SECTION 5: NUTRITION & FEEDING MANAGEMENT

This section will help you understand how to feed your pigs and inform you about federal law around feeding pigs in Canada.

TAKE HOME MESSAGES:

1. **It is *illegal* to feed meat to pigs** under the Canadian Food Inspection Agency's (CFIAs) Health of Animals Regulations. This includes:
   - All pet food containing meat or meat by-products.
   - Food waste containing meat.
2. **It is *illegal* to feed international waste to pigs** (e.g., leftover garbage from ships and airplanes) under the Canadian Food Inspection Agency's (CFIAs) *Health of Animals Regulations*.
   - This waste can be contaminated with viruses like **African swine fever (ASF)** and **Foot and Mouth Disease (FMD)**.
3. **Do not feed kitchen wastes or food scraps to pigs.**
   - In the event wastes or scraps have trace amounts of virus, the outcome to animal health could be potentially devastating.
   - If a disease occurred, it could cause widespread outbreaks affecting many thousands of pig producers and even cause disruptions in the export of pork products.
4. **Viruses like ASF or FMD can cause serious implications including death of your pigs as well as cause a national emergency and disrupt trade.** These viruses can SURVIVE several months in fresh, frozen, cooked, artificially cooked, and processed pork products. **ANY PORK SCRAPS ARE SERIOUS RISKS.**

5.1 NUTRITION BASICS & REQUIREMENTS

There are a few definitions on feeding pigs to be familiar with:

WORD	DEFINITION
Ingredient	A component of a pig's diet. Just like flour is an ingredient in baking bread, feeds like barley, wheat, dried distillers' grains and canola meal are examples of ingredients in pig feed.
Nutrient	A micro molecule required for body functions and life, and that is derived from ingredients (e.g., proteins, minerals, vitamins).
Mineral	An element required for body functions and life. Mineral elements are further categorized as macro elements (e.g., Calcium, Phosphorous, Magnesium) and micro elements (e.g., Iron, Cobalt, Copper). Minerals exist in all feed ingredients. Minerals can be added to a pig's diet as a component of a supplement or a premix.
Vitamin	An organic compound needed for normal growth and body functions. Vitamins are required in very minute amounts. Vitamins can be found in feed ingredients; however, levels vary widely among ingredients and their bioactivity diminishes with time. Vitamin requirements are typically met by adding them to a pig's diet as a component of a supplement or a premix.
Supplement	A supplement is a manufactured feed that is enriched with proteins, minerals, vitamins, and other essential nutrients. It is combined and fed with other feed ingredients to provide a nutritionally balanced diet to pigs.
Premix	A mixture of specific micronutrients (e.g., micro minerals, vitamins) that are required in very minute quantities. The premix is then added as one of several components in the manufacture of a feed supplement. The premix is of such a volume that when included in a supplement, it ensures equal distribution of micronutrients throughout the feed supplement.
Complete Feed	A nutritionally balanced diet that has all the necessary nutrients (including carbohydrates, proteins, minerals and vitamins) in one diet. Feeding a complete feed to pigs is similar to feeding dog kibble at home (it is one simple diet that provides everything the animal's body requires).
Creep Feed	A highly digestible diet used to introduce solid feed to young piglets.
DDGs	Dried distillers' grains are the leftover grains from alcohol production. DDGs provide both energy and protein; however, when fed it MUST be supplemented as it is not a balanced diet on its own.
Ad libitum	Ad libitum (or ad lib) means feeding as much or as often as the animal desires.
Ergot	A fungus that grows on grains turning the grain black and can cause growth, health and reproductive issues in pigs.
Mycotoxins	A toxin produced by mould or fungus that can develop in crops and can cause growth, health and reproductive issues in pigs.
Deficiency	A lack of a necessary nutrient and can cause growth, health and reproductive issues in pigs. A nutrient deficiency compromises the pig's immune system, which can make the pig highly susceptible to diseases.
Toxicity	A moderate to serious health condition resulting from ingesting a toxic compound or an excessive amount of a nutrient (e.g., Copper, Molybdenum).
Swill Feeding	Process of feeding recycled food products to pigs. The Canadian Food Inspection Agency (CFIA) has strict regulations regarding the feeding of recycled food products to pigs.
Kitchen Waste	Leftover food or food products that are starting to spoil and/or have exceeded their posted expired dates.

1. WHAT DOES A PIG NEED?

*Pigs **can** eat many things, but that does NOT mean they **should**. Pigs need:*

- **Nutritionally balanced diet.** A diet that includes a combination of ingredients that satisfies the body's nutritional requirements to support body maintenance, growth, health and reproduction. Dietary nutrients are in balance with one another, but not in excess.
- **Do not feed a finishing ration to young piglets at weaning.**
  - A pig's digestive system changes and develops with age.
  - Nursing piglets should be gradually introduced to creep feed at day 10 of age.
  - Creep feed is a specially formulated, highly digestible feed that promotes stomach development in pre-weaned piglets and provides nutrients for growth.
  - Upon weaning onto creep feed and fresh water, the weanling should be gradually introduced to a combination of creep feed and a grower feed, and before long be solely consuming the grower feed and water.
  - The transition from a milk diet to milk and creep feed, then to a grower ration is critically important to the piglet's digestive system development, health and growth rate.
  - This transitional feeding period in piglets is similar to what people do with babies who start on a milk/formula diet, then onto baby foods before transitioning solely to whole foods.
- Fresh feed every day.

2. WHAT ARE EXAMPLES OF INGREDIENTS IN PIG DIETS?

Remember, ingredients are the components of the recipe. When you cook a casserole, you may not add the exact same ingredients every time, but you are creating a nutritious supper. This is the same with pig feed; not every diet will have the same ingredients, but the goal is to develop a nutritionally balanced ration.

Some examples of ingredients include:

- Grains such as wheat, barley, or corn
- Beans and by-products
- Animal by-products such as fishmeal
- Protein supplements
- Mineral and vitamin premixes
- Grain by-products from alcohol production (e.g., DDGs)

3. WHAT ARE EXAMPLES OF PIG DIETS?

EXAMPLE	COMMENTS	RECOMMENDATIONS
Complete Feed	A single, completely balanced ration (or diet) that includes all required nutrients. Compare this to feeding dog kibble to your dog – this is the same idea. One diet that is nutritionally balanced and is fed every day.	It is recommended to feed a complete feed.
Single Grain Diet	Some farmers choose a single grain like barley, or whatever is affordable in the area, as the bulk of their pig's diet.	If you feed a single grain you **MUST** add a **SUPPLEMENT** (e.g., proteins, vitamins, minerals) and possibly a **PREMIX** (e.g., micro minerals, vitamins) to ensure pigs are receiving a nutritionally balanced diet.
Homemade Diet	Some farmers choose to make their pig diets at home. Ingredients could include a mix of grains grown on farm combined with purchased supplements and premixes.	If you feed a home-made diet you **MUST** add a **SUPPLEMENT** (e.g., proteins, vitamins, minerals) and a **PREMIX** (e.g., micro minerals, vitamins) to ensure pigs are receiving a nutritionally balanced diet. It is ***illegal*** to feed meat scraps or international waste to pigs. It is ***ill-advised*** to feed recycled food products and/or kitchen waste to pigs due to the risk to animal health and introducing diseases. The Canadian Food Inspection Agency (CFIA) has **strict regulations** regarding the feeding of recycled food products to pigs, kitchen wastes, meat scraps and international waste.

Note 1: Commercial farms will have specific complete diets for set age groups and stages of production. Depending on your goals, you can consult a local feed nutritionist or maybe your veterinarian to set up rations for different ages of pigs (e.g., weanlings, grower-finisher, gestating sows, lactating sows).

Source: Canadian Food Inspection Agency (CFIA) – 3.19 Recycled Food Products, 2019[1]
For more details concerning CFIA regulations regarding the feeding of recycled food products to pigs, please visit their website.
https://www.inspection.gc.ca/animals/feeds/regulatory-guidance/rg-1/chapter-3/eng/1329319549692/1329439126197?chap=19

4. WHERE CAN I PURCHASE PIG FEED?

- Local farm supply stores
- Commercial feed mills
- Local feed mills
- Neighbours
- Grow your own
- Local Hutterite colonies

5. HOW MUCH DO I FEED MY PIG?

Every breed will have different requirements. It is important to research the specifics of your breed. Use the following recommendations as a general guideline:

ANIMAL	AMOUNT
Piglets <12 hours	MUST receive **colostrum** (the first milk) from their mother.
Piglets	Will nurse on sow throughout the day. Can introduce **creep feed** around day 10 or up to 2 weeks prior to weaning. **Approximately 20–50 grams/piglet/day.**
Growing Pigs	**Feed Ad Lib.** For a proper ration, consult a feed nutritionist. **They will consume approximately 4% of body weight/day.** E.g. 10 kg pig will eat 0.4 kg of feed/day 50 kg pig will eat 2.0 kg of feed/day 100 kg pig will eat 4.0 kg of feed/day
Finishing Pigs	**They will consume approximately 4% of body weight/day.** Compared to a grower ration, it is advisable to switch to a more economical finishing ration during this stage. For a proper ration, consult a feed nutritionist.
Gilts	**Feed Ad Lib until 6 months of age.** **Then control consumption to approximately 2–3% of body weight/day.** Do not want gilts getting too fat before breeding. Consider a specific diet for gilts. Consult a feed nutritionist.
Gestating Sows	The goal is to have sows at farrowing in good condition. Not too fat, not too thin. For a proper ration, consult a feed nutritionist. **Control consumption to approximately 1.5% of body weight/day.** E.g., 100 kg sow will need 1.5 kg of feed/day 200 kg sow will need 3.0 kg of feed/day 220 kg sow will need 3.3 kg of feed/day ***In general:*** If a sow is too fat: ↓ feed (only in the first 4–6 weeks of gestation) If a sow is too thin: ↑ feed If a sow is >100 days pregnant: ↑ feed If a sow is known to have large litters: ↑ feed
Lactating Sows	**Feed Ad Lib.** It is very important that lactating sows be fed a nutritionally balanced diet. They need a healthy diet and lots of food. Nursing requires a significant intake of nutrients to satisfy lactating needs. For a proper ration, consult a feed nutritionist. **They will consume approximately 2% of body weight/day + 0.5 kg per each piglet nursing on her.** E.g., 100 kg sow with 5 piglets will need 2.0 kg + [(0.5) x (5)] = 4.5 kg/day 200 kg sow with 5 piglets will need 4.0 kg + [(0.5) x (5)] = 6.5 kg/day 220 kg sow with 8 piglets will need 4.4 kg + [(0.5) x (8)] = 8.4 kg/day
Boars	Don't let full grown boars get too fat. They will lose their libido and may get too lazy to do their important job of breeding. **Control consumption to approximately 2% of body weight/day.** E.g., 200 kg boar will need 4.0 kg of feed/day 300 kg boar will need 6.0 kg of feed/day

Source: Adopted from Manual for Pig Rearing in Uganda, 2011[2]

6. HOW OFTEN DO I FEED MY PIG?

- This is your pig's favourite part of the day.
- Feed pigs EVERY day.
- For pigs being fed ad libitum:
  – Offer fresh feed daily that they can graze as they please.
- For pigs on restricted amounts:
  – Offer fresh feed ideally two to three times a day.
- Try to feed at the same time every day – pig stomachs are like alarm clocks.

Estimate of weekly feed, labour, water, and manure management requirements for different types of swine enterprises. *

ITEM	FARROW-TO-FINISH (FROM A FARM WITH 20 SOWS)	FARROW-TO-FEEDER (FROM A FARM WITH 20 SOWS)	FEEDER-TO-FINISH (WITH SPACE FOR 100 HOGS)
Feed (lb or kg/week)**	5800 (2630) ***	1200 (545)	4500 (2040)
Labour (hour/week)	16	11	5
Water (US gal or L/week)	2100 (7950)	700 (2650)	1400 (5300)
Manure output (cu.ft. or cu.m./week)	370 (10.5)	100 (2.8)	160 (4.3)
Manure output (US gal or L/week)	2000 (7570)	725 (2745)	1200 (4545)

* Includes all animals that would be associated with this type of operation (e.g., sows, weaners, growers, finishers, boars).

** Feed cost figure are not provided due to variability of ration feed ingredients and wide variability in pricing depending on local and national grain markets.

*** Imperial and metric equivalents provided for all units [e.g., lb (kg), US gal (L), cu.ft. (cu.m.)].

Source: PennState Extension. Agricultural Alternatives. Swine Production, 2016[3]

7. HOW DO I GIVE FEED TO MY PIG?

- Use a feed trough to deliver feed.
- Make sure you have enough space for all pigs to eat at the same time – bigger pigs will push smaller pigs out of the way. The size of the feeder should be relative to the number of pigs and should be easily accessible.
- Make sure feeders are bolted down to the ground.
- Set feeders up so that they minimize feed wastage and minimize contamination by feces and urine.
- Maintain clean feeders/troughs that are free of feces as well as wet, spoiling feed.

- Consider how feed will be refilled. For example: for a few pigs, a trough that can be refilled by hand over the side of the pen would work fine; for a larger herd that will go through feed rapidly, a larger scale hopper that could be topped off with the bucket of a tractor or skid steer could be considered.
- Other important considerations for feed troughs include being weather and pest proof. In an outdoor feeding system, consider some sort of tarp or cover for the feeder that can be easily removed for filling, but will keep out the elements and deter birds and rodents.
- Feed pigs every day with FRESH feed into a CLEAN feeder.
- You can feed pigs by hand daily or set up feeders to feed automatically.

Source: Adopted from Introduction to Small Scale Pig Production – Pork Nova Scotia, 2016[4]

8. WHO CAN HELP ME WITH FEEDING MY PIG?

- Livestock feed nutritionists from local country stores or feed mills.
- Possibly your veterinarian.

Don't be afraid to seek help when it comes to pig nutrition. A proper diet is KEY to raising well-grown, healthy pigs. If feeding is done correctly, it can prevent many problems.

5.2 FEED SAFETY

KEY POINT CHECKLIST

There are a few critical concepts you must be aware of when it comes to safe feeding practices for pigs.

1. Feeding Swill or Kitchen Wastes

- **It is *illegal* to feed meat to pigs.** This includes:
  - All pet foods containing meat or meat by-products.
  - Food waste containing meat.
- **It is *illegal* to feed international waste to pigs.** This includes:
  - Leftover garbage from ships or airplanes.
- It is ***ill-advised*** to feed recycled food products to pigs due to the risk to animal health and introducing diseases.
- The practice of feeding swill or kitchen wastes to pigs is ***ill-advised*** due to the risk to animal health and introducing various lethal diseases, some of which could cause immediate trade restrictions and suspension of pork exports from Canada.

2. High Risk Ingredients

Based on scientific research, the Canadian Pork Council (CPC) recognizes some ingredients are more high risk than others in terms of their ability for dangerous viruses to survive in the ingredient. **Be aware of the following and AVOID feeding:**

HIGH RISK FEED INGREDIENTS
Rice hulls and corn cobs, conventional soybean meal, organic soybean meal, soy oil cake, distillers dried grains, choline chloride, kitchen wastes, and plasma.

Source: Canadian Pork Council. What's Hitching a Ride In Your Feed?, 2020[5]

3. Sourcing Feed Safely

- Purchase feed from a feed mill or a farm store that has the complete feed milled at a location using a HACCP (hazard assessment program) or is registered with the Animal Nutrition Association of Canada FeedAssure® program.
- If you are planning to use whole grains that are purchased within the country or grown locally, consider collecting and submitting a grain sample for mycotoxin testing. Discuss the test results with a local feed nutritionist to ensure the grain is safe to feed your pigs.
- If you are purchasing grains, DDGs or other feed ingredients, ***do not import from outside of Canada***. Purchase locally or purchase a complete feed. Companies that legally import feed products from countries that are known positive for such diseases as African swine fever (ASF) must follow strict handling and feed quality assurance protocols before selling the feed to mills or farmers.
- Don't purchase or feed plasma, don't feed meat scraps, and avoid purchasing feed that you don't know where it comes from or how it was stored.

Source: Canadian Pork Council. What's Hitching a Ride in Your Feed?, 2020[5]

4. Feed Storage

DO:

- Fence off feed bins/feed storage.
  - Rodents, predators, insects, flies and other pests (including wild pigs) will be attracted to spilled feed.
  - Sweep up spilled feed.
- Store feed in a dry area that does not allow chemical, biological or water contamination.

Photo: Dr. Kelsey Gray

AVOID:

- Allowing birds, rodents, or predators to access your pig feed.
- Allowing spilled feed to lay around and attract pests and wild animals.
- Allowing feed to get wet and mouldy.
- Allowing feed to be stored next to chemicals that could contaminate the feed.

Photo: Dr. Kelsey Gray

5. Mycotoxins and Ergot

- Mycotoxins are toxins produced by fungi that can grow in grain crops.
  - Can cause problems in pigs ranging from feed refusal to serious illness. Examples include:
    i. Fumonisin → Liver and lung damage
    ii. Alfatoxins → Feed refusal
    iii. Zearalenone → Breeding problems
- Ergot is a fungal disease of cereal grains such as rye and wheat whereby the fungus replaces the affected grain with a long, hard, blackish body.
  - Ingestion of infected grains can cause a wide range of symptoms including severe gastrointestinal upset, convulsions, decreased milk production, abortions, vasculitis, gangrene, and death.


Photo: Malachy Young, Ph.D., P.Ag, Gowans Feed Consulting.

- Prevention:
  - Avoid high moisture when storing feed.
  - Don't feed mouldy feed.
  - Source feed from reputable suppliers.
  - Collect feed samples and submit for testing. Contact your local feed mill for instructions on feed sampling and submission.

- Management:
  - Watch for the sudden appearance of abnormal symptoms such as listlessness, decreased feed intake, isolation, pain, panting, and lack of general activity.
  - Immediately contact your veterinarian upon the first signs of abnormality in your pigs because it may be the onset of disease or potential mycotoxin ingestion.
  - If your feed has mycotoxins and you must feed it, consult a qualified feed nutritionist about safe feeding levels and products that can bind mycotoxins to make it safer to feed.

6. Poisonous Weeds

Redroot Pigweed
Photo: B.C. Government

- Redroot Pigweed *(Amaranthus retroflexus)*
  - Can lead to weakness, trembling, incoordination, dragging rear legs, and death.
  - Summer and early fall months.
- Cocklebur *(Xanthium spp.)*
  - Can lead to depression, nausea, weakness, incoordination, vomiting, and death.
  - Young two-leaf seedling stage or ground seeds are most dangerous.
  - For a description of this weed, its toxicity and photos, please refer to the following Colorado State University website https://csuvth.colostate.edu/poisonous_plants/Plants/Details/95
- Black Nightshade (*Solanum nigrum)*
  - Can lead to anorexia, constipation, depression, incoordination, and death.
  - Unpalatable so unlikely to be consumed unless pigs are unable to find other food.
  - Leaves and green berries are most dangerous.

Black Nightshade
Photo: B.C. Government

7. **Nutritional Diseases of Pigs**
   There are many different types of nutritional diseases that can be avoided by good management and feeding a nutritionally balanced ration. Here are some key diseases to be aware of:

DISEASE	WHAT DOES IT LOOK LIKE?	HOW TO DEAL WITH IT?
Iron Deficiency Anemia	Pale piglets, piglets failing to grow, death in suckling piglets.	200 mg of iron. Given as an injection (in the muscle) to EVERY piglet before 4 days of age.
Salt Toxicity/Water Deprivation	Can happen in hot days if pigs do not have access to water. Incoordination, walking into walls, and twitching.	Make sure pigs have access to fresh water 24/7. If your pigs were out of water and are showing signs of disease, call your vet IMMEDIATELY. Water must be reintroduced VERY SLOWLY if pigs have been deprived of water.
Mulberry Heart Disease (Vitamin E/ Selenium Deficiency)	Sudden death of young rapidly growing pigs.	Feed a nutritionally balanced ration with appropriate levels of Vitamin E and Se.
Calcium, Phosphorous, Vitamin D Imbalance	Lameness in pigs of all ages especially large rapidly growing pigs.	Feed a nutritionally balanced ration. Have feed tested. Treat pigs with anti-inflammatory for pain. Call your vet.
Mycotoxicosis	Many different signs. For more information, see subsection above titled 5. Mycotoxins and Ergot.	Feed diets free of mycotoxins. Have feed tested. Consult with your vet and feed nutritionist.

5.3 WATER

1. **Nutritional Value**
   - It is an ESSENTIAL component of the diet. Without water, there is no life.
   - A readily available source of quality water allows the pig to consume and thrive on a nutritionally balanced diet.

2. **Availability**
   - 24/7 access to FRESH water.
   - Pigs consume about 10% of their bodyweight in water per day.
   - Running water lines directly into the barns should be buried or properly insulated to avoid freezing in the winter.

3. **Source**
   - City or regional water systems or treated well water is preferred.
   - Pond water should be avoided – surface contaminants can cause health problems.
   - Can offer water in a trough or basin.

- Ensure source is bolted to ground so that pigs do not spill it and deprive their resource.

4. **Quality**
   - Periodically collect and submit a water sample for testing to ensure the pH, bacteria count, and mineral content are appropriate for livestock.
   - Quality Guidelines:

PARAMETER	GUIDELINE
E. coli	0
Coliform Bacteria	<1000 cfu/100 mL
Total Solids	<3000 mg/L
Salts	<1000 mg/L is ideal 1000–5000 mg/L may cause diarrhea

Bottom line: Water is important. Get it tested if you are seeing problems.

Source: PennState Extension. Agricultural Alternatives. Swine Production, 2016[3]

5.4 PASTURED PIGS

From the Introduction to Small Scale Pig Production – Nova Scotia, 2016[4]

"Pastured pigs will forage on available vegetation, but are very aggressive and can cause lasting damage to the plants in a pasture setting. If possible, sometimes rotating pigs to a new pasture will help protect the longevity of the pasture as well as reduce disease, parasite, and pathogen risks.

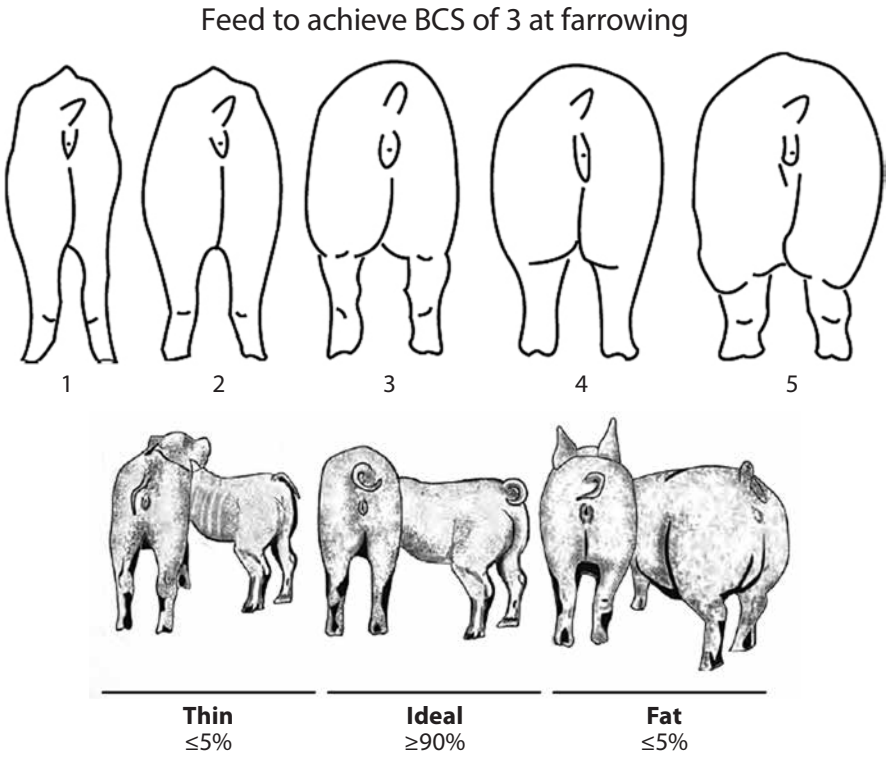
The longer pigs stay in one place, the more risk there is of creating a mud hole. While pigs do like to wallow in the mud to stay cool in the summertime, they do not like to be in a damp and cold environment all the time. Between rotating to fresh areas of pasture and providing sufficient bedding (especially within the sheltered areas), the damage to the pasture and to the pigs' health can be minimized.

Straw, hay, and shavings all make good bedding as long as it isn't mouldy or too dusty. Pigs will usually choose an area of their pen that is cooler or draftier to use as their 'bathroom' area, and generally won't contaminate their 'living' area unless they are overstocked, or the pen is too dirty."

5.5 BODY CONDITION SCORING

Body condition scoring is a management tool used to assess body or fat reserves of an animal. It is a great method to critically examine the nutritional state of your herd and determine if your animals are too thin, too fat, or just right.

1. Some diseases can result in animals losing body condition (i.e., fat reserves) or can prevent them from growing. These animals must be assessed by a veterinarian and treated.
2. Animals should NEVER be too thin as a result of not being fed enough. It is YOUR job to ensure your animals have access to enough feed that is part of a balanced diet EVERY day.
3. Overweight animals may experience mobility issues, farrowing as well as breeding issues.
4. Overweight of animals is a sign that the feed cost of production is excessive.



Source: Michigan State University, MSU Extension. Sow body condition influences productivity and profitability, 2011[6]
https://www.canr.msu.edu/news/sow_body_condition_influences_productivity_and_profitability

SECTION 5 REFERENCE LIST

1. Canadian Food Inspection Agency, Chapter 3 – Specific Registration Information by Feed Type, 3.19 Recycled Food Products (2019)
2. Manual for Pig Rearing in Uganda. Drs. Linda Nelson and John Carrs, Daktari Animal Health (2011)
3. PennState Extension. Agricultural Alternatives. Swine Production (2016)
4. Pork Nova Scotia. Introduction to Small Scale Pig Production (2016)
5. Canadian Pork Council. What's Hitching a Ride In Your Feed? (2020)
6. Michigan State University, MSU Extension. Sow body condition influences productivity and profitability (2011)