Dr. Becker: So let’s talk a little bit about the killed virus that is mandatory in every state: rabies virus. Let’s talk about why some states have a one or three year option. Some of my clients think that the three-year vaccine is three times stronger, while some think it’s three times as much volume. Some people think it’s researched three times longer. If you could shed a little bit of light on what’s going on, that would be excellent.

The Rabies Vaccine

Dr. Schultz: Rabies is a really good example of a noninfectious vaccine. Prior to the mid-80s, all of our canine and feline rabies vaccines were modified live. One dose was adequate to immunize. We generally gave that dose at 12 weeks of age or older, when there was no maternally-derived antibody to interfere. In those days with the modified live, you would revaccinate each year, because they didn’t know whether or not the immunity was longer than that.

In the late 70s and early 80s, we had an episode occur in this country where some kittens being vaccinated in California came down with rabies. That caused USDA to rethink the approval of a modified life rabies vaccine. This may have actually been not the vaccine becoming virulent, but those kittens may very well have been severely immunosuppressed. They could have actually been infected with feline leukemia virus and/or feline immune deficiency virus. And that’s why they came down with rabies. But obviously when that happened, it was decided that modified live or infectious rabies would no longer be allowed. We then started switching entirely over to a noninfectious, killed, inactivated rabies product.

We never did change the vaccination program. We changed the vaccine, but not the program. My recommendations back in 1976, which I published then, in 1977, and 1978, when we switched from a modified live rabies vaccine to inactivated vaccine, we should give two doses two to four weeks apart, and then revaccinate in a year. But we didn’t. Fortunately, the rabies glycoprotein antigen in the killed vaccine is a very powerful antigen. They had to add something to that vaccine, which you generally have to add to most inactivated vaccines called an adjuvant.
An adjuvant is a very strong immuno stimulant, which provided enough stimulation to that glycoprotein to allow that one dose of vaccine to stimulate in a majority – not all – of dogs and kittens a protective response until another dose can be given a year later.

Generally, when you go much beyond about six to eight weeks between the two doses, you’ll have no immunity at all. For example, any of you who might use a lepto product, you would never go beyond six weeks between the two doses, because you wouldn’t have any immunity at all. That’s a very weak antigen compared to rabies.

**Thimerosal, Aluminum, and Adjuvants in Pet Vaccines**

**Dr. Becker:** Back to antigens. What are those? Could you go over the antigens that are added veterinary vaccines? Some of the antigens that have been included in human vaccines, like thimerosal, have been removed, but has that been the case in veterinary vaccines?

**Dr. Schultz:** There’s a number of different things added to various vaccines. One is a preservative, and thimerosal, which contains mercury, is a very effective preservative. It has been added to human vaccines for many, many years; it’s one of the most effective preservatives. We haven’t had thimerosal added to very many veterinary vaccines at any point. We do have other preservatives, but that was one that wasn’t used widely like it was in human medicine.

Thimerosal has become very much of a concern, because mercury – being one of a number of heavy metals – does have potential to cause adverse reactions and can be very toxic at high levels (neurotoxic in case of mercury at high levels). It’s one of the things that they have made an effort in human medicine to take out of all vaccines or reduce significantly. Right now, most human vaccines no longer contain that particular preservative. In veterinary vaccines, I’m not aware of any of them containing thimerosal, because we didn’t have that many in the first place.

**Dr. Becker:** And aluminum?

**Dr. Schultz:** Aluminum was part of and is still the most common part of human adjuvants. Alum is the adjuvant that’s added, and it’s the only one approved for human vaccines. Again, we have veterinary vaccines that have alum or aluminum in, but we have many other adjuvants in veterinary medicine. Veterinary medicine actually has always been far more ahead of the vaccine curve than human medicine. We have new vaccines, using new technologies that have been improved in veterinary medicine, and it’s still not approved in human medicine.

**Dr. Becker:** But there’s a lot more research.
**Dr. Schultz:** There’s more research that we can apply to veterinary vaccines. It’s not that they’re not doing that research for human vaccines; it’s just that they’re very slow to apply it. They can’t get approval for a lot of technologies and new adjuvants as quickly as we can in veterinary medicine.

The other advantage we have in veterinary medicine, which is very critical, and I hope as pet owners, you understand how important this is to your pet. That is the ability for us to do animal studies on a target species. So if I want to develop a new vaccine or drug for dogs, I want to do that work in dogs; I don’t want to do it in rodents, which is what you have to do for human vaccines until you can actually take it to a clinical trial. But it takes a long time to get there. It’s one of the reasons that we can move more quickly in veterinary medicine. And I think we can also make a better product – we can test it on 10 beagles, so we don’t have to test it on someone’s poodle.

**Adverse Vaccine Reactions in Pets**

**Dr. Becker:** Sure. Back to the adjuvants question, we see vaccine reactions in veterinary medicine. We see pets die from vaccines in veterinary medicine. You see, there are different types of allergic reaction: anaphalaxis, a secondary autoimmune disease, and long-term, progressive degenerative autoimmune diseases. First of all, are you able to see the correlation between overvaccination and an increase in autoimmune conditions in pets?

**Dr. Schultz:** I think there’s no question in both pets and humans – autoimmunity is more prevalent today that it was 20 or 40 years ago. I think there are multiple reasons for that. Without questions, vaccines would be one of those reasons. But there are also many intoxicants, many environmental pollutants, and many chemicals, and so there is a lot of factors in the environment that in what generally is a genetically predisposed individual – and that’s the important thing, for example, in immune-mediated or hypersensitivity type of diseases.

Genetics play such a key role. These other factors are triggers to cause in a genetically predisposed individual these immune-mediated diseases. It can be natural infection, vaccines, and all of those other factors. And so yes, we are seeing more of it in all of the species.

**Dr. Becker:** So if you have pets that have vaccine reaction, what are your recommendations? In my practice, we have a very minimalistic vaccine protocol. We do titer to make sure that it’s going to be effective. But if we’ve had animals that have vaccine reactions, it would be out of the question for me to continue to vaccine. I simply wouldn’t do it.

**Dr. Schultz:** That’s absolutely the approach that everyone should take. Now if it’s an adverse reaction to a core vaccine and you’ve already immunized, what you should be doing is a titer. And if there is any titer measurable, don’t give that particular product again. If there isn’t,
you’re going to be almost obligated to make sure that the animal is protected against these core diseases. There are so deadly, and it’s very important to have immunity.

And you have a few options: you can pre-treat the animal depending on what the reaction is, but that would be no assurance that he won’t have another adverse reaction. You can switch products, and hope that it was something in that specific product you used initially. But that also won’t guarantee that you won’t have a reaction, because the animal may be, for example, hypersensitive to bovine serum albumin, which would very likely be in any manufacturer’s product.

**Dr. Becker:** And really, in the risks versus benefits, the risk would be high enough. Certainly, that would be something I would feel uncomfortable doing in terms of revaccinating a patient that has had a reaction, because the potential is there for a more significant reaction to occur.

**Dr. Schultz:** Certainly.

**Dr. Becker:** Now, back to the one-year, three-year rabies.

**Dr. Schultz:** Let me get back to that particular question. We want to make sure that the animal is immune to the core products. Now if that adverse reaction was to a non-core or optional product, which they very often are, quite honestly, the core vaccines are far safer than the non-core vaccines in terms of adverse reaction.

**Dr. Becker:** We’ll talk about why in a minute.

**Dr. Schultz:** My response is always “Forget about that particular vaccine.” If it happens to be lepto, Lyme, or injectible bordetella, don’t even think about giving it again.

**Dr. Becker:** That, to me, would be common sense approach, that if you have a patient with a significant reaction to a vaccine that your veterinarian is encouraging you to get –let’s say for protection against lepto – simply just don’t continue giving those injections. It would be counterintuitive to do so.