

MARKETING HEALTHY CALVES THAT STAY HEALTHY

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Too often I hear the following comment in regard to Florida and southern cattle - "they get sick."

Today's feedlot no longer wants calves that become sick. It requires too much time to treat a calf and it is too costly. In the past, many feedlots and stocker operations had access to short yearlings or yearling cattle. This type of animal required little attention and most generally stayed healthy. There are several reasons why it did:

1. Since it is older by the time it went to the stocker operation or feedlot, it had probably been vaccinated several times with various vaccines and had some protection against the various pathogens to which it would become exposed.
2. The calf was old enough when it was vaccinated at that time that it would have had no interference from passive immunity and should respond to the vaccine.
3. By the time the calf became a yearling, probably all of the unhealthy calves had died, so there were just the survivors left.

Today we no longer have the yearling cattle to put into the feedlot. We now must look at calves as the source of supply. Several things in the past few years have created this situation.

1. Cheap land and feed are no longer available that afford one to carry that calf another 6 to 8 months.
2. We have bred our cattle through improved genetics and selection so that we are now weaning a heavier and earlier maturing calf. We no

longer need to grow this animal out on roughage so that it will finish out at 1100 to 1200 lbs. in the feedlot.

Because of the improved genetics, the calf today can go directly into the feedlot to be finished. This is an advantage to the feedlot owner if the calf is healthy and stays healthy since:

1. A good calf will gain more economically than an older animal.
2. More pounds of gain can be put on a calf than on a yearling, which can add to the profitability.
3. The feedlots pens are filled for a longer period of time, which cuts down on the constant movement of cattle in and out of the lot.
4. We will have a higher quality product if it is finished by 14 to 16 months of age.

HOW DO WE MARKET A HEALTHY CALF AND KEEP IT HEALTHY?

The answer is we must begin immunizing the calf at an earlier age instead of waiting until it is weaned, shipped, or arrives at the feedlot.

Have you ever thought why a calf becomes sick that goes to the stocker operation or feedlot? Let's follow a calf that has just been taken from its mother and look at the changes and stresses it experiences.

First we take the calf from its mother. Up until now, it has a pretty easy life. It has had little, if any, exposure to pathogens. A truck takes the calf to the auction market, where it is then exposed to other calves. It then goes through the auction ring, is mixed in with other calves, loaded in a crowded

truck and is exposed to new pathogens while being shipped to a stocker operation or feedlot.

This calf originated in Florida, where the weather in the Fall and Winter is mild, but ends up in a western or northern feedlot 24 to 36 hours later, where the weather is not so kind.

At the feed yard, it is then run through the processing pens and chute, where it is vaccinated with from 4 to 10 antigens, dewormed, treated for lice and grubs, implanted, castrated if it is a bull, dehorned if it has horns, and then placed in a muddy pen on a different type feed and must drink out of an automatic waterer, which it is not familiar with. After all this, then we wonder why that calf became sick and why it died!

How do we overcome this? The answer is simple and forward. We must begin to immunize the calf prior to weaning and shipping. It must have some protection already developed when it gets exposed to new pathogens.

One can not vaccinate today and have protection tomorrow. It takes time to produce this protection.

WHEN DO WE START VACCINATING?

The first chance one has in Florida to start an immunization program on a calf probably is that the branding or marking time. The calf at this time is probably 2 to 4 months of age. In this age of calf, we sometimes have difficulty in immunizing it. There are several reasons why:

1. The calf is young and may have passive immunity, which interferes with the calf's ability to produce active immunity.
2. The calf's immune system is not as well developed as in the older calf, but it is capable of producing adequate immunity if it can respond to that vaccine.

WHAT TYPE OF VACCINE SHOULD I USE?

Before one starts vaccinating, remember these calves are nursing cows that are probably pregnant

or are being bred. Therefore, one should be careful in the type of vaccine they select.

There are several methods used today in the classification of vaccines. One method used is to classify them as Live or Killed. I personally prefer this classification.

When this classification is used, the term "Killed" means all components in the vaccine are killed. The vaccine does not replicate or produce an infection in the animal, which prevents shedding of vaccine virus. Also, there is no danger of introducing a contaminant into a herd since all components in the vaccine are killed.

Another classification of vaccines is to refer to them as being a replicating or a non-replicating vaccine. In this classification, all replicating vaccines are Live, because as the name indicates, the vaccine replicates or produces an infection in the animal. When this occurs, there is a possibility of the vaccine virus being shed from the animal receiving the vaccine to other susceptible animals. This could interfere with the fertility of breeding animals or could cause an abortion in a pregnant animal.

The non-replicating vaccines in this classification include both Live vaccines and all Killed vaccines. These vaccines do not create an infection in the animal or replicate. Some live vaccines included in this classification are the BRSV vaccine and the chemically altered IBR vaccine, as they are not supposed to replicate or create an infection in the animal.

I feel the classification of vaccines using this method is misleading because too many people have the impression that non-replicating vaccines are Killed vaccines. They are **not** Killed. They are Live vaccines and all components of the vaccine are Live, as they are produced by the same methods that all Live vaccines are manufactured. They have the potential of introducing a contaminant into a herd, which has occurred in the past from the use of non-replicating vaccines.

I feel there is no a place for a Live vaccine in a breeding herd because of the dangers of shedding

and the potential of introducing a contaminant into a herd. Because of this, the vaccines recommended here are Killed vaccines with the exception of the intranasal IBR, PI3 vaccine, which is Live and is regarded as being safe to use in calves nursing pregnant cows and cows being bred. However, some ranchers are hesitant to use this vaccine because, as mentioned earlier, of the danger of introducing a contaminant into a herd. After evaluating the differences in the types of vaccines available, the rancher must make the final decision as to what vaccines he or she wishes to use in his/her operation.

WHAT SHOULD WE VACCINATE FOR?

Appendix Table 1 shows recommendations for vaccination against various diseases at branding or marking time.

In Florida, one should definitely consider the use of an 8-way Clostridial bacterin. This bacterin contains antigens against 4 different types of Blackleg as well as providing protection against 3 different types of Enterotoxemia. It also contains an antigen to protect against Clostridial hemolytica or Redwater disease which is common in the Florida area.

At this time, we should also begin to immunize the calf against the viral pathogens that it may become exposed to. This includes IBR, BVD, PI3, and BRSV viruses. One should use only a Killed Virus Vaccine at this time for reasons stated earlier. If one has the choice of administering this vaccine in the muscle or subcutaneously under the skin, one should always select the subcutaneous route of injection.

Sometimes it is quite difficult to immunize a young calf against IBR because of the passive immunity it may have. This is why some people prefer to administer an intranasal IBR, PI3 vaccine at this time. Research has shown that in the calf that has passive immunity or circulating antibodies, it has the capability of replicating in the respiratory tract which then would establish memory so that this calf

when vaccinated with a Killed Virus IBR vaccine, will respond and produce active immunity. Remember though, it is a Live Vaccine (Appendix Table II).

At this time, one may wish to include in his/her vaccination program, a vaccine to protect against Pasteurella, Haemophilus, and Leptospirosis. I feel these are optional and should be left to the discretion of the owner and purchaser.

At this 2 to 4 months of age vaccination time, Brucellosis could be administered to the heifer calves.

IS A SECOND DOSE NECESSARY?

At 6 to 12 months of age, or at least 3 to 4 weeks prior to weaning or shipping, a second dose of vaccine should be administered if at all possible. All the vaccines given at 2 to 4 months of age should be repeated except for the intranasal IBR, PI3 vaccine, if it was originally used, and Brucellosis.

Appendix Table III lists the recommended vaccines to be given at this time.

There are several reasons why two doses of vaccine should be administered:

1. Most Killed Virus Vaccines and bacterins, as well as some Modified Live Viral Vaccines (BRSV and chemically altered IBR) require two doses of vaccine before the calf has adequate protection. The first dose starts the immune process but adequate protection is not achieved until the second dose is administered (Appendix Table IV).
2. Some calves may have passive immunity to various diseases when vaccinated at 2 to 4 months of age, which would interfere with the calf's ability to respond to the vaccine and establishing memory (Appendix Table V).

When one vaccinates at this later time, the passive immunity has dropped to a point that it no longer should interfere with the calf's ability to produce active immunity and establish memory.

This calf then, when vaccinated at the feedlot, would respond much sooner and produce a higher degree of protection since memory was established at the 6 to 12 months vaccination. If the calf was only vaccinated at the 2 to 4 month time frame and passive immunity was present, we would not have established memory at that time and the calf at arrival at the feedlot would be starting at square one, where it would take considerable time to provide adequate protection, which is too late to keep it healthy.

If a vaccination program is to be successful and particularly if one is going to keep a calf healthy, the calf must have the most protection when it is exposed to the most challenge. No matter how much protection an animal has, it can be overridden with exposure (Appendix Table VI).

In summary, to successfully market healthy calves and to keep them healthy at the feedlot, the vaccination program must begin while the calf is nursing its mother. The calf should receive two vaccinations prior to weaning or shipping.

One vaccination would be better than none as, in many cases, we would have begun the immune process and established memory in the calf so that it would respond sooner at its final destination to the vaccine given there.

If one waits until the calf is shipped, and the vaccination is then begun, we are as the old saying goes, "a day late and a dollar short." I repeat, you do not vaccinate today and have protection tomorrow. It takes time to produce this protection. That is why we must start the vaccination of calves while they are still on their mothers.

I have had the opportunity this last year to follow 32 loads of calves that originated in Florida and were sent to a feed yard in Nebraska that were on a similar vaccination program as presented in this paper. The health of these calves has been excellent and the performance of them has been satisfactory. The cattle are now ready for slaughter and the death loss on these calves is 0.28% of 1%. This is excellent when one compares the death loss in these calves to those of heavier calves that were sent to feedlots in Texas, Oklahoma, and Kansas (Appendix Table VII) which shows that the death loss on these calves range from 1.15 to 2.06%.

APPENDIX

Table I. Calf Vaccinations 8 Weeks - 4 Months (1st Vaccination)

- 1) Intranasal IBR-PI3-(Optional)
- 2) IBR-BVD-PI3-BRSV-KV
- 3) Clostridial 7 to 8 way
- 4) Brucellosis - (Heifers)
- 5) Haemophilus? - (Optional)
- 6) Pasteurella? - (Optional)
- 7) Lepto-5 - (Optional)

This table shows the vaccines that can be administered at branding and marking time. Notice some are optional and should be used at the owners discretion.

Mean IBR virus antibody titers in four groups of calves vaccinated with various vaccines.

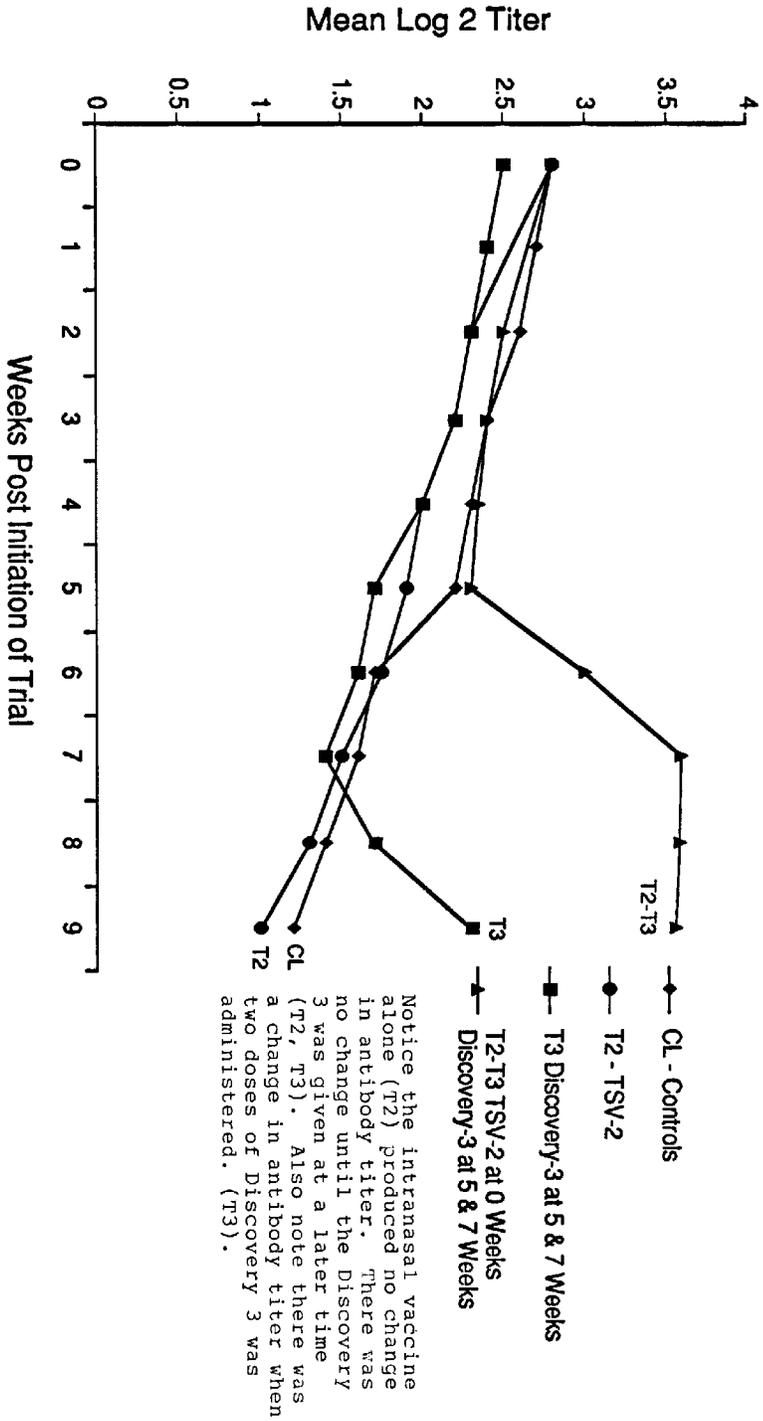


Table 2. Mean IBR Virus Antibody Titers in Four Groups of Calves Vaccinated With Various Vaccines.

Table III. Calf Vaccinations 6 Months - 12 Months (2nd Vaccination)

- 1) IBR-BVD-PI3-BRSV-KV
- 2) Clostridial 7 or 8 way bacterin
- 3) Haemophilus somnus? - (Optional)
- 4) Pasteurella? - (Optional)
- 5) Lepto-5 - (Optional)

All vaccines given at branding or marking time would be administered a second time prior to weaning or shipping for best results, except the intranasal IBR-PI3 vaccine if it was administered initially.

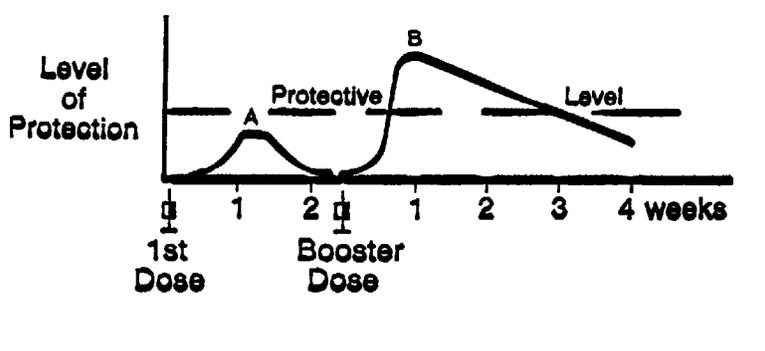


Table 4. Level of Protection

In a calf that has not been vaccinated previously, the first dose of vaccine establishes memory only. The second dose when given a minimum of two to three weeks later, then gives a boosting effect which produces a much higher level of protection.

Immunization of the Young Calf

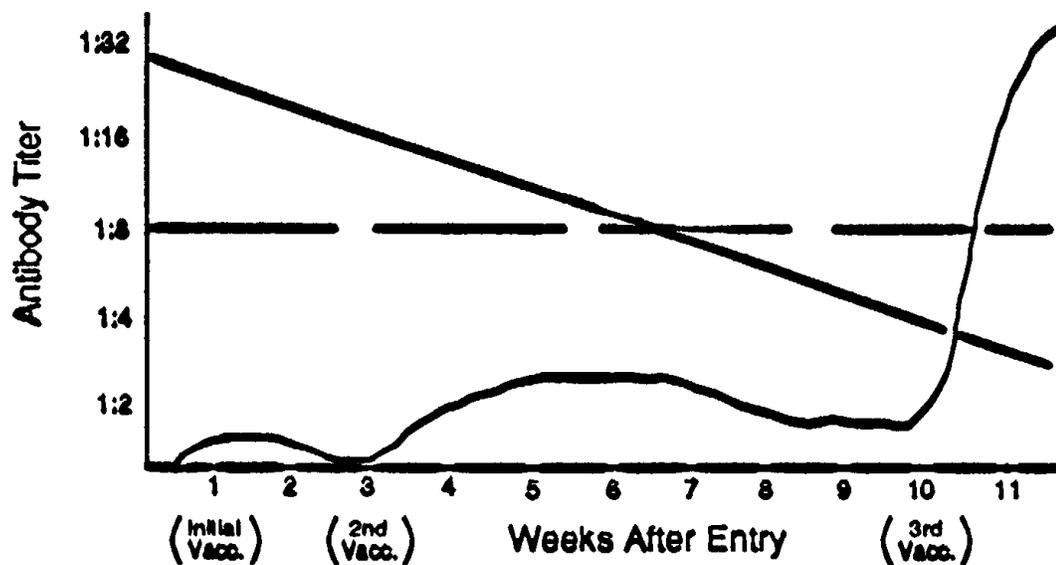
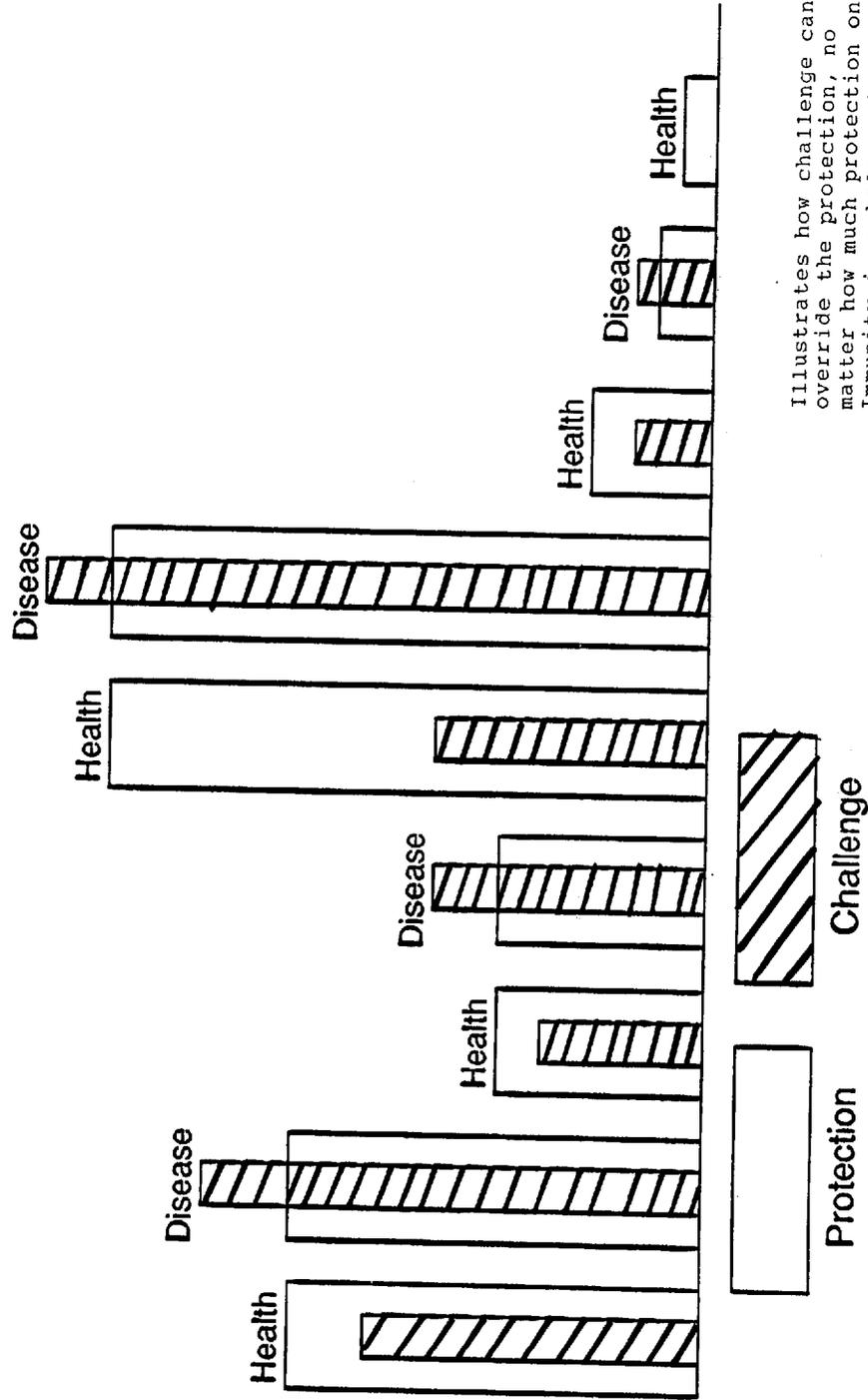


Table 5. Immunization of the Young Calf

This table shows show passive immunity interferes with immunizing a young calf. High passive immunity would interfere with a calf establishing adequate memory from the first dose. A second dose could at that time establish memory because the passive immunity had dropped to a level that no longer would interfere with the calf responding to the vaccine. By establishing memory with the second dose, this would enable the calf to respond sooner when it was revaccinated at the feedlot or collection point.

Protection vs. Challenge = Health? or Disease?



Illustrates how challenge can override the protection, no matter how much protection one has. Immunity is a balance between protection and challenge.

Table 6. Protection vs challenge

Table VII. Close Out Data of Feedlots in Kansas, Oklahoma and Texas

No. of Feedlots	No. of Head	Av. Daily on Feed	Av. Daily Gain	Cost of Gain	% Dead
350	68,780 Av. wt. 678#	164	2.79	.5499	1.29
237	40,108 Av. wt. 669#	146	2.59	.5672	1.15
51	8,204 Av. wt. 634#	203	2.94	.5436	2.06

This table shows the percent of death loss various feed yards in Texas, Oklahoma, and Kansas. Notice this is considerably higher than in the Florida calves that were vaccinated before weaning and shipment that were sent to Nebraska, which had only a 0.28% death loss.