Risk factors for changing infection status in the Danish Surveillance Program for Salmonella Dublin in dairy herds

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...a serious zoonosis: High case mortality in human cases (Helms et. al, BMJ 326, 2003)

Human Salmonella Dublin cases in Denmark

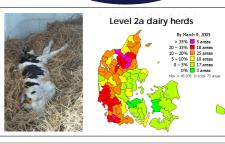
of Salmonella **Dublin?**

Why surveillance

Most likely free of salmonella Level 2a Too high antibody Levels in blood or bulk-tank milk samples Unknown status (lack of samples or recent contact to Levels 2a or 2b) Level 3a Clinical salmonellosis diagnosed by culture

Level 3b
Contact to Level 3 herds

...causes disease and economic losses in the cattle industry



Purchase of cattle, calf mortality, local density of breed and herd size.

Factors that were studied

cattle herds, neighboring 2a cattle herds, organic farming, The analyses were controlled for region.

or positive culture without clinical symptoms

Movement of all cattle is recorded

Shift from Level 1 to 2a Indicative of new infection

Factors associated with becoming infected

- Increasing number of infected neighbours in a 2 km radius
- Number of cattle purchased from 2a-dairy herds
- Increasing herd size

DATA

How was the study designed?

Danish Cattle Database

Which factors are associated with changes between level 1 and 2a?

Models

Two multivariable logistic regression models accounting for correlation between repeated quarterly level designations to each study herd: All Danish dairy herds in 2002-2003

(approximately 7000 herds)

SUMMARY

Factors associated with shifts between infection levels 1 and 2a under the Danish Surveillance Program for Salmonella Dublin were related to purchase from Level 2a herds, neighbour density and infection level, production type and herd size

Shift from Level 2a to 1 Indicative of recovery

Factors leading to slower recovery:

- Organic production
- Overlapping manure spreading area from neighbouring herd
- For large herds: Large breed and increasing number of infected neighbours in a 2 km radius

More information: "Development and estimation of the effect of new methods and strategies for surveillance of salmonella in cattle" International EpiLab-report 2005, Warnick, Nielsen and Nielsen, www.dfvf.dk