PennState Extension

UVM EXTENSION

Swine Reproduction Series:

Breeding Stock Care - Nutrition

Dr. Elizabeth Hines, Swine Specialist
Penn State Extension
eah405@psu.edu
Ph: 1-814-865-3267
Instagram: @psu_swience

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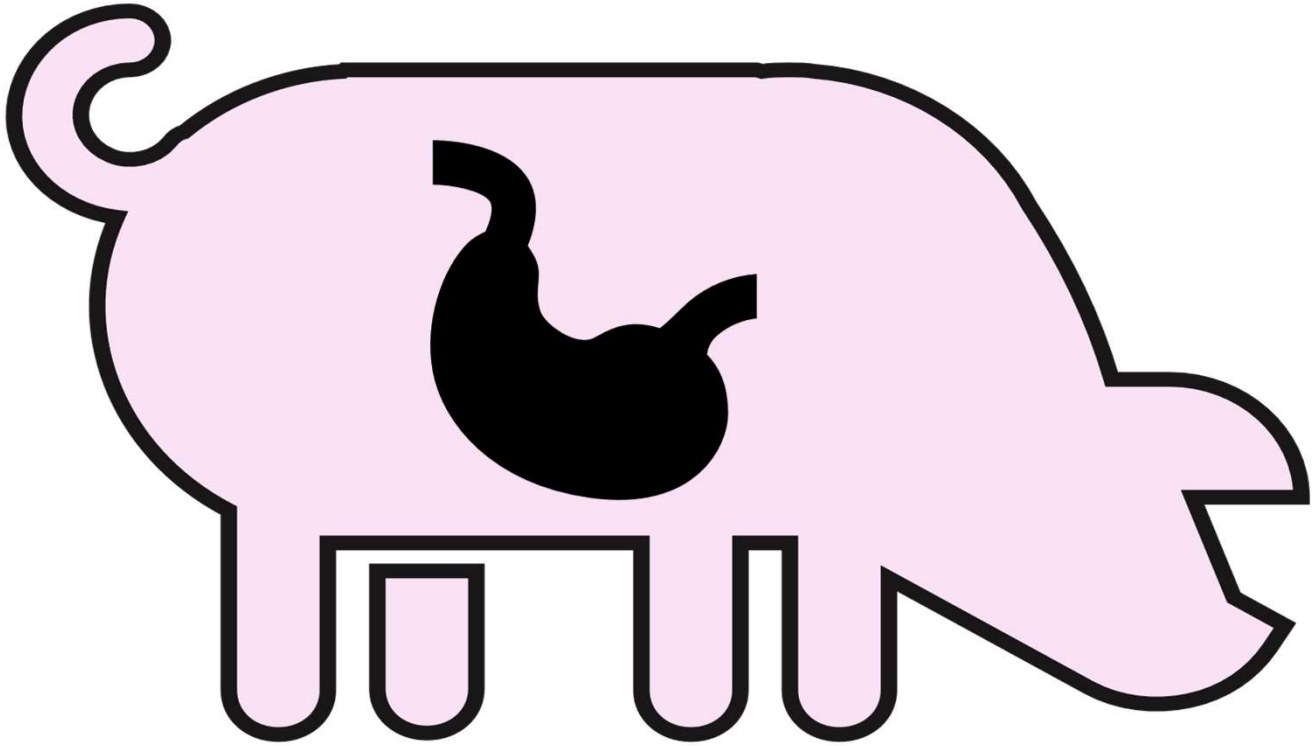
Monogastric

- Possess a single-chambered stomach.



Reduced capacity for cellulose digestion, as compared to ruminants.

Because pigs are monogastric…

- Grass does not provide enough energy or protein to pigs
  - Cattle have the rumen to predigest
  - Pigs need direct fed proteins and energy to directly fuel tissue growth
- Adjust diets by growth demands
  - Not all pig feeds should be the same for all stages of growth
    - Boar ≠ pregnant sow ≠ gilt ≠ barrow
    - Wean pig ≠ feeder pig ≠ finishing pig

What *does* a pig need to eat?

- Protein
  - Pigs produce tissue (meat, fat, baby pigs, milk)
  - All tissues are made of **protein!**
    - All proteins are made of Amino Acids– more on this later.
- Energy
  - It takes **energy** to build tissue and run the body
- Vitamins and Minerals
  - The nuts and bolts of the system – any lacking become the broken lugnut
- Fiber?
  - Limited usefulness in sows/boars

Water

- Water
  - Constant access
- Nipples or controlled dispensers
  - No pans/buckets/pails
  - Training tool
- Water quality related issues
  - Health issues
  - Reduced performance

Photo courtesy of the National Pork Board

Protein = Amino Acids

- The building blocks of protein!
- In growing pigs (peak muscle growth)
- **Lysine** is the first growth rate limiting amino acid.
  - Not enough lysine, slows down muscle growth
  - Ratio of other amino acids to Lysine should be considered in a diet – especially if using synthesized amino acids
- Reproductive stock: minimum Lysine still important
  - Late Gestation
  - Milk production
  - Boar maintenance

Protein

- Create amino acid balance with ingredients
  - Soybean meal
  - Cereal grains
  - Byproducts
    - Whey/Casein
    - Bakery
    - Poultry meal
    - Fish meal
- Synthetic amino acids

Energy and Fiber

- High energy for lactation – finishing pigs
- *Can* increase fiber (decrease energy) during gestation and in mature animals
  - *Limited capacity for fermentation*
  - *Limited stomach size*
  - *Pigs will eat to caloric needs OR gut fill, whichever happens first.*
    - Why we limit fiber- fills the gut but doesn't provide adequate nutrition for pigs in high demand metabolic states.

Carbohydrates and fats (Energy)

- Grind grains
  - Corn
  - Barley
- Vegetable oil
- Choice white grease (CWG)
- Byproducts
  - Bakery
    - Requires permitting to use in diets

Fiber

- Grass is good here!
  - Difficult to control how much consumed
  - Ok to offer free choice
  - Stay below 10% of diet – preferably 3-6%
- Straw
- High lignin hay
- Alfalfa, use with caution
  - Estrogenic content
- Be cautious of mycotoxins, molds, fungi!

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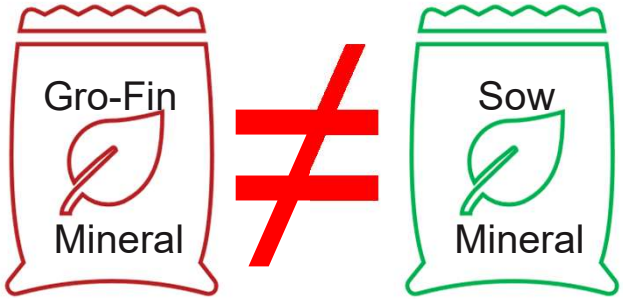
Vitamins and Minerals

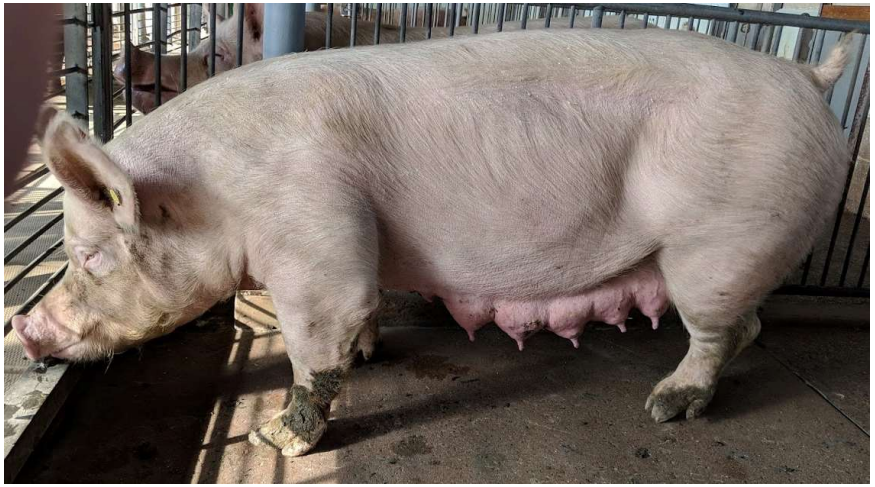
- Vitamin and Mineral demands depend on stage of growth/age and environment
  - Requirements are different for bacon makers and baby makers



- Best bet – get a premix or complete diet
  - Content of diet heavily influenced by diet ingredients
  - Optimize growth of tissues and bone, without wasting in manure

Feeding swine

- What do pigs need
  - Bacon makers (Pork)
    - Finishing pig (200 – 300 lbs.)
    - Grower pig (60 – 200 lbs.)
    - Nursery pig (10 – 60 lbs.)
  - Baby makers (Reproduction)
    - Mature sow/boar
    - Gestating sow
    - Pubertal gilt



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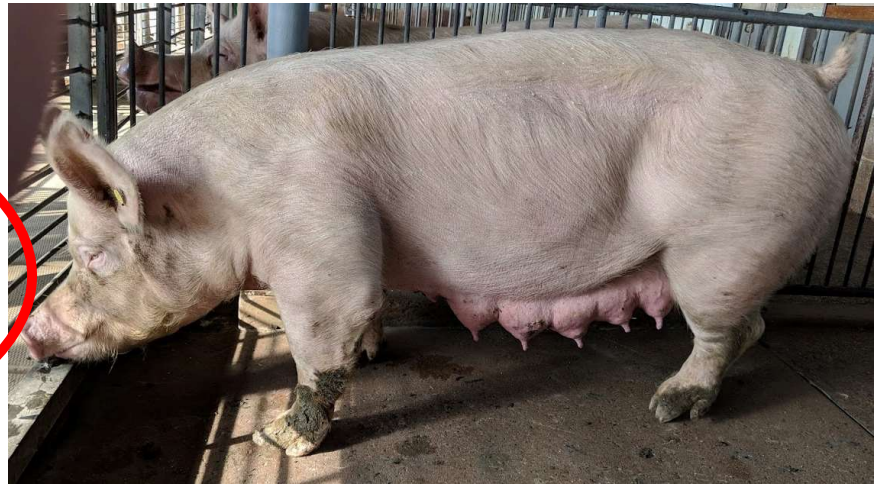
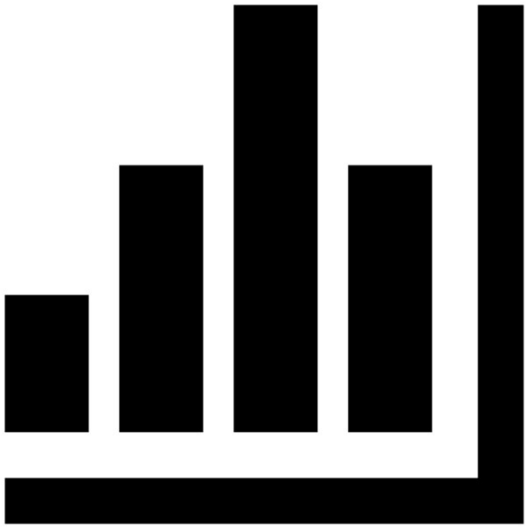


Breeding herd [Baby makers] nutritional needs

- Goals?



Nutrient Requirements for Gestating Pigs, Baby Makers

Parity (body weight at breeding, lbs.)	1 (315)		2 (370)		3 (415)		4 + (450)					
Anticipated gestation weight gain (lbs.)	145.6		134.4		116.928		100.8		89.6		100.8	
Anticipated litter size	12.5		13.5		13.5		13.5		13.5		15.5	
Days of gestation	< 90	> 90	< 90	> 90	< 90	> 90	< 90	> 90	< 90	> 90	< 90	> 90
NE content of the diet	1,124 kcal/lb.											
Estimated feed intake + wastage (lbs./day)	4.7	5.6	4.9	5.8	4.9	5.8	4.9	5.8	4.5	5.6	4.7	5.6
Calories per day (kcal)	5,287	6,294	5,539	6,546	5,539	6,546	5,539	6,546	5,036	6,294	5,287	6,294
Estimated CP% per diet	10.1	13.4	8.9	12.2	7.9	11.1	7.1	10.1	7.2	10.3	7.4	10.9

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Weight gain (lbs.) per pig	~11.5 lbs./pig		10		8.5		7.5		6.5		6.5	
Days of gestation	< 90 days of gestation, or approximately the first ¾ of gestation											
NE content of the diet	1,124 kcal/lb.											
Estimated feed intake + wastage (lbs./day)	<5lbs.	5.6	<5lbs.	5.8	<5lbs.	5.8	<5lbs.	5.8	<5lbs.	5.6	<5lbs.	5.6
Calories per day (kcal)	5,287	6,294	5,539	6,546	5,539	6,546	5,539	6,546	5,036	6,294	5,287	6,294
Estimated CP% per diet	10.1	13.4	8.9	12.2	7.9	11.1	7.1	10.1	7.2	10.3	7.4	10.9

Early Gestation Feeding Summary:

Parity	Feed by parity. Especially keeping diets tailored to less than parity 3 and greater than parity 4											
Weight gain (lbs.) per pig	Gilts and young sows still growing during gestation, need more feed per pig gestated.											
Days of gestation	< 90 days of gestation, or first ¾ of gestation											
NE content of the diet	1,124 kcal/lb. (high feed efficiency breeds)											
Estimated feed intake + wastage (lbs./day)	< 5 lbs. of feed per day. Do not feed free-choice, be sure gets her allotted amount!											
Calories per day (kcal)	5,287	6,294	5,539	6,546	5,539	6,546	5,539	6,546	5,036	6,294	5,287	6,294
Estimated CP% per diet	10.1	13.4	8.9	12.2	7.9	11.1	7.1	10.1	7.2	10.3	7.4	10.9

Too much protein is wasteful, potentially harmful to weight/farrowing, and expensive – but not enough protein hurts appropriate growth – stick closely to recommended CP levels by parity. (+/- 1%)

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Weight gain (lbs.) per pig	~11.5 lbs./pig		10		8.5		7.5		6.5		6.5	
Days of gestation	> 90 days of gestation, or, approximately the last ¼ of gestation											
NE content of the diet	1,124 kcal/lb.											
Estimated feed intake + wastage (lbs./day)	4.7	5.6	4.9	5.8	4.9	5.8	4.9	5.8	4.5	5.6	4.7	5.6
Calories per day (kcal)	5,287	6,294	5,539	6,546	5,539	6,546	5,539	6,546	5,036	6,294	5,287	6,294
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Estimated CP% per diet	10.1	13.4	8.9	12.2	7.9	11.1	7.1	10.1	7.2	10.3	7.4	10.9

Late Gestation Feeding Summary

Parity (body weight at breeding, lbs.)	Feed by parity. Especially keeping diets tailored to less than parity 3 and greater than parity 4											
Weight gain (lbs.) per pig	Gilts and young sows still growing during gestation, need more feed per pig gestated.											
Days of gestation	> 90 days of gestation, or, approximately the last ¼ of gestation											
NE content of the diet	1,124 kcal/lb.											
Estimated feed intake + wastage (lbs./day)	Feed 5.5 to 6 lbs. per day. Increase allowance, but not too much! Do not feed free-choice, be sure gets her allotted amount!											
Estimated CP% per diet	10.1	13.4	8.9	12.2	7.9	11.1	7.1	10.1	7.2	10.3	7.4	10.9

Increasing CP in late gestation in the diet AND feeding amount. So a change in protein content (but not energy) and overall amount of feed benefits sow and litter

Nutrient Requirements for Lactating Pigs, Baby Makers

Parity	1			2 +		
Postfarrowing body weight (kg)	390			470		
Litter size	11			11.5		
Lactation length (days)	21					
Mean daily weight gain of nursing pigs (g)	0.42	0.51	0.60	0.42	0.51	0.60
NE content of the diet (kcal/lb.)	1,124					
Estimated feed intake + wastage (lbs./day)	13.3	13.3	13.3	14.8	14.8	14.8
Anticipated sow body weight change (lbs.)	+3	-17	-40	+8	-13	-35
Estimated CP% per diet	12.2	13	13.9	11.8	12.6	13.4

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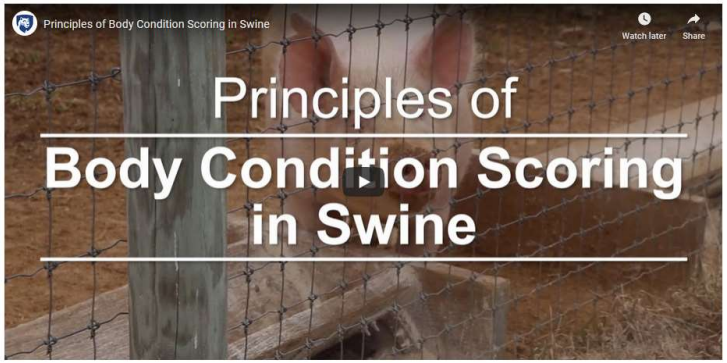
Estimated CP% per diet	12.2	13	13.9	11.8	12.6	13.4

Lactating sows, crude protein and litter sizes

- Increased litter sizes has drive up CP feeding
  - Very common to see CP between 17-21%
  - Seems to benefit the sow, however
    - Keep milk flowing
      - Fiber
      - Energy
    - Minimize extreme weight swings
      - Nutrition should be converted to milk, not body tissue THEN milk
      - Extreme weight swings hurt at farrowing, milk production, and breeding



Nutrient Requirements for Boars

ME intake (kcal/day)	6,530
Feed intake (lbs./day)	4.4
Crude protein (%)	13

- Maintenance!
  - Limit feed
  - Keep lysine up but remember – not building muscle! Just maintaining

Nutrition and Feeding summary

- Grow-finish rations are both too much (CP, energy), and not enough (Vitamins/Minerals) for breeding stock
- Maintenance + work – not growth for most mature stock
- Sows – feed by parity, stage of production, expected performance
  - Still much unknown about feeding sows, BUT, think Goldilocks
    - Don’t over feed
    - Don’t under feed
- Boars - Feed to maintain, maintain, maintain

Questions?

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