

Notes on *Pasteurella multocida*

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The question was raised if anyone was familiar with the research done at the University of Oregon concerning *Pasteurella multocida*. I answered yes, I am familiar with the research conducted at Oregon State University, not the University of Oregon, Rabbit Research Center (OSURRC). I was at the center from 1981 until 1990 helping conduct some of the very research mentioned. Many of the things learned about *Pasteurella multocida* from that time has been presented in previous posts to Showbunny. Some bottom lines from that research:

There is currently no "cure" or viable vaccine for *Pasteurella multocida*. One reason it is a problem is that it resides in areas of the respiratory tract that has a limited blood supply. This reduces the ability of the immune system and antibiotics in the blood from completely killing off the Pasteurella. The numbers can be reduced by treating, but almost (notice I didn't say always) never completely removed. Did I mention that Pasteurella is a bacterium and not a virus? Antibiotics are effective against bacteria, which are alive, but not viruses, which technically speaking are not.

Pasteurella multocida can be carried in a rabbit without causing symptoms to be displayed. Usually the rabbit's immune system will keep the population in check. Events or conditions that reduce the rabbit's immune system tend to bring on outbreaks. This can be kindling, changes in weather, traveling to and from shows, poor feed, etc. So, healthy immune systems, proper sanitation and good ventilation can reduce the symptomatic cases of "snuffles".

In one study where we developed the ELISA test for measuring antibody titers for *Pasteurella multocida* we found that every herd (other than our own Pasteurella free herd) was infected with infection rates running 50-95% of the animals tested. Measuring antibody titers lets you know that rabbits have been exposed to Pasteurella and can give a reflection of an active infection (such as snuffles with a runny nose), but may not always tell you if the organism is present. Once exposed to Pasteurella, a rabbit will produce antibodies for the rest of their lives. That is one drawback to the ELISA test. However, the ELISA was more accurate at predicting rabbits that were carriers of Pasteurella than deep nasal culturing. There is a new test (one I am working on) that appears at this time to be even more accurate than either culturing or the ELISA. Another drawback to the ELISA is that it can't show a rabbit that has just been infected since it takes times for the antibody response to develop. Our test can find a single bacterium in a swab and has proved to be more accurate at detection than deep nasal swabs (naso-pharyngeal swabs).

Rabbits can be infected at birth. Studies at OSU on newborn kits showed that you could detect *Pasteurella multocida* in kits within an hour after birth. So yes, definitely an infected doe can pass on Pasteurella. Studies done elsewhere show that the most common form of spreading is direct contact (like the doe licking the young at birth). Interestingly, it may not be nose to nose contact. More likely the does pick up Pasteurella when they lick infected drinking valves, cage wire or their own fur. The first place to colonize with Pasteurella is the back of the throat, the naso-pharyngeal area. That is the place your nose drains into the back of your mouth. From there, it can spread into the nasal turbinates (the sinuses) where it is difficult to eliminate it due to poor blood supply. In one study, separating an infected rabbit from one Pasteurella free by as little as 12 inches prevented the spread from the infected doe to the non-infected doe. This was under laboratory conditions under the best ventilation and sanitation conditions, but suggests that it is spread by direct contact in the barn, like taking an infected doe to a buck and then each doe visiting the buck could be infected.

The best defense is to provide a sanitary environment for the rabbits to help their immune system keep Pasteurella in check. It is actually the rabbit's immune system (as is true of our own) that will control infections. All antibiotics do is slow down the multiplication of bacteria allowing time for our own immune system to build up to rid us of the pathogenic bacteria. Anything that aids the rabbit in having a strong immune system will help reduce the incidence of Pasteurella.

We found at OSU that you could select for rabbits that were resistant to *Pasteurella multocida*. Most likely these animals had a stronger, more virile immune system. Selection can therefore play a role in reducing the consequences of infection, but can't eliminate it completely. Pasteurella free herds can be developed, several exist in the US. Problem is that these rabbits, not having been exposed to Pasteurella for up to several decades, have little immunity to Pasteurella and may be more susceptible to infection. Selecting for healthy rabbits in a herd that carries Pasteurella is a far better approach to dealing with it than trying to treat all the rabbits. This is especially true if you are going to show and subject your rabbits to further exposure.

I know this has been long and I am sure I have left out a lot of what we did at OSU. I would be happy to answer any questions. As a P.S., I am glad some of you are finally spelling Pasteurella correctly. Louis Pasteur must be rolling in his grave every time it is spelled incorrectly.