Introduction to Raising Pigs

Introduction

Pigs are an adaptable and rapidly growing species that may be attractive for small and beginning farmers seeking to incorporate livestock into their farm. This factsheet summarizes typical performance of the type of pigs most commonly raised in the United States. Although these estimates are not universal, they are a starting point for developing a plan to raise pigs. Estimates of feed use for a sow and a litter of pigs to market as well as a glossary of terms and abbreviations commonly used in pig production literature are also presented.

Objectives

- Provide pig reproduction and post-weaning growth estimates suitable for initial planning purposes
- Provide planning estimates of resources needed—feed, water, bedding, and space—to begin raising pigs
- Introduce and summarize terms and abbreviations commonly found in pig production literature

Defining the Typical Pig

There is a wide variety of breeds and types of pigs available to small and beginning pig farmers. Differences in mature size, growth rate, and reproductive rate will impact the amount of feed and other resources needed to successfully raise different types of pigs. Heritage or rare breeds of hogs are often an attractive choice for small farms because of their uniqueness. Unfortunately there is little published performance data available for most of these breeds. Much of the available production information relating to these types of pigs is anecdotal or general. Even within a relatively well-known breed such as the Berkshire there can be large variation in performance between genetic lines. This factsheet focuses on production expectations for pigs representative of commercial pig production in the United States. Table 1 summarizes typical age and weight benchmarks for commercial pigs in the United States. Farmers considering raising heritage or rare breeds of pigs can use these values as points of comparison for planning purposes.

Farrowing and Reproductive Performance

Pigs commonly farrow (give birth) to litters of 10–14 pigs. In 2013 the average number born alive (NBA) for U.S. pig farms was 12.4 pigs/litter (NPB, 2014). Gestation length in pigs is usually about 114 days or 3 months, 3 weeks and 3 days. In systems where young pigs are weaned at 21 days of age, most sows will farrow multiple litters of pigs in a year—with 2.3 litters/sow being typical for U.S. operations (NPB, 2014). Pre-wean mortality—pigs that are born alive but do are survive to weaning—is about 10% for U.S. pig farms (USDA, 2015). Reducing pre-wean mortality is a priority for all pig farms regardless of size. In the U.S. industry, farrowing crates are almost universally used and close monitoring of sows and litters, especially during the first week following farrowing is common. A sow in the U.S. can wean 26 pigs/sow/year with some farms reporting more than 30 pigs/sow/year (NBP, 2014). Several niche markets prohibit the use of farrowing crates and restrict the use of antibiotics. In an analysis of production records from Midwest farmers raising pigs for these markets, Stender et al. (2010abc) reported prewean mortality of 18–26% and only 10 pigs/sow/year.

Although weaning pigs at 21 days is an effective strategy for most of the U.S. pork industry, some markets require later weaning ages. Many small and beginning pig farmers also choose to wait to wean pigs until the pigs are closer to 6 or 8 weeks of age. At 21 days of age, the pig's gut is not fully mature which necessitates the feeding of more complex transition diets. Delaying weaning allows the pigs to derive

nutrition from the sow as milk for a longer period of time which enables feeding simpler and thus less expensive diets to the growing pigs once weaned. However longer lactations will delay the rebreeding of the sow and thus reduce the total number of litters per sow and thus pigs per sow per year.

Post-weaning Growth

Table 2 summarizes reasonable growth expectations for pigs in the United States. Young pigs grow rapidly. Pig growth is influenced by several factors. As discussed previously, genetics of the pigs plays an important role in growth performance. Three other important factors that influence growth and performance are health, thermal environment, and feed characteristics.

Healthy pigs grow faster and more efficiently than pigs that are sick or injured. Becoming familiar with normal pig behavior in order to quickly identify and treat pigs that are injured or sick is important for beginning pig farmers. A number of resources are available to assist the novice with identifying and correctly treating the compromised pig (see resource list).

Thermal environment is the combined effect of air temperature, moisture, and air flow on a pig. The thermal neutral zone is the range of temperatures at which the pig can maintain body temperature through control of sensible heat loss. For small pigs the thermal neutral zone is very narrow, while larger pigs are comfortable within a wider range of temperatures. Table 3 summarizes the approximate thermal neutral zone for pigs at different stages of growth.

Shelter, bedding, and water are three tools farmers commonly use to modify a pig's environment. Shelter and bedding are used to help keep pigs warm, dry, and draft-free during cold weather. Shade, breeze, and water are particularly important during hot weather. During cold weather, preventing drafts on young pigs is essential and during hot weather encouraging air flow and evaporative cooling helps keep pigs comfortable.

Table 4 summarizes minimal space requirements for pigs with access to outdoor lots (MWPS, 1987). These values are suitable for planning purposes in terms of getting started with raising pigs, but some niche markets or certification agencies may require greater space allowances. The Midwest Plan Service has a number of publications that address shelter and ventilation for pigs in greater detail. These factsheets can be accessed through the following website https://www-mwps.sws.iastate.edu/catalog/livestock-operations/swine-pork (https://www-mwps.sws.iastate.edu/catalog/livestock-operations/swine-pork)

Table 5 provides estimates of bedding use by different types of pigs. A wide variety of materials can be used for bedding with the critical considerations being absorbency and the material's structure when wet. For example, shredded paper is very absorbent, but tends to become a solid mat when wet. This mat then dries into a nonporous mass that can be difficult to remove. Alternatively wood chips maintain their structure after wetting, but are less absorbent than other materials. Mixing different bedding materials can help overcome these challenges.

Water is necessary to support normal growth and development of pigs and is also important for cooling pigs and cleaning equipment. Water consumption will increase during hot weather and will generally decrease during cold weather. Providing adequate supplies of fresh, clean drinking water to lactating sows is especially important because water is a major component of milk (Klobasa et al., 1987). Water consumption is heavily influenced by thermal environment, stage of production, and feed quantity and quality. It is recommended that regardless of conditions, pigs be provided free access to drinking water at all times. A variety of equipment for delivering drinking water to pigs is available and Table 6 presents minimum drinking water estimates that can be used for planning purposes. Midwest Plan Service (1987) provides more specific design considerations for livestock watering systems and Brumm (2008) presents water use and flow rate recommendations for pigs in greater detail.

Pigs that are cold typically consume more feed in order to compensate for the energy required to maintain body temperature. Depending on the relative balance between higher maintenance requirements and increased feed intake pigs that are close to the lower boundary of the thermal neutral zone may actually

grow faster. However at some point, the severity of the cold becomes too extreme and growth rate will decline despite increased feed intake. Pigs that are warm will generally reduce feed intake and thus growth rate will decline slightly. Pigs that are hot will reduce feed intake with a correspondingly significant decline in growth rate.

Feed is probably the most important factor influencing growth and performance of pigs. Pigs are nonruminant animals and as such have a limited ability to utilize fibrous feedstuffs. Pigs also have very specific requirements for certain amino acids that must be met in order to support normal growth and performance. Diets that combine sources of energy in the form of starch (corn) and a source of protein with a complementary amino acid profile (soybean meal) are most common in the United States. Cumulative feed use by pigs is summarized in table 7 and is based on a typical corn-soybean meal diet. Alternative feedstuffs may be available and in some cases are economical. If correctly formulated a wide variety of diets will support rapid and efficient growth in pigs. A full discussion of pig nutrition and feedstuffs is beyond the scope of this factsheet.

Resource List

The following is a brief list of resources available through the Pork Information Gateway at the time of this factsheet's publication that new and beginning pig farmers may find useful. The factsheets are available for download through the following website: http://porkgateway.org/resources/type/factsheets/ (http://porkgateway.org/resources/type/factsheets/)

Swine Health and Management

- Baby Pig Management-Birth to Weaning
- Biosecurity for Alternative Pig Farms
- Identification of the Sick or Compromised Pig
- Injection Reference

Swine Nutrition

- Understanding the Nutrient Recommendations in the National Swine Nutrition Guide
- National Swine Nutrition Guide Tables on Nutrient Recommendations, Ingredient Composition, and Use Rates
- Example Diets for Swine
- Feeding for Niche Swine Production

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Support Material

Table 1. Typical age and weight benchmarks for commercial pigs in the United States

	Weight, lb	Age, days
Birth	3	0
Weaning	13	21
Market	275	175
Puberty	250–300	150–200
First mating	275–325	210–240

Table 2. Growth rate, feed intake, and feed conversion of weaned pigs[1,2]

Age of pig, weeks	Weight, lb	Growth rate, lb/d	Feed intake, lb/d	Feed conversion ratio, lb feed:lb gain
6	27	0.5	0.6	1.2
8	47	1.4	1.9	1.4
10	68	1.5	2.7	1.8
12	90	1.6	3.6	2.3
14	115	1.8	4.6	2.6
16	145	2.1	5.7	2.7
18	176	2.2	7.0	3.2
20	210	2.4	8.4	3.5
22	244	2.4	8.8	3.6
24	275	2.2	9.0	4.1
26	305	2.2	9.2	4.2

[1] Adapted from Carr, 1998.

[2]Assumes healthy pigs of commercial genetics kept in a thermoneutral environment, and fed a balanced diet.

Table 3. Estimated comfort temperature and thermal neutral zones of pigs[1,2]

Size of Pig	Comfort temperature[2]	Thermal neutral zone[3]
< 12 lb	86–93°F	80–96°F
30 lb	72–86°F	70–92°F
70 lb	65–72°F	65–90°F
150 lb	60–65°F	52–85°F
300 lb	58–65°F	40–80°F

[1] Kyriazakis and Whittemore, 2006.

[2] Comfort temperature is the range of temperatures where the pig is most comfortable and is expected to perform most ideally.

[3] Thermal neutral zone is the range of temperatures within which groups of pigs with access to feed can typically maintain normal body temperature.

Table 4. Space recommendations for pigs with outdoor access[1]

		Shed with lot[2]		Pasture[3]
Type of pig	Approximate weight, lb	Inside, ft^2/head	Outside, ft^2/head	Shaded Area, ft^2/head
Nursery pig	30–75	3-4	6-8	4
Grower	75-150	5-6	12-15	6
Finisher	150-300	6-8	12-20	8
Gestating sow	325	8	14	15-20
Boar	400	40	40	15-20
Sow and litter[4]	430-500	24	15-20	20-30

[1] Based on MWPS (1987) unless otherwise noted

[2] More outside lot space is often provided to facilitate manure drying

[3] Total space needs on pasture is heavily dependent on local rainfall and soil fertility conditions area listed here is minimum recommendation for shaded area only.

[4] Based on space recommendations for crate-free farrowing (GAP, 2015)

Table 5. Estimated amount of bedding needed for various types of pigs[1]

Type of pig	Bedding material	Average amount needed
Sow and litter (lb/sow and litter from birth to 5 week weaning)		
	Shredded corn stalks	200 lb per sow
	Oat straw	180 lb per sow

	Barley straw	240 lb per sow
	Wood chips[2]	185 lb per sow
	Shredded paper	250 lb per sow
Growing pigs (lb/pig from wean to market)		
	Shredded corn stalks	200 lb per pig
	Oat straw	180 lb per pig
	Barley straw	240 lb per pig
	Hardwood sawdust[2]	335 lb per pig
	Pine sawdust[2]	200 lb per pig
Gestating sows (additional lb/sow housed/year)		
	Corn stalks	2500 lb per sow space
	Oat straw	2250 lb per sow space
	Barley straw	3000 lb per sow space

[1] Based on Brumm et al. (2004) and Harmon et al. (2004)

[2] Wood products should be used with caution. Wood chips and sawdust exposed to bird droppings need to go through a heat cycle to avoid transmission of avian tuberculosis to pigs.

Table 6. Drinking water estimates for pigs[1]

Type of pig	Gallons/pig/day
Lactating sow and litter	8
Weaned pigs, 30–50 lb	1
Growing pigs, 50–100 lb	3
Finishing pigs, 100–300 lb	4
Gestating sow	6
Boar	8

[1] Based on MWPS (1987)

Table 7. Example feed use for a sow and litter of 10 pigs[1,2]

Type of diet	Pig description	lb/d/pig	days in phase	Total lb
Gestation[1]	pregnant sow	5.0	141	705
Lactation	sow nursing pigs	14.0	42	588
Nursery	10 pigs 25–50 lb	1.9	14	266
Grower	10 pigs 50–100 lb	2.7	45	1,215
Finish 1	10 pigs 100–200 lb	5.9	45	2,655
Finish 2	10 pigs 200–300 lb	8.9	45	4,005
Total				9,434

[1] Assumes corn-soybean meal based diets. Non-lactating sows are limit fed while other types usually are fed ad libitum.

[2]Assumes that one sow will produce two litters every year with 42-day lactation.

Glossary of Common Abbreviations and Terms

Average Daily Feed Intake (ADFI) a calculated measurement of feed consumption rate

ADFI = Feed Disappearance / Days on Feed

Average Daily Gain (ADG) a calculated measurement of growth rate

ADG = (End weight – Start weight) / Days on Feed

Barrow a castrated male pig

Boar an intact male pig

Farrow the process of giving birth

Feed Conversion Rate (FCR) a calculated measurement of feed efficiency

FCR = ADFI / ADG

Feeder pig a young growing pig; feeder pigs are young animals that have been weaned and have transitioned to non-milk diets; commonly used to refer to pigs that are about 40 lb but a wide range of weights may be used depending on region
Gilt a female pig that has not farrowed a litter of pigs
Litter a group of young pigs farrowed or nursed by a sow at the same time
Market pig a growing pig that has reached market weight; usually weighing 240–300 lb but exact weight may vary by region and market
Number Born Alive (NBA) number of live born pigs in a litter
Parity the number of litters a sow has farrowed
Pigs per Sow per Year (PSY) a common measure of sow productivity; usually refers to the number of pigs weaned by a particular sow in a calendar year
Pre-wean Mortality (PWM) the number or percentage of pigs that were born alive but were not successfully weaned by a sow
Sensible heat loss heat exchange (loss) that reduces the pig's body temperature
Sow A female pig that has farrowed

Related Resources

Pig Breeding Systems for Small and Beginning Pig Farmers (https://porkgateway.org/resource/pig-breeding-systems-for-small-and-beginning-pig-farmers/)
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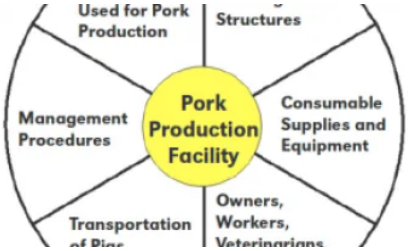

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