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BEHAVIOR OF MINIATURE PET PIGS

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A variety of miniature pigs currently exist in the United States, but the breed most commonly kept as a pet is the Vietnamese Potbellied Pig. This breed of pig is a member of the Suidae family (*Sus scrofa*) and was first introduced to North America in the early 1980s. The North American Potbellied Pig Association (NAPPA, 385 Muttart Road, Neenah, WI 54956) has established breed standards for the potbellied pig and currently maintains one of the three breed registries in the United States. The maximum height for potbellied pigs according to these standards is 18 inches at the shoulder, and the maximum weight is 95 pounds. The average potbellied pig weighs in at about 120 pounds; Most potbellied pigs weighing more than that are morbidly obese.

When first introduced to the U.S., the Vietnamese Potbellied Pig was heralded as the "pet of the 90s" and even earned such labels as the "yuppie puppy." Believed by some to be a perfect house pet, it was several years before their prices dropped and the fad died. The two primary causes for the potbellied pig's decline in popularity were (1) the mistaken impression that the pigs would remain under 50 pounds, and (2) the discovery that their environmental needs were more complex than previously believed. They did not, in fact, make "perfect house pets."

Just as people will continue to have other exotic or unusual pets that are a challenge to keep, there will always be people who keep pet pigs. Many people choose to have a pet pig because of allergies to other more traditional pets. Some choose pigs for their novelty or because they

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have heard that they are intelligent and clean. Many other potbellied pig owners, however, are true "pig lovers" and thrilled with the concept that their favorite animal comes in a smaller, easier to keep package that doesn't require a farm in the country to maintain. Unfortunately, many people buy a potbellied pig on impulse, without first determining what is needed to keep a pet pig. These are the people most likely to quickly become disenchanted with their novel pet and want to find it another home.

Potbellied pigs do, in fact, make great pets for some people. They are clean, do not carry fleas or ticks, bond readily to people, and are relatively easy to train. They are trained differently from a dog, however. They are quite unique from dogs in their social behavior and eliminative behavior. When not given the proper diet, training, exercise, and environment, they are likely to become obese, irritable, and overtly aggressive.

Because miniature pigs are often kept by city dwellers, the exotic pet veterinarian is usually the first person the pet pig owner will turn to for help. They may be reticent to drive long distances in order to find a large animal or swine veterinarian; if they must, they will be most disappointed if their pet is treated like livestock. For the pet owner who has truly bonded with his or her pig, the pig is frequently treated as a child substitute, and their owners want the best care possible.

Veterinarians who are knowledgeable about the pet pig's behavior can help educate their clients about pig behavior and the training needed to make it a pleasant pet. The veterinarian is then likely to assure him or herself a much more tractable patient to care for in the hospital. Ultimately, the veterinarian armed with some knowledge of pig behavior will also be more prepared to handle the pig in a way that keeps it calm and tractable.

COMMUNICATION

Audition and Vocalization

Vocal signals are the most important means of communication amongst pigs,⁴² making their well-developed hearing a necessity. Because of their relatively immobile ears, however, pigs must turn their heads in order to localize sound.⁴⁶ An extensive vocabulary has been documented in swine ranging from staccato grunts to screams to squeals, depending on the pig's motivational state.²⁹ It is normal for a pig to grunt almost constantly while walking, exploring, and greeting another individual. An isolated pig will vocalize more frequently than pigs within a group.⁴² Pigs are easily startled and are likely to panic when hearing a loud or unusual noise.³⁶ The sound of one pig screaming in panic will frequently cause unrest among other pigs within hearing distance.

Vision

A limited amount of information has been published on the subject of swine vision, and much of it is contradictory. While some references state that swine vision is poor,^{8, 44} others claim that it is quite good, similar to many other higher mammals.^{16, 36, 42} Because of their similarity to humans regarding eye structure and visual acuity, swine are frequently used as human models in biomedical research.⁴²

Studies have shown that when unable to see, pigs can still establish and maintain a dominance order, suggesting that sight does not play as important a role in their behavior as the other senses.¹⁴ The pig's compact, relatively inflexible anatomy limits its use of visual cues, contributing to the lesser role that vision plays in swine communication. The facial expressions of pigs are also limited. When kept as a pet, the Vietnamese Potbellied Pig is prone to obesity, and frequently its eyes are obscured by rolls of fat.⁴⁹ Consequently, the eyes of these pigs are difficult to visualize, and their ability to see may be impaired.

The most expressive part of the pig's anatomy is its tail. Unlike commercial swine, potbellied pigs have a straight tail that wags almost constantly.⁴⁹ Further study of this unique aspect of the potbellied pig's anatomy might prove useful in developing a better understanding of its visual cues.

Many potbellied pigs have especially long bristles covering their dorsal midline. Piloerection in these individuals is prominent when they are aroused, such as when threatening aggression or when receiving a belly rub (Fig. 1).⁴⁹



Figure 1. A potbellied pig displaying piloerection.

Olfaction

One of the more important means by which pigs recognize individuals is by smell.⁴² Pigs have long been noted for their exceptional sense of smell, and olfaction plays an important role in determining behavior.^{5, 16} The olfactory area of their sensory cortex is equal in size to both the auditory and the visual areas of the brain.⁴² Piglets use their sense of smell to help identify specific teats when nursing, and adult pigs use their sense of smell when foraging for food.^{36, 46} When two pigs are first introduced, they sniff each other extensively around the face and ventrum.²⁹ It has been noted that aggression amongst newly mixed swine can be lessened by first making them anosmic.^{29, 42}

BODY CARE

Thermoregulation is more of a challenge for swine than many other domestic animals because of their thick layer of subcutaneous fat and rare sweat glands.^{15, 36} Their sparse hair coat also puts them at high risk of sunburn.¹⁵ In order to maintain body temperature, pigs rely on specific behavioral strategies. When cold, pigs will choose to huddle close together; when temperatures rise, they will spread out, lying near each other but not touching.^{15, 36} When hot, pigs will attempt to wallow in water or mud by whatever means necessary.^{15, 36} A coating of mud will have cooling affects on the pig longer than will periodic immersion in water. If mud is available, it will be chosen over plain water.³⁶

Pet pigs housed outdoors and not given water to lie in, may turn over water dishes in an attempt to make themselves a wallow.²¹ They may also spend more time rooting up the ground in order to lie on the cooler subsoil.⁴⁶ Outdoor pigs require adequate shade and drinking water. They should also be provided with an additional source of water for lying in (Fig. 2). The simplest way to provide this is by using a plastic wading pool with a side cut down to make a low entrance. The pool needs only a few inches of water in it, so that the pig can lie down without its head being under water.

Miniature pigs are also sensitive to extremely cold weather and prefer temperatures above 60°F.²¹ If kept outdoors in the winter time, a draft-free shelter is needed with plenty of bedding. Observations of outdoor pigs indicate that they are most interested in avoiding air movement. If allowed, they will build elaborate beds in which to keep warm at night.^{17, 54}

Rubbing also appears to play an important role in the comfort behavior of pigs.^{15, 24} Most pigs will rub themselves on stationary objects in their environment. Outdoors, trees and fence posts will be used; indoors, furniture, doorjambs, and walls may all be used as habitual rubbing posts. This behavior may be related to the fact that the pig has a limited ability to groom itself because of its portly shape, and a minimum of social grooming occurs among pigs.^{29, 36} Grooming behavior



Figure 2. A potbellied pig attempting to cool off.

by subordinate pigs is usually directed towards dominant pigs. The dominant pig will lie down while the subordinate nudges and nibbles at its belly.²⁹

SOCIAL BEHAVIOR

The social behavior of swine is unique from most domestic animals in that a dominance hierarchy is established among a litter of pigs within hours to days after birth.^{19, 28, 38} Neonatal pigs begin fighting almost immediately after birth to establish the "teat order."²⁸ They are equipped for this with unique weaponry in the form of sharp "needle teeth" that they use to fight for the preferred anterior teats of the sow.^{19, 29, 38} Once a teat order has been established, piglets recognize "their" teat by sight and odor and will fight as necessary to defend that teat.²⁸ Piglets continue nursing their acquired teat until weaning.⁴⁵ Apparently, the establishment of this order helps to prevent the need for any further aggression related to nursing while insuring milk supply for each individual in the litter.³⁸ Typically, the larger, stronger neonates acquire the most productive teats. Therefore they grow larger and faster than the other neonates and maintain their dominant status at least until weaning.^{36, 38, 42} Thus, beginning at birth aggression plays an important role in the life of the pig.

A social dominance order also will be established among groups of newly mixed pigs.²⁹ Whenever previously unacquainted pigs meet, they will fight until the dominance hierarchy is established. Fighting usually peaks within a few hours and then declines rapidly over the next few

days.³⁹ Most studies indicate that the hierarchy is relatively stable after 7 days. Aggressive behaviors include charging and pressing or butting (also known as knocking) the opponent's head, neck, and shoulders.²⁹ As fighting escalates, snaps and bites will be directed at the ears, jowls, neck, and shoulders of the opponent. Pigs also use a behavior called levering, in which the attacker uses its head and snout to lift another pig off its feet.²⁹ A pig may also threaten another individual with an open-mouthed toss of the head or feint of the snout without actual contact.^{20, 49} The most common gesture shown by the defeated pig is a subtle lowering and turning of its head away from the victor.^{20, 29} The defeated pig may then retreat with the victor in pursuit. In fact, retreating does not always inhibit further aggression from the dominant pig.³¹

Once the dominance hierarchy is well established, the mere approach of a dominant individual may result in the retreat of the subordinate pig.² The existence of actual submissive signals amongst pigs is the subject of some debate.³¹ Some authors suggest that the tilt of the head away from the opponent is a submissive signal.²⁰ Others state that submission is indicated by the complete withdrawal or retreat of the subordinate individual.³¹ There is increasing evidence that the existence of an "avoidance order" is actually what limits aggressive incidents among pigs.³² Research also indicates that when newly mixed pigs are similar in size and strength, they will be more likely to engage in aggressive encounters.^{12, 33} It appears that pigs assess their opponent's strength and the subsequent likelihood of winning a fight, and are less likely to engage in aggression when the outcome appears clear.^{19, 33, 40} Therefore, when pigs of significantly different sizes are mixed, they are less likely to fight as vigorously or for as long as pigs of similar size.

Dominant status within the group gives the individual greater freedom of access to resources such as food, shelter, resting places, and sexual partners.¹⁹ Within groups of confined pigs, most aggression occurs during feeding.²⁹ Studies show that the number of aggressive encounters increase when pigs are fasted and provided with less space.^{13, 25, 34} Aggressive incidents may be decreased by providing enriched environments and by frequent regrouping of young swine.⁵⁰ Recognition among pigs appears to be based on familiarity through association.^{43, 48}

As would occur in nature, piglets allowed to mingle at an early age fought less when reintroduced as weanlings.⁵² Thus, allowing pigs to become familiar with each other decreases the need for fighting when they are reintroduced at a future date although fighting is not completely eliminated.^{1, 33} One researcher²² suggests, however, that there may be a limit to the number of relationships that an individual pig can remember, especially if the relationships are not regularly reinforced. Thus, exposing the pig to an ever-changing number of individuals might also be a source of conflict and frustration leading to redirected aggression.²²

Retaliatory behavior in which a subordinate pig directs aggression towards a dominant individual is relatively common in pigs.⁴⁶ Even when severe retaliatory aggression is directed towards a dominant ani-

mal, it may simply turn its head away from the subordinate.¹³ Small groups of well-acquainted pigs have a much higher incidence of retaliatory aggression and unclear dominance relationships.¹⁷ Overcrowding increases the likelihood of these aggressive interactions. Thus, it may be more accurate to consider swine relationships as bidirectional rather than unidirectional, as is common with other domestic animals.⁴⁶

EXPLORATORY BEHAVIOR

Exploratory behavior is an important and unique feature of the porcine species. Curiosity is expressed by exploration, and animals explore in order to gain information about their environment.¹⁰ There is evidence to suggest that exploration is self rewarding and that many animals explore even when their appetite for food and water has been sated.¹⁰

The pig, when living in a semi-natural environment, has been shown to spend about one third of its active time in exploration.^{10, 47} The pig's exploratory behavior is usually directed at objects at floor level that it will manipulate by sniffing, nibbling, rooting, and nudging.¹⁶ When not provided with appropriate objects to explore and manipulate, animals experience a form of sensory deprivation and often seek to address the problem by developing alternative behavioral strategies.^{10, 17} Tail biting and stereotypes such as head weaving and bar biting are some of the problems that may occur in commercial swine kept in barren, confined conditions.²⁶ Some research suggests that providing toys or other objects to pigs for manipulation decreases the level of aggression amongst newly mixed pigs.^{7, 19}

Exploration and play are also closely linked behavior patterns that are very important in the development of young animals.^{51, 54} Exploration is one of the first behaviors shown by neonatal mammals when searching for the mammary glands of their mother.⁵¹ Exploration and play in the environment aids the young animals' development of problem-solving abilities. Therefore, the negative effects of a barren environment may be more pronounced in a young, developing animal than in an adult provided with the same environment.¹⁰

There is also evidence to show that inhibiting exploratory behavior may negatively effect an animal's reaction threshold.¹⁰ Animals from barren environments react more intensively to novel stimuli than animals from enriched environments.¹⁰ This response can have a major effect on the tractability of the pet pig. It verifies the importance of providing pet pigs with a stimulating environment and exposing them to a variety of external stimuli while they are being socialized and trained.

INGESTIVE BEHAVIOR

Swine are omnivorous foraging animals that are usually diurnal in nature,² but in hot climates may become nocturnal in their habits.²⁴

Free-ranging swine eat a wide variety of plant and animal matter including roots, seeds, grasses, invertebrates, eggs, and carrion.^{16, 24, 36} Similar to other homeotherms, their food consumption will decrease in hot weather and increase in cold weather.³⁶ Pigs have distinct taste preferences and will choose foods containing higher levels of sucrose when given the opportunity.^{2, 35, 42}

When pigs are allowed to free feed, they prefer to eat many small meals throughout the day.²⁹ Feral pigs may travel 1.5 to 3 km/day and spend much of their time foraging and eating. Domestic pigs maintained in a semi-natural environment spend more than half of their day foraging.⁴⁷ Pigs raised in confinement, as well as pet pigs, may consume their daily ration in as little as 15 minutes, leaving little reason for them to spend a normal amount of time in species-typical behaviors such as foraging. Social facilitation is a well-documented aspect of swine ingestive behavior.³⁰ When familiar pigs are grouped together for feeding, they will eat more than if they are fed separately.

In pigs, drinking is closely related to eating.² Only 25% of a pig's water consumption occurs more than 10 minutes before or after feeding.⁶ If allowed, pigs will alternate between drinking and eating until satisfied.⁴⁶ If a pig's food is restricted, it appears to compensate by drinking proportionally more water. Research indicates that abdominal fill rather than purely osmoregulatory mechanisms dictate water consumption in the pig.⁵⁶

ELIMINATIVE BEHAVIOR

The discriminating eliminative behavior of pigs has been well documented.^{3, 41, 53} If given enough space, pigs will choose a single location for elimination as far from the resting area as possible.¹⁵ When defecating and urinating, pigs prefer to align themselves with walls or back into corners.^{3, 41} If space is limited, pigs will choose to eliminate nearer to their food and water, to avoid dirtying their sleeping area.³ If pigs are very overcrowded, they will lose much of this fastidious behavior, so the presence of pigs that are dirty from their own feces is suggestive of husbandry or management problems.¹⁵

Evidence suggests that the pig's fastidious eliminative behavior is learned.¹⁵ Pigs that are weaned prior to 6 weeks of age may not have the opportunity to learn proper eliminative behavior. Sows that are not themselves discriminating about their elimination are more likely to raise piglets that will not be fastidious about their elimination either.²

COMMON BEHAVIOR PROBLEMS

Aggression

Potbellied pig aggression towards humans appears to be the most common behavior problem reported by owners of pet pigs.⁹ Most often

this takes the form of dominance aggression. In the typical case, the owner reports that the aggression developed when the pig was 1½ to 3 years of age. Many times after collecting a thorough case history, it becomes apparent that the pig had demonstrated aggressive gestures or threats in the past that the owner failed to recognize or simply did not perceive as a problem.

The most common threat directed at humans by the pet pig is the head toss.⁴⁹ The threat can occur so quickly and silently that many people do not recognize it until it is over. The pig will snap its head quickly in the direction of the person who it is trying to threaten. There rarely appears to be any real attempt to bite. Occasionally, the pig will produce a sharp grunt before snapping, but the vocalization does not usually occur in time to give ample warning of the threat. Pigs may threaten when disturbed while resting or when being moved from a favored sleeping location. Pigs are likely to threaten when attempting to displace them from food, especially if the food is something that they are not usually given.

Many pet pig owners report that the first person the pig ever threatens or attacks is a visitor to the home. The pig that threatens visitors may be attempting to establish a social order with the perceived newcomer to the herd.⁴⁹ Many people will perceive the pig's aggression towards visitors as territorial behavior, but pigs rarely actively defend territory.⁵⁴ In semi-natural environments pigs have been noted to defend their nests.⁵⁴ Often pet pigs are given space by their owners in laundry rooms, large walk-in closets, or bathrooms. Provided with blankets and allowed to spend many hours alone sleeping in these locations, the pig may perceive this space as a nest. Many pet pigs become aggressive about defending this space to the extent that they will begin physically blocking the entrance and charging at anyone that attempts to enter.

Many pet pigs quickly learn to use threatening behavior to get what they want. This can become extremely dangerous if the pig is allowed to play unsupervised with small children. Many children find it entertaining to feed pigs and may be at risk of being bitten simply because their hands smell like food. Although a bite that happens in a situation like this may be perceived as an accident on the pig's part, the pig's behavior is likely to be reinforced because the child may drop whatever food it is carrying when frightened. Children are also very likely to retreat from a location when threatened by a pig. When this happens, the pig's behavior is again reinforced and the pig, possibly believing that it is the dominant member of its human herd, becomes more likely to behave aggressively when someone attempts to make it do anything that it does not want to do.

In the multi-pig household some degree of aggression between pigs is likely and usually normal but nevertheless disturbing to the pet owner. Pet pig owners need to be informed that when first adding a new pig to a household where one or more pigs already live, some aggression will occur. Aggression can be reduced by allowing the pigs to become acquainted where fighting is made impossible by barriers but

where the animals can still see and smell each other.¹⁹ Child gates can decrease aggression between new pigs and established pigs. Aggression between pigs in a household is also likely when one is removed and reintroduced even after a short period of time. This is a common occurrence when one pig is taken to a show or is hospitalized. When it returns, it may have to fight to resume its previous position in the hierarchy. Studies in commercial swine have suggested that the more dominant the pig, the longer it can be away without having to fight to reestablish dominance on its return. The more low-ranking animal is likely to be attacked after an absence of only 3 days.³⁶

Tail biting, a serious behavior problem of swine reared in confinement, rarely occurs in potbellied pigs. The cause of tail biting in pigs is not clear but appears to stem from their strong exploratory tendencies.²⁶ Pigs explore their environment by rooting, chewing, and manipulating objects.¹⁶ If their environment is crowded with conspecifics, but otherwise barren and unstimulating, the pig is likely to direct its exploratory behaviors to the tails of the other pigs.^{17, 26} Potbellied pigs are rarely raised in close confinement, so tail biting is unlikely to develop. The unstimulating environment and the boredom or stress that ensues, however, may play a very important role in the development of behavior problems more typical in the pet pig, such as aggression and destructiveness.

Destructiveness

The destructive behavior of the pig is another common cause of complaints by pet pig owners, and many pigs are abandoned or rehomed because the owner cannot tolerate this behavior and has no idea how it can be corrected. Pigs confined indoors are more likely to be destructive. They direct their normal exploratory behavior towards carpeting, linoleum, wallpaper, and even drywall. Pigs may move furniture around and remove items from shelves. Left unattended they can learn to open most cabinets, cupboards, and refrigerators. All animals seek a certain level of sensory input. If sensory input is too low, as the case may be with a barren environment, they will increase their level of exploration.¹⁰ This is a likely cause for the extreme destructiveness shown by many pigs confined indoors.

Pigs housed outdoors can do a great deal of damage to landscaping. They will root up the soil looking for food items, and in hot weather may be trying to lie on the cooler underlying subsoil.² The pig that roots excessively is not necessarily driven by hunger but rather by a drive to explore its environment. Many pet owners will seek to remedy this problem by having a ring applied to their pig's nose. The use of rings in pet pigs is not recommended for two reasons. First, rings rarely stop the rooting completely. A pig with a ring in the center of its nose will root with the side of the nose. Second, rooting is an important part of the pig's behavioral repertoire.⁴⁹ In the wild more than a third of its time

is spent exploring.⁴⁷ If this behavior is halted, the pig must spend its time doing something else. Pigs not allowed to express their normal behaviors may be more likely to become inactive, obese, irritable, and even aggressive towards people.

Housebreaking

Many owners of pet pigs complain of difficulty housebreaking them. Often, people acquire pet pigs because they have been told how clean they are. They have unreasonable expectations, and they don't know how to set the young pig up to succeed at housebreaking. The discriminating eliminative behaviors of the pig are unique and an understanding of these normal behaviors is necessary for them to be successfully housebroken. Many owners, attempting to housebreak their pig as they might a puppy, will confine it to a kennel or crate with a litter box, food, and water. The pig may be reluctant to eliminate near where it sleeps and eats and may try to avoid eliminating until it is released from the crate. If the owner does not supervise it closely, it is likely to search for a toilet area in some distant area of the house.

Pet pig owners also must be certain that the container they provide for their pig's litter box is stable, easy for the pig to step into and out of, and large enough for the pig to turn around in (Fig. 3). A common cause for the previously well housebroken pig to begin eliminating on the floor is for it to have outgrown its box. Finding a box large enough for the fully-grown potbellied pig can be challenging, but if the box is not comfortable for the pig, it will not use it.

Polyuria (PU) and polydypsia (PD) can also lead to difficulty housebreaking the pet pig. Pet pig owners often underfeed their pigs in an attempt to keep them small. The pig will then drink proportionally greater quantities of water and need to urinate frequently, making house-



Figure 3. A litter box for a large house pig.

breaking more difficult. Medical causes of PU/PD should also be ruled out, however. Cystitis, diabetes mellitus, and diabetes insipidus may all occur in the potbellied pig and can cause excessive thirst and urination.³⁷ Female pigs also seem more likely to urinate outside of the box when in heat, illustrating just one of the many good reasons for spaying female pigs that are kept as pets.

Owners of pet pigs have also noted that pigs that are usually well trained to go outside to eliminate may cease doing so in inclement weather. It appears that the spoiled or pampered house pig may simply find it more convenient to eliminate indoors rather than face rain or snow. Therefore, some pet pig owners may find it most convenient to keep a litter pan available for use during bad weather.

PREVENTING BEHAVIOR PROBLEMS

Choosing the Pet Pig

The first step in preventing behavior problems in the pet pig can be taken before acquiring the pig. Potbellied pigs should be acquired from a reputable source. A reputable breeder is one who does not make promises about the future size of the potbellied pig, who does not wean piglets prior to 6 or 8 weeks of age, and who will make themselves available to answer questions long after the pig has been taken to its new home. A reputable breeder is likely to have maintained contact with people who have purchased their pigs in the past and can help potential new pet pig owners make contact with others who can answer their questions about owning a pig. A list of certified breeders may be acquired by writing the North American Potbellied Pig Association.

Many factors may play a role in the development of behavior problems in the pet pig. Differences in aggressiveness have been documented in different breeds of swine,^{12, 42} so genetics may play a role in contributing to aggression in potbellied pigs. Potbellied pigs in North America originated from a relatively small population of imports, so the degree of inbreeding is beginning to be a concern. More research will need to be done before we can document whether or not certain lines of potbellied pigs are more likely to be aggressive than others. In the meantime, people seeking to acquire a potbellied pig from a specific breeder, should speak with other owners of potbellied pigs who have purchased from that breeder and ask about the occurrence of aggression in those pigs.

Much research has been done in commercial swine on the subject of early weaning and it is thought to play an important role in the development of behavior problems in pigs.⁴ Many people who breed pigs for pets appear to believe that removing them from the sow and putting them into a home where they can be bottle raised by people will insure that they bond quickly and become very tame. This may be so,

but the behavior problems that are a likely result far outweigh any benefits attained from early handling by humans.

It is easy to underestimate the contribution of the sow to the neonatal pig's development. She does not seem to be a very involved mother in that she does not chew the umbilical cord or lick or groom her newborns.^{36, 51} Pigs learn proper eliminative behavior from their sow, however, so removing piglets early might contribute to housebreaking difficulties.^{2, 15} Early weaned commercial swine show increased levels of aggression towards other piglets.⁵⁵ No one has documented whether this translates to higher levels of aggression among adult pigs, but it should be of some concern. Early weaned commercial swine have also been shown to direct an excessive amount of belly nosing and nuzzling at their penmates.⁵⁵ Very early-weaned pigs spend less time interacting with conspecifics or exploring their environment.⁵⁵ Some researchers have suggested that this is indicative of a high level of stress in the piglet.⁵⁵ Early weaned potbellied pigs also demonstrate this behavior, and it is frequently directed at their owner's arms and legs. Although the behavior may seem cute at first, as the pig gets larger and stronger, it can lead to painful bruises.

The relationship between mother and neonate is an influential one in most any species.^{4, 51} In swine, by preventing the development of a normal mother-offspring bond, the early weaned animal may be unable to develop stable social relationships as an adult.³⁹ No studies have been done yet that actually document the occurrence of aggression in early weaned animals, compared to those weaned at 8 to 10 weeks of age.

Some breeders of potbellied pigs have hypothesized that the more dominant piglets in the litter are more likely to attempt to be dominant as adults; therefore, they are more likely to behave aggressively towards their human family members than lower ranking piglets. This theory seems reasonable but one researcher⁴⁵ found no relationship in commercial swine between dominance in the litter and later dominance when mixed with pigs of similar ages. At this time, there is not enough evidence to suggest that evaluating the potential pet pig's status in the litter would help a pet owner choose a pig that is less prone to behave aggressively.

Most reputable breeders of potbellied pigs castrate male piglets before selling them as pets, and many have female pigs spayed before sale. The reproductive behavior of swine has been well documented by previous authors^{16, 29, 46} and will not be covered in depth here, since the aim of this paper is to assist veterinarians with pigs kept as pets. Neither intact male nor intact female pigs make good pets. Not only do male pigs have a strong unpleasant odor, making them poor house pets, they also grow long, sharp tusks, are more likely to behave aggressively, and are prone to mounting other pets and people.

Female pigs that remain intact are not quite as bad as intact males, since their misbehavior usually only occurs when they are in estrus. Female pigs experience estrus about once a month, however, and during this time they are likely to be more active, vocal, and aggressive. They

frequently have lapses in their housebreaking skills during estrus and may engage in destructive nesting behaviors. It is never too late to spay or neuter the pig intended to be kept as a pet, but when the breeder passes this cost along to the consumer, the consumer usually gets the better bargain than if they had to arrange for the surgery after acquiring the pig. As with any animal, the cost of the surgery increases with animal size; the obesity that is so common in adult pigs makes them poorer surgical candidates than young pigs.

Caring for the Pet Pig

Before bringing home the new pig, the pet owner should make the decision as to whether the pig will live indoors or outdoors. If the pig is to be kept primarily indoors, the decision should be made as to whether the pig will be litter trained or taught to go outside to eliminate. Having a pig in the house is not unlike having a toddler in the house; they cannot be left unattended. Therefore, the pig to be housed indoors needs to have a room, such as a bathroom or laundry room, or a crate or pen, in which it can be confined when it cannot be supervised. The space should be large enough to allow food, water, and bedding to be placed a few feet away from a litter pan. If someone is available to allow the pig outside every 2 to 4 hours for elimination, then the litter pan is not necessary.

If the pig is to be housed outdoors, it must be provided with shade and a pool of water in which it can cool itself. In the wintertime, the pig needs a draft-free shelter containing sufficient bedding in which to nest. Because of the exploratory drive of the pig, many pet owners will find it preferable to build a pen for their pig or fence off a section of yard for the pig's use.

No matter where the pig will be housed, a critical part of its environment is the provision of objects that it can manipulate. A variety of different objects can be provided for the pig to satisfy its natural drive to root. Blankets, pillows, beanbag chairs, and stuffed animals have all been used to provide pigs with rooting material. Pet owners have also used brown paper bags and newspapers. Most toys that are safe for toddlers are also safe for pigs. The pig is stronger and more capable of destroying these items, however, so some supervision is suggested in case small pieces are broken off that the pig could swallow.

Pigs confined indoors should also be offered a rooting box (Fig. 4).⁴⁹ The rooting box can simply be a large, shallow box constructed of wood or concrete mixing containers, plastic wading pools, or other prefabricated containers. The box must be readily accessible so that the pig can step into it easily. Most plastic containers need an entryway, no more than 3 to 4 inches high cut out for the pig. The bottom of the box should then be covered with large flat river rocks or other smooth stones. The stones should be large enough that the pig will not accidentally ingest them and smooth enough that the pig's feet will not be cut



Figure 4. A rooting box for a small pet pig.

or bruised by them. Small food items can then be sprinkled amongst the rocks periodically. The pig will spend hours searching the rocks for food, continuing its natural exploration long after the food is gone.

Outdoor pigs can be provided with hay or straw to manipulate. Numerous studies on commercial swine have suggested that providing straw or other means of environmental enrichment can decrease aggression and decrease the occurrence of stereotypies.⁹ High fiber diets offered *ad libitum* also have been shown to decrease the incidence of oral behaviors in commercial swine.⁹ Although potbellied pigs probably should not be fed *ad libitum* because of their tendency to obesity, the significance of these studies should not be overlooked. There is nothing to suggest that the needs of the potbellied pig are any different from those of commercial swine.

Because of the fact that exploratory behavior and foraging for food are so closely linked in the pig, how the pet pig is fed may be more important than what it is fed. Swine reared in confinement may spend as much as 50% of their time resting or sleeping. For the potbellied pig this sedentary lifestyle leads to obesity, hoof and joint problems, and subsequently a poor quality of life. Offering the pet pig its daily ration of food in a way that requires the pig to forage increases the amount of time spent feeding and increases the amount of time the pig spends in

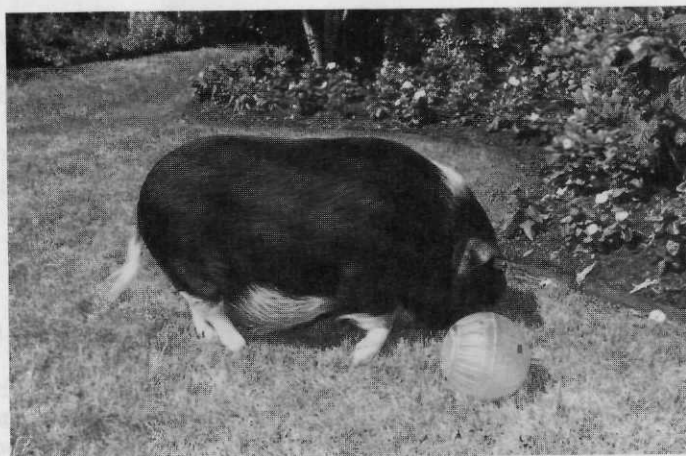


Figure 5. A pet pig acquires a snack from his food ball.

species typical behaviors. As long as the weather is fair and dry, simply broadcasting the pig's ration across the back yard is a good way of requiring the pig to forage for its food. Many owners of pet pigs spread the pig's ration in its rooting box each day. Other devices such as the Manna Ball (Be Sure Training, PO Box 225, Carnation, Washington, 98014) can also be used to force the pig into working for its food. The Manna Ball is a large plastic ball with small holes in it. Pig feed is placed inside the ball and as the pig pushes the ball around, the feed falls out. Some pet owners have constructed similar devices using rodent exercise balls and even plastic water or soda pop bottles. Using a drill to make appropriate sized holes in the container, the pet owner can make an inexpensive food ball that can be disposed of when it gets defaced (Fig. 5).

Several studies in commercial swine indicate that pigs provided with environmental enrichment in the form of toys spend less time lying and sleeping and exhibit a lower level of aggressive behavior.^{7, 57} The implications of this for people keeping pigs as pets has not been thoroughly studied but suggests that providing pigs with an environment where they can perform more natural behaviors will result in a healthier and better behaved pig.

Training and Handling

Early, gentle handling of piglets is necessary to decrease their fear of humans.⁴⁹ A piglet purchased from a reputable breeder will have had some handling but will need to be carefully socialized before accepting handling calmly on a routine basis by its new family. Pet owners should be prepared for the fact that piglets routinely squeal when picked up,

especially if lifted with hands around the thorax or abdomen. Sows, unlike dogs and cats, do not pick up and carry their babies. Only a predator will carry a baby pig, so lifting the piglet should be limited once it is settled in its new home. Pigs are highly food motivated so socialization can begin with the new owner sitting on the floor next to the piglet while it eats and touching it gently. Once the pig continues eating while being touched, progress to stroking, then manipulating various body parts such as ears, feet, and tail. With time, the pig can be held in the lap while eating and eventually be lifted in the arms, but this entire process can take several weeks.

All pigs should be taught to wear a harness and leash (Fig. 6). Few pet pig owners are capable of carrying a fully-grown potbellied pig. Training the small pig to wear a harness and walk on a leash is much easier than attempting this with a fully-grown pig. Although not impossible to leash train, a fully-grown pig will be a more enjoyable pet if it can be transported easily when necessary. A well-socialized pig that walks on a leash is also a much more tolerable veterinary patient.

While the pig is being harness trained and is still small and easy to



Figure 6. A potbellied pig on harness and leash.

handle, it should be taken as many places as possible and exposed to many different sights, sounds, people, and animals. Obviously, in order for this to have a positive effect on the young pig, these experiences should be pleasant ones. Healthy treats should be kept available for strangers and visitors to offer the pet pig.

All pet pigs should be taught some basic obedience commands or tricks (Fig. 7). This establishes a foundation for leadership exercises. Once the pig knows a command such as "sit", it can be asked to sit before receiving anything it wants. Similar to the "Nothing in Life is Free" program used to establish leadership with dogs, this is a benign method for teaching the pig that the owner is in charge. Pigs can be extremely demanding, manipulative pets, "training" their owners to feed them on demand by squealing and whining at all hours of the day and night. Ignoring this behavior from the beginning is critical to establishing an appropriate relationship with the pig and may go a long way towards preventing future aggressive problems. The command-reward system is an excellent means of doing this.

Teaching the pig a variety of different tricks or behaviors that it can perform on command is also another means of keeping it mentally stimulated. The pig is an intelligent animal that can quickly learn new tasks, especially when rewarded with food. Continually teaching it new tasks is an excellent way of giving the pig an appropriate outlet for its curiosity and strong exploratory drive.

Proper discipline of the pig is also critical in order for it to learn acceptable rules of behavior. The pig should never be struck around the face or snout. Not only will this teach them to fear human hands



Figure 7. A pig shaking hands on command.

reaching towards them, it may actually promote snapping. In the pig social structure aggression is usually met with aggression. The pig also has extensive nervous innervation in its snout, similar to that in a human fingertip, suggesting that a blow to the snout may be extremely painful.⁵¹ Research shows that pigs do not respond well to being slapped or spanked, a technique many pet owners have tried with poor results.²³

Appropriate discipline of the pet pig requires an immediate and strong response to a threat such as snapping, butting, or charging. In many instances, a sharp "haaghhh" combined with stomping the feet and clapping the hands is enough to interrupt aggression in the pet pig. Actually chasing the pig from the room may be necessary, however, in order for it to recognize that it has "lost" the fight.

Remote punishment with shaker cans or squirt water bottles may be useful when teaching the pig to stay away from objects or areas that the owner does not want the pig near. The best way to train the pig not to bother certain items, however, is simply to keep them out of reach and praise the pig whenever the owner sees it manipulating its own toys or bedding. Squirting water or using the shaker cans in the face of an aggressing pig may be ineffective. The motivation to behave aggressively appears to override the effects of a relatively mild form of punishment such as noise or water.

TREATING BEHAVIOR PROBLEMS

As is the case with most behavior problems, prevention is easier than treatment. The longer a behavior problem has been going on, the harder it will be to change because the behavior has been learned and strongly reinforced over time. A pig that has become increasingly aggressive over a period of years will be very challenging to treat, and unfortunately this is a common situation.

If the pig is not so large or aggressive that it can do real harm to its owner, then you may suggest the use of the "shoulder shove." This is simply a dominance gesture that the pet owner can direct towards the pig that is threatening. The owner should use the base of the palm to apply enough force to the pig's shoulder to push it aside and to even push it off its feet if possible. The shoulder shove is not intended to hurt the pig but rather to express the owner's dominance in a way that the pig may recognize. If the shoulder shove succeeds in terminating the pig's aggression, the owner may still want to run the pig out of the room and confine it alone for a few moments before allowing it to rejoin the family. This social isolation could be the most effective form of punishment for an animal as sociable as the pig.

If the pig is so aggressive that he or she cannot be handled at all, then a swine board can be used in response to the pig's aggression. When handling commercial swine, the swine board has been used effectively to terminate an aggressive event.²³ The board is held against the

pig's shoulder and neck and used to press the pig against a fence or wall until it relaxes and walk away.

Severe cases of aggression in potbellied pigs should be referred to a specialist in animal behavior whenever possible.

SUMMARY

Pigs are clean, intelligent, and entertaining animals. Because they are domesticated animals, they are not even as unusual a pet as a hedgehog or snake. The animal lover that buys a pig on impulse, however, is likely to have a disappointing experience. Those who acquire a pet pig with the most common preconceived but inaccurate notions are even more likely to be quickly disenchanted with their "exotic pet." Many pet owners will complain of the size that their pig attains; but if the pig were more manageable and better behaved, its ultimate size would probably be of less concern. Given the proper environment, diet and veterinary care, the miniature pig can be a terrific pet.

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