

Backyard pig stuff cow vets need to know

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Abstract

Veterinarians develop and maintain skills allowing them to serve communities in a diverse set of ways. This is an opportunity and privilege, but can sometimes be daunting. Since graduating veterinary school in 2019 I have spent nearly every aspect of my professional career focused on swine – swine production, nutrition, safety of feed supply, etc. With a well-rounded education, knowledge and skills are still present, albeit likely in a disorganized manner in my mental filing cabinet. Bovine practitioners in the course of their routine clinical practice likely will be faced with the dreaded “show pig” question at some point in their career. The base skills of the bovine practitioner should serve as a solid foundation, and with some additional reading and a few phone calls you should feel comfortable with the quality of medicine and services you can provide to swine clients with non-commercial operations. The goal of this manuscript and presentation is to highlight some of the key areas of swine medicine that bovine practitioners should be familiar with to best serve their diverse set of clientele. These include a brief overview of the production and show pig industries, bugs and drugs, and a short list of important procedures to be aware of that with some practice can readily be incorporated into your skillset. Terrific resources exist elsewhere and this is certainly not a single source for all relevant information, rather intended to be a refresher of key concepts to guide communication with small scale swine producers and owners.

27 **Key Words:** porcine, show pig, swine

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29 **Introduction**

30 The swine industry is very diverse. Numbers are readily available summarizing numbers
31 of pigs in commercial production and the US currently has approximately 6 million commercial
32 sows with 75 million hogs and pigs at any single point. This equates to roughly 120-130 million
33 market animals produced per year. This, however, does not capture the smaller and yet important
34 segment of the industry representing backyard and exhibition swine. Numbers are not as readily
35 available for this segment, but as many would know if visiting the local fair or based on phone
36 calls to the clinic there are many small holding swine operations in the countryside. This creates
37 challenges and opportunities for the veterinary community. The commercial swine industry is
38 well-served with a strong veterinary community who use evidence based decision making
39 processes to best manage health and welfare of large populations of animals. The smaller
40 industry, however, often relies on local practitioners with a mixed animal focus or relying of
41 veterinary expertise that includes little, if any, swine experience. This is what makes the
42 veterinary profession exciting and yet daunting at times (particularly as recent graduates, a
43 category in which I would consider myself also!) when faced with questions that push the
44 boundaries of our knowledge. The goal of this presentation is to summarize key aspects of swine
45 veterinary medicine to take back to your practice and feel more confident with your ability to
46 provide quality service to swine owners of all sizes.

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48 **Swine industry overview**

49 Before digging in further, it is relevant to briefly discuss and have a base understanding of
50 the swine industry in the United States and globally. The US is a major global player in swine
51 production, producing approximately 11% of the worlds pork. China is the largest swine
52 producer globally with roughly half of the world's pigs being raised in China. The European
53 Union ranks second in pigs raised, and the US is the 3rd largest swine producer globally. With
54 this production of roughly 120-130 million pigs per year, export markets are a very important
55 market and currently roughly 30% of all pork produced in the United States is exported to other
56 countries with some of the major export partners being Mexico, Canada, and Japan. Developing
57 and maintaining this export market is critical for success of the swine industry as well as allied
58 industries that provide support extending as far as grain producers. It is estimated that the US
59 Swine industry uses approximately 1.7 billion bushels of corn and 11.2 million metric tons of
60 soybean meal, representing a cost of approximately \$12.9 billion annually (National Pork
61 Producers Council).

62 Why does this matter? If a foreign animal disease such as African swine fever virus
63 (ASFV) is detected in the United States, our export partnerships are immediately shut off. This
64 would have devastating effects on the swine industry and other allied industries. As
65 veterinarians, we serve as the boots on the ground evaluating, diagnosing, and prescribing
66 therapeutics to maintain animal health. Having an understanding of high impact diseases such as
67 ASFV is critical to effectively raise the red flag if abnormalities are observed. The commercial
68 swine industry would seem like a logical place where a foreign animal disease would first be
69 detected because of the large number of animals, but we also must recognize the often very
70 limited biosecurity practices that backyard swine producers can employ so many are of the
71 opinion we need to improve education of small producers to recognize abnormalities to increase

72 the speed at which a disease would be investigated, diagnosed, and actions be implemented to
73 prevent further spread. The backyard swine industry is much smaller than the commercial swine
74 industry. However, in terms of identification and response to significant disease incursions
75 represent a major concern. Mixed animal and “cattle vets” are important stakeholders in this
76 conversation. Thus, in addition to serving rural communities and being the one stop shop for
77 veterinary advice across multiple species, we are partners in protecting animal health.

79 **Refresher of key swine bugs**

80 This is not intended to be a comprehensive summary of bugs, drugs, pathology, and
81 practical field strategies to maintain swine health. We will briefly summarize key pathogens that
82 veterinarians in the field are likely to face. For a more in depth level of information, two
83 references I would recommend are: Diseases of Swine (11th edition) and the Swine Disease
84 Manual (5th edition). Diseases of Swine is the gold standard for detailed information covering
85 just about every aspect of swine health in great depth. The Swine Disease Manual is written in
86 much simpler terms and I find it a terrific resource to a 2-3 page summary of a specific disease
87 and I would highly encourage those wanting to learn more about swine disease and incorporate
88 swine medicine into your practice the Swine Disease Manual should be on your desk!

89 Two common clinical presentations that veterinarians in the field will often face include
90 enteric disease – diarrhea or looseness, and respiratory disease. Diarrhea comes in all shapes,
91 smells, textures, and colors which can provide some preliminary indication regarding etiological
92 cause. A common etiology often leading to diarrhea in pigs from birth until a few months of age
93 includes *Escherichia coli* (*E. coli*). *E. coli* can be isolated with high frequency even in animals
94 without clinical disease, but a variety of virulence factors can result in clinical disease and this

95 diagnostis is often established using multi-plex polymerase chain reactions to look for genes
96 associated with shiga toxin, heat labile toxin, heat stabile toxin, etc. Other pathogens of interest
97 resulting in enteric disease include rotavirus, coronaviruses (porcine epidemic diarrhea virus,
98 transmissible gastroenteritis virus, and porcine deltacoronavirus), *Salmonella*, and ileitis (caused
99 by *Lawsonia intracellularis*). Practicioners working with swine clientele should be familiar with
100 these etiologies including clinical presentation, diagnostic strategies, and mitigation strategies
101 both including prevention and therapeutic interventions when necessary.

102 Respiratory disease is also very common both in commercial swine production and
103 backyard production. Key viruses to be familiar with include porcine reproductive and
104 respiratory syndrome virus (PRRSV), influenza (influenza A virus), as well as bacterial
105 pathogens such as *Mycoplasma hyopneumoniae*, *Streptococcus suis*, and *Glasserella parasuis*.
106 Like many other situations, respiratory disease in pigs (often called porcine respiratory disease
107 complex; PRDC) is multifactorial in nature. Management practices such as air quality should be
108 thoroughly investigated in any situation where respiratory disease is the presenting complaint. In
109 addition to understanding management practices that may be contributing to the situation,
110 understanding of vaccination programs is an important area for veterianrians to have a base
111 understanding. Given the diversity of the swine industry, exposure risk, and goals, there is huge
112 diversity in vaccination programs used. A great resource has been put together by Iowa State
113 University providing relevant information for producers of all types (Iowa State University,
114 2023).

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116 **Other miscellaneous topics of importance**

117 Other areas of importance for the practitioner include understanding of the need of iron
118 injections for pigs shortly after birth. Pigs are born with marginal iron status, and without
119 supplemental iron pigs quickly become anemic. When pigs are housed outdoors or have access
120 to dirt, they generally are able to have enough iron intake to prevent this iron deficiency anemia.
121 However, if raised indoors young piglets will quickly become iron deficient and it is very
122 common to give a single or multiple iron injections shortly after birth. It is common to give 150-
123 200 mg of iron either in the form of iron dextran or gleptoforron within the first week of life.
124 Some research indicates a second dose may be useful, but my experience has been a single 200
125 mg dose of iron provided intramuscularly within the first week of life should be sufficient to
126 avoid iron-deficiency anemia.

127 Mycotoxins are another area of important where a baseline level of understanding is
128 helpful. A more robust description is available elsewhere, but some key things to remember is
129 that aflatoxin is important because the potentially carcinogenic nature of the toxin which the
130 Food and Drug Administration takes seriously and there are FDA Action Levels for aflatoxin
131 meaning it is illegal for feed manufacturers to sell feed that has levels above that threshold.
132 Fumonisin, deoxynivalenol, and zearalenone are also mycotoxins to be aware of. Fumonisin can
133 cause fatal pulmonary edema when fed at high enough levels and we experienced this first hand
134 in north-central KS around 2020. Deoxynivalenol is well known to reduce feed intake and even
135 cause vomiting which gives rise to the common name for the toxin of vomitoxin. Zearalenone
136 causes estrogenic-like effects so if having issues related to abnormal reproductive function
137 investigating for presence of zearalenone would be warranted.

138 Parasites are a big deal for backyard and exhibition pigs. Simply put, any time a pig has
139 contact with soil that has previously housed pigs they are at a much more significant risk of

140 parasitism. In modern, indoor swine production parasites are not of significant concern generally,
141 but when housed outdoors parasites are an important topic. Good resources are available online
142 summarizing parasites affecting pigs as well as therapeutic intervention recommendations based
143 on the specific parasite.

144 And finally, minor surgical procedures are well within the scope of general practitioners
145 skillsets for backyard pigs. Procedures as simple as ear notching and clipping needle teeth should
146 take very little reading to become familiar with and be able to perform. Castration, c-sections,
147 and repair of hernias (inguinal/scrotal, umbilical) are procedures that with some practice can be
148 incorporated into your practices. The success of C-sections in swine is not nearly as great as
149 other species and I am by no means an expert in this procedure, but reports of colleagues in the
150 field have reported well over a 50% survival for the sow which is highly successful. To perform
151 these various procedures, there are a large number of anesthesia/analgesic protocols available for
152 use. A common one combines Telazol, Ketamine, and Xylazine, although many others are
153 available. The key here is to find a combination that meets your requirements and can
154 accomplish your goals, then tweak that procedure as you go and become more familiar with the
155 effects in relation to the desired plane of anesthetic depth. Find one that works for you and tweak
156 from there.

157 As a veterinarian, you will likely be asked to help with animal health papers to allow
158 clients who may be taking animals across state lines to different shows. As a USDA accredited
159 veterinarian, this process is very similar to other species. Ensure you understand the
160 requirements for the state the animal will be travelling to and help the client understand what
161 requirements are needed to ensure a successful experience. Particularly with show pig clients,
162 this likely will be a common ask and should be fairly routine for you in clinical practice but

163 ensure you understand the requirements of the state receiving the animals as well as any specific
164 testing/certifications needed by the exhibition organizers.

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166 **Summary**

167 Swine medicine is an exciting field, with numerous similarities and areas of crossover
168 with other fields of the profession. Cow vets shouldn't be afraid of the "show pig" call. A base
169 level of knowledge is needed to provide a satisfactory level of care, although with available
170 resources this is very manageable with some practice and determination. Have access to good
171 resources, and find yourself a mentor who knows more about pigs than you do and don't feel bad
172 giving them a call. Life, and especially the practice of veterinary medicine, is a team sport!

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