

**Note:** The SDRS is a collaborative project among multiple VDLs in the US swine industry. The VDL collaborators and industry partners are all invited to submit content to share on this bonus page related to disease prevention, control, and management. Stay tuned for more content in future editions.

## Information for *Escherichia coli* genotype, pathotype and virotype by PCR is now available on the SDRS monthly PDF reports

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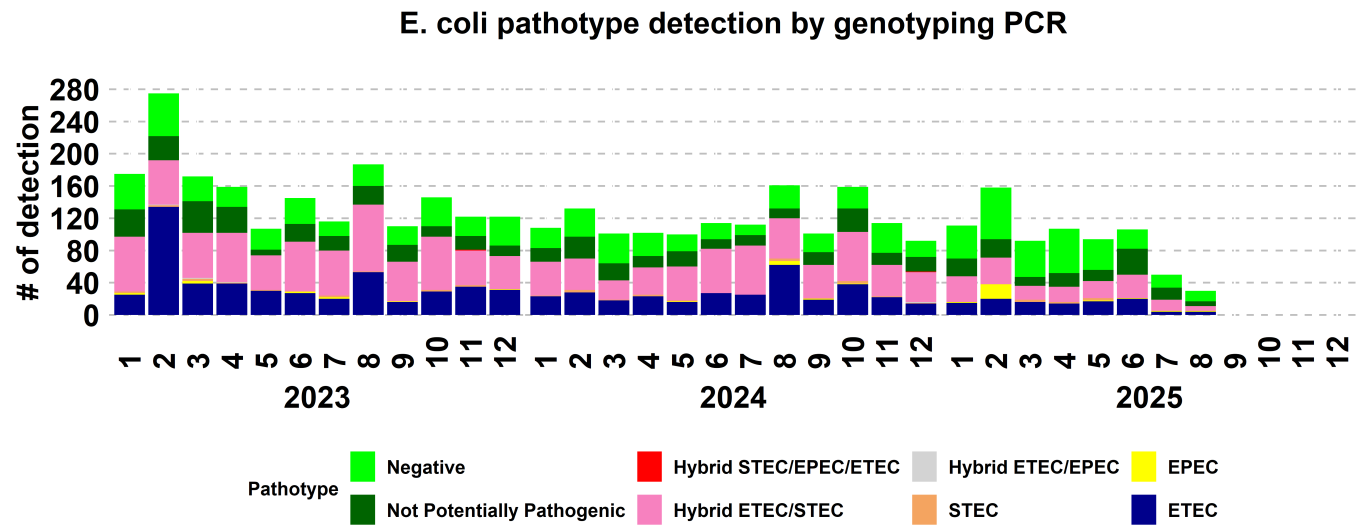
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The Swine Disease Reporting System is including a new pathogen on the PDF monthly report: *Eschericia coli*. *E. coli* infections in pigs, commonly referred to as colibacillosis, are severe conditions that can result in diarrhea, dehydration, and even death. While *E. coli* can be associated with various diseases, it may also be present in healthy pigs, so the characterization of *E. coli* virulence factors has become essential for accurately diagnosing potentially pathogenic strains.

When a clinical sample arrives at the laboratory suspected of *E. coli* infection, the most common approach is initially to process it through general bacteriological culture for pathogen isolation. Once *E. coli* is identified, further diagnostic testing (PCR) is essential to determine whether the isolate harbors specific virulence factors that characterize a strain as pathogenic.

Several types of pathotypes are described in the literature based on PCR genotype, such as enterotoxigenic *E. coli* (ETEC), Shiga toxin-producing *E.coli* (STEC), enteropathogenic *E. coli* (EPEC), and their hybrid versions. Samples not classified as any pathotype were considered not potentially pathogenic (i.e., only a fimbriae gene was detected, with no other gene detection). The samples with negative PCR targets were also classified as not potentially pathogenic. The genotype target genes are associated with the pathotype classification, and depending on the detection and expression of these genes, we can associate them with a potential pathogenic strain (i.e., ETEC pathotype classification because of F18 and STa detection by PCR). The virotypes are identified by collating all positive PCR targets tested within a sample. They can be related to the pathotype classification based on detecting determined genes within a sample. Therefore, the SDRS project incorporated historical and ongoing data *E.coli* genotype PCR from the participant veterinary diagnostic laboratories to report the primary targets detected, the predominant pathotypes in the field, and the main virotypes detected at a state level. All these information are available in the three charts below present in the new *E. coli* page in the SDRS report.

**Figure 1.** *E. coli* pathotype detection by genotyping PCR.

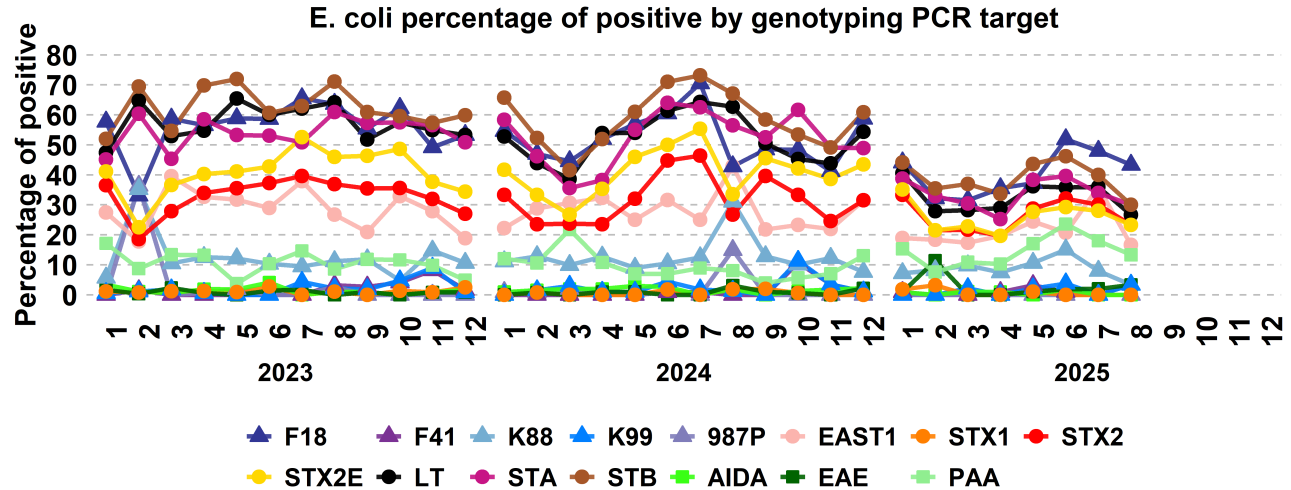


**Attachment genes:** Fimbriae - F18, K88(F4), K99(F5), 987P(F6), F41; **Adhesins** - EAE (Intimin), PAA, AIDA.

**Toxin genes:** Heat-label -LT; Heat-stable -STa and STb; **Shiga toxins** -Stx1, Stx2 and Stx2e; and EAST1.

Obs: Not all samples have been tested for all targets.

**Figure 2.** *E. coli* percentage of positive by genotyping PCR target.



**Pathotypes:** Enterotoxigenic *Escherichia coli* (ETEC) - Has fimbriae and toxin (not Stx2e) genes. Associated with neonatal and post-weaning diarrhea.

Shiga toxin-producing *Escherichia coli* (STEC) - Has fimbriae (F18) and toxin (must be Stx2e) gene. Associated with edema disease.

Enteropathogenic *Escherichia coli* (EPEC) - Presence of the EAE (Intimin) adhesin.

Hybrids ETEC/STEC, ETEC/EPEC, STEC/EPEC, and ETEC/STEC/EPEC - Combination of characteristics of more than one pathotype.

**Figure 3.** Most frequent *E. coli* virotypes detected by each state in 2025.

**Most frequent *E. coli* virotypes detected by State in 2025**

Source: ISU, UMN, and KSU VDLs; SDSU-ADRDL, OH and Purdue ADDLs.

SiteState	First Most Frequent	Second Most Frequent	Third Most Frequent
IA	F18; LT; STA; STB; STX2E	F18; PAA; EAST1	EAE
IL	F18; LT; STA; STB; STX2E	K88; STA; STB	F18; LT; STA; STB
IN	F18; LT; STA; STB; STX2E	PAA; STX2E	K88; EAST1; LT; STB
KS	K88; PAA; EAST1; LT; STA; STB		
MN	F18; LT; STA; STB; STX2E	K88; PAA; EAST1; LT; STA; STB	EAST1
MO	F18; LT; STA; STB; STX2E	K88; PAA	K88; STA; STB
NC	F18; LT; STA; STB; STX2E	F18	F18; EAST1; LT; STB
NE	F18; LT; STA; STB; STX2E	F18; EAST1; LT; STB	EAST1; LT; STA; STB; STX2E
OH	F18; LT; STA; STB; STX2E	F18; LT; STA; STB	EAE
OK	F18; EAST1; LT; STB	F18; EAST1; LT; STB; STX2E	STA; STB
SD	K88; PAA; EAST1; LT; STA; STB	F18; LT; STA; STB; STX2E	F18; PAA; EAST1; STX2E

**Virotypes:** Collation of all positive PCR targets tested within a sample. Color code of the table associating the virotype detected with the pathotype classification.