compromise the health of the pigs.

In order to fulfil pigs' essential needs enrichment materials and objects should meet **all** the characteristics listed above to comply with the legal requirements. This means that if the enrichment provided does not have all of these properties a combination of materials that together have all these characteristics is essential.

A large range of materials can be used for enrichment for pigs, and to help assess the effectiveness of different materials, and the way they are presented, to meet all of the above characteristics, enrichment materials should be categorised as ^{9,10,11}

- **Optimal materials** - materials possessing all the characteristics listed above, and so can be used alone;
- **Suboptimal materials** - materials possessing most, but not all, of the characteristics listed above, and should be used in combination with other materials;
- **Marginal interest** - materials providing distraction for pigs which should not be considered as fulfilling their essential needs, and so optimal or suboptimal materials should also be provided.

Materials that are ineffective on their own as enrichment for pigs

Materials categorised as **suboptimal** or of **marginal interest** should not be used on their own as pig enrichment materials.

Suboptimal materials used as bedding (e.g. wood shavings, shredded paper, soil and sand) usually meet the needs for investigation and manipulation but are not necessarily edible or chewable. A combination of materials (e.g. natural ropes, root vegetables, forage in racks, compressed straw in cylinders, hessian cloth bags, rubber or plastic items, commercially available toys, chains or wood) should be used in systems where bedding cannot be provided as a source of enrichment.

Materials of marginal interest include objects, such as hard plastic piping or chains. They can provide distraction but should not be considered as fulfilling the essential needs of the pigs. Other materials should also be provided.

Items not suitable as enrichment for pigs

All enrichment materials provided must be safe, and not compromise the health of the animals. There are a number of items which are no longer suitable to provide to pigs as environmental enrichment, and should not be used. Listed below are some examples of unsafe materials:

- Wood that is non-virgin - this can contain sharp objects e.g. nails or splinters from older, dried wood etc. which can hurt pigs when chewing, and can be treated with chemicals which are toxic to pigs (e.g. railway sleepers) .
- Synthetic rope – if swallowed in pieces it may cause intestinal obstruction.

- Tyres – as some may contain wire or metal strips which could cause harm to the pigs.
- Dry sawdust – when airborne this maybe dusty or irritating.
- Materials with the risk of biological or chemical contaminants e.g. peat/mushroom compost that can harbour disease-causing agents, or dog chews like pig ears, which are made from animal products, as these could present a disease risk to pigs.
- Dirty or soiled enrichment objects – which may provide a reservoir for disease-causing agents.

Additional practical considerations

It is also important that the enrichment material or object chosen is compatible with the farm system. For example, it must suit the flooring found in the pens, and ensure that materials do not fall through slats and risk blocking slurry removal systems. As a general rule, substrate enrichments are best suited to solid floored pig housing systems, and object-based enrichments can be effective for pigs kept in systems with slatted floors.

The installation of enrichments must be well thought out, not just to ensure they remain of sustained interest to the pigs, but that they are also easily sourced, maintained or replaced, cost effective, easy to store and install, and safe for the stockperson too. It is important that any suspended enrichments are at the correct height. Studies have shown objects suspended at eye-level are manipulated more than items left on the floor.^{12,13} This makes it possible to keep the items cleaner and also the pigs interested for longer.

The different ways environmental enrichment can be provided for differing types of housing and systems are presented in the following sections of this guide. Information on the types of enrichment materials that are most

suited to each housing system are discussed, including their properties, ideas on how to present the enrichment, quantities to provide, and practical considerations too, such as ease of installation and maintenance.

Types of enrichment

Substrates used as bedding

Good quality straw as bedding is reported in several studies to be an excellent choice as it satisfies all five of the criteria for good enrichment materials. It is **safe, edible, chewable, investigable and manipulable**. Thus, it is considered to be an **optimal** enrichment material that can be used alone. Studies show that straw stimulates and increases exploratory behaviour, as long as it is regularly replenished and of good quality (eg not mouldy or wet).¹⁴ Bedding (straw or other) has the highest potential to provide successful enrichment.¹⁵

However, straw is not always practical as a bedding material, being more suited to solid floored housing where it will not adversely affect slurry systems. It is generally considered that supplying straw where possible in smaller quantities, as a non-bedding form of enrichment (eg in racks or feeders) is better than no straw at all.¹⁴

Other materials can also be used for bedding, including hay, elephant grass (miscanthus), wood shavings, shredded paper or silage and can also be used effectively, and offer all the main properties that pigs find attractive.

Enrichment material not used as bedding

For some systems straw or bedding materials can be problematic if it passes into slurry systems. However, these materials could still be provided with different presentation, such as small amounts of straw chopped, in racks or compressed into cylinders. This allows pigs to root and forage and has been demonstrated to reduce the development of tail biting.¹⁵ In studies, when pigs are offered several different materials,

straw is not always the preferred choice.^{16,17} This means that when substrate dispensers are used as enrichment alternatives to a straw bed, materials other than straw might be equally suitable or even more attractive to pigs.

In housing systems where materials for bedding cannot be provided as a source of enrichment various foodstuffs like hay, silage, or root vegetables can be used to offer different forms of stimulation provided in racks, or novel containers where only small amounts can be accessed at a time, encouraging them to be consumed rather than wasted through slats. If liquid feeds are fed, a roller in the trough could be used, allowing pigs to root to get food.

Alternatively, enrichments in the form of objects like, sisal rope, wood, rubber or plastic items, balls, toys, pipes, hose, chains and some commercially available items (ie foraging towers, Weda rooting cones or Bite Rite™) can be provided.

NOTE: Some of these will need to be used in combination with other enrichments as presented alone they do not fulfil all the properties listed above to be considered **optimal** enrichment, nor do they meet the legal minimum requirements. Combinations of enrichment (such as a combination of ropes with wood, or chains and rubber hoses) can also be effective forms of enrichment.¹⁸ Pigs will very quickly lose interest in them though if they are not varied regularly, or kept clean. However, they can be of value as supplements to other edible, investigable and manipulable materials.

Varying the enrichment regularly is a good way to stimulate and prolong the pigs' interest in the materials and items offered.

In the following sections of this guide are some suggestions for enrichment materials, how they may be provided, and some practical

considerations. It is not an exhaustive list, and a range of other materials can be used. Any materials provided (either alone or with additional enrichment) should fulfil the minimum legislative requirements and allow for **“...proper investigation and manipulation activities...which does not compromise the health of the animals.”**

How best to provide enrichment materials on your farm

We know what properties good enrichment materials should have, but some are better suited to some pig housing systems than others. The following sections of this guide will show a wide range of enrichment options and discuss their properties, and suitability for use in different pig housing systems.



Three different types of enrichment (EUWeINet)