

Detection of VTEC in livestock farms

NRL for E. coli

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VTEC

- ▶ Three farms of dairy cows in Czech Republic
- ▶ Three groups of animals (3 weeks, 3 months, 1 year)
- ▶ Rectal swabs collected in summer and winter season
- ▶ Screening of *stx1*, *stx2* and *eae* in primocultures
- ▶ Immunomagnetic separation
- ▶ In positive samples detection of isolated colonies
- ▶ Multiplex PCR for *stx1*, *stx2* and *eae*
- ▶ O serogroup identification



VTEC in rectal swabs in summer and winter season

Herd	Age	No. of positive animals/tested			
		VTEC	EHEC	VTEC+ EHEC	VT- eae+
A	3 W	3/10	3/10		
	3 M	9/10	3/10	1/10	4/10
	1 Y	10/10	10/10		
B	3W	1/10	1/10		1/10
	3 M	4/10	3/10	1/10	5/10
	1 Y	8/10	8/10		
C	3W	3/10	1/10		
	3M	5/10	5/10		
	1 Y	7/10	7/10		

Herd	Age	No. of positive animals/tested			
		VTEC	EHEC	VTEC+ EHEC	VT- eae+
A	3 W	0/10			
	3 M	4/10	3/10		2/10
	1 Y	6/10	3/10		2/10
B	3 W	0/10			
	3 M	7/10	5/10	2/10	1/10
	1 Y	6/10	6/10		1/10



VTEC x EHEC in summer season

- ▶ VTEC were detected on all farms
- ▶ Poor detection of VTEC in group of 3W old animals – almost no EHEC detected
- ▶ 90% of 3M old animals excreted VTEC in stool – 30% of them EHEC on the farm A
- ▶ In the group of 1 year old animals 70-100% excreted EHEC



VTEC x EHEC in winter season

- ▶ In the group of 3W old animals were no detection of VTEC and EHEC
- ▶ On the farm A 30% of 3M old and 30% of 1Y old animals excreted EHEC;
- ▶ on the farm B 50%-60% 3M and 1Y animals were for EHEC positive



Type of isolates on tested farms

Herd	Age	Type of isolates in summer season	Herd	Age	Type of isolates in winter season	
A	3 W	O? VT1+, eae+	A	3 W	No isolates	
	3 M	O26 VT1+, eae- O? VT1+, eae + O54 VT2+, eae-;		O? VT1+, eae- O? VT- eae+	3 M	O103 VT1+, eae+ O128 VT1+, eae+ O26 VT-, eae+ O? VT-, eae+
	1 Y	O157 VT2+, eae+ O103 VT1+, eae+		O? VT2+, eae+	1 Y	O157 VT2+, eae+ O? VT2+, eae+ O153 VT2+, eae- O? VT2+, eae- O156 VT-, eae+ O? VT-eae+
B	3W	O? VT2+, eae+ O? VT-, eae+	B	3 W	No isolates	
	3 M	O103 VT1+, eae+ O115 VT2+, eae+ O153 VT2+, eae-		O? VT2+, eae- O115 VT-, eae+	3 M	O103 VT1+, eae+ O? VT1+, eae+ O125 VT2+, eae- O? VT-, eae+
	1 Y	O157 VT1,VT2+, eae+ O? VT1+, VT2+, eae+			1 Y	O103 VT1+, eae+ O128 VT1+, eae+ O? VT1+, eae+
C	3W	O? VT2+, eae+ O?VT1+, eae-				
	3M	O26 VT2+, eae+				
	1 Y	O? VT2+, eae+ O? VT1+, VT2+, eae+				



O serogroup determination

- ▶ EHEC of serogroup O157 detected only in group of 1 year old animals - farm A in both season, farm B in summer season
- ▶ On the farm A: 58,8% of all EHEC isolates were O157; 17,6% - O103; 17,6% - O128; 11,8% O54
- ▶ On the farm B 46,7% - O103; 40% - O157 of EHEC serogroup
- ▶ On the farm C 38,5% of EHEC isolates identified as O26
- ▶ All O157 and O103 isolates were stx and eae positive
- ▶ 71,4% of O26 isolates contained stx and eae gene



Conclusion

- ▶ Our results show significant prevalence of EHEC isolated from the rectal swabs of dairy cows
- ▶ Almost from all positive primoculture by multiplex PCR we were able to isolate VTEC strains and detect O serogroup (except of 3M old animals on farm B and C)
- ▶ Pour prevalence of VTEC in groups of 3W old animals on all farms
- ▶ High prevalence of O157 EHEC in group of 1 year old animals



▶ Thank you very much for your attention 😊

