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**Animal Health
Fact Sheet**

VACCINATION PROGRAM FOR BEEF CALVES

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Beef 40

Vaccines are an important tool to use in herd health programs for the protection of animal health. However, vaccines do not prevent all disease by themselves, and should be used in conjunction with good management practices. The timing of vaccination and selection of product are important considerations. It is best to use vaccines as part of a total herd health program. Your veterinarian, who understands the local and current conditions, is an important advisor for any health program or vaccination schedule you plan to implement.

CRITICAL CONTROL POINTS

There are four critical points for calf health before vaccines are even considered. These are nutrition, care of the newborn, sanitation and housing.

It is critical that the cow receive adequate nutrition during the last 60 days of gestation. This is especially true for first calf heifers. The nutrients for the cow that are of special concern for calf health are protein, energy, vitamins A and E, and the trace elements, especially copper, selenium and zinc. After birth, the calf must continue to receive adequate nutrients. This is particularly critical during winter (cold weather) to provide the calf with energy for body heat.

Newborn calves should nurse their dam well or receive 2 quarts of good quality colostrum within the first 2 to 6 hours of life. If calved in a corral, the navel should be clipped to 1 inch and soaked in iodine. In cold weather, dry the calf off and provide supplemental heat or cover with a "calf jacket" to help conserve its body heat. Calves are not able to control their body heat well during the first few days of life and are very susceptible to cold stress which decreases their ability to absorb colostrum antibodies. If calving on the range, select an area with adequate brush and tree cover for windbreak and precipitation protection. Or, provide "calf-huts" for this protection.

It is critical that the environment for the new calf is clean for its birth and early life. Calving on the range usually provides this cleanliness, unless the cows are concentrated into "snow-yards," etc. For confined calving, the maternity stall must be thoroughly cleaned after each delivery. In addition to being clean the housing must be, and remain, dry. It must also be well ventilated (not drafty) or calves placed there will die from pneumonia in spite of other efforts that are made.

It is important to move the recently calved cow/calf to a clean, new location. Put similar age calves together and do not mix with calves that are 2-3 weeks older. Keep the groups small (10 to 25 pair) until the calves are 3 weeks old.

GOALS OF VACCINATION

A number of different vaccines and vaccine combinations are available for cattle. Carefully consider those which are really needed for your operation as you select from those available. The multiple brand names and combinations of products can be very confusing. This will be less of a problem if you decide what specific diseases or organisms you want to vaccinate for and then begin to select from the products available. Also, consult with your herd veterinarian.

Vaccines are not 100% effective to 100% of the animals vaccinated, but they do increase the level of immunity in a herd and the relative resistance of individual animals. The goals are to protect the calf against potential disease agents, begin to provide protection for the calf's entry into the adult herd and to increase or at least maintain the level of herd immunity.

Some vaccine products require that two doses be given; one as a priming or beginning dose and a second or booster dose 3 to 4 weeks later. Little protection is provided by some vaccines until 1 to 2 weeks after the second dose of vaccine is given.

VACCINES TO STRONGLY CONSIDER

1. The vaccines for clostridial diseases are available in various combinations of from two to eight agents. These diseases are common and usually cause sudden death with little time for treatment, so vaccination is usually recommended.

| | |
|-----------------|--|
| Blackleg | <i>Clostridium chauvoei</i> |
| Malignant edema | <i>Clostridium septicum</i> |
| Black's disease | <i>Clostridium novyi</i> ; <i>C. sordellii</i> |
| Enterotoxemia | <i>Clostridium perfringens</i> Type C and D |
| Redwater | <i>Clostridium haemolyticum</i> |

2. Four viral agents commonly cause respiratory or reproductive problems:

| | |
|------|--------------------------------------|
| IBR | (infectious bovine rhinotracheitis) |
| PI3 | (parainfluenza type 3) |
| BVD | (bovine virus diarrhea) |
| BRSV | (bovine respiratory syncytial virus) |

All of these diseases commonly occur in beef cattle and basic herd protection should be provided. Both modified live virus (MLV) and killed (inactivated) products are available and both types should be considered in a vaccination program. Some MLV products may cause abortion and fetal defects if given to pregnant dams. Only specifically designed and approved vaccines or killed vaccine products should be given to pregnant dams or animals mixing with them. Some of the fetal effects of BVD infection can be prevented with a good vaccination program. All replacement heifers should be vaccinated with at least one dose of a MLV, BVD product at 4 to 8 weeks prior to breeding. Additional doses, prior to that, may also be of value.

3. Leptospirosis has not been as common in recent years, but is still present in Utah. It is advisable to have a reasonable level of herd immunity to this agent. Several strain combinations are available, but it is usually best to use the five-strain type of vaccine to provide a broad spectrum of protection.

4. Brucellosis has been essentially eliminated from all cattle in the U.S. However, it is still present in some wildlife (elk and bison in the Greater Yellowstone area). Regulations in some states still require vaccination before cattle can enter. Currently, the decision on whether to vaccinate for brucellosis depends more on the plan for use or marketing of the heifers than for disease control. This vaccine must be given by an accredited veterinarian, when the heifer is from 4 to 12 months of age and cannot be given later in life. A legible tattoo is essential.

OTHER VACCINES TO CONSIDER

A variety of other vaccines are available and the following may be considered for special situations which would warrant it. Consult with your veterinarian. Plan carefully to incorporate the initial vaccination and needed boosters into your vaccination schedule.

Scours vaccine (rota virus, corona virus, and E. coli with the K99 antigen)

Campylobacter (was called vibrio in the past)

Pasteurella (involved in pneumonia)

Pinkeye

Salmonella

Haemophilus somnus

Trichomoniasis

INJECTION SITE LESIONS AND BEEF QUALITY ASSURANCE

The injection of vaccines into muscle tissue commonly produces lesions and scar tissue which remain for life. Injections occasionally produce abscesses, which are even worse for carcass quality. The guidelines for Beef Quality Assurance should be followed.

1. When possible, select vaccine products which can be administered subQ (subcutaneously) and inject them in front of the shoulder.
2. If a product must be given intramuscularly, inject it into the muscles of the neck, in front of the shoulder.

Injections into the muscle masses of the rump and hindquarters have created great problems because of injection lesions in these sites. These cuts of meat from adult cull cattle are often used for sandwich meats and are not all just ground into hamburger as some producers suppose. Research has shown that vaccines given to baby calves (30 to 50 days of age) in these muscles of the rear quarters produce lesions that are still present at slaughter several months later. Even for calves, all vaccines should be administered in front of the shoulder.

CAUTIONS WITH VACCINE ADMINISTRATION

Be aware that anaphylactic (allergic) reactions are always possible when administering vaccines and be prepared with at least some epinephrine available.

Recent work has demonstrated that vaccines prepared from gram negative bacteria may contain sufficient amounts of endotoxins to cause clinical problems. Lepto, campylobacter, salmonella, E. coli and pasteurella vaccines could all be potential problems. It has been recommended that not more than two of these products be administered at one time.

Cattle tend to hold their body heat in hot weather and may be severely stressed by working them later in the day when it is hot and humid. Cattle should be worked in the early morning while it is cooler. Avoid working cattle if the temperature is over 85 degrees Fahrenheit with over 40% humidity, or at higher temperatures with lower humidity.

It has recently been reported that the use of an injectable type of MLV-IBR vaccine in calves under 5 days of age may result in a massive infection by this herpes type one virus. If calves are to be vaccinated at less than 5 days of age, the intranasal product should be used. Even for calves less than three months of age the intranasal product tends to give the best results because it is less affected by colostral immunity.

GUIDELINES FOR VACCINE CARE AND HANDLING

- Read the package insert and follow directions for the specific product used.
- If two doses are directed - give two doses, or there may be very little immunity.
- Calves vaccinated when under 6 months should usually be vaccinated again after 6 months of age.
- To obtain a benefit in the colostrum from vaccination, give the last prescribed dose of the vaccine at least 4 weeks pre-calving.
- Refrigerate and store vaccines as directed on the label. Use an ice cooler to protect vaccines while they are away from the refrigerator.
- Reconstitute only the amount of vaccine which can be used within an hour and then mix more later, as needed.
- Keep the reconstituted vaccine out of direct sunlight and away from excessive heat.
- Remember that some vaccines may cause abortion (IBR) and fetal defects (BVD). Read the label of the specific vaccine for precautions about use in or around pregnant animals.
- Always read the label and be sure the product is suitable for the animals to be vaccinated. If you are unsure, talk to your veterinarian or call the company directly, before you use the product.

WEANING

To reduce the illness rate at weaning and into the feeding period, it is preferred to wean the calves on or near the cow/calf ranch of origin for 30 to 45 days and complete the following procedures prior to extensive shipping and mixing with other calves.

- Castrate and dehorn (or tip) any calves previously missed.
- Continue vaccine programs 1, 2, or 3 as outlined below.
- Treat for internal and external parasites (including treatment for liver fluke, if needed).
- Adapt and adjust to water troughs.
- Adapt and adjust to feedbunks.
- Introduce and adapt to concentrate feeds.
- Provide coccidiostat for control of coccidiosis.
- Observe carefully for illness and treat early.

It must be recognized that this will require extra feed, facilities and labor. If the cow/calf ranch is not prepared to provide these, it may be best to ship the calves to a nearby backgrounding lot for this period of adjustment and post-weaning procedures.

EXAMPLES OF BASIC VACCINATION PROGRAM

| Timing | Vaccines Used | | |
|---|--|---|--|
| | Example 1 | Example 2 | Example 3 |
| 1-3 months of age | Blackleg / Malignant edema Enterotoxemia C & D IBR, PI3 (intranasal) Dehorn, castration | 7 or 8-way Clostridial vaccine IBR, PI3 (intranasal) Dehorn, castration BRSV, Pasteurella (If problem with summer pneumonia) | 7 or 8-way Clostridial Chem. Alt. MLV-IBR/PI3, K-BVD, MLV-BRSV Dehorn, castration |
| 4 weeks later | | Repeat of Clostridial vaccine BRSV, Pasteurella (if booster directed) | |
| 2-6 weeks pre-weaning | | Repeat of Clostridial vaccine Killed IBR, PI3, BVD, BRSV Pasteurella | Repeat of Clostridial Chem. Alt. MLV-IBR/PI3, K-BVD, MLV-BRSV |
| Weaning | Blackleg / Malignant edema Enterotoxemia C & D MLV - IBR, PI3, BVD, BRSV | MLV- IBR, PI3, BVD, BRSV (Pasteurella - if booster needed) | MLV- IBR, PI3, BVD, BRSV |
| 2-3 weeks post weaning | MLV - IBR, PI3, BVD, BRSV | MLV - IBR, PI3, BVD, BRSV | MLV- IBR, PI3, BVD, BRSV |
| Replacement heifers at 8 months | Brucellosis | Brucellosis | Brucellosis |
| 1 month pre-breeding of replacement heifers | Blackleg / Malignant edema Enterotoxemia C & D MLV -IBR,PI3, BVD, BRSV Lepto (5 strain) | Repeat of Clostridial vaccine MLV-IBR, PI3, BVD, BRSV Lepto (5 strain) | Repeat of Clostridial vaccine MLV-IBR, PI3, BVD, BRSV Lepto (5 strain) |

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