

The dairy industry continues to change as the quantity of farms decrease, while the numbers of cows per farm increase. This trend has triggered an increased risk for the entry of BVD persistently infected (PI) animals into the herd, in turn causing negative impacts on reproduction, health and performance due to infection. Individual sampling of all lactating animals is perceived by many in the industry to be cost-prohibitive. Now however, due to the sensitivity of real-time PCR testing and the large amount of virus shed in the milk by PI cows, **bulk sample testing** has made the identification of the BVD virus a cost-effective first step in identifying the presence of a PI in the milking herd.

In 2007, the National Animal Health Monitoring System (NAHMS) bulk milk tank tested 527 dairies across the United States. Their test results found a 1.7% positive rate over all, with large dairies (>500 hd) positive 12.8% of the time with a higher percent in western dairies (7.7%) vs eastern dairies (1.1%). Small dairies (< 100) had 0 positives and medium dairies (100-499) were 3.5% positive. They also found that 83% of dairy herds contained BLV-infected cattle and that 68% of were affected by Johne's disease.

From 2011 through 2013, in conjunction with Merck Animal Health, API undertook a similar bulk milk tank testing program targeting mostly larger dairies (>500 hd) from Vermont to California. The results from the program indicated that the incidence of infection had increased since NAHMS's 2007 study. The sample included 182 dairies of which 18% were positive (33/182), including 118 large dairies (>500 hd) where 28% (33/118) were positive.

The information has prompted our team at API to redouble our efforts to support the industry by introducing our **Bulk Tank Milk Disease Monitoring Program**.

Animal Profiling International Bulk Tank Milk Monitoring Program

Bovine Virus Diarrhea virus can cause three distinct disease states:

- **Reproductive:** Early embryonic death, Persistently Infected (PI), or a Congenitally (CI) infected calf
 - **Respiratory:** Immune suppression and Bovine Respiratory Disease (BRD)
 - **Digestive:** Diarrhea
1. PI cows are a constant source of BVD virus being shed to the environment
 2. Over 25% of large dairies tested have been found to have BVDv-PI positive animals
 3. BVD-PI cows in a dairy herd can cause losses in the range of \$20.00-\$88.00, per head

Bovine Leukemia Virus can result in:

- Reduced milk production and cow longevity
 - Immune suppression with nearly 40% of BLV-infected cattle developing persistent lymphocytosis
 - Just under 5 % of infected cattle will also develop malignant lymphosarcoma
1. BLV infected cows are a constant source of virus transmission to herd mates
 2. Losses to the US dairy industry due to BLV are estimated at \$285 million
 3. The subclinical impact of BLV infection on cow longevity is not included in the estimated cost of losses mentioned in item #2 above

Johne's disease (*Mycobacterium paratuberculosis*) can result in:

- Reduce milk production and cow longevity
 - Immune suppression resulting in chronic wasting
1. Johne's infected cows are a constant source bacteria in the environment
 2. Subclinical cases are the most common source of transmission to calves via colostrum
 3. Estimated losses to the U.S. dairy industry due to Johne's is over \$250 million, annually

Program Benefits

- Bulk tank milk samples can be used to screen large dairies to identify herds with lactating BVDv-PI cows, as well as herds with significant Johne's and BLV infection rates.
- String samples can be used to narrow the search to specific groups, minimizing the need for individual testing.
- Next business-day result reporting means operational decisions can be made quickly, minimizing the time for "clean-up" process.

Bulk Tank Disease Monitoring Charges

- Single Disease Profile, (BVDv-PI) = \$45.00/per sample
- Two Disease Profile, (BVDv-PI + BLV) = \$80.00/per sample
- Three Disease Profile, (BVDv-PI + BLV+ Johne's) = \$105.00/per sample

Examples

Example: Disease Clean-Up Process for BVD-PI

The investment associated with utilizing bulk tank samples to monitor a dairy is minimal (submitting three samples per year with up to 3,500 cows represented per sample).

- Bulk tank milk samples: \$45 per sample (up to 3,500 head per sample)
- Individual testing, pooled PCR: \$2.40 per head
 - Confirmation of positives: \$1.95

Example: Ideal Large Dairy Clean Up

Dairy	State	Size	Date	Sample	Sample #	Positive	Cost
My Milk	ID	5,000	11/5/2013	Bulk Milk	3	1	\$135.00
			11/8/2013	String Milk	10	1	\$450.00
			11/14/2013	Ear Notch	173	1	\$473.70
			12/20/2013	Bulk Tank	3	0	\$135.00
\$0.18	per head		10 days				\$893.00

Estimated Preventable Losses Due to the Presence Of BVD-PI Cows on the Dairy:

	100 cows	500 cows	3,500 cows	7,000 cows
Conservative \$20.00 per head	\$ 2,000.00	\$ 10,000.00	\$ 70,000.00	\$ 140,000.00
Median \$50.00 per head	\$ 5,000.00	\$ 25,000.00	\$ 175,000.00	\$ 350,000.00

Bulk Tank Milk Sample Collection Procedure



Milk from the bulk tank or string samples can be used to screen herds for the presence of a persistently infected (PI) BVD animal in the milking string. Bulk tank samples can be taken from up to 3500 cows and should be repeated quarterly to make sure all cows are represented in the milking string throughout the year. Sample should be from a well-agitated bulk tank and from the first milking. When string sampling, all animals should be inventoried accurately to make sure if a positive sample is found, the proper cows can be tested individually to find a target animal. Preserved samples may be used for testing and shipped without icepacks.

MATERIALS NEEDED:

1. At least 10 ml of milk.
2. Leak proof plastic container.
3. Shipping container with ice packs.
Note: Ice packs are not necessary if you are shipping preserved milk.

COLLECTION PROCEDURE:

1. Write date and # of animals on tube.
2. Maintain records of cows in string.
3. Include sample from hospital and fresh pens.
4. Maintain collected samples in a cooler with ice packs or in freezer prior to shipment.
Note: Ice packs are not necessary if you are shipping preserved milk.
5. Samples can be frozen right after collection to accommodate multiple samples on multiple days.
6. Include “**Client Information and Sample Submission Form**” with each shipment.

For questions, contact API Customer Support/Sales: (877) 278-1344 or sales@animalprofiling.com
Headquarters and lab: 6040 N. Cutter Circle, Ste. 317, Portland, OR 97217, (503) 247-8066, www.animalprofiling.com

Bulk Tank Milk Sample Submission Form

Operation Name: _____

Contact Name: _____
Last First M.I.Billing Address: _____
Street Address
City State ZIP Code

Office Phone: () _____ Mobile Phone: () _____

Office Fax #: () _____ E-mail Address: _____

Operation Type: Dairy

Send Results: (circle one) Fax E-mail

Invoice to: (circle one) Operation Vet

*Results will be emailed or faxed to you the next business day after samples are received.***VETERINARIAN INFO**

Veterinarian Name: _____ Clinic Name: _____

Veterinarian Address: _____

Veterinarian Phone: () _____ Veterinarian Fax: () _____

Veterinarian Email: _____

TEST TYPE: BVD, JOHNE'S, BLV *Select test to run. Indicate number of samples under selection.*

	Bulk Milk PCR	Sample ID and Notes
BVD		
JOHNE'S DISEASE		
BLV		

SHIPPING PROCEDURES**Monday through Thursday Shipments**

- Place samples and ice pack in insulated envelope or bag prior to packing in box during hot weather.
- Samples should be wrapped tightly and sealed to avoid samples being loose in the box.
- Include Bulk Tank Milk Sample Submission Form (this sheet) with shipment.

Shipping Methods

UPS, FedEx, DHL, U.S. Postal Service "Express" or Priority

SEND TO:
Animal Profiling International, Inc.
6040 North Cutter Circle, Ste. 317
Portland, OR 97217
Phone: 503-247-8066**Important!**

With a two-day shipment (U.S. Postal Service Priority Mail® or 2nd Day UPS or FedEx), it is best to mail on Monday, Tuesday or Wednesday. Samples mailed on Thursday or Friday will not be delivered until Monday.

SIMPLE STEPS TO TEST YOUR CATTLE

1. Call API for sample collection and shipping protocols.
2. Collect a milk or serum sample according to API instructions.
3. Ship the samples to the API laboratory according to instructions.
4. Results will be reported directly to you and/or your veterinarian.
5. Isolate and/or remove positive animals.

API will work with you and your veterinarian to design programs to best eliminate the costly effects of BVD.

ABOUT US

Animal Profiling International, Inc. is an American company dedicated to the improvement of animal health management through risk-assessment technologies and advanced animal identification systems. API has tested over 2 million head of cattle for Bovine Viral Diarrhea (BVD) and currently services clients in over 40 U.S. states.

API's industry experts provide the products and services that operators in the beef, dairy and food supply industries need to make their jobs easier, more efficient, and more profitable while upholding the company's goal of improving animal health, performance, and management techniques.

Bovine Viral Diarrhea (BVD)

Bovine Viral Diarrhea (BVD) virus continues to be the source of large losses in the dairy industry. Estimates based on studies show that a dairy with persistently infected (PI) animals can lead to losses of \$20-160 per head, annually.

The PI is the main source for the continued spread of the virus; its removal from the herd lessens the negative effects of BVD, including decreased reproduction, poor health and reduced performance.

According to 2007 National Animal Health Monitoring Service (NAHMS) data, BVD virus was present in bulk tanks in 12.5% of dairies with over 500 head and 3.5% of dairies with 100-499 head. Our current data suggests that PIs are present in 10-25% of U.S. herds depending on region and size of herd. Herds in areas where expansion is taking place have higher incidences of infection.

Q. WHAT IS BOVINE VIRAL DIARRHEA?

A. BVD is a virus that is transmitted between animals via direct contact, much like a human flu or cold.

Q. WHY IS IT SO SERIOUS?

A. BVD suppresses the animal's immune system, enabling other disease organisms to invade. Salmonellosis, coccidiosis and other opportunistic diseases are often more prevalent in herds with BVD.

Q. IS BVD INFECTION ALWAYS RECOGNIZABLE?

A. No. Calves that are infected as fetuses can become persistently infected (PI). PI animals typically show no visible signs of illness but will continue to shed the virus at a very high rate throughout their lives. These "Typhoid Mary" animals are the primary source for the spread of BVD infection in both cow herd and feedlot situations.

Q. WHAT ARE SOME OF THE COSTS ASSOCIATED WITH BVD INFECTION?

A. When a PI animal is present, studies have shown that additional expenses can cost up to \$120 per cow in the herd. These costs are due to treatments, spontaneous abortions, slow weight gains, low conversion rates, secondary illnesses and animal deaths.

Q. WHY SHOULD I USE API TO SCREEN MY ANIMALS?

A. API uses the industry's latest and most effective analytical methods such as Polymerase Chain Reaction (PCR) and Antigen Capture ELISA, providing 99% accuracy and next business-day results for quick decision making.

Q. HOW DO I KEEP BVD PI ANIMALS OUT OF MY HERD?

A. Follow a strict management schedule aimed at reducing infected animals while implementing a vaccination program that reduces the risk of disease.

**FOR MORE INFORMATION, OR TO ORDER,
CONTACT API CUSTOMER SERVICE:**

877.278.1344 or sales@animalprofiling.com

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The company has tested over 2.5 million head of cattle and dairy animals for BVD and currently services clients in over 40 U.S. states. In addition to BVD and BLV testing, the company also provides diagnostic services for the detection of Johne's disease, Mastitis, Neospora and pregnancy in cattle.

Bovine Leukemia Virus (BLV)

WHAT IS BOVINE LEUKEMIA VIRUS (BLV)?

BLV is caused by the bovine leukemia virus. It is mainly in the white blood cells and causes inflammation and dysfunction in lymph nodes throughout the body. 88.5% of dairy herds and 38.7% of beef herds are infected with the virus.*

HOW IS BLV SPREAD?

Once an animal is infected they are lifetime carriers and shedders. The virus is spread through animal to animal contact via blood, milk/colostrum and in-utero from dam to offspring.

WHAT ARE THE SIGNS AND SYMPTOMS OF BLV?

Weight loss, decreased milk production and downer cows. Most symptoms appear between 3-6 years of age.

IS BLV CURABLE?

There is no treatment. Animals affected get progressively worse and are culled or die.

HOW DOES BLV AFFECT MY HERD?

- Decreased value of cull cows. Leukosis tumors are the number one cause of condemnation at slaughter facilities.
- Cow longevity
- Milk production decreases as BLV herd prevalence increases
- Inability to sell breeding stock. Many countries that have chosen to eradicate the disease have placed import restrictions on U.S. cattle.

* USDA National Animal Health Monitoring Survey 1996

ABOUT THE BLV TEST

Animal Profiling International, Inc. uses an ELISA (enzyme-linked immunosorbent assay) for the detection of antibody to BLV. It is very accurate on either milk or serum. Test negative cows are BLV free.

API's service assists you in identifying infected cattle, allowing you to make informed decisions leading to the minimization of economic losses due to wasting and decreased milk production.

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API will work with you and your veterinarian to design programs to best eliminate the costly effects of Johne's disease.

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Johne's Disease

QUICK FACTS

- One in 10 animals moving through livestock auction facilities has Johne's disease
- Eight out of 100 U.S. beef herds are estimated to be infected with Johne's disease
- 68.1% of U.S. dairy operations are infected with *Mycobacterium avium* paratuberculosis (MAP), the bacteria causing Johne's disease
- Lost productivity due to Johne's disease is estimated to cost the U.S. dairy industry \$200 - \$250 million annually

WHAT IS JOHNE'S DISEASE?

Johne's (pronounced "Yo-nees") is an incurable wasting disease. It is an infectious bacterial disease of livestock that primarily affects the intestinal tract.

HOW IS JOHNE'S SPREAD?

The microbe can live in manure and/or water for over a year and can be spread to other animals in manure tainted food or water.

IS JOHNE'S CURABLE?

No, it is not curable and can be fatal. Infected animals need to be identified and removed from the herd to prevent continued spread of the disease.

WHAT ARE THE SIGNS AND SYMPTOMS OF JOHNE'S DISEASE?

Animals may have chronic diarrhea, weight loss and appear malnourished and weak. Signs of Johne's disease may not appear until years after infection.

ABOUT THE JOHNE'S TEST

Animal Profiling International, Inc. is an APHIS-Approved Laboratory for Johne's disease testing and uses a USDA approved ELISA (enzyme-linked immunosorbent assay) for the detection of *Mycobacterium paratuberculosis*-specific antibodies in serum or milk of cattle.

API assists you in identifying infected cattle and making informed decisions to minimize economic losses that come with wasting and decreased milk production.

The sensitivity and specificity performance, as well as the suitability for standardization of the ELISA technique, make it a preferred serologic method for antibody screening.

** USDA National Animal Health Monitoring Systems - Dairy 2007*

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BLV Dairy Testing Strategy

WHAT WILL BLV COST YOU?

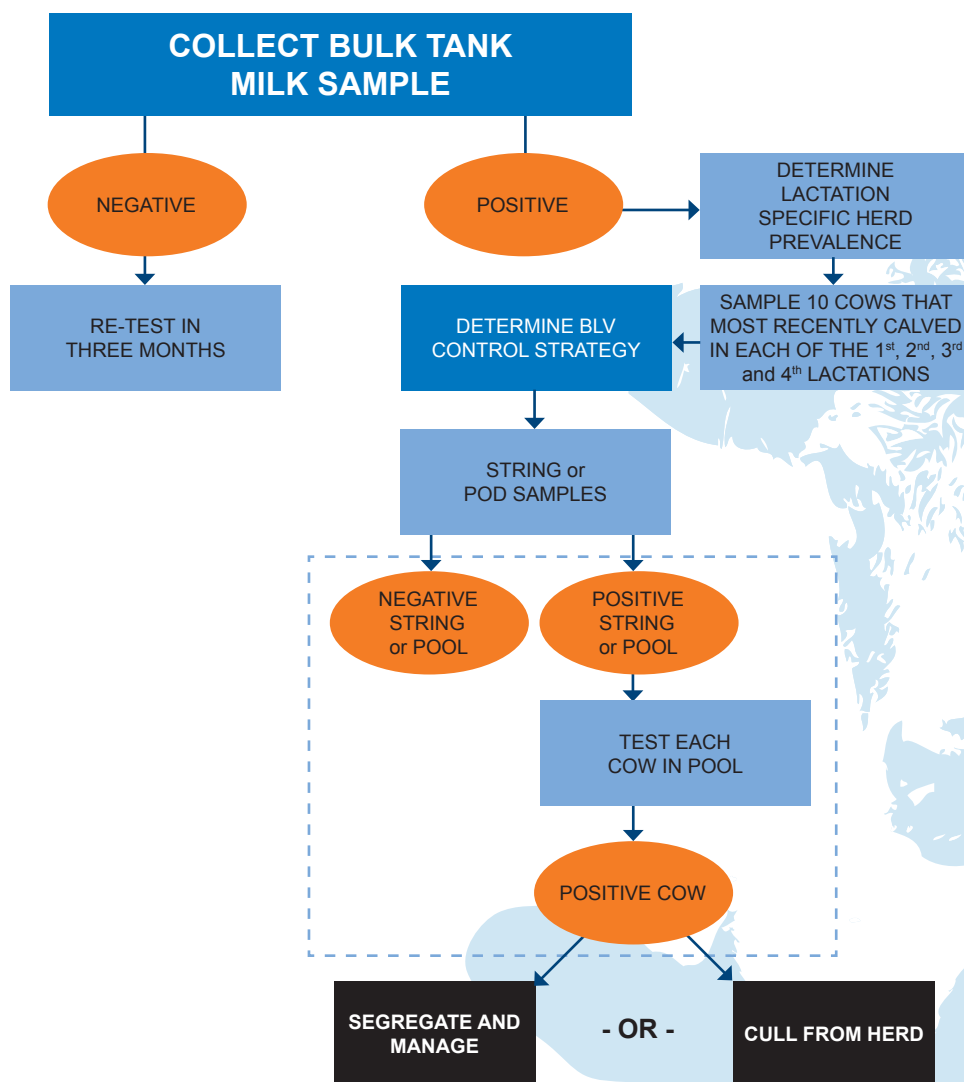
- Within herd, BLV prevalence rate range from 23%-46%
- Decreased milk production. 209 lb. of milk per cow/per year for each 10% increase in the herd prevalence
- Decreased cow longevity
- Estimated annual economic loss to U.S. Dairy Industry is \$285 million

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BVD-PI Dairy Testing Strategy

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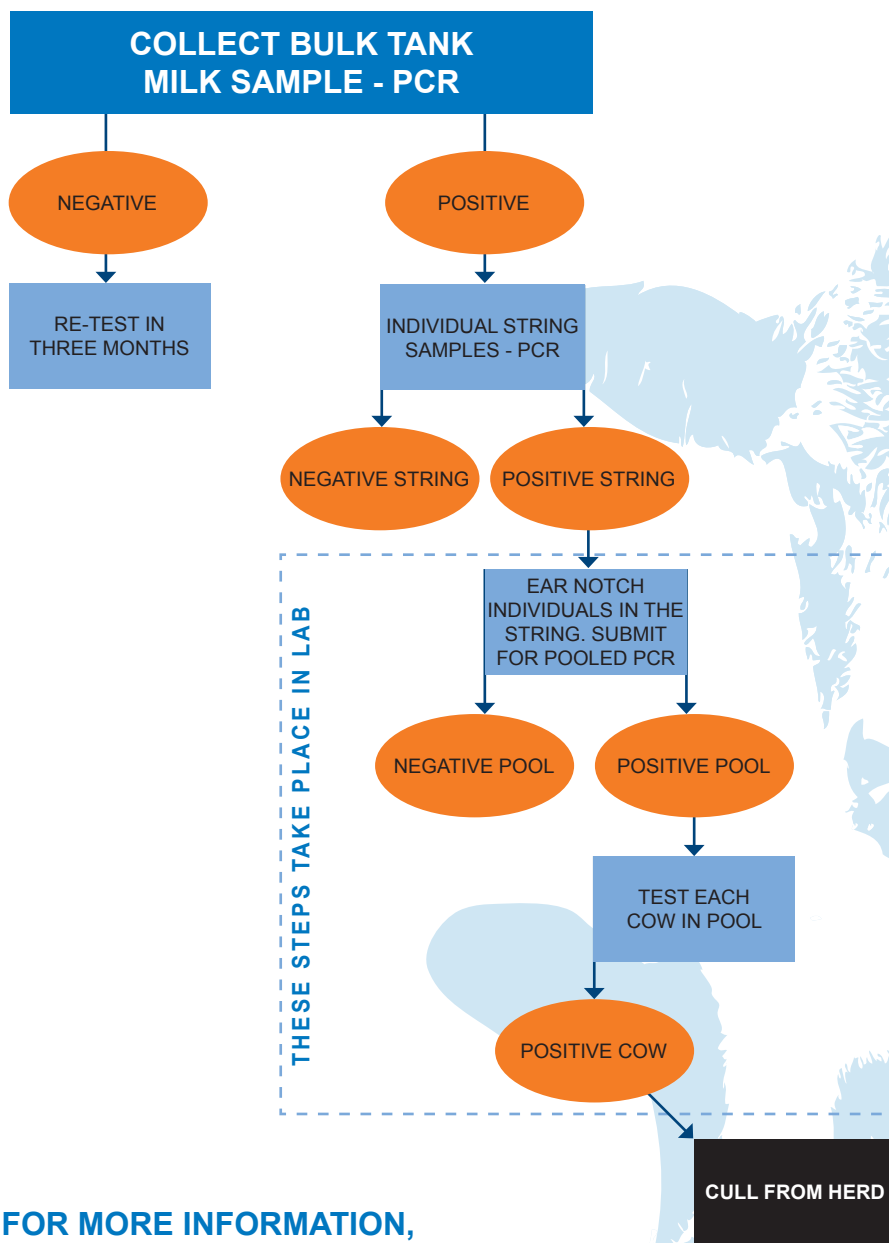
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- Our current data suggests that PIs are present in 10-25% of U.S. herds depending on region and size of herd.
- Herds in areas where expansion is taking place have higher incidences of infection.
- Estimated loss from BVD in a dairy is \$20-\$88 per cow, per year.

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