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Goals and Benefits of Enrichment

There are many proven benefits of providing enrichment in swine barns. By providing an outlet for expression of exploration and foraging behaviour, aggression, competition and stress are decreased, allowing for healthier and happier pigs. Other goals and benefits of enrichment are:

- To increase the range and number of normal behaviours
- To reduce severity or frequency of abnormal and damaging behaviours
 - This includes tail and ear-biting, belly nosing, sham chewing and fighting
- To increase positive use of the environment and space
- To increase the animal's ability to cope with physiological and behavioural challenges
- Gut health in weaning pigs is improved when straw and fibre are provided through increasing saliva production and maturing the intestine
- Weaned pigs have less lesions when enrichment is provided
- Sows are more fit at farrowing and less laid on pigs are noted with shorter birthing intervals
- To decrease the amount of still born piglets
- Lowers food conversion ratio and increases daily weight gain.
- To reduce stress, fear response and diarrhea in weaning pigs
- Increases oxytocin levels when provided before farrowing which allows for faster bonding and better birthing.
- Improves producers bottom line due to a decrease in injuries
- When bedding is provided, lameness and gastric ulcers are lessened



Enrichment Categories

The following are enrichment categories from the Code of Practice for the Care and Handling of Pigs.

Social enrichment:

Indirect (olfactory, visual, auditory) or direct contact with other pigs

Physical enrichment:

Altering enclosures or adding accessories like objects, substrates or permanent structures (nest boxes)

Occupational enrichment:

enrichment that encourages exercise and psychological enrichment that provides animals with control or challenges (devices)

Nutritional enrichment:

Presenting novel or varied food types or changing the method of food delivery

Sensory enrichment:

Auditory, olfactory, visual, tactile and taste stimuli

Simple Criteria for Choosing Enrichment: The Six S's

When choosing enrichment for your swine barn there are six key factors to consider. Enrichment items should be safe, sanitary, simple, soft and suspended, with the site chosen also being an important aspect. Further specifics are provided here:

Safe

- Not poisonous or toxic or preserved wood
- No sharp edges
- No tires
- No staples or fixings in wood
- No toxic materials
- Not able to trap limbs or body parts
- Fragments of broken down object do not pose safety risk
- Not able to be used to damage the pen or injure pen-mates

Sanitary

- No fouled materials
- Can be easily cleaned or sterilized

Simple

- If too complex can lead to vice due to frustration
- A number of simple items is better than one complex item and allows access to more pigs

Soft

- Should be malleable to promote novelty – pigs enjoy objects that they can gradually destroy

Site

- Do not place over lying, feeding or drinking areas
- Dunging areas or open areas are the optimal position
- Maintain novelty by switching sites

Suspended

- Extends the novelty factor
- Avoids fouling
- More pigs can gain access if the item is suspended in a central location



Recommended Practices

Code of Practice Requirement for Enrichment: "Pigs must be provided with multiple forms of enrichment that aim to improve the welfare of the animals through the enhancement of their physical and social environments." (NFACC, 2014)

When providing enrichment in your barn, these practices should be taken into consideration in order to see the most benefits. This extra information is tied to the Simple Criteria for Choosing Enrichment.

- Access to a range of novel suspended toys (cloth strips, rubber, and straw dispensers) should be provided continually and the pen floor should have free toys
- Physical enrichment like straw, sawdust, hay, wood, peat, mushroom compost, or a mixture of such should be provided if it can be used safely and does not negatively affect the animals' health
- Rotate enrichments so that a novelty factor remains and benefits are seen
- Replacing rope with new rope maintains interest if rotating toys is not an option
- Pigs often lose interest in soiled objects so hanging enrichments are more effective
- Effective enrichment includes: An object that is chewable, complex, malleable, ingestible and destructible while encouraging foraging and exploratory behaviour
- Items should not be placed in sleeping, eating, drinking and elimination areas. Do not place in corners either. They should be placed in an area many pigs will have access to.
- Distribute multiple enrichments throughout a pen to ensure access is available and to mitigate aggression due to social status (depending on group size)
- Adjust object size to the size of the pigs so that it can fit in their mouth
- Rotate objects every 2 days between at least 3 objects
- "All enrichment objects need to meet requirements in the National Swine Farm-Level Biosecurity Standard and the section on Biosecurity in CQA® for Canadian Hog Producers." (NFACC, 2014)
- Monitor enrichment objects to ensure they don't cause health problems (e.g. strangulation, choking, poisoning, obstruction of the digestive tract, transmission of pathogens) or compromise food safety
- Do not use old tires/boots even though they are cheap and available since treated rubber can cause health problems in pigs
- Objects should be hung no higher than snout level



Enrichment for Each Phase of Production

Did you know...
The amount of still born piglets can be reduced by providing burlap to sows in gestation crates

As pigs grow and age they show different preferences when it comes to enrichment. For example, sows prefer consumable materials such as straw or fibre while piglets prefer malleable materials such as rope. More information is provided on the enrichment preferences for each phase of production. The overall preferences are listed from most preferred to least preferred.

Nursery

- Rope is the preferred object but it has to be replaced often
- Suspended objects are better than floor objects
- Rope and burlap are preferred in strings versus knotted, though knotted versions last longer
- PorkyPlay is preferred over BiteRite when choosing commercial toys

Overall preference: straw, wood shavings, wood bark, newspaper pieces, rope, burlap, rubber hose, commercial toys, rubber mat, chain

Grow/Finish

- Straw is best, especially when provided in deep bed systems
- Other types of bedding are also great for enrichment
- Racks with enrichment such as straw, mushroom compost or silage work in slatted floor systems, but they need to be accessible to not increase aggression
- Simple objects like chains, balls and commercial toys should have supplemental enrichment that involves destructible or rooting materials

Overall preference: straw, bedding, fresh soft wood (birch wood is best), food enrichment (beet, grass, turnip), straw or mushroom compost in racks, rope, shredded paper, rubber, soft plastic, hard wood, chain, pvc pipe, balls



Sows

- Prefer feedstuff and destructible objects
- Bedding such as straw is the ideal enrichment
- Racks with enrichment such as straw, mushroom compost or silage work in slatted floor systems, but they need to be accessible to not increase aggression
- Simple objects like chains, balls and commercial toys should have supplemental enrichment that involves destructible or rooting materials
- Usually prefer rope to wood or a chain but this may vary between farms

Overall preference: Straw bedding, straw in rack, EasyFix Astro, hanging rope, BiteRite, Tri-Star Standard Toy, hanging wood, smaller balls, chain, PorkyPlay, cow calf ball

How to Assess Effectiveness




How effective the enrichments are in a barn can be measured through various parameters. These include the number of interactions, length of interactions or contact with the object, time spent near the enrichment, an increase in sow activity and pen utilization, as well as a reduction of aggressive, stereotypic or undesirable behaviours. Often these measures are taken before and after the enrichments have been implemented into the pens to see how much of a difference has been made. When the objects are rotated throughout the pens, all of these measures see an increase. Pigs interact most with the object on the first day it is available, with contact decreasing shortly after, depending on which object is being used. For each piglet that contacts the object, the amount of times they interact with it over an hour ranges from 5 to 20 times; rope being the most interacted with while PVC pipes were the least interacted with for piglets. When enrichment objects are rotated three times a week, many more sows are within less than a meter of the enrichment compared to when it is not rotated showing that novelty is very important to keeping enrichment effective.











Economics of Enrichment for Different Phases






Enrichment objects can be implemented on swine barns for a low cost considering the many benefits they provide. Objects found around the barn may be useful, such as untreated wood, chains, rope and burlap. Depending on the enrichment used, objects and durability will vary. Suspended enrichments are the most common form in slatted floor systems as they do not get as dirty and are more effective for the pigs. These use a chain and mounting hardware that costs about \$40 per enrichment. Attachments can be added to the chain to increase effectiveness and to add novelty. In a year, a chain with a cotton rope attached is around \$0.65 per pig. Costs of the objects themselves are often low. For example, burlap is around \$1.04 per pen and rope is around \$1.90 per pen. Since these objects are often manipulated by the pigs, they may need to be replaced every 3-20 days, costing about \$5 per pen over six weeks. When burlap is placed in pre-farrowing, the number of still born pigs is reduced to the extent that every \$1 spent on the burlap provides \$3 return through piglet value, so it is well worth the initial investment. The upkeep and labour needed to maintain enrichment is most of the cost, so more durable objects may be used as well. Often more durable items are more expensive up front but they can last three months or more, as is seen with commercial toys. Another benefit of enrichment is the decrease in health costs. This is due to a decrease in aggression between pigs, as well as a decrease in stress that in turn boosts the immune system. Buyers are also willing to spend premium amounts on meat that was raised ethically. In Denmark, these protocols to raise pig's increases production costs by 7.9% or €0.11/kg, though the return is €0.17/kg back. Programs available in Canada include Certified Humane, Certified Organic, Global Animal Partnership and Animal Welfare Approved. With buyers looking for more ethically raised pork and enrichment improving the welfare of pigs, it is in everyone's best interest to implement enrichments in pig barns.



Different Types of Enrichment




Bedding					
Types of Enrichment	Information	Advantages	Disadvantages	Phase of Production	Photo
Straw	<ul style="list-style-type: none"> Keep dry and clean Areas without straw are needed to help pigs cool down Should be properly stored on site 100 g of straw for each pig a day is sufficient 	<ul style="list-style-type: none"> Rated 7 out of 10 for animal well-being Reduces culling due to lameness by reducing balance difficulties Improves physical comfort, nutrition and thermal behaviour Encourages natural rooting and exploration behaviours Maintains the pigs' interest Allows nest-building behaviour of sows Is a buffer during fighting 	<ul style="list-style-type: none"> Cannot implement on slatted floors Increases labour through renewing regularly (123 min./animal/year) Straw cost can be high Can be a biosecurity risk due to the possibility of harbouring disease causing agents such as salmonella and mycotoxin moulds 	<ul style="list-style-type: none"> Sows Ideal for any age of pig 	 <p>https://www.pig333.com/articles/enrichment-material-to-prevent-tail-biting_10829/</p>
Sawdust	<ul style="list-style-type: none"> Cannot be from wood that has been chemically treated Should be stored on site Keep dry and clean 	<ul style="list-style-type: none"> Can be a buffer during fighting Encourages natural rooting and exploring behaviours Improves pigs' thermal regulation and comfort 	<ul style="list-style-type: none"> Not usable on slatted floors Increases labour due to renewing regularly Cost can be high 	<ul style="list-style-type: none"> Sows Ideal for any age of pig 	 <p>https://www.fosterbros.com/animal-bedding-and-arena-flooring.html</p>
Other	<ul style="list-style-type: none"> Other bedding includes peat, silage, mushroom compost and forage (dried plant material) Should store on site Keep dry and clean 	<ul style="list-style-type: none"> Can be more attractive than straw Encourages natural rooting and exploring behaviours Edible which increases its appeal, especially corn silage Improves thermal regulation and physical comfort Can be a buffer during fighting 	<ul style="list-style-type: none"> Has a significant cost Cannot be used in a slatted floor system Labour increases due to regularly renewing it 	<ul style="list-style-type: none"> Sows Ideal for any age of pig 	 <p>https://www.fwi.co.uk/livestock/livestock-feed-nutrition/feeding-pigs-silage-offers-sustainability-gains</p>

Complex Objects					
Types of Enrichment	Information	Advantages	Disadvantages	Phase of Production	Photo
Garden Hose with Chain Inserted	<ul style="list-style-type: none"> Chains are inside of plastic garden hose and fixed to the floor 	<ul style="list-style-type: none"> When the hose is worn out, the chain is a new object to explore Holds the interest of the pigs Easy to use in slatted floor systems 	<ul style="list-style-type: none"> Must replace damaged hoses 	<ul style="list-style-type: none"> Grow/finish pigs and sows 	 <p>https://www.homedepot.com/p/Swan-5-8-in-Dia-x-6-ft-Leader-Water-Hose-CLOLH-5806FM/202305259</p>
Rocking Devices with Objects	<ul style="list-style-type: none"> KONG-type dog toys, PVC garden hoses or any other objects can be attached to the end of the rocking device Should be installed so several pigs can access it at once Can be installed between two pens Should be installed so that it is safe for animal use Ensure object attached to the end of the rocking device is secured tightly so that appeal is maintained 	<ul style="list-style-type: none"> Can reuse some materials from the farm Maintains pig interest Objects stay clean Can be used in a slatted floor system 	<ul style="list-style-type: none"> Toys hanging from the device can break and may need to be replaced which increases labour 	<ul style="list-style-type: none"> Grow/finish pigs and sows 	 <p>https://www.bigdutchmanusa.com/en/pig-production/products/accessories/enrichment/enrichment-toys/</p>

Simple Objects					
Types of Enrichment	Information	Advantages	Disadvantages	Phase of Production	Photo
Wood	<ul style="list-style-type: none"> Can be used as a wooden stake in the corner of a pen, block of wood suspended from a chain, sawdust in a box, attached vertically through a U-shaped plastic tube or hook mounted on the wall and can be put in a holding device Pigs prefer suspended objects When using a holding device, the woods diameter should be 10 cm or more, at least three should be in the same pen and distance between the holding devices should be 40 cm Softwood is preferable over hard wood Size of wood blocks should be proportional to the pigs 	<ul style="list-style-type: none"> Quick and easy to install Can be used in slatted floor systems 	<ul style="list-style-type: none"> Wood is only a 3/10 for animal well-being The object is ineffective when it is dirty and mobile 	<ul style="list-style-type: none"> Grow/finish pigs and sows 	
Chain	<ul style="list-style-type: none"> Chain size should be adapted to the animals size Usage is increased when positioned closer to the floor 	<ul style="list-style-type: none"> Easy and fast to implement Sturdy Can be used in slatted floor systems 	<ul style="list-style-type: none"> Chains are a 2/10 for animal well-being Loses novelty quickly Should be used with other materials or rotated weekly with other materials 	<ul style="list-style-type: none"> Grow/finish pigs and sows 	
Rope	<ul style="list-style-type: none"> A sisal rope (natural fibre) is recommended Should be 1 m long with a diameter of 14 mm (1/2 inch) with 20 cm touching the floor To increase its longevity, knots can be made 	<ul style="list-style-type: none"> Quick and easy to install Is chewable Can be used in slatted floor systems 	<ul style="list-style-type: none"> Is only a 3/10 for animal well-being Needs to be replaced when damaged or soiled 	<ul style="list-style-type: none"> Nursery pigs and sows 	
Brush	<ul style="list-style-type: none"> Can attach the end of a stiff broom to the wall or at the level of the pigs' head Injury to the animal should not be caused by the type of brush used Can also buy commercially 	<ul style="list-style-type: none"> Amuses pigs and allows them to scratch 	<ul style="list-style-type: none"> If broken it may need replacing 	<ul style="list-style-type: none"> Grow/finish pigs and sows 	 <p>https://www.msschippers.com/vink-pig-brush-M1909773.html</p>
Plastic Ball	<ul style="list-style-type: none"> Can be on the floor or suspended Size should be chosen based on the size of the pigs Can be placed in a box on the floor to prevent it from becoming dirty 	<ul style="list-style-type: none"> Easy to install and manage Can be used in a slatted floor system When hanging, maintains interest and is durable, often lasting over 3.5 months 	<ul style="list-style-type: none"> Only a 2/10 for animal well-being Becomes dirty easily so pigs are less interested Should be replaced if damaged or soiled Pigs are usually not interested in larger size balls; stay under 30 cm or so 	<ul style="list-style-type: none"> Nursery and grow/finish pigs 	 <p>https://groupsowhousing.com/wp-content/uploads/2017/08/Enrichment-presentation-IMB.pdf</p>
Others	<ul style="list-style-type: none"> Other simple enrichments may include a plastic container, a plastic 5 gallon bucket, a hose (flexible non-metallic conduit or PVC garden hose), plastic flooring from nursery or farrowing, feed delivery chain with plastic pellets every 7 cm Can be on the floor, put in a box or suspended in the pen Injury should not occur due to enrichment objects 	<ul style="list-style-type: none"> Can reuse objects and materials Inexpensive 	<ul style="list-style-type: none"> Appeal is lost when objects are soiled To maintain interest the objects should be changed regularly 	<ul style="list-style-type: none"> Grow/finish pigs and sows 	 <p>https://www.homehardware.ca/en/5-gallon-white-plastic-pail-with-metal-handle/p/4544603</p>

Commercial Toys and Equipment					
Types of Enrichment	Information	Advantages	Disadvantages	Phase of Production	Photo
Bite-Rite™	<ul style="list-style-type: none"> •20 to 25 pigs can use one Bite-Rite™ toy •Two versions: red for sows and finisher pigs and blue for piglets •Chew sticks can be replaced •Ikadan is the manufacturer •Chew sticks are S-shaped making them more attractive to pigs due to their elastic nature 	<ul style="list-style-type: none"> •Easy to install with chain •No floor space is taken up and it stays clean longer •Several pigs can use it at once •Can be used in a slatted floor system •Easy to chew •More durable than some non-commercial options 	<ul style="list-style-type: none"> •Can lose appeal quickly •Sticks become damaged and need to be replaced often (around 3 weeks the first time then every 2 days) •More expensive than non-commercial options 	•Sows and nursery pigs	 <p>http://www.ikadan.dk/Default.aspx?ID=1581</p>
Rooting Cone	<ul style="list-style-type: none"> •Can adapt the size to different pig sizes; 80 mm diameter for finisher pigs, 60 mm diameter for piglets •Pigs should be able to put the ball in their mouth without destroying it •Fasten it so it stays in an ideal location •Should be installed in the center of the pen to increase access to the object •Estimated to last for two years •21 to 25 pigs can use one Rooting Cone •Weda is the manufacturer 	<ul style="list-style-type: none"> •Safe material for animals and is long-lasting •Can be used by the pig when standing, lying down or sitting •Can be used in a slatted floor system •Helps animals express natural behaviours •Maintains pig interest •More durable than non-commercial options 	<ul style="list-style-type: none"> •The balls can be damaged by the pig and will need to be replaced •Increases labour to replace parts of the object •More expensive than non-commercial options •Not very effective for sows 	•Nursery and grow/finish pigs	 <p>https://www.weda.de/en/picture-gallery-house-equipment</p>
PorkyPlay	<ul style="list-style-type: none"> •Easy to install with chain •Ketchum is the manufacturer 	<ul style="list-style-type: none"> •Has an antibacterial function •Can come in various scents with odour maintaining interest •Can be used in a slatted floor system •More durable than non-commercial options 	<ul style="list-style-type: none"> •May need to be replaced if broken •More expensive than non-commercial options \$21.95 	•Nursery pigs	 <p>https://www.ketchummfg.com/porkyplay</p>
Tri-Star/ Standard Pig Toy	<ul style="list-style-type: none"> •Plastic disc that hangs and has replaceable chew sticks •Can purchase on Farmers Farmacy 	•Very durable disc portion	<ul style="list-style-type: none"> •Chew sticks can be removed by sows too easily so they are often not used •More expensive than some options (\$30) •Chew sticks could end up in the manure pit in slatted floor systems 	•Any phase of production	 <p>https://www.farmersfarmacy.com/gc/gc_item?F=D&K=634984&R=H%2FCatalog%3AInstrument%3APig%20Enrichment%20Toys&SN=031400111666249669417&FF=H&FK=Catalog:Instruments:Pig%20Enrichment%20Toys&Z9=0</p>
EasyFix Astro	<ul style="list-style-type: none"> •Occupies up to four pigs at once •Easy to install with chain •EasyFix is the manufacturer 	<ul style="list-style-type: none"> •Easy to install •Sows really enjoy it, maintains interest •Durable, lasts around 1.5 months before replacement is needed, though this may vary for each barn 	•More expensive than some other options (\$31)	•Finishing pigs and sows	

EasyFix Luna	<ul style="list-style-type: none"> •Is a floor level toy •Can occupy up to six pigs at once •EasyFix is the manufacturer 	<ul style="list-style-type: none"> •Mobile and rolls easily •Different sizes are available •Durable, lasts around 3 months 	<ul style="list-style-type: none"> •Not suspended so easier to get stuck and less pigs can interact with it •More expensive than other options (\$51) •Can get stuck in the door of ESF systems 	•Different sizes for each phase of production	
Rally Rooter Foraging Tower	<ul style="list-style-type: none"> •Used to dispense organic material like straw •Big Dutchman in the manufacturer •Can be built into the wall of the pen or freestanding •Opening size can be adjusted 	<ul style="list-style-type: none"> •Can be used in a slatted floor system •Allows access to organic material at any time •Allows for natural foraging behaviour •Adds fibre to the pigs diet 	<ul style="list-style-type: none"> •Has to be refilled regularly •Needs to be placed so that many pigs have access to avoid aggressive behaviours •May need multiple per pen depending on pen size 	•Sows and grow/finish pigs	 <p>https://www.bigdutchmanusa.com/en/pig-production/products/accessories/enrichment/rally-rooter/</p>

Feedstuff					
Type of Enrichment	Information	Advantages	Disadvantages	Phase of Production	Photo
Straw in Rack	<ul style="list-style-type: none"> •Place so that access by the pigs is maximized and refilling is possible from the main walkway •Dispenser should be around 40 cm deep •Dispenser's bottom rung should be 1 m above the floor •Space between dispenser bars should be around 4 cm •Can be used in a slatted floor system if a metal plate is underneath the dispenser to collect straw •Straw should be easy to remove from the dispenser •Place above liquid feed troughs to reduce straw wastage or in a lying area that has solid floor 	<ul style="list-style-type: none"> •Straw in a dispenser is a 6/10 for animal well-being •Encourages natural exploring and rooting behaviour •Can be added to the feed ration if the feeding system allows •Holds the interest of the pigs 	<ul style="list-style-type: none"> •Increases labour due to refilling the dispenser •If pigs do not have enough access to the dispenser, it can cause aggression 	•Sows and grow/finish pigs	 <p>https://www.domino.dk/en/products-for-porkers/straw</p>
Sugar Beet Pulp	<ul style="list-style-type: none"> •Is available in pellet form •To hold the pigs' interest, 0.5 kg of beet pulp should be added to each pen 	<ul style="list-style-type: none"> •Can use in feed bins •Edible and also allows rooting behaviour •Can be used on slatted floors •Easy storage and transport •Provides nutrition •Improves gut health, reproductive rates, fertility and animal handling 	<ul style="list-style-type: none"> •Has a significant cost (\$1 to \$2/pig/year) •Needs to be stored properly in order to ensure butyric acid bacteria (BAB) spores are not present 	•Sows and grow/finish pigs	 <p>https://www.feedstrategy.com/animal-feed-additives/six-unique-ingredients-to-lower-piglet-feed-cost/</p>
Other	<ul style="list-style-type: none"> •Other enriching feedstuff includes silage, cabbages on the floor, suspended carrots on a string, rutabagas in a box and coconuts cut in half 	<ul style="list-style-type: none"> •Can be used on slatted floors •Provides nutrition •Is edible and encourages exploration 	<ul style="list-style-type: none"> •Need to be constantly renewed •Has a significant cost •Supply may be difficult 	•Sows and grow/finish pigs	 <p>https://www.fwi.co.uk/livestock/silage-feed-advice-for-pig-farmers</p>

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