General Health Information on Miniature Pigs

Sherrie Clark, DVM, MS, PhD, DACT
Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA

INTRODUCTION

The introduction of miniature and pot-bellied pigs in the U.S. began in the 1980’s and their popularity remained for a number of years and then subsided until about 3 years ago. They were quite popular in Europe for a number of years prior to their re-introduction to the U.S. – and the first place that they gained popularity was Hollywood. Actresses treated these pets the same as they did miniature dogs – carrying them around in small bags and dressing them in cute outfits. Due to their personalities and similarities to the dogs, the popularity of miniature pigs as pets has continued to increase and the need for veterinarians who are willing to provide health care has increased. This proceedings article will outline information about the health and care of miniature swine.

KEY INFORMATION FOR OWNERS

Once a person has decided that they want to adopt a miniature pig, remind them that these animals can live up to 15-20 years of age. This is quite a commitment that owners need to realize. Also, the potential new pet pig owner needs to check with city or county ordinances to make sure that they are in compliance and will be able to legally have a miniature pig reside in certain areas. There are “exotic pet laws” that restrict what type of animals can be kept as pets – each state has their own guidelines and need to be verified before the pig is adopted.

NUTRITION

Owners tend to overfeed or feed the pigs a diet consisting of people food and treats. Other owners will try to feed them commercial dog or cat food – this will not provide the appropriate amino acid, lysine that pigs require in their diet. There are commercial diets formulated for miniature pigs and owners should follow the label. In general, feeding ¼- ½ cup twice daily with snacks of fruits and vegetables is an acceptable diet. Indoor/outdoor pigs that graze may have to have the amount of feed reduced. As with recommendations to other pet owners, make sure that pigs have fresh water available at all times. Also, if a pig becomes anorectic it is a sign that the pig is not feeling well and needs to be monitored very closely – this species is VERY food motivated!

Breeders have a list of “foods to avoid”. The list includes: onions, table scraps, junk food, sweets, high sugar fruits, potatoes (too much starch), and tomatoes (too much acid). As with limiting overeating and the amount of unhealthy foods in our own diets, this should be a consideration in the diet of the miniature pigs. It can be fun to watch them eat and treats can be used as a training tool, but the pigs can be trained much like a dog without excessive treats.
TRAINING

Miniature pigs are quite intelligent. They have been ranked either 3rd or 4th on the intelligence list depending on the source that you read behind humans, primates, dolphins and whales. They are an extremely social species and appear very curious and seem to enjoy learning new skills and tricks. They can be relatively easily trained to walk on a harness and to use a litter box. Many owners may allow their pig to indoor/outdoor and train them to “ask” to go outside just like a dog.

Because of their high level of intelligence, pigs that are kept as full time house pets can become bored easily and are often destructive when finding ways to entertain themselves. It is not uncommon for them to root up carpeting or linoleum floors, eat drywall, turn over house plants and root through the dirt.

ENVIRONMENT

Miniature pigs can thrive in both indoor and outdoor environments. If they are housed in an exclusive outdoor location, there are a few key considerations specific for pigs: Pigs need a pool or puddle for cooling off in hot weather. They do not sweat efficiently and must have a way of lowering their body temperature when they become over heated. As with other pets, access to fresh water and shelter are a necessity in extreme temperatures – both hot and cold. In extremely hot weather, note that light-colored pigs may get sunburned.

Pigs are very susceptible to pneumonia. The biggest cause of pneumonia is weather, but it can also be brought on by stress. Pigs can "stress out" quite easily. Because of their small lung size, bronchitis or pneumonia can kill a pig quickly. The veterinarian must always keep in mind that pneumonia can be a result of various organisms including viruses, bacteria, and parasites.

Other considerations with regards to environment are the pig’s exposure to parasites. They are susceptible to the same internal and external parasites as domestic pigs, but many do not have the same degree of exposure as they do not generally live in the same type of facilities and enjoy a less populated community of pigs. In general, it is recommended to perform routine fecal exams to determine the pig’s exposure to various internal parasites. Skin scrapings and general dermatologic exams will help determine if pigs have exposure to mites and lice (very prominent organism – as large as a tick!) There are anthelmintics used in the commercial swine industry that are effective at treating the parasites infecting miniature swine. Ivermectin is the most common parasiticide used as it is effective against almost all of the internal and external parasites. The injectable 1% solution administered at 300 µg/kg or 1 ml/ 75 lbs. of body weight subcutaneously is used every 6 months – 2 treatments 2-3 weeks apart if the pigs are diagnosed with mites or lice. There are no topical products that are effective against lice – some may be helpful with mites. The main internal parasite not treated by ivermectin is the whipworm. This organism can be treated with fenbendazole orally at 9 mg/kg for 3-12 days. Pet owners will call their veterinarian with regards to flea exposure to their pet pig. It is likely that there is a generalized flea problem in the animal’s environment and the pig gained exposure from fleas from other domestic pets – dogs or cats. They need to be educated on general flea treatment protocols for the environment. The author does not have a preferred product that will be effective to treat fleas on miniature pigs.
GENERAL HEALTH

Miniature pigs are generally pretty healthy animals. Pigs should receive yearly vaccinations, yearly hoof trimmings, and a yearly physical exam. Due to their smaller size, compared to traditional pot-bellied pigs, it is much easier for clientele to transport their pig to the veterinary clinic. This is desirable for many practices – especially when further diagnostics may need to be performed or when the owner requests services offered by traditional small animal practices such as surgical castration, ovariohysterectomy, and dental exams/cleanings. Anesthesia of the patient is needed for these procedures and many practitioners are more comfortable with anesthetizing pigs in the clinic setting as opposed to the field setting. Many practitioners do not have much experience with anesthesia of swine and are unsure of what can be used effectively and method of administration. There are various combinations available and the basis for most of these combinations is xylazine and ketamine in combination with either butophanol or Telazol®. The author will not discuss all of the possibilities for sedation or general anesthesia of pigs as there are various combinations that work well in dogs and generally work well in miniature swine.

MEDICATIONS

As with anesthetics used in treating dogs, there are several medications that have been used to treat miniature swine. The veterinarian should note that technically they are still considered food animals, but most practitioners treat them as pets as these animals will not enter the food chain. Most large animal practitioners who treat domestic pigs will have antibiotics that are approved for use in swine, but small animal veterinarians will not. They will use antibiotics used to treat conditions in dogs and usually will be effective as long as the appropriate medication is used to treat the diagnosed condition. Many owners would prefer to treat their pigs with oral medications – this can be quite effective as pigs are very food motivated and accept some of the medications as treats. Others are very smart and selectively pick the pills out of their food – just like a dog!

During semi-annual or annual physical examinations, miniature pigs may require regular foot/nail trimming and vaccinations, respectively. The degree to which the nails of the feet need to be trimmed will depend on the flooring on which the pig is housed. If there is an abrasive surface such as concrete or the pig is housed on dirt, the need for hoof trimming will decrease. Also, if the physical size of the animal is kept at an ideal weight, the conformation of the foot will not change and the hoof will be worn properly and the need for trimming will be decreased.

Vaccinations of miniature pigs can be variable depending on the source. Most sources will agree that all pigs should be vaccinated for Erysipeothrix and possibly the respiratory organisms (Mycoplasma, Bordetella, Pasteurella, and influenza). It can be difficult for practices to get single doses of vaccines as the commercial products are packaged for large populations. If the pigs are healthy and risk for exposure to many of these organisms is low, then vaccination for all of these organisms is not necessary. There is always the question regarding vaccinating for rabies – pig are relatively resistant to rabies infection and there is no approved product for use in swine.
REPRODUCTION

This is an area not generally important for most pet pig owners as they think they are adopting pigs that are already castrated or spayed. Many of the owners have not even thought about how early the miniature pigs reach puberty. This can lead to some embarrassing situations for the owner.

Puberty

An intact male can become sexually active as early as 6-8 weeks of age. He will express mounting and dominance behavior over his pen mates, other pets, and household objects. Owners may notice the boar exteriorizing his penis, but more commonly they notice “a swelling on the abdomen or belly near the umbilicus” that is present and then goes away. This swelling is likely accumulation of fluid into the boar’s preputial diverticulum. The fluid usually has a foul odor and is generally composed of urine and semen. Many resources believe that this fluid is used to lubricate the penis during coitus while others consider this fluid to be an attractant for females. While it may appear that this strong odor may attract some females, the major fluid that contains pheromones in the boar is saliva. When excited, the boar will begin to chomp his jaws and increase production of androgens in the saliva – he will appear to be frothing from the mouth.

Both male and female pigs will need to be of adequate size in order to come into puberty and begin breeding. The general rule is that they need to be 2/3 of their mature body weight for their breed. It has been documented that around 12 to 16 weeks of age, a female pig will go into her first estrus and will continue to cycle every 21 days (range 18-24 days). A gilt may begin showing signs of estrus sooner if she is housed in a small group of other pigs or has contact with a boar. Her vulva may begin to swell and become reddened and she will respond with a lordosis response when pressure is applied to her back as would a domestic gilt. Her behavior will be the most noticeable: the gilt may eat less while in estrus, she will have an increased locomotor activity, and seek out affection from other pets. Also, she may become increasingly ornery towards owners (increased vocalization in the form of squealing, rooting and biting behavior towards owner’s legs) and many animals until she goes out of estrus, which generally lasts 1-3 days.

Pre-breeding Recommendations

Owners who have obtained miniature pigs with the intent to breed need to consider a variety of reproductive characteristics. The female needs to have at least 8-12 functional teats in order to raise a litter. Additionally, she needs to be at an appropriate body condition and have shown signs of estrus at least once prior to breeding. Waiting until her 2nd or 3rd estrous cycle will increase the number of ovulations and, therefore, the number of piglets. Another practice that could increase the number of ovulations is that of “flushing”. Flushing involves the increase in feeding rate from 2% to 3% of their body weight 10-14 days prior to breeding.

Other considerations involve administration of pre-breeding vaccinations to reduce chances for infertility or abortion. The primary agents included in this vaccine are: porcine parvovirus, *Leptospira (canicola, grippotyphosa, hardjo, iceroaemorrhagiae, pomona)* +/-
bratislava) and Erysipelothrix rhusiopathiae. The vaccine is generally administered 3 weeks apart with the second dose 2-4 weeks prior to the animal’s initial breeding and then 2 weeks prior to subsequent breedings to both males and females. Other health recommendations involve a routine deworming program as well as general health exams. Most owners will not ask for assistance with breeding management as they will just put males and females together and hope for the best. They may call for pregnancy diagnosis and in the event of a problem during delivery of the piglets.

Pregnancy and gestation

The gestation length for a miniature pig is the same as a domestic pig: 3 months, 3 weeks, 3 days or ~114-115 days. Litter sizes will vary from 4 to 12 piglets with an average litter size of 5.1 piglets. The majority of losses during pregnancy occurs during the first trimester and can be affected by heat stress, nutrition, and other stresses that affect the general health of the pig. In general, piglets will be viable when delivered after 110-112 days of gestation.

During gestation, sows need to be fed a diet specific for her energy, protein, and mineral needs. There are commercial diets for miniature swine that can be used to meet these needs – the feeding of a combination of adult and youth diets should meet these needs for the gestating or lactating female. The sow or gilt should gain up to 20% of her body weight during gestation, with the majority of this being during the last trimester due to piglet growth.

Pregnancy diagnosis

Many breeders will assume that their gilt or sow is pregnant when she is not receptive to breeding by the male on her next estrus after mating. They may or may not have a relationship with a veterinarian who could perform pregnancy diagnosis via transabdominal ultrasonography. This can be performed beginning as early as 19-20 days post-mating, but most exams will occur around 28-30 days post-mating. The gilt or sow can remain standing for the exam. A 3.5-5 mHz transducer can be used on the abdomen and placed medial to the flank fold and pointed towards the bladder. A positive pregnancy diagnosis will consist of identifying hyperechoic fetuses within the hypoechoic amniotic vesicles in the uterus (Figure 1). With an accurate breeding date, the farrowing date can be determined. After 30 days, the growing piglets can be monitored via ultrasonography or radiographs to ensure that they are developing normally.

![Figure 1. B mode ultrasonographic image of a pregnant sow ~ 25 days of gestation.](image-url)
Parturition and neonatal care

It is generally recommended to limit the amount of exposure of the gilt or sow to other pigs or many visitors to the house for 2 weeks prior to farrowing to limit the exposure to pathogens. It is also a good idea to limit this exposure during the first few weeks post-farrowing. Breeders should prepare a farrowing box in preparation for the birth of the piglets. This box should be kept as clean as possible and could contain some small soft bedding. It should be a warm and dry place that is free of drafts and out of the way from the rest of the household and pets. A heat lamp or pad is recommended to keep the piglets warm after they are born as it can be difficult for them to maintain their own body temperature. Be sure to keep electrical cords out of the reach of the sow and piglets as they may accidentally chew on the cords and become electrocuted. Be sure that the sow can find a place to remain cool as her environmental temperature requirements (60-70°F) are much cooler than the piglets (92-95°F).

Near the time of farrowing, gilts and sows will begin nesting and becoming increasingly restless. This behavior may occur 12-24 hours prior to farrowing. The mammary glands will increase in size a few days prior to farrowing and form a sticky secretion at the end of the teats. The ligaments around the perineal area (tail head) will begin to soften and the vulva will become enlarged and elongate.

During the first stage of labor, the female becomes restless and withdrawn and her breathing may become rapid. She will go to her nest/farrowing box and will not be responsive to food or treats. When she is in the 2nd stage of labor, the rupture of the chorioallantois has occurred and strong abdominal contractions will ensue. Piglets can be delivered in anterior or posterior position and will generally occur every 15-10 minutes. It can take up to 4 hours for a normal litter to be born – expect that this will be longer for gilts as they will likely rest longer between piglets. The placentas of the piglets can either be passed with each piglet or group of piglets or can all be passed at the end of farrowing.

When monitoring a sow that is farrowing, keep the area clean, warm and as dry as possible. A sow that becomes alarmed or disturbed during farrowing may halt the process and this could lead to a dystocia. Dystocia is not common in pigs (less than 1% of farrowings), but could be more of a concern in the pot belly pig as genetic selection allows smaller females to be bred early and piglets may not pass through a small pelvic diameter. First litter females and older sows are the most likely ones to experience uterine inertia and subsequent dystocia. The uterus may not contract and move piglets through the uterine horns. Females should be examined for any obstruction within the birth canal if a piglet is not delivered after at least 3 hours of abdominal contractions or it is longer than 1 hour between piglets. This should always be performed prior to administration of oxytocin. The additional administration of calcium gluconate (SQ) will assist with uterine contractions and delivery of any retained. Causes of dystocia will be discussed in more detail in the “Reproductive Disorders” section of this article.

During the post-partum period, the sow should be monitored closely. If this is her first litter, she will likely be nervous and anxious with respect to her piglets and could savage them. These sows may need to be sedated with a phenothiazine tranquilizer such as acepromazine for
her to accept the piglets and allow them to nurse. An additional concern regarding the sow is whether she is producing enough milk for the piglets. The sow should lie quietly while the piglets nurse. She will generally grunt to her piglets at the time of feeding to let the piglets know that she is letting down her milk. If she is agalactic, she may move away from the piglets or lie on her mammary glands so that piglets cannot nurse. The mammary glands should be monitored for signs of mastitis and agalactia and treated appropriately with antibiotics, anti-inflammatory agents, and oxytocin. Additionally, the sow’s appetite, general attitude, and rectal temperature should be monitored closely during the first week post-partum. If the piglets need to be fed, they can be fed using a syringe or a pet nursing bottle. They should be fed 10% of their body weight (25-40 ml) at each feeding every 4-6 hours during the first 12 hours of life. This will ensure adequate immunoglobulin transfer to the piglets. If the sow does not have adequate colostrum, then cow colostrum can be used as a substitute.

It is imperative that piglets be fed frequently (every 3-4 hours) as they do not have adequate fat stores and can die of starvation. Additionally, they need to be kept warm so that they will be able to adequately absorb the nutrients from their gastrointestinal tract. If the piglets are not able to nurse, they can be fed via a stomach tube or supplemented with oral glucose. Once they are nursing well and gaining weight, they can be transitioned to pan feeding by 4-5 days of age. Overfeeding can result in the piglets developing diarrhea, which can lead to dehydration. Their feeding should be adjusted as to how they are gaining weight and tolerating feedings if they are not nursing the sow.

COMMON REPRODUCTIVE DISORDERS

Dystocia

As discussed previously, dystocia is not very common in swine. The clinical signs associated with dystocia and indications for intervention include: gestation over 115 days, prolonged stage 1 of labor and no progression to stage 2, straining and contractions associated with stage 2, but no piglets are delivered, delivery of 1 or 2 piglets and signs of labor cease, longer than 1 hour between piglets, and a foul discharge coming from the vulva. There are a variety of causes of dystocia and manual removal of piglets can be difficult in these animals due to size constrictions. If an obstruction is not determined (either by palpation of the vaginal canal or via ultrasonography/radiography), then oxytocin (10-20 IU) can be administered in the muscle to stimulate uterine contraction and expelling of piglets. If 2 doses 30-60 minutes apart does not result in delivery of the piglets, then a cesarean section is recommended.

The procedure for cesarean section in the pig has been described in various sources. Once the pig is appropriately anesthetized (+/- epidural anesthesia), a paramedian approach (dorsal to the mammary gland) has been described as to reduce the chance of dehiscence from vigorous nursing from the piglets. Piglets are introduced to the gilt or sow once she has recovered from anesthesia and will lie quietly for the piglets to nurse. Even with a normal birth, piglets are still at a risk of being crushed by being laid on – this may be more of a concern with a female that did not give birth to them via the vaginal route. Gilts or sows should be administered non-steroidal
anti-inflammatories and analgesics post-operatively and monitored closely in anticipation that she will be calmer with the piglets if pain is controlled.

**Inguinal hernias and cryptorchidism**

Both of these conditions occur primarily in male piglets and can be recognized prior to weaning at around 6 weeks of age. Breeders will generally not attempt to castrate these males. Both of these conditions have been considered to be congenital defects in the domestic pig and should not be used for breeding. Repair of the hernia is recommended at castration. Abdominal exploratory surgery is generally recommended for removal of retained testes. Descriptions of these surgical procedures are available in many of the large animal surgery text books.

**Uterine and Ovarian masses**

It is common for geriatric sows to develop masses on the reproductive tract. The procedure for ovariohysterectomy (OHE) has been the recommended treatment. Various approaches have been described: ventral midline, paralumbar (flank), ventrolateral, and paramedian. For a routine oophorectomy, a paralumbar approach may reduce many of the complications observed post-operatively in pigs. The most common complication has been hemorrhage or development of adhesions which lead to potential gastrointestinal disorders. The author prefers the ventral midline approach as an OHE is the most common surgical procedure that will remove all parts of the reproductive tract that could develop into benign or malignant masses. One should note that the broad ligament of the pig can be quite thick and vascular – this is one of the primary reasons that the author prefers the visualization provided by the ventral midline approach.

**Miscellaneous anomalies**

There are a variety of other anomalies and disorders that can affect the reproductive tract of miniature swine that also affect domestic pigs. Some of these include: persistent penile frenulum, prolapsed penis and prepuce, preputial diverticulitis, vaginal prolapse, uterine prolapse, and urethral obstruction. All of these anomalies are diagnosed and treated according to the severity of the condition and decisions are then made on the potential to affect the individual’s breeding capacity.

**CONCLUSION**

The author hopes that the information provided will assist practitioners in increasing their knowledge regarding pot-bellied and other miniature pigs. Additionally, this information should provide a bit more confidence in providing veterinary care for this species in their practices.
REFERENCES


APPENDIX

**Breeds:** Below are the basic breeds of the miniature pigs that are popular pets. A lot of this information came from various sources and one of which is a breeder’s web site: (http://weeminipiggyfarm.com/your_mini_pig_care_and_more).

**Miniature Vietnamese Pot-bellied Pigs** - These miniature pigs represent probably the most popular breed owned today. They have a docile disposition, in general. The author has worked with a number of these pigs that will bite and “attack” the legs of people that they do not know or trust. Their exaggerated pot bellies and swayed backs are completely normal and healthy. Their average height is about 16 - 20 in. and their average weight can be over 100 lbs.

**Juliani (Painted Miniature) Pig** - These little guys are truly miniature, averaging about 12-16 inches and weighing 15-60 pounds. Like the pot-bellied pig, they have a gentle disposition and are quite playful. The mini Juliana has a longer nose, lighter boned body and longer legs then a pot-bellied pig. They have more of a straight back with less of a belly. The mini Juliana is usually spotted.

**African Pygmy or Guinea Hog** - These miniature pigs weigh in at an average of 20-40 pounds and reach an average height of 14 to 22 inches. They are active, alert and highly intelligent. In contrast to the pot-bellied pigs, African Pygmies have straight backs.

**Kunekune** – is a small breed of pig from New Zealand. The Kunekune pig is relatively hairy with a pudgy build and may bear wattles hanging from their lower jaw. Color ranges include black and white, ginger, cream, gold-tip, black, brown and tri-colored.

The miniature pig sizes:

"**Potbelly Pig**: 18 - 26" weigh up to 200 lbs

"**Miniature Potbelly Pig**: 16 - 20" weigh up to 100 lbs

"**Toy Pig**: 14 - 16" (Can be a combination of two breeds). These pigs will be many different colors as well to include chocolate, spotted, pink, and red.

"**Micro pig**: 12 - 16" This is a new breed in itself, you will notice a different body type than the pot-bellied pig and “a longer, squared off nose, straight back, smaller tummy and longer leg.”

"**Mini Micro Pig or Teacup**: 15" and under, same as the micro in looks but smaller. The true ones that stay this small are very rare.

"**Mini Juliana Pig**: 10 -16" This is a breed in itself. Unlike the pot-bellied pig, the Juliana is very delicate boned and has a long nose and has spots. Also knows as the painted pig or spotted Juliana. This is the smallest of all of the mini breeds.