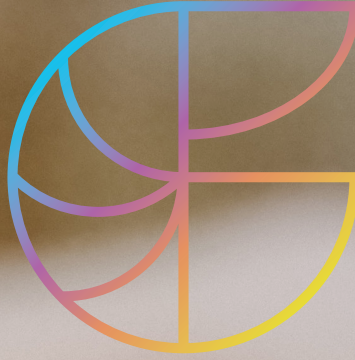




GENICS

Pork **MultiPath Plus**[™] Validation Document

Including PRRS Virus Detection

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Background

Pork **MultiPath Plus™** supports proactive herd-health surveillance through the detection of multiple respiratory and enteric pathogens from a single submission. The respiratory and enteric **MultiPath™** panels provide quantitative pathogen-load data for their included targets. Pork **MultiPath Plus™** also includes detection of porcine reproductive and respiratory syndrome virus with differentiation of PRRSV-NA and PRRSV-EU.

Validation

Pork **MultiPath Plus™** validation data is prepared in accordance with the World Organization for Animal Health (WOAH) Manual for Validation of Diagnostic Assays.

Respiratory Pathogen Panel		
Pathogen	Pathogen Type	Assay
<i>Actinobacillus pleuropneumoniae</i> serovar 1	Gram-negative bacteria	APP1
<i>Actinobacillus pleuropneumoniae</i> serovar 5	Gram-negative bacteria	APP5
<i>Actinobacillus pleuropneumoniae</i> serovar 7	Gram-negative bacteria	APP7
<i>Actinobacillus pleuropneumoniae</i> serovar 15	Gram-negative bacteria	APP15
<i>Streptococcus suis</i>	Gram-positive bacteria	SS generic
<i>Streptococcus suis</i> serotype 2	Gram-positive bacteria	SS 2
<i>Streptococcus suis</i> serotype 3	Gram-positive bacteria	SS 3
<i>Glaesserella parasuis</i> (also <i>Haemophilus parasuis</i>)	Gram-negative bacteria	GP (HP)
<i>Pasteurella multocida</i>	Gram-negative bacteria	PM
<i>Mycoplasma hyorhinis</i>	Cell wall-less bacteria	MHR
<i>Mycoplasma hyopneumoniae</i>	Cell wall-less bacteria	MHP
<i>Klebsiella pneumoniae</i>	Gram-negative bacteria	KP
<i>Bordetella bronchiseptica</i>	Gram-negative bacteria	BB
Porcine circovirus 2	DNA virus	PCV-2
Porcine reproductive and respiratory syndrome virus (PRRSV-NA & PRRSV-EU)	RNA virus	PRRSV

Enteric Pathogen Panel		
Pathogen	Pathogen Type	Assay
<i>Lawsonia intracellularis</i>	Gram-negative bacteria	LI
<i>Brachyspira pilosicoli</i>	Gram-negative bacteria	BP
<i>Brachyspira hyodysenteriae</i>	Gram-negative bacteria	BH
<i>Salmonella enterica</i>	Gram-negative bacteria	SE
<i>Salmonella enterica</i> serovar Typhimurium	Gram-negative bacteria	SEty
<i>Escherichia coli</i> Fimbrial antigen F4 (K88)	Bacterial virulence factor	EC F4
<i>Escherichia coli</i> Fimbrial antigen F5 (K99)	Bacterial virulence factor	EC F5
<i>Escherichia coli</i> Fimbrial antigen F6 (987P)	Bacterial virulence factor	EC F6
<i>Escherichia coli</i> Fimbrial antigen F18	Bacterial virulence factor	EC F18
<i>Escherichia coli</i> Fimbrial antigen F41	Bacterial virulence factor	EC F41
<i>Escherichia coli</i> heat labile enterotoxin	Bacterial toxin	EC LT1
<i>Escherichia coli</i> heat stable enterotoxin 1	Bacterial toxin	EC ST1
<i>Escherichia coli</i> heat stable enterotoxin 2	Bacterial toxin	EC ST2
<i>Escherichia coli</i> Shiga-like toxin 2e or verotoxin 2e	Bacterial toxin	EC STX2e
<i>Escherichia coli</i> virulence factor eaeA (intimin)	Bacterial virulence factor	EC eaeA
Porcine rotavirus A	RNA virus	RVA
Porcine rotavirus B	RNA virus	RVB
Porcine rotavirus C	RNA virus	RVC
Porcine circovirus 2	DNA virus	PCV-2
<i>Clostridium difficile</i> toxin A	Bacterial toxin	Cda
<i>Clostridium difficile</i> toxin B	Bacterial toxin	Cdb
<i>Clostridium perfringens</i> toxin B	Bacterial toxin	Cpb
Porcine reproductive and respiratory syndrome virus (PRRSV-NA & PRRSV-EU)	RNA virus	PRRSV

Pork MultiPath Plus™ Limit of Detection and Limit of Quantitation

The Analytical Sensitivity (ASe) or Limit of Detection (LOD, i.e. the lowest detectable copy number of pathogen analyte) was assessed by a serial dilution of pathogen template in a dilution to extinction experiment (DTE). The Limit of Quantitation (LOQ) represents the dynamic range of each individual pathogen assay in which quantitation of the exact copy number of pathogen in a sample is possible with high precision.

Respiratory Pork **MultiPath Plus™**

MultiPath™ Assay	Upper LOQ copies	Lower LOQ copies	LOD
APP1	1800	10	2
APP5	1800	5	3
APP7	2000	2	2
APP15	1800	10	2
SS generic	2000	10	4
SS 2	1800	25	2
SS 3	1000	13	13
GP (HP)	1800	6	6
PM	2000	2.5	2
MHR	1800	10	3
MHP	1800	5	4
KP	1500	25	3
BB	1250	10	2
PCV-2	1800	25	3
PRRSV-NA & PRRSV-EU	2000	10	10

Enteric Pork **MultiPath Plus™**

MultiPath™ Assay	Upper LOQ copies	Lower LOQ copies	LOD
LI	2000	10	3
BP	2000	50	3
BH	1800	50	4
SE	1500	25	4
SEty	1500	50	6
EC F4	2000	10	6
EC F5	1250	3	3
EC F6	1800	3	3
EC F18	1000	50	7
EC F41	1800	5	5
EC LT1	1800	25	4
EC ST1	1000	50	10
EC ST2	1500	50	7
EC STX2e	1000	50	3
EC eaeA	2000	50	4
RVA	2000	250	6
RVB	1800	25	4
RVC	1000	10	4
PCV-2	1800	25	4
Cda	1250	100	2
Cdb	1500	3	3
Cpb	500	2.5	2
PRRSV-NA & PRRSV-EU	2000	10	10

100% Sample Concordance

Compared with USA-based, German-based and Australian-based diagnostic laboratories Genics Pork **MultiPath Plus™** delivers 100% concordance on samples from each region.

Sample Compatibility

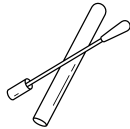
Pork **MultiPath™ Plus** is compatible with sample types such as:



Faeces sample



Lung, tonsil & intestinal tissue sample



Nasal, tracheal, rectal, lung, tonsillar swabs



Oral fluid rope sample



Faeces sock sample



Bioaerosol eDNA samplers

On-farm Commercial Validation

The use of Pork **MultiPath™** respiratory and enteric panels for surveillance screening have been validated on three pig farms. Over a four-month period 2 pig batches per farm were monitored from weaner to finisher age (4 to 20 weeks) by fortnightly sampling of oral fluids (from cotton ropes) and pooled faeces (from socks).

Reference Paper — Gerszon et al. (2024). The use of oral fluids and sock samples for monitoring key pathogens in pig populations for surveillance purposes. Preventive veterinary medicine, 228, 106237. <https://doi.org/10.1016/j.prevetmed.2024.106237>

This scientific work demonstrated that Pork MultiPath™ Enteric and Respiratory panels:



Detect multiple pathogens simultaneously with high sensitivity and specificity.



Identify co-infection patterns and reveal the relationship between different pathogens.



Expose which pathogens are most relevant in which age group or production stage.



Provide thresholds/markers for the prediction of forthcoming symptoms in early stages of infection.



Evaluate the efficiency of antimicrobial usage, vaccination schemes and disinfection procedures.



Enable cost-effective and practical testing of pooled samples to regularly monitor population health status.