BOVIDIAR
(Rotavirus, Coronavirus, E. coli F5, and Cryptosporidium)

Diarrhoea is a major cause of morlity in young cattle under one month.
Bovine neonatal gastroenteritis is a multifactorial disease. It can be caused by viruses (coronavirus or rotavirus), by bacteria: (Salmonella, pathogenic strains of E. coli) or by protozoa such as Cryptosporidium.
Coronavirus and rotavirus are often associated with episodes of neonatal diarrhoea. Cryptosporidium is also frequently isolated in faeces, where it can be present in very high quantities. It can persist for a long period in the environment. F5-positive enterotoxigenic *E. coli* is frequently isolated in under-three-day-old calves, particularly in colostrum-deprived calves or in calves fed colostrum that is free of anti- *E. coli* F5 + specific antibody.
The diagnosis of the etiological agent of diarrhoea can be performed only in the laboratory because the clinical signs do not suffice to distinguish between these different microorganisms. It is possible to identify these agents by means of different techniques, including culture, staining, electron microscopy and floating techniques. However, these techniques are labour intensive, impractical and time consuming.
These classical techniques have rapidly been replaced by the ELISA technology because of its simplicity and limited laboratory equipment requirements.
The sensitivity and specificity of the ELISA technique for detecting these pathogens is at least as good as that of the more classic techniques, and the results are very similar. The ELISA technique is rapid and reliable and is particularly suited to the analysis of large numbers of samples.
Nevertheless, ELISA can be time consuming and expensive especially when small number of analysis has to be performed.
Chromatographic lateral flow immunoassay is becoming the gold standard for gastroenteritis diagnosis because of its simplicity, rapidity, sensitivity and specificity. Laboratory equipment required is limited. Results compared with classical techniques are rather similar in terms of diagnosis and strips are far easier to use.

Use of the kit

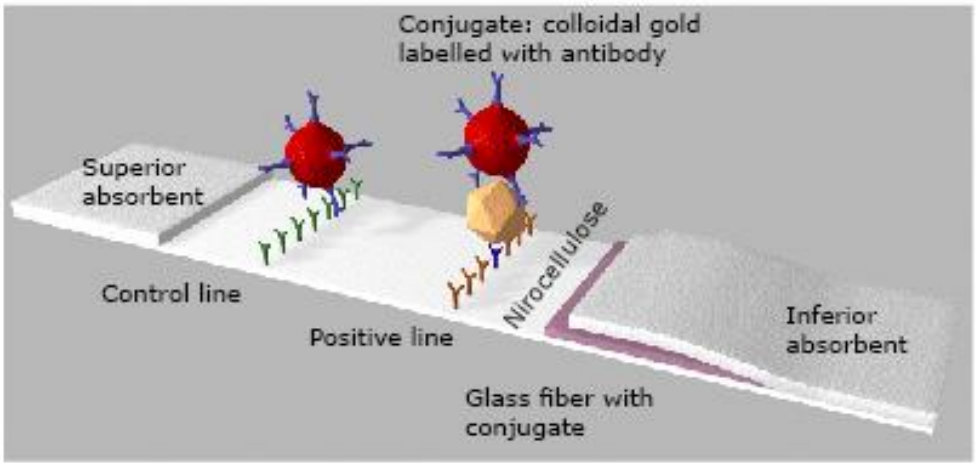
The kit is designed to detect Rotavirus, Coronavirus, E. coli F5 (K99), Cryptosporidium in calf stool

Reliable Results

The use of monoclonal antibodies as conjugates and to capture the pathogens on the strip ensures excellent specificity and very reliable results.

Ease-of-Use

Minimal hands-on-time
Room temperature incubation
Results available in 10 minutes



Sensitivity, specificity, VPP VPN and concordance test

For validation trials:

- Either the gold standard method when prescribed by OIE guidelines;
- Or a commonly recognized and used method when no gold standard exists.

For POC scour assays, we commonly refer to ELISA and / or rtPCR for virus / bacterial detection.
For parasite, we commonly refer to egg counting.
Relative sensitivity and specificity (rSe, rSp) are indicated as well as the corresponding positive and negative predictive values (PPV and NPV) for the prevalence defined by the reference. We also indicate the Kappa coefficient which approximates the degree of concordance between the two methods.
Internal validation data are presented in the contingency tables set below.

Rotavirus

Rota	K 348 (ELISA)			
BOVIDIAR		+	-	
	+	93	13	106
	-	11	246	257
		104	259	363

rSe	89,4 %
rSp	95,0 %
PPV	87,7 %
NPV	95,7 %
Kappa =	0,84 Excellent

Rota	dsRNA electrophoresis PAGE			
BOVIDAIR		+	-	
	+	48	0	48
	-	2	40	42
		50	40	90

rSe	96,0 %
rSp	100 %
PPV	100 %
NPV	95,2%
Kappa =	0,95 Excellent

Coronavirus

Corona	K 344 (ELISA)		
BOVIDIAR	+	-	
+	8	1	9
-	1	78	79
	9	79	88

rSe 88,9 %
rSp 98,7 %
PPV 88,8 %
NPV 98,7 %
Kappa = 0,87 Excellent

Corona	rtPCR		
BOVIDIAR	+	-	
+	7	2	9
-	4	74	78
	11	76	87

rSe 63,6 %
rSp 97,3 %
PPV 77,8 %
NPV 94,9%
Kappa =0,38 Poor to moderate

E.coli F5 (K99)

E.coli F5	K 348 (ELISA)		
BOVIDIAR	+	-	
+	12	2	14
-	3	346	348
	15	348	363

Se relative 80,00 %
Sp relative 99,4 %
VPP 85,7 %
VPN 99,1 %
Kappa = 0,82 Excellent

E.coli F5	rtPCR		
BOVIDIAR	+	-	
+	19	1	20
-	4	62	66
	23	63	86

Se relative 82,6 %
Sp relative 94,4 %
VPP 95,0 %
VPN 93,9 %
Kappa = 0,84 Excellent

Cryptosporidium parvum

Crypto	Egg count / Flotation		
BOVIDIAR	+	-	
+	32	3	35
-	2	63	65
	34	66	100

Se relative 94,4 %
Sp relative 95,5 %
VPP 91,4 %
VPN 96,9 %
Kappa = 0,89 Excellent

Crypto	K 348 (ELISA)		
BOVIDIAR	+	-	
+	141	17	158
-	0	205	205
	141	222	363

Se relative 100 %
Sp relative 92,3 %
VPP 89,2 %
VPN 100 %
Kappa = 0,90 Excellent

Cryptosporidium parvum

Crypto	rtPCR		
BOVIDIAR		+	-	
	+	47	5	52
	-	13	70	83
		60	75	135

Se relative	78,3 %
Sp relative	93,3 %
VPP	90,3 %
VPN	84,3 %
Kappa = 0,72	Good

Trotz,William et al, Veterinary Parasitology, 134 (2005) 15-23