RAINBOW
## *PIGLET SCOURS*

Neonatal diarrhea is a multifactorial condition commonly present on pig farms and leads to economic losses due to increased morbidity and mortality of piglets. The piglet's immature immune system and lack of fully established microbiota at birth predispose neonatal piglets to infection with enteric pathogens. The microorganisms that for decades have been associated with enteritis and diarrhea in suckling piglets are, among others, rotavirus A, enterotoxigenic *Escherichia coli* (ETEC), *Clostridium perfringens* type C,

In addition ETEC are associated with PWD (post weaning diarrhea) which can cause mild to severe watery diarrhea from 3 days after weaning age onwards, F4 and F18 being the most frequently found.
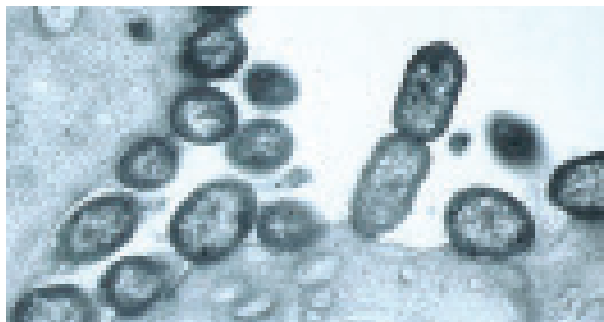
E.coli attachment onto the epithelial surface of the enterocytes

Clinical findings often miss accuracy when it comes to identify the etiologic agent(s). Laboratory analysis may come too late when there is a need for a quick diagnosis and an adequate treatment.

RAINBOW™ Piglet Scours Test is **the first** on-site **rapid diagnostic assay** available on the market which enables practitioners:

- To make a quick and reliable field diagnosis
- For the detection of up to 8 causal pathogens simultaneously
- Based on individual or pooled stools from clinically affected piglets
- With results in **10 minutes**.

RAINBOW™ Piglet Scours Test is of particular interest in numerous contexts, such as :

- Regular monitoring of pathogens at farm sites
- Compliance with "rationale use of antibiotics" guidelines
- Implementation of a specific vaccination program
- Suspicion of the role of *Clostridium* in microflora dysbalance;
- Focus on ETEC particular fimbriae (in relation with potential toxin secretion)

RAINBOW™ Piglet Scours Test is designed for an individual sample analysis as well as a pooled analysis (allowing up to 5 samples to be mixed together/see protocol below), and thus offers two versions accordingly.

■ The sampling protocol, whether it is individual or pooled, should be selected based on an assessment of the situation at the farm, to provide a relevant analysis. The following sample panels are recommended:
- o Minimum 5 **individual** stools
- o Or Minimum 2 **pooled** stools

■ The Quality of the sampling is essential:
- o Identify Piglets with characterized diarrhea
- o Perform a rectal collection

PERFORMANCES:

■ Pooling factor:
- o Criteria: similarity of test results of pooled stools (from diarrheic piglets) versus characterized individual stools
- o Validation: the assay allows pooling up to 5 stools (to allow 1 positive to be found) on the following pathogens:
  - Rotavirus
  - *E.coli* F4 / F5 / F18
  - *Clostridium perfringens*

■ Comparison with post culture PCR:
- o Criteria: Positive Predictive Value (PPV) with 5 individual stools at farm level, against bacteriology followed by PCR
- o Results on *E.coli* F4:
  - PPV on Rainbow: 75%
  - PPV on post culture PCR: 82%
- o Results on *E.coli* F18:
  - PPV on Rainbow: 86%
  - PPV on post culture PCR: 95%

MULTIPLE COMBINATIONS:
Depending on clinical contexts, *RAINBOW*™ Piglet Scours Test offers different combinations:

■ Neonatal diarrhea
- o *E. coli* F4 and F5 / rotavirus / *Clostridium perfringens*

■ Post weaning diarrhea
- o *E. coli* F4 and F18 / rotavirus / *Clostridium perfringens*

■ Comparison with ELISA (BIO K 326):

    o Criteria: relative sensitivity (rSE) and specificity (rSp) and kappa concordance factor on individual stools.
    o Validation:

ROTA	REFERENCE ELISA		
RAINBOW PIGLET SCOURS	+	-	
+	11	5	16
-	2	101	103
	13	106	119

SE RELATIVE	84,62 %	VPP	68,75 %
SP RELATIVE	95,28 %	VPN	98,06 %
KAPPA	0,73	GOOD	

F4	REFERENCE ELISA		
RAINBOW PIGLET SCOURS	+	-	
+	15	11	26
-	1	76	77
	16	87	103

SE RELATIVE	93,75 %	VPP	57,69 %
SP RELATIVE	87,36 %	VPN	98,70 %
KAPPA	0,65	GOOD	

F5	REFERENCE ELISA		
RAINBOW PIGLET SCOURS	+	-	
+	63	1	64
-	11	125	136
	74	126	200

SE RELATIVE	85,14 %	VPP	98,44 %
SP RELATIVE	99,21 %	VPN	91,91 %
KAPPA	0,87	EXCELLENT	

CLOSTRIDIUM DIFFICILE	REFERENCE ELISA		
RAINBOW PIGLET SCOURS	+	-	
+	23	7	30
-	5	85	90
	28	92	120

SE RELATIVE	82,14 %	VPP	76,67 %
SP RELATIVE	92,39 %	VPN	94,44 %
KAPPA	0,73	GOOD	

F18	REFERENCE ELISA		
RAINBOW PIGLET SCOURS	+	-	
+	14	3	17
-	2	122	124
	16	125	141

SE RELATIVE	87,50 %	VPP	82,35 %
SP RELATIVE	97,60 %	VPN	98,39 %
KAPPA	0,83	EXCELLENT	

F41	REFERENCE ELISA		
RAINBOW PIGLET SCOURS	+	-	
+	31	11	42
-	10	120	130
	41	131	172

SE RELATIVE	75,61 %	VPP	73,81 %
SP RELATIVE	91,60 %	VPN	92,31 %
KAPPA	0,67	GOOD	

CRYPTOSPORI-DIUM	REFERENCE ELISA		
RAINBOW PIGLET SCOURS	+	-	
+	11	6	17
-	2	101	103
	13	107	120

SE RELATIVE	84,62 %	VPP	64,71 %
SP RELATIVE	94,39 %	VPN	98,06 %
KAPPA	0,70	GOOD	
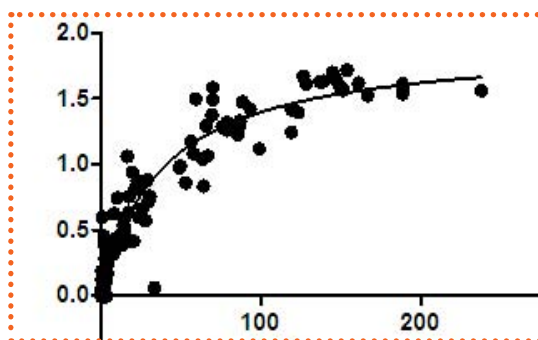
Clostridium perfringens

Correlation ratio between :

■ Scanned strips (using as strip reader)
■ Reference ELISA

value r^2= 0,89

> Product characteristics:

- Test kit containing 5 devices
- 18-months stability at room temperature
- **If unopened, the product can withstand extreme temperature and humidity conditions**

> Procedure:

- Note: reliable detection of the etiologic agent starts with the proper collection of representative stool samples from diarrheic piglets.

COLLECTION AND TEST PROTOCOL FOR INDIVIDUAL STOOL :

COLLECTION AND TEST PROTOCOL FOR POOLED STOOLS:

Bio-X Diagnostics is ISO 9001:2008 certified to assure the best to its customers
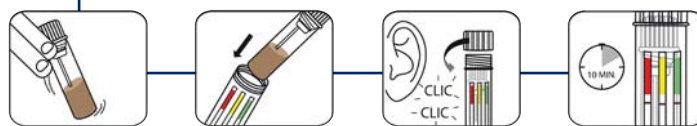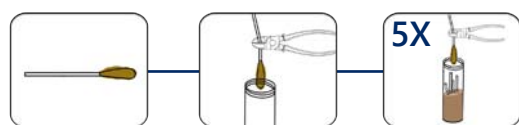
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