

Washington Pork Producers

Newsletter

SAVE THE DATE

WPP SUMMER MEETING

July 6, 2018
Ritzville, Washington

Lunch begins at 11:30AM
Cow Creek Mercantile

1611 S. Smitty's Blvd Ritzville, WA (use exit 221)
(hosted lunch for individuals participating in the meeting)

Summer Meeting starts at 1PM in Room #1,
Washington Association Of Wheat Growers
109 East 1st Street Ritzville, WA

*Topics will include: the budget,
delegate selection for the 2019 Pork Forum,
Article of Incorporation proposed changes, and
Swine Information Day 2019*

**All Washington Pork Producers members
are welcome and encouraged to attend.**

PUBLIC NOTICE BY WASHINGTON STATE PORK PRODUCERS ASSOCIATION AND THE NATIONAL PORK BOARD

The election of pork producer delegate candidates for the 2019 National Pork Producers (Pork Act) Delegate Body will take place at 1:00 p.m., Friday, July 6, 2018 in conjunction with a Board of Directors meeting of Washington State Pork Producer Association, in Room 1 of the Washington Association of Wheat Growers building, at 109 East 1st Street, Ritzville, Washington, 99169. All Washington State pork producers are invited to attend.

Any producer, age 18 or older, who is a resident of the state and has paid all assessments due may be considered as a delegate candidate and/or participate in the election. All eligible producers are encouraged to bring with them a sales receipt proving that hogs were sold in their name and the checkoff deducted.

For more information, contact Washington State Pork Producers Association, 2001 VanTine

Your WPP Board Members

Tom Cocking, President	509-595-8415
Paul Klingeman, Jr., V. Pres.	509-760-7170
Melanie Seidel, Secretary	509-628-0334
Jaime Sackmann, Treasurer	509-989-5970
Don Van Tine, State Contact	509-397-2694

NEWSLETTER EDITOR: Sarah M. Smith

Road, Garfield, Washington, telephone 509/397-2694.

U.S. Pork Producers Respond to Mexican Retaliation Tariff

Mexico today (06.05.18) levied punitive tariffs – 10 percent effective today, escalating to 20 percent on July 5 – on unprocessed pork (not including variety meats) in retaliation for tariffs on its metal exports to the United States. Mexico's decision follows similar retaliation in early April by China, which imposed additional 25 percent tariffs on U.S. pork, reducing live hog values by as much as \$18 per animal on an annualized basis. The following statement may be attributed to Jim Heimerl, NPPC president and a pork producer from Johnstown, Ohio.

"The toll on rural America from escalating trade disputes with critically important trade partners is mounting. Mexico is U.S. pork's largest export market, representing nearly 25 percent of all U.S. pork shipments last year. A 20 percent tariff eliminates our ability to compete effectively in Mexico. This is devastating to my family and pork producing families across the United States.

"We appreciate the variety of interests and issues the Trump administration is balancing in its trade negotiations with Mexico, China and other



countries. While producers are trying to be good soldiers, we're taking on water fast. The president has said that he would not abandon farmers. We take him at his word."

The U.S. pork sector sustains more than 500,000 jobs across rural America. More than 110,000 of these jobs are directly tied to exports of American pork.

www.nppc.org 06.05.18

U.S. Pork Exports Set New Volume Records in 2017: Pork Variety Meats Surpass \$1 Billion in Export

In 2017, U.S. pork exports recorded the largest year ever in volume, with sales to more than 100 countries around the world. U.S. pork and pork variety meat exports totaled 5.399 billion pounds valued at \$6.486 billion, up 6 percent and 9 percent respectively from 2016.

"Exports continue to be an important piece of the puzzle for adding to producers' bottom line," said Craig Morris, vice president of international marketing for the Pork Checkoff. "Recognizing the importance of exports, the National Pork Board recently approved nearly \$8.7 million for 2018 export market activities, the most significant financial investment of Checkoff dollars in international marketing efforts to date. With more high-quality U.S. pork available than ever, we are redoubling efforts to build on the momentum of the past year."

Pork variety meats were the shining star during 2017. Exports tied the 2011 record, with 82

percent of edible variety meat exported. Pork variety meat exports totaled \$1.17 billion, setting a new total value record and surpassing \$1 billion for the first time. Together, China and Mexico accounted for 86 percent of U.S. pork variety meat exports. In 2017, total edible pork variety meat exports added \$9.67 in value to every hog marketed, according to the U.S. Meat Export Federation.

U.S. pork and pork variety meat exports accounted for 26.6 percent of total pork production, with 22 percent of muscle cuts exported, in 2017. Export value returned an average \$53.47 per head back to producers, up 6 percent from 2016.

The top six markets by volume were Mexico (1.768 billion pounds), China/Hong Kong (1.09



production forecasts for 2019 indicate growth expectations for beef (+1.8 percent), pork (+3.1 percent), broilers (+2.3 percent), turkey (+0.9 percent), eggs (+2.1 percent), and milk (+1.3 percent). Conversely, veal production is expected to decrease by 2.1 percent, while no growth is projected for lamb. Compared to average annual growth rates for 2014-2018, 2019 forecasts for beef and turkey are projected to see higher growth than the 5-year averages of 1.2 percent and 0.4 percent, respectively. Pork, broilers, and eggs are expected to be about on pace with 5-year average growth rates of 3 percent, 2.3 percent, and 1.9 percent, respectively. The forecast growth rate for milk production is down from the 5-year average of 1.7 percent. Over the 2014-2018 period, veal production contracted notably, averaging annual decreases of 8.1 percent, but recent years and the 2019 forecast indicate a slowed rate of contraction. Similarly, in 2019, lamb, which had average annual declines of 1.3 percent over the past 5 years, is expected to maintain production levels consistent with 2018.

USDA ERS Livestock, Dairy & Poultry Outlook, LDP-M-287, 05.16.18



billion pounds), Japan (868 million pounds), Canada (459 million pounds), South Korea (382 million pounds) and South America (229 million pounds).

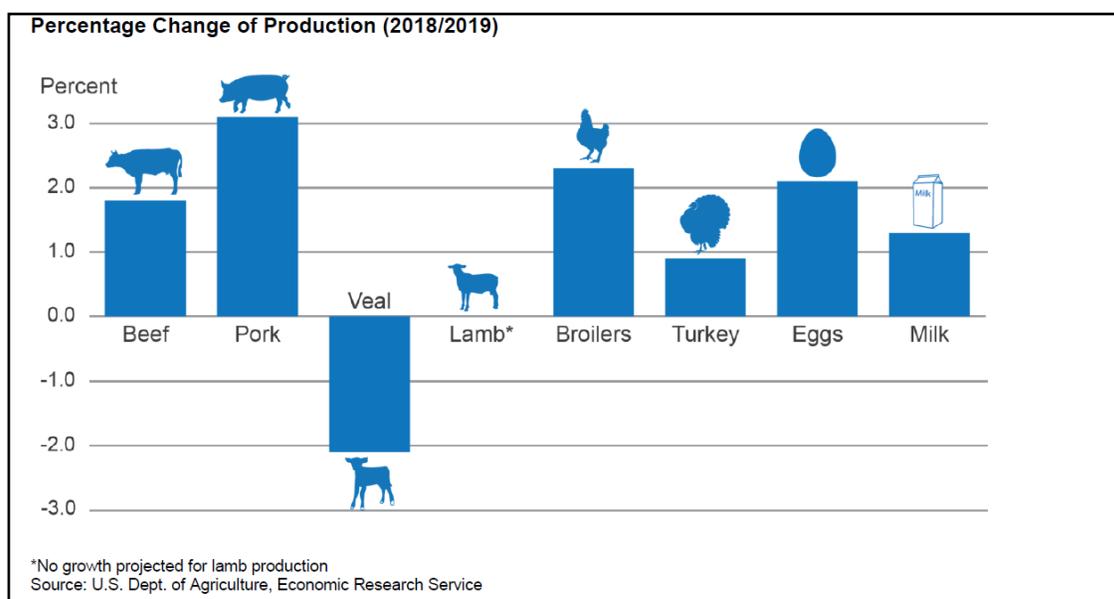
The top six markets by value were Japan (\$1.626 billion), Mexico (\$1.514 billion), China/Hong Kong (\$1.078 billion), Canada (\$792 million), South Korea (\$475 million), and South America (\$268 million).

www.pork.org, February 7, 2018

Strong Production Increases Expected in 2019

Ongoing expansion of U.S pork processing capacity—which began in late 2017 and is set to continue into 2019—will most likely lead to strong year-over-year increases in commercial pork production in 2019. Production is expected to increase almost 3 percent next year, to about 28 billion pounds. However, it is likely that hog producers will receive only slightly higher hog prices next year—despite enhanced competition from processors, bidding to fill new processing plants—as processors’ demand for hogs may be tempered by higher labor costs, while consumer demand for increased volumes of pork could be moderated by large supplies of competing meats. Prices for 51-52

2019 Forecasts: Production of Beef, Pork, Broilers, Turkey, Eggs, and Milk Expected to Increase



Don't Leave the Door Open to Ileitis

There are not many topics over which all pig farmers in the U.S. would agree, but two things they would agree on are: no one likes dead pigs; and the worst type of dead pig is a market-sized pig.

Death loss in market hogs is frustrating for farmers. It's difficult to move a market-weight dead pig out of a pen, and it's also a significant loss in feed, labor and animal health expenses when a pig goes on the compost pile instead of the truck. Because everyone agrees with these points, all producers need to have an ileitis plan in place the day a weaned pig arrives at their farm.

About Ileitis

Ileitis breaks generally occur in the weeks prior to and around the time of marketing. They manifest as both sudden death loss in good animals; and fall out, pallor and brown to red or black stools in the general population. Ileitis generally has significant costs in loss of pigs, medication of remaining animals, and changes to marketing plans to accommodate treatment plans and withdrawal periods. In general, ileitis breaks are some of the most costly disease issues I see regularly in the finishing period.

Tools are Available

The good news is there are many tools available for prevention of ileitis. These tools fall into two categories. The first is prevention via vaccination. There are two vaccines on the market for effective ileitis control. The second plan is a medication-prevention strategy. Medication plans are generally not my first choice for ileitis prevention. Based on research out of the Pipestone Applied Research (PAR) barn, medication plans are not as cost effective. In addition, with the pressure on the industry to be responsible when using antibiotics, it is difficult to justify significant use of medically important antibiotics when excellent vaccines are available. Having said that, I do believe there is a time and place for the use of preventative medication plans.



Preferred Strategies

My first recommendation is to use a vaccine strategy. Both vaccines, in my clinical experience, and from the Pipestone Applied Research (PAR) data, are efficacious. There are pros and cons to each.

The BIVI Enterisol Ileitis vaccine has been on the market the longest. It is extremely easy on labor to complete the vaccination process, as it is run through a water medicator. The person vaccinating the barn does need to be educated on the product and does need to follow certain protocols to make sure the product reaches the pig in an appropriate state. Because the product is a modified live vaccine, it cannot be run through the medicator at a time when there are any antibiotics in either the feed or water. There must be a non-medicated window in which to administer the vaccine.

The Merck Porcilis Ileitis product is newer to the market. It is administered via a 2 cc injection in the neck. Although the product requires more work in terms of labor, it does not require a non-medicated window to administer the product.

Depending on the facilities, care givers,

health status and a range of other factors, producers tend to choose one vaccine over the other and stick with it. My field experience is both are effective.

Don't Leave the Door Open

Despite the excellent tools available for mitigation of ileitis concerns, I am still involved with diagnosis and treatment of dozens of ileitis cases each year. Those cases are extremely costly to the caregiver and owner of the pigs. If you don't have an ileitis prevention plan in place at your finishers, please work with your veterinarian to develop one. Leaving the door open to such a costly and preventable pathogen is ill advised.

Written by Cara Haden, DVM, at Pipestone Veterinary Services. If you have any questions regarding ileitis control please contact her at cara.haden@pipestone.com or a swine specialist at 507-562-PIGS (7447).

www.porkbusiness.com, 06.05.18

USDA/CVB Issues Notice on Senecavirus A in Biological Products

The USDA's Center for Veterinary Biologics (CVB) recently issued [CVB Notice 18-05 Detection of Senecavirus A \(SVA\) in Veterinary Biological Products](#) to warn of potential contamination of swine vaccines.

According to CVB, Senecavirus A (SVA) is a single-stranded RNA virus belonging to the family *Picornaviridae* that causes blister-like lesions on the mouth, snout, and hooves in susceptible swine. These lesions, they note, are clinically indistinguishable from those caused by exotic agents including foot-and-mouth disease, swine vesicular disease, vesicular stomatitis, and swine vesicular exanthema. This virus was uncommon in the U.S. prior to 2015, but has become more prevalent since then, and is found as a contaminant in porcine trypsin and serum.

The CVB intends its notice to help ensure that veterinary biological product manufacturers who use ingredients of animal origin derived from swine are aware of the issue and can prevent the use of material that does not meet acceptable standards for purity and quality in the manufacturing process.

The CVB is now testing all Master Seeds and Master Cell Stocks that have been produced using

Use these Swine Health Biosecurity Control Points to ensure proper sanitation.

- **Cleaning:** This process involves removing all dirt and manure from equipment. It is an important step in the overall sanitation process, because some disinfectant products can be used up or inactivated by dirt and manure. Hot water and detergents, similar to those used for dish washing, may make cleaning much easier.
- **Disinfection:** Disinfectant products are chemical agents that inactivate or kill pathogens, such as bacteria and viruses, and should be used only when all visible manure and dirt have been removed. Always consult the disinfectant label claims regarding proper dilution and contact times and be sure to work with your veterinarian to make a decision on which product will work best for your situation.
- **Drying:** Drying is crucial to the process of equipment cleaning because drying kills many infectious organisms. Without including a drying step in your cleaning process, the risk of allowing infection to survive and multiply may increase.

Dehydration: The Need for Water

Dr. Marcia Carlson Shannon, University of Missouri

The Need for Water

Water is one of the most important and essential nutrients required by animals. Pigs require water for a variety of reasons, including proper function of cells, maintaining body temperature, moving nutrients into the body tissue, removing metabolic waste, growth, and reproduction. Water makes up approximately 80% of the empty body weight of a newborn pig and approximately 55% of a finishing pig. Water intake should be approximately 2.5 times the feed intake of the growing pig. Therefore, 0.3 gallons of water should be consumed per pound of feed consumed to maintain growth and health. Table 1 shows the estimated water requirements for pigs at different stages of production. These values are for pigs in a thermoneutral environment (comfortable temperatures) and under ideal conditions. Water needs may vary (as much as 50%) due to temperature, diet, housing, stresses, and frequency of water provided.

A reduced or restricted water intake will slow the growth rate of pigs. Protein deposition requires a large amount of water, but lipid (fat) deposition requires much less water. If not enough water is available for protein deposition then muscle mass and muscle definition will be affected.

Dehydration Issues

If water is withheld from a growing pig for more than 24 hours, it may result in salt poisoning. Salt poisoning is common in all ages of pigs and is related to a shortage of water. The same syndrome is seen when pigs consume feed or water with high concentrations of salt. The normal concentration of salt in the diet (0.4 to 0.5%) becomes toxic in the absence of water. The worst clinical signs and most deaths occur if unlimited water is given to pigs after a period of restricted water intake. Salt poisoning becomes more severe as the concentration increases.

Salt poisoning or water deprivation can occur following pump breakdowns, blockage of water lines and nipple drinkers or when pigs do not drink because the water is too warm or unavailable. Therefore, it should be a daily routine to check that all sources of water are adequate, free flowing and available.

Early signs of dehydration are thirst, constipation, skin irritation, and lack of appetite. Nervous signs follow, especially when unrestricted water is suddenly available after a period without water. Nervous signs include; ear twitching, aimless wandering, bumping into objects, dog-sitting, falling over sideways and apparent deafness and blindness. Affected pigs may move round in a circle using one foot as a pivot and may convulse. Convulsions re-occur with remarkable regularity at approximately seven-minute intervals.

Water should be reintroduced gradually to pigs that have been without water for more than 24 hours. When pigs become severely dehydrated, they need to be rehydrated gradually so that they do not drink large quantities of water quickly. Electrolytes in the water can help rehydrate affected animals. Pigs showing nervous signs need to be placed in a darkened area with bedding to help prevent injuries.

Dehydration Signs and Symptoms:

- Always check the water supply, especially if pigs are not eating
- Signs develop within 24 to 48 hours (thirst, lack of appetite and constipation)
- The first signs are often pigs trying to drink unsuccessfully
- Nervousness and pigs wandering around apparently

blind

Class of Pig	Water Intake*
Nursery (up to 60lb BW)	0.7 to 1
Grower (60-100lb BW)	2 to 3
Finisher (100-250lb BW)	3 to 5
Gestating Sows & Boars	3 to 6
Lactating Sows	5 to 7

- Incoordination



- Nose twitching just before intermittent convulsions
- Mortality is usually high

Table 1. Estimated Water Requirements of Pigs

*gallons per pig per day

County Fair/Youth Shows and Sales

All pig/market hog auctions/sales are required by law to have checkoff deducted from the sale of exhibitor's pigs participants at the first point of sale, based on the gross market value.

To determine the first point of sale for your fair's sale, please read the following scenarios as examples, which will help you appropriately deduct and remit checkoff.

- A. If the sale price is established with the packer prior to the sale, and the hogs are to be delivered to the packer (no hogs going to subsequent buyers). Checkoff is due at this point and is based on the selling price to the packer. Funds are then to be remitted by the packer after deducting from the exhibitor's check.
- B. A premium/award/scholarship sale would not require checkoff to be deducted, if your fair has only the exhibitor "go through the sale ring" and the hog has already gone to the packer. No checkoff would be due at this sale, as the packer would have remitted the checkoff yet deducted it from the exhibitor's payment. In this case the auction/sale bid price in total goes to the exhibitor.
- C. If the sale/auction is held in such a manner that the pig goes through the auction and, after it is sold, an option is given to the buyer to re-sell the pig to the packer and pay the difference to the exhibitor, checkoff is due on the amount the 1st buyer (not the packer) paid for the pig. Checkoff is due based on the auction sale value and is to be remitted to the NPB. (the packer's buyers should be informed that checkoff has been deducted and exempt you from another checkoff based on their purchase price).
- D. Checkoff is based on the gross sale price. Gross is the original full or first point of sale price paid. Therefore if at the initial sale of an animal the bid price is \$1 per pound that is the basis of which checkoff should be calculated. The second sale price, of say 40 cents per pound, is not to be assessed or used as the basis of the checkoff assessment.
- E. Terminal sales (all animals must go to slaughter) checkoff is generally withheld by the packer and submitted to the National Pork Board. A bid (floor price) is submitted by packer prior to auction, so this becomes the first point of sale, however private bidders can also have animals slaughtered at local

Youth Swine Producers. . .

Temperature Concerns for Pigs

With summer comes hot weather. Extremely hot temperatures not only impact your pig's comfort and well-being, but they can also greatly impact the animal's growth and feed intake. Proper management of animals during summer weather is critical.

Youth, parents, and leaders should pay close attention to management practices and the over-all well-being of their animals at temperatures above 75 degrees. However, the Thermal Danger Zone for animals and humans are temperatures above 100 degrees. Remember, animals kept outside without adequate shade are going to be in the Danger Zone when the thermometer on the porch reads 80-85 degrees.—Make sure your animals have adequate shade and provide cooling and ventilations systems when necessary to help keep animals comfortable.



Fans, air inlets, and water misting or drip systems can be very effective ways to help cool animals and their surroundings. Additionally, ensure pigs (especially white ones) can

either cover themselves with mud or access shade to prevent sunburn.

Try to minimize working/handling/feeding animals during the heat. Feed early in the mornings and at night after it has started to cool. **And most importantly**, make sure animals have access to an adequate supply of clean, cool water continuously. Pay extra attention to the temperature of water from hoses and where nipple valves are placed (if in the sun, both water and equipment will be too hot to encourage water intake by animals).

Transportation of animals in summer heat is very hard on them; not only because of the heat, but often trailers are hotter than the outside temperature and have limited airflow. Only transport your animal if absolutely necessary. Haul early or late to take advantage of cooler temperatures, do not make stops and unload immediately upon arrival.

Minimizing excess handling is also another way to minimize stress. Daily working with your pig for a short 5-10 minute period in early morning or late evening is adequate to achieve necessary training. Longer training times should be done in cooler morning or evening temperatures. Remember once an animal gets excited it can take 20-30 minutes for the heart rate to return to normal. --S. M. Smith, WSU Extension

New National Online Quality Assurance Program for All Sale Species

The National Pork Board has announced the transition of the Youth Pork Quality Assurance Plus (YPQA) to the new Youth for the Quality Care of Animals (YQCA), a multi-specie (beef, dairy, goat, poultry, rabbit, sheep and swine) program. This transition started in 2017 and the old YPQA is no longer available for certification.

Annually, youth food animal producers raise thousands of food animals that contribute millions of pounds to the U.S. food supply. Understanding how to produce a safe wholesome food animal product can only come from a comprehensive educational program focused on proper care and welfare of food animals.

Developed by a group of educators and livestock industry professionals, YQCA provides a science-based educational program that is accessible nationally for every exhibitor ages 8-21. Its framework enhances the educational experience of youth, improves the care of food animals and provides a

higher level of food safety to consumers. While embracing the founding principles that all quality assurance programs cover, YQCA has added information addressing animal welfare, such as daily health observations, proper use of medications, and establishing a valid Veterinary Client Patient Relationship (VCPR). Principal topic areas are similar across the species covered in the curriculum.

The Goals of YQCA:

1. Ensure safety and well-being of project animals produced by 4-H and FFA youth for showing and marketing.
2. Ensure a safe food supply to consumers.
3. Enhance the future of the livestock industry by educating youth on these very important issues so they can become more informed producers, consumers and/or employees in the agriculture and food industry.
4. Maximize the limited time and budgets of state and national youth program leaders to provide an effective quality assurance program.
5. Offer livestock shows a valid, national quality assurance certification for youth livestock exhibitors.

There is a \$12 fee for participating in the online training. Some have expressed concern about the cost. However, I would like to remind all that this is a cost of raising a food animal—just like buying feed, show supplies, etc. Also, these programs are essential and demanded by some of our major packing plants we supply animals to. With young producers and beginner 4-H leaders/parents often involved in the raising of these food animals, a solid educational program will not only build confidence with consumers purchasing your animals but will also help youth be better informed and raise a better-quality food animal. Participating in the YQCA Quality Assurance program for youth and food animal production is a win-win for everyone. I highly encourage everyone raising and exhibiting an animal that will be sold to produce food to go through the YQCA online program. To participate in the YQCA online program go to <http://yqca.org>.

In addition, producers, clubs/chapters, business, industry sponsors, or others that would like to support youth to participate in this program can go online

BOYS!
GIRLS!

RAISE BETTER PIGS

AND
EARN MONEY!




Thousands of Pig-Club Boys and Girls are earning money by raising pigs while attending school.

YOU CAN DO IT TOO

And it is pleasant work to earn money in this way. Get a good pig. He costs no more to feed, and gives you more pork than a scrub.

IT IS EASY TO START.

Any ambitious boy or girl between ten and eighteen years of age can

JOIN A PIG CLUB!




These clubs are conducted jointly by the United States Department of Agriculture and your State Agricultural College.

You should be a member. It costs you nothing to join and become eligible for the many prizes offered to Pig-Club members.

TO PARENTS:

Encourage your boys and girls to join a Pig Club. It will teach them to earn and save money, and give them a new and deeper interest in the farm. It will help keep them on the farm.

APPROVED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE

Approved: *S. H. Hurd*
Secretary of Agriculture

WRITE TO-DAY FOR FULL INFORMATION TO

DON'T DELAY—JOIN TO-DAY!

1915 USDA Poster inspiring young people to raise pigs.

There have been reports of whipworm diagnosis in 4-H/FFA pigs for summer fair. Historically, some youth have also experienced poor doing pigs and death loss as a result of whipworms infection. Whipworms have largely been removed from the commercial swine farms that are raised indoors on raised floors because they do not have access to contaminated soil or feces from other pigs.

Whipworm eggs can withstand severe cold, dryness, most chemical disinfectant and can live at least seven years in the soil. So even if youth only have pigs 4-6 months out of the year, infected pigs from previous years can infect newly introduced pigs to the facilities. Great care needs to be taken to not introduce whipworms to your facilities from other pigs or manure on shoes or equipment. Also, not all swine dewormers are effective against whipworms. To ensure proper diagnosis and treatment, consult your veterinarian. Below is information from Iowa State University Veterinary Medicine about

(<http://yqca.org>) and purchase the \$12 coupons and distribute to youth to take the YQCA program. If you have additional questions please feel free to email or call Sarah M. Smith, WSU Regional Extension Specialist at smithsm@wsu.edu or 509-754-2011, X4363.

Whipworm Infection

Occurrence

Whipworm, *Trichuris suis*, infections occur in domestic and feral swine; infection has also been reported in some primates, including man. Infection is relatively common in swine raised on pasture or in dirt lots. In the United States, whipworms were one of the three most prevalent internal parasites of swine, based on examination of several thousand fecal samples submitted to laboratories between 1988 and 1994.

All age groups are susceptible but most infestations occur in swine less than six months old. In adults, clinical signs can be induced when infection occurs in the face of severe stress. However, whipworms commonly infest adult pigs at a subclinical level and serve as a major source of infection for other swine. All major swine-producing countries have whipworm. Historical information

Whipworm infections were common historically when more swine were raised outdoors on pasture or in previously used lots. In situations where that method of production is still practiced, whipworm infection is still common. Rearing swine in a confinement setting, without access to contaminated soil or feces from previous groups, has led to elimination of whipworms as a significant problem for most producers. In outdoor operations, newer anthelmintics have allowed for improved control over this once-troublesome parasite.

Etiology

Trichuris suis is the etiologic agent of whipworms in swine. Mature female whipworms are six to eight cm long, and males are about half that length. The life span of adults is four to five months. The anterior two-thirds of the parasite is quite thin and, when seen at necropsy, is buried in the mucosa of the intestine; the posterior one third is visibly thicker and usually seen protruding into the intestinal lumen. Worms are not visible grossly until at least three weeks post-infection.

Microscopically, ova are approximately 65 by 25 µm, yellow to brown in color, double operculated, and easily recognized. Ova passed in feces become infective in three to four weeks. The prepatent period is seven to eight weeks but clinical signs can be observed within one to two weeks of severe infestation. Ova production tends to be sporadic and there are times when there are few ova in the feces.

Epidemiology

Although adult worms have a relatively short life span and lay ova only sporadically, ova remain infective in most environments for up to six years. This long period of survival tends to perpetuate the species, even if pasture

rotation is practiced. Adult swine tend to harbor low levels of infection resulting in a continual source of ova contamination in the environment.

Pathogenesis

After ingestion of larvated eggs, L3 larvae hatch and enter the mucosa of the anterior small intestine. The larvae reside there temporarily, return to the intestinal lumen for a period of time, then deeply invade the mucosa or submucosa of the cecum and colon. This penetration results in diffuse mucofibrinous to mucohemorrhagic typhlocolitis. Focal ulcerations may be complicated by secondary invasion of microorganisms that include salmonellae and the protozoan, *Balantidium coli*. Secondary infection often is an important part of the disease process.

The inflammatory reaction around the parasites results in edematous thickening of the wall of the gut and the formation of inflammatory nodules around some parasites. In heavy infections, a fibrinous pseudomembrane may form on the mucosa. Regional lymph nodes may be swollen as a consequence of drainage of toxic products.

Clinical signs

Clinical effects are directly related to severity of infestation and presence of concurrent diseases. Mild infestations are subclinical. Signs include anorexia, mucoid or mucohemorrhagic diarrhea, dehydration, and possibly death of severely affected animals. Signs are most apparent two to four weeks following exposure to contaminated facilities.

Lesions

During early stages (one to three weeks post-infestation) whipworms are not visible as they migrate within the mucosa. There is a mucoid to mucohemorrhagic typhlocolitis with excessive mucus, fibrin and blood on the mucosa. Lesions vary in extent from focal to diffuse and in acute stages, often resemble those of swine dysentery. The affected gut wall is thickened and edematous. Histopathology is required for diagnosis and will reveal the migrating larvae. Later, maturing whipworms become visible with careful gross examination. Worms often protrude from inflammatory nodules in the gut wall and purulent exudate may be visible around them. Gentle traction on parasites will free them from the gut wall, revealing the thin anterior end buried in the mucosa. Dilated lymphoglandular complexes should not be mistaken as lesions of either whipworms or nodular worms. Inflammation of the cecal and colonic walls can be quite extensive and severe even when only few adult worms are observed.

Diagnosis

Diagnosis is accomplished by necropsy of a typically affected pig. Mature parasites are easily found in the cecum or colon and can be identified by their size and whip-like form. Immature worms can cause severe lesions if numerous. They are much smaller than adults. For identification, they require careful observation, perhaps with the aid of flotation over a dark background or use of a magnifying lens. Extensive lesions of the immature worms in mucosal migrations closely resemble and must be differentiated from those of swine dysentery, salmonellosis and proliferative enteritis, any of which may be concurrently present.

The presence of ova can be determined by laboratory fecal examinations by seven weeks after infestation but clinical signs and lesions will often be quite severe before ova are present. The double operculated eggs are distinctive. However, ova production often is sporadic and there may be few or no ova in a single fecal sample. The number of ova found on fecal examinations may not be a reliable indicator of the number of worms present.

can
on



Control
Control
depend