APHIS Info Sheet

Veterinary Services
Centers for Epidemiology and Animal Health

VS

December 2009

(revised January 2010)

Vaccination of Cattle and Calves on U.S. Beef Cow-calf Operations

Vaccinations are an integral tool for preventing disease and for maintaining herd health. Vaccinations can improve overall herd health, resulting in decreased death loss and improved productivity. In addition, vaccinations can improve reproductive efficiency by reducing infertility, embryonic and fetal deaths, and abortions. Optimum vaccination programs vary by region, disease exposure, facilities, and other herd-specific variables. Factors such as sanitation, nutrition status, and concurrent infections must also be considered.

While nearly all operations would benefit from some sort of immunization program, vaccination protocols may vary considerably between individual operations. Protocols must be tailored to an operation's specific needs including, perhaps, the eventual marketing plan. The operation's veterinarian is in an ideal position to make optimum recommendations.

The U.S. Department of Agriculture's National Animal Health Monitoring System (NAHMS) conducted the Beef 2007–08 study, which focused on beef cow-calf health and management practices in 24 States.* These major beef cow-calf producing States represented 79.6 percent of U.S. operations with beef cows and 87.8 percent of U.S. beef cows.

One of the goals of the Beef 2007–08 study was to take an in-depth look at vaccination practices on the Nation's beef cow-calf operations.

General vaccination practices

Overall, almost 7 of 10 operations (68.9 percent) vaccinated any beef cattle or calves in 2007. Operations with 1 to 49 beef cows were less likely than operations with 50 or more beef cows to vaccinate any beef cattle or calves (table 1).

Table 1. Percentage of Operations that Vaccinated any Beef Cattle or Calves in 2007, by Herd Size

Percent Operations				
Herd Size (Number of Beef Cows)				
1-49	**50-99**	**100-199**	**200 or More**	**All Operations**
Percent	**Percent**	**Percent**	**Percent**	**Percent**
59.4	86.6	95.9	92.1	68.9

A higher percentage of operations in the Central region (90.7 percent) vaccinated any beef cattle or calves in 2007 compared with operations in the Southeast region (59.8 percent) [table 2].

Table 2. Percentage of Operations that Vaccinated any Beef Cattle or Calves in 2007, by Region

Percent Operations		
Region		
West	**Central**	**Southeast**
76.3	90.7	59.8

A relatively small percentage of operations vaccinated calves less than 22 days of age (11.7 percent) [table 3]. When calves in this age group were vaccinated, they were vaccinated most commonly against clostridial disease agents. Less than 10 percent of operations vaccinated calves in this age group with any particular vaccine type.

*** States/Regions:**
West: California, Colorado, Idaho, Montana, New Mexico, Oregon, Wyoming
Central: Iowa, Kansas, Missouri, Nebraska, North Dakota, South Dakota
Southeast: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Oklahoma, Tennessee, Texas, Virginia

Nearly two-thirds of operations (62.3 percent) vaccinated any calves aged from 22 days to weaning. As with younger calves, the most common vaccination was a 2- or 4-way clostridial vaccine (57.7 percent of operations). Approximately 3 of 10 operations vaccinated calves aged from 22 days to weaning for respiratory diseases such as infectious bovine rhinotracheitis (IBR) or bovine viral diarrhea (BVD) (29.6 and 33.1 percent of operations, respectively). Only 39.6 percent of operations vaccinated any cows for any of the listed diseases.

For cows, the most commonly used vaccine was for *Leptospira* (31.7 percent of operations) followed by BVD (28.1 percent of operations) and IBR (24.6 percent of operations). Less than one-third of operations (31.5 percent) vaccinated bulls for any of the listed diseases. Vaccination for BVD and leptospirosis occurred on approximately one of five operations (24.3 and 21.2 percent, respectively).

Table 3. Percentage of Operations by Type of Vaccine Used for Any Beef Cattle or Calves in 2007, and by Cattle Class:

	Percent Operations					
	Cattle Class					
Vaccine Type	Calves 1-21 Days	Calves 22 Days Through Weaning	Weaned Replacement Heifers Through Breeding	Bred Replacement Heifers Through Calving	Cows	Bulls
General (respiratory and/or reproductive)						
	Percent	Percent	Percent	Percent	Percent	Percent
Infectious bovine rhinotracheitis, rednose (IBR)	2.1	29.6	19.4	11.9	24.6	18.2
Bovine viral diarrhea (BVD)	3.0	33.1	25.1	13.7	28.1	24.3
Histophilus somni	0.4	16.6	9.3	5.3	7.9	5.5
Respiratory						
PI3V (parainfluenza 3 virus)	2.0	26.6	19.3	11.1	22.6	17.6
BRSV (bovine respiratory syncytial virus)	2.0	25.4	18.1	9.7	21.1	16.2
Pasteurella/ Mannheimia	1.2	12.6	5.9	3.0	4.5	3.1
Reproductive						
Brucella abortus	NA	6.4	14.8	2.8	1.0	NA
Leptospira	NA	10.5	19.9	15.1	31.7	21.2
Campylobacter (*vibrio*)	NA	NA	12.6	10.0	19.0	13.3
Tritrichomonas	NA	NA	0.7	0.9	1.0	0.7
Neospora	NA	NA	NA	0.4	0.3	NA
Clostridial						
Clostridium chauvoei (blackleg) and/or *Cl. septicum* (malignant edema) and/or *Cl. novyi* and/or *Cl. sordellii* (2- or 4-way)	8.1	57.7	24.8	8.1	14.5	10.1
Cl. perfringens C and D (enterotoxemia, overeating)	6.3	33.8	12.2	6.7	11.6	8.2
Cl. tetani (tetanus)	1.8	17.6	4.7	2.1	5.7	3.6
Digestive						
Rota/Corona	0.9	0.2	1.3	4.8	5.3	NA
E. coli	0.5	0.7	0.9	4.9	5.5	NA
Salmonella	0.4	0.0	0.1	0.5	0.3	0.0
Other						
Anaplasma	0.0	0.0	0.1	0.0	0.2	0.3
Johne's	0.0	0.0	NA	NA	NA	NA
Moraxella bovis (pinkeye)	1.3	10.7	4.9	3.0	4.7	4.9
Wart virus	0.0	0.0	0.8	0.1	0.2	0.0
Any	11.7	62.3	36.7	24.2	39.6	31.5

Summary

Over two-thirds of operations (69.4 percent) vaccinated some cattle or calves. Among the various classes of cattle and calves, calves aged from 22 days through weaning were the animals vaccinated most commonly; 62.3 percent of operations vaccinated some calves in this age group for some disease agent.

While vaccination can be considered costly to an operation, it can also be an effective risk-management tool. Often, when a new disease is introduced into a naïve unvaccinated herd, it can have devastating effects on pregnancy, calving, and weaning rates, and weaning weights. Producers should work with their veterinarians to assess the true risks of disease exposure and the tolerance for risk. Based on that information, they can decide an optimum vaccination strategy for their herd.

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