

Vaccination Program Guidelines for Dairy Cattle¹

J.K. Shearer²

Every dairy operation is different. Feeding practices, management styles, health care programs, and facilities vary greatly. Because of this, the degree of stress, patterns of disease resistance and pathogen exposure are variable and unique to each operation. Consequently, there is no "one size fits all" with vaccination programs, but all must be "tailor-made" to fit the individual needs of each dairy.

Further, not all vaccines on the market are completely or consistently effective (Table 1). In some cases duration of immunity is short, thus requiring frequent boosting to maximize protection. While this should not preclude the use of these vaccines when and where indicated, it should caution those with unrealistic expectations about disease control through vaccination alone. A case in point, pinkeye, caused by *Moraxella bovis*. Attempting to prevent pinkeye in cattle through vaccination alone, while ignoring fly control, is doomed to failure.

Table 1. Cattle vaccines generally regarded as being ineffective or only marginally effective.*

<i>Pasteurella hemolytica</i> bacterins
<i>Pasteurella multocida</i> bacterins
<i>Pasteurella hemolytica</i> vaccine (modified live, intradermally administered)
<i>Salmonella</i> bacterins
<i>Moraxella bovis</i> bacterins
Rotavirus-coronavirus (modified live virus) vaccine
<i>Staphylococcus aureus</i> bacterin-toxoids
*Adapted from Dr. C. A. Hjerpe, <i>Veterinary Clinics of North America: Food Animal Practice</i>, 1990.

1. This document was is Fact Sheet DS 67 of the Dairy Production Guide, published September, 1992, Florida Cooperative Extension Service. For more information, contact your county Cooperative Extension Service office.
2. Associate Professor, College of Veterinary Medicine, Institute of Food and Agricultural Sciences, University of Florida, Gainesville.

The Institute of Food and Agricultural Sciences is an Equal Opportunity/Affirmative Action Employer authorized to provide research, educational information and other services only to individuals and institutions that function without regard to race, color, sex, or national origin.
Florida Cooperative Extension Service / Institute of Food and Agricultural Sciences / University of Florida / John T. Woeste, Dean

Table 2. Cattle vaccines that are seldom needed or cost effective on the vast majority of ranches/farms in the United States.*

<p>Anthrax Vaccine</p> <p><i>Clostridium septicum</i> bacterins</p> <p><i>Leptospira grippotyphosa</i> bacterins</p> <p><i>Leptospira icterohemorrhagiae</i> bacterins</p> <p><i>Leptospira canicola</i> bacterins</p> <p><i>Clostridium botulinum</i> bacterins</p> <p><i>Clostridium novyi</i> bacterins</p> <p>Rabies Vaccine</p> <p>Tetanus Toxoids</p> <p>Erysipelas Bacterins</p> <p><i>Clostridium perfringens</i>, type D, toxoids</p> <p><i>Clostridium sordellii</i> bacterins</p> <p>*Adapted from Dr. C.A. Hjerpe, Veterinary Clinics of North America: Food Animal Practice, 1990.</p>
--

Still other vaccines are prepared against diseases which occur so infrequently that routine use would not likely be cost effective (Table 2). Thus, design of a vaccination program must take into consideration a variety of factors, many of which will require the advice of someone familiar with infectious disease problems on the dairy and those in the immediate area (neighboring dairies) or region. Under most circumstances, this places the herd's veterinarian in a uniquely qualified position as the best source of such information.

Factors to consider in designing a herd vaccination program should include the following:

1. age of sex of the animals
2. location of farm(s) on which cattle were previously located
3. location of farm(s) on which the owner intends to keep the cattle
4. disease histories of the farm(s) from which cattle have originated and same for the farm(s) to which they are being relocated

5. vaccination history of the cattle
6. disease history of the cattle
7. intended use of the cattle
8. length of time the owner intends to keep the cattle
9. is the herd open or closed? (is there movement of animals into and out of the herd; for example does the herd purchase replacements?)
10. the degree to which the herd is isolated from other cattle, such as neighboring dairies or ranches

In summary, the best vaccination program for a dairy is not the one that incorporates the most vaccines into its health care scheme. Instead, the best vaccination program for a herd is the one which employs vaccines for protection against the most probable infectious pathogens based on current as well as previous disease problems, management factors unique to the herd, and effectiveness of the vaccines selected for use.

Table 3. Guidelines for the vaccination of dairy cattle.*

Infectious agent	Disease syndrome	Type of vaccine**	Frequency of Administration				Annual booster
			Age in Months				
			< 1	< 3	< 6	12	
Brucellosis	abortion	ML			X		No
IBR/PI3***	abortion respiratory disease conjunctivitis vaginitis	MLV, CA, I	(X)	(X)	(X)	X	Optional
BVD****	abortion diarrhea	MLV, I		(X)	(X)	(X)	Optional
NETCHAT	immune suppression						
BRSV*****	Respiratory disease	MLV, I	(X)	(X)	(X)	(X)	Optional
<i>Leptospiriosis</i>							
<i>canicola</i>	abortion	B		(X)	(X)	X	Yes
<i>grippotyphosa</i>	abortion	B		(X)	(X)	X	Yes
<i>hardjo</i>	abortion weak calves	B		(X)	(X)	X	Yes
<i>icterohaemorrhagiae</i>	anemia	B		(X)	(X)	X	Yes
<i>pomona</i>	abortion weak calves	B		(X)	(X)	X	Yes
<i>Vibriosis (Campylobacter)</i>							
fetus	abortion	B			(X)	X	Yes
Vaccination strongly recommended for herds relying on natural service (bulls).							
* Disease agents and associated clinical syndrome(s), type(s) of vaccine(s) available, and suggestions with respect to age and frequency of administration are listed for major pathogens of dairy cattle. The specific needs of certain operations may require use of vaccines other than those listed herein. Readers are encouraged to consult their veterinarian for specific advice.							
** MLV = Modified Live Virus, ML = Modified Live, CA = Chemically Altered, I = Inactivated, B = Bacterins, T = Toxoids							
*** Infectious Bovine Rhinotracheitis/Parainfluenza virus.							
**** Bovine Virus Diarrhea.							
***** Bovine Respiratory Syncytial Virus.							
() designation that the vaccine may be used safely at this age if desired to meet the specific needs of individual operations.							

Vaccination Program Guidelines for Dairy Cattle

Table 4. Guidelines continued.

Frequency of Administration			Frequency of Administration				Annual Booster
Infectious Agent	Disease Syndrome	Type of Vaccine**	Age in Months				
			< 1	< 3	< 6	12	
<i>Clostridium</i>							
<i>chauvoei</i>	blackleg	B		(X)	(X)	X	Yes
<i>septicum</i>	malig. edema						
	gangrene	B		(X)	(X)	X	Yes
<i>novyi</i>	hepatitis	B		(X)	(X)	X	Yes
<i>sordellii</i>	hepatitis	B		(X)	(X)	X	Yes
<i>hemolyticum</i>	anemia	B		(X)	(X)	X	Yes
<i>tetani</i>	tetanus						
	lockjaw	T		(X)	(X)	X	Yes
<i>perfringens</i>							
C & D	sudden death						
	gangrene	T	(X)	(X)	(X)	X	Yes
<i>Haemophilus</i>							
<i>somnus</i>	encephalitis	B		(X)	(X)	(X)	Optional
	respiratory disease						
<i>Pasteurella</i>							
	Respiratory disease/ Shipping fever						
<i>hemolytica</i>	pneumonia	ML, B	(X)	(X)	(X)	Opt.	Optional
<i>multocida</i>	pneumonia	B	(X)	(X)	(X)	Opt.	Optional
<i>Moraxella</i>							
<i>bovis</i>	Pinkeye						
	keratocon- junctivitis	I	(X)	(X)	(X)	(X)	Optional
<i>Anaplasma</i>							
<i>marginale</i>	Anaplasmosis						
	anemia	ML, I	(X)	(X)	(X)	(X)	Optional
Wart virus	Warts	I	(X)	(X)	(X)	(X)	Optional

** MLV = Modified Live Virus, ML = Modified Live, CA = Chemically Altered, I = Inactivated, B = Bacterins, T = Toxoids