

# Enriching the living space of pigs to comply with the Code

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**T**he Code of Practice for the Care and Handling of Pigs<sup>1</sup> urges Quebec pork producers to house their pregnant sows in groups and to provide some kind of enrichment in their living space. This practice applies for hogs, as well as sows.

This document is a decision-making support tool regarding the types of enrichment possible, groups them in categories and outlines the advantages and disadvantages of each type. This tool explains the different ways of enriching the living space of sows in groups or of finisher pigs.

## Enrichment: what is it exactly?

The term *environmental enrichment* is used to describe the changes (modifications or additions to the environment) that are designed to improve the living conditions of the animals by allowing them to express a wider range of natural behaviours.<sup>2</sup>

Pigs are very curious, sociable animals. They like to root around and explore. In the wild, pigs spend 75% of their time in activities such as burrowing, foraging and exploring.<sup>3</sup> In semi-natural surroundings, about six to eight hours are given over to exploration and rooting. Pigs do this even when they are receiving concentrated feed rations.<sup>4</sup>

In most farming systems, pigs are deprived of an environment where they can express their natural/normal behaviours. Animals that live in non-enriched settings sometimes develop abnormal behaviours, called stereotypies. Stereotypies are repetitive abnormal behaviours, such as gnawing on the cage bars, a behaviour frequently seen in sows in crates, or tail-biting<sup>5</sup> and ear-chewing in the pig pens. Therefore, to reduce these behaviours and minimize aggression in the pen, enrichment of the pigs' environment is recommended.<sup>1</sup>

## Enrichment: why do it?

There are many reasons to enrich the living environment of pigs<sup>1, 6</sup>:

- To improve animal performances (feed intake, ADG and FCR)
- To reduce the frequency of abnormal behaviour (tail-biting, biting, aggression)
- To increase the ability to deal with the challenges in a much more normal way
- To broaden the range of behaviours
- To increase the array or number of normal behaviours
- To boost positive use of the environment
- To reduce stress in the animals.<sup>2</sup>



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Enrichment can impact significantly the techno-economic performance of a farming business. Negative interactions between pigs often have a negative effect on their performances.<sup>7</sup> On the other hand, the average daily food intake is higher for pigs living in an enriched environment, feed consumption lower, and their growth rate is higher; all of which translates to increased net weights of meat and higher backfat levels.<sup>8</sup>

What's more, animals raised in an enriched setting also react less aggressively to changes in their surroundings.<sup>9</sup> 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.<sup>7, 10, 11</sup>

## Enrichment: What to use?

When selecting the type of enrichment to provide for pigs, several points should be considered. First, the material or object chosen must be compatible with the type of flooring found in the pen; small sized organic materials fall through slats and can clog liquid manure removal systems.<sup>12</sup>

It is also important to examine the objects or materials used in order to make sure they do not cause any health problems (e.g. choking, poisoning, etc.), nor do they present a food safety or health risk<sup>13</sup> for the herd (salmonella).

Note that the ideal enrichment material or item for stimulating the pigs should have the following characteristics<sup>1, 3, 12, 14, 15, 16</sup> :

- Destructible
- Deformable
- Edible
- Chewable
- Odorous
- Clean.

In order to maintain the pigs' interest in them, the materials and enrichment items used in the pens must meet these characteristics. Pigs are attracted by newness; this is why there has to be a rotation of different materials and toys so as to sustain the novelty effect.<sup>17</sup>



## Enrichment: How to go about it?



The installation of materials and enrichment items must be well thought out. Several studies have shown that objects suspended at the eye-level of the pigs are manipulated more than objects left on the floor.<sup>18, 19</sup> This makes it possible to keep the pigs interested, since the objects stay clean for a longer time.

If the items are placed on the floor, boxes can be installed to put the objects into and in so doing, keep them from getting dirty quickly.<sup>14</sup>

The advantages and disadvantages of the different types of possible enrichment are presented in the Tables, along with tips for optimal installation. Items are classed according to whether they are bedding, feed, a single item (made from one material or just one object), a complex item (combination of more than one material or object) or commercially made equipment.

# Enriching the living space of pigs to comply with the Code

## Bedding

### Straw

#### General information and recommendations

- Straw must be kept clean and dry.<sup>1</sup>
- Storage facilities should be included in the layout.
- Provide the pigs with access to areas without straw bedding where they can cool down in warm weather.<sup>3</sup>
- An allocation of 100 g straw/animal/day would be enough to keep the pigs occupied.<sup>20</sup>



Source: ref. 20

#### Advantages

- On a scale of 1 to 10, straw is rated 7 for animal well-being.<sup>21</sup>
- Reduces difficulties regarding vertical balance (standing) significantly<sup>22,23</sup> and results in less culling of sows due to lameness.<sup>24</sup>
- Encourages the pigs' exploration and rooting behaviour.<sup>25</sup>
- Plays a role in the pigs' physical comfort, thermal regulation and nutrition.<sup>3</sup>
- Allows sows to exhibit their nest-building behaviour.<sup>3</sup>
- Acts as a buffer during fighting.<sup>26</sup>
- Holds the pigs' interest.<sup>27</sup>

#### Disadvantages

- Must be renewed regularly, which takes a lot of time (123 min./animal/year).<sup>21</sup>
- Cost of using straw is high.
- May harbour disease causing agents, e.g. mycotoxin molds<sup>28</sup> and salmonella.<sup>21</sup>
- Cannot be used on slatted floors.<sup>29</sup>

### Sawdust

#### General information and recommendations

- Must not come from chemically treated wood.<sup>1</sup>
- Must be kept clean and dry.<sup>1</sup>
- Storage facilities should be included in the layout.



#### Advantages

- Encourages the pigs' exploration and rooting behaviour.
- Plays a role in pigs' physical comfort and thermal regulation.
- Can act as a buffer during fighting.

#### Disadvantages

- Must be renewed regularly (adds to employee workload).
- Cost of using sawdust is high.
- Takes more work.
- Cannot be used on slatted floors.

### Others

#### General information and recommendations

- Other possible bedding: mushroom compost, peat, forage (dried plant material), silage.
- Must be kept clean and dry.<sup>1</sup>
- Storage facilities should be included in the layout.

#### Advantages

- Pigs find these materials more attractive than straw.<sup>25</sup>
- Pigs really like corn silage because it is edible and much more varied than other materials.<sup>30</sup>
- Encourages the pigs' exploration and rooting behaviour.
- Plays a role in pigs' physical comfort and thermal regulation .
- Can act as a buffer during fighting

#### Disadvantages

- Must be renewed regularly (adds to employee workload)
- Significant cost associated with its use
- Not to be used on slatted floors



# Enriching the living space of pigs to comply with the Code

## Feedstuffs

### Straw in a dispenser or rack

#### General information and recommendations

- The straw dispenser or rack must be positioned so that it:
  - Maximises access by the pigs to the straw<sup>31</sup>;
  - Facilitates regular filling from the main walkway.<sup>31</sup>
- The bottom rung of the dispenser should be positioned 1 metre (approx. 40 inches) above the floor.<sup>31</sup>
- The dispenser itself should be about 40 cm deep (a little over 15 inches).<sup>31</sup>
- There should be about 4 cm (1 ½ inches) of space between the bars of the dispenser).<sup>31</sup>
- The dispenser can be installed on a slatted floor provided a metal plate is put below it to collect any straw that falls.<sup>3</sup>
- Possible location of the dispenser<sup>31</sup>:
  - Lying area with a solid floor
  - Above the liquid feed troughs. This reduces straw wastage.
- It should be easy to remove the straw from the dispenser.<sup>31</sup>



Photo: Valérie Courboulay

#### Advantages

- On a scale of 1 to 10, straw offered in a dispenser is rated 6 for animal well-being.<sup>21</sup>
- The straw can be added to the feed ration if the feeding system allows this.<sup>20</sup>
- Encourages the pigs' rooting and exploration behaviour.
- Holds the pigs' interest.<sup>29</sup>

#### Disadvantage

- The dispenser must be filled regularly, which takes a lot of work time (10 min./animal/year).<sup>21</sup>

### Sugar Beet Pulp

#### General information and recommendations

- Must add 0.5 kg of beet pulp daily to each pen to hold the pigs' interest.<sup>27</sup>
- Available in pellet form.<sup>32</sup>

#### Advantages

- Can be made available in a feed bin.<sup>27</sup>
- Suitable for slatted floors.<sup>27</sup>
- Allows pigs to root around as well as being edible.<sup>27</sup>
- Provides nutrition.<sup>33</sup>
- Transport and storage is easy.<sup>32</sup>
- Readily available in Quebec province.<sup>34</sup>
- Contributes positively to<sup>32</sup>:
  - Improvement in gut health
  - Fertility and high reproductive rates in sows
  - Animal handling (animals are less nervous).

#### Disadvantages

- Potential source of butyric acid bacteria (BAB) spores if it is badly stored.<sup>35</sup>
- Significant cost associated with its use.
- An expensive material (\$1 to \$2/pig/year).

### Others

#### General information and recommendations

- Other feedstuff arouses the pigs' interest, such as:
  - Coconuts cut in two.<sup>14</sup>
  - Carrots suspended by a string.<sup>14</sup>
  - Rutabagas in a box.<sup>14</sup>
  - Cabbages left on the floor.<sup>14</sup>
  - Silage.



#### Advantages

- Provide nutrition.
- Suitable for slatted floors.
- Encourage exploration behaviour in pigs, in addition to being edible.

#### Disadvantages

- Because these items are edible, they have to be renewed on a regular basis.
- Significant cost associated with their use.
- Expensive.
- Supply is difficult for some producers.

# Enriching the living space of pigs to comply with the Code

## Materials and simple objects

### Wood

#### General information and recommendations

Materials and objects that can be used:

- Simple wooden stake placed in a corner of the pen
- Block of wood suspended from a chain or attached to the floor
  - The animals generally manipulate the block of wood more often when it is suspended.<sup>19</sup>
  - If the chain and the block of wood are available to the pig, the two items are considered as a single complex item.
- A hook or a U-shaped plastic tube can be mounted on the wall in order to attach a log vertically.<sup>3</sup>
- The wood can be put into a holding device, but in this case, these criteria must be respected<sup>31</sup>:
  - Minimum diameter of the wood should be 10 cm (about 4 inches)
  - Devices must be installed in order to have 3 pieces of wood in the same pen
  - There should be a minimum of 25 cm (about 10 inches) between the floor and the piece of wood
  - Distance between two holding devices should be 40 cm (about 16 inches)
- The size of the blocks of wood should be proportional to the size of the pigs.<sup>31</sup>
- The use of softwood is recommended because hardwoods are difficult to chew.<sup>3</sup>
- Sawdust can be put in a box.<sup>14</sup>



Source: ref. 20



Source: ref. 36

#### Advantages

- Does not need much time for installation and management (about 2 min./animal/year).<sup>21</sup>
- Suitable for slatted floors.

#### Disadvantages

- On a scale of 1 to 10, wood is rated 3 for animal well-being.<sup>21</sup>
- If the wood is mobile and dirty, the pigs are less interested and so the object becomes ineffective.<sup>12</sup>

### Chain

#### General information and recommendations

- The chain will be used more if it is positioned close to the floor rather than at groin height.<sup>12</sup>
- The size of the chain should be adapted to the size of the animal.



Photo: Valérie Courboulay

#### Advantages

- Sturdy and easy to use in livestock farming.<sup>12</sup>
- Requires less than one minute per animal per year for installation and management.<sup>21</sup>
- Suitable for slatted floors.



Source: ref. 5

#### Disadvantages

- On a scale of 1 to 10, chain is rated 2 for animal well-being.<sup>21</sup>
- An object that quickly loses its novelty aspect.<sup>37</sup>
- Not recommended for long-term use unless used in conjunction with other materials (complex object) or replaced weekly.<sup>37</sup>
- Unsuitable object for investigation activities.<sup>12</sup>

### Plastic Ball

#### General information and recommendations

- Can be suspended in the pen or left on the floor.
- To prevent the ball from becoming dirty, it can be put in a box on the floor.<sup>14</sup>
- The size of the ball should be adapted to the size of the animal.

#### Advantages

- Requires less than one minute per animal per year for installation and management.<sup>21</sup>
- Suitable for slatted floors.



Photo: Valérie Courboulay

#### Disadvantages<sup>21</sup>

- On a scale of 1 to 10, the plastic ball is rated 2 for animal well-being.
- If left on the ground, the ball becomes dirty and therefore less interesting.
- Should be replaced if soiled by excreta/manure or damaged.

# Enriching the living space of pigs to comply with the Code Materials and Simple Objects

## Rope

### General information and recommendations

- Use of a sisal rope (natural fibre) is suggested.<sup>38</sup>
- Appears to hold the pigs' interest when<sup>38</sup> :
  - A sisal rope about 1 m (40 in) long is used
  - The diameter of the rope is about 14 mm (approx. 1/2 inch)
  - About 20 cm (approx. 8 inches) of rope touches the floor
- Knots can be made in the rope so that the pigs would have more trouble breaking it.<sup>5</sup>



Source ref. 5

### Advantages

- Estimated time needed to install and manage the enrichment object is 8 minutes per animal per year.<sup>21</sup>
- Can be chewed by the pigs.
- Suitable for slatted floors.

### Disadvantages

- On a scale of 1 to 10, rope is rated 3 for animal well-being.<sup>21</sup>
- Has to be replaced when too damaged or soiled by excreta/manure.

## Brush

### General information and recommendations

- The end of a stiff broom can be used and attached to the wall or at the pigs' head level.<sup>20</sup>
- The type of brush used should not cause injury to the animal.



### Advantage

- Gives pigs a place for scratching and amuses them for a while.

### Disadvantage

- May need replacement if broken.

## Others

### General information and recommendations

- Certain things can be reused as enrichment objects, such as:
  - A hose (PVC garden hose or flexible non-metallic conduit)
  - An empty plastic container
  - An empty plastic bucket (5 gallons)
  - A feed delivery chain with plastic pellets every 7 cm (approx. 3 inches)
  - Plastic flooring from nursery or farrowing unit .
- Objects may be suspended in the pen, put in a box or left on the floor.<sup>14</sup>
- Objects should not cause any injury to the pigs.

### Advantages

- Inexpensive.
- Enables the reuse of materials and objects.

### Disadvantages

- Objects rapidly lose their appeal when soiled with excreta/manure
- Should be changed on a regular basis so as to maintain the pigs' interest.

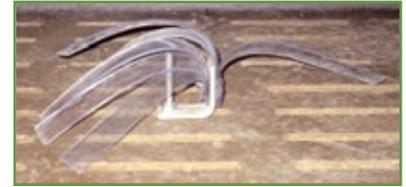
# Enriching the living space of pigs to comply with the Code

## Complex Objects

### Plastic strips secured to the floor by means of a metal structure

#### General information and recommendations

- Allow for an area of 1.5 m<sup>2</sup> around the object to give maximum access to the enrichment object.<sup>5</sup>
- Choose sturdy materials to optimize durability of the object.



Source: ref. 5

#### Advantages

- Holds the pigs' interest.<sup>5</sup>
- Easy to use in barns with slatted floors.

#### Disadvantages

- Not very sturdy and strips break easily.<sup>5</sup>
- Strips have to be replaced when damaged

### Chains inserted in a garden hose

#### General information and recommendation

- Uses three pieces of plastic garden hose inside which are chains to fix the hose to the floor.<sup>39</sup>



Source: ref. 5

#### Advantages

- Holds the pigs interest.<sup>29</sup>
- The chain inside the hose makes for a new object when the plastic hoses are worn out.<sup>29</sup>
- Easy to use in barns with slatted floors

#### Disadvantage

- Damaged plastic hoses have to be replaced

### Objects on Rocking Devices

#### General information and recommendations<sup>40</sup>

- These objects can be attached to the end of a rocking device: KONG-type dog toys, PVC garden hose, and any other material or object.
- The rocking device can be installed between two pens.
- It is a good idea to install a rocking device that is accessible to several pigs at once.
- Make sure the rocking device is installed so that it is safe and does not injure the animals in any way.
- Make sure the object at the end of the rocking device is attached tightly so it does not lose its appeal.



Source: ref. 40



#### Advantages

- Possible to reuse certain materials from around the farm.
- Objects stay clean.<sup>40</sup>
- Holds pigs' interest.<sup>40</sup>
- Easy to use in barns with slatted floors.

#### Disadvantage<sup>40</sup>

- Toys hung from the end of rocking devices break and have to be replaced; this adds to employee workload.

# Enriching the living space of pigs to comply with the Code

## Commercial Equipment

### Foraging Tower

#### General information and recommendations

- For use with organic material such as straw or hay.<sup>41</sup>
- The tower can be set up either as a freestanding device or built into the pen wall.<sup>41</sup>
- Manufacturer: Big Dutchman.
- Distributor: Distribution Jean Blanchard inc.

Photo: Big Dutchman



#### Advantages

- The pigs can access small amounts of organic material at any time.<sup>42</sup>
- The opening between the bottom of the container and the plastic base is adjustable.<sup>41</sup>
- Tower can be used for finisher pigs in the same way as for group-housed sows.<sup>42</sup>

#### Disadvantage

- Tower has to be filled with organic material on a regular basis, which requires workers.

### Rooting Cone

#### General information and recommendations

- The size of the rooting cone is adapted to the size of the pigs<sup>43</sup> :
  - 60 mm in diameter for piglets
  - 80 mm in diameter for finisher pigs
- The size of the balls was chosen so that the pigs are able to put the ball in their mouth without destroying it.<sup>44</sup>
- Fasten the rooting cone so that the pigs do not find themselves trapped in a corner of the pen.<sup>43</sup>
- Estimated life of the object is two years.<sup>44</sup>
- Must be installed in the center of the pen to prevent attacks so as to obtain access to the object.<sup>44</sup>
- 21 to 25 pigs/Rooting Cone.<sup>44</sup>
- Manufacturer: Weda.
- Canadian distributor: Glass-Pac in Ontario.

Photo: Weda



#### Advantages

- Made of flexible, long-lasting material, that is safe for animals.<sup>43</sup>
- Manipulable when the pig is standing, sitting or lying down.<sup>43</sup>
- Allows the animals to express their natural behaviours.<sup>43</sup>
- Manipulated more than the other objects.<sup>43</sup>
- Suitable for slatted floors.
- Keeps the pigs interested, even after a few months.<sup>44</sup>

#### Disadvantages<sup>45</sup>

- The polyurethane balls can be damaged by the pigs.
- Certain parts of the rooting cone have to be changed when damaged; this adds to employee workload.

### Bite-Rite™

#### General information and recommendations

- 20 to 25 pigs/Bite-Rite™.<sup>46</sup>
- Uses S-shaped chew sticks: this makes them more elastic and consequently, more attractive to pigs.<sup>47</sup>
- Chew sticks are replaceable when they are badly damaged.<sup>47</sup>
- Two versions of Bite-Rite™: blue for piglets and red for finisher pigs and sows.<sup>47</sup>
- Manufacturer: Ikadan.
- No Canadian distributor / US distributor: Ikadan System USA Inc.

Source: ref. 5



#### Advantages

- Easy to install using a chain.<sup>48</sup>
- Does not take up floor space.<sup>48</sup>
- Manipulable by several pigs at the same time.
- Easy to chew.
- Suspended object, so it stays cleaner longer.
- Easy to adjust according to the pigs' age.
- Suitable for slatted floors.

#### Disadvantages

- Can quickly lose its appeal
- Sticks have to be changed when they are damaged

## Enriching the living space of pigs to comply with the Code

**A**ll told, there are several options available for producers to enrich the environment of pigs. Some options are more expensive than others. However, environmental enrichment can be done at a lower cost by reusing materials or objects already available on the farm. Even so, it is important to hold pigs' interest, and this means changing the materials and the enrichment items on a regular basis. Since this practice could have beneficial effects on animal performances, farmers may see advantages to adopting it.



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### **Production:**

Marie-Aude Ricard, Engineer  
Sabrina Fournel

### **Collaboration:**

Sébastien Turcotte, Agronomist

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