

# Review of data from monitoring and eradication programmes in the Czech Republic 2008

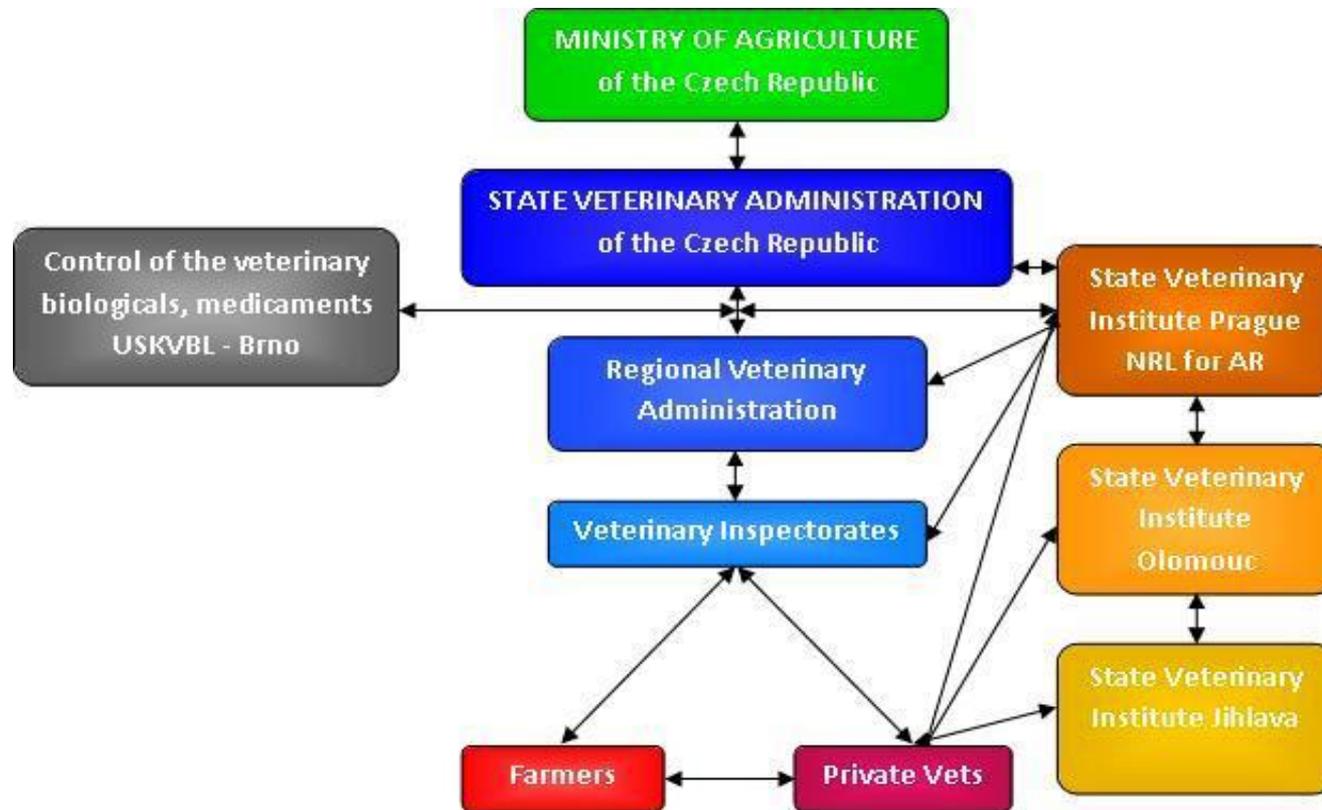
**State Veterinary Institute Prague**

**NRL for Antibiotic resistance**

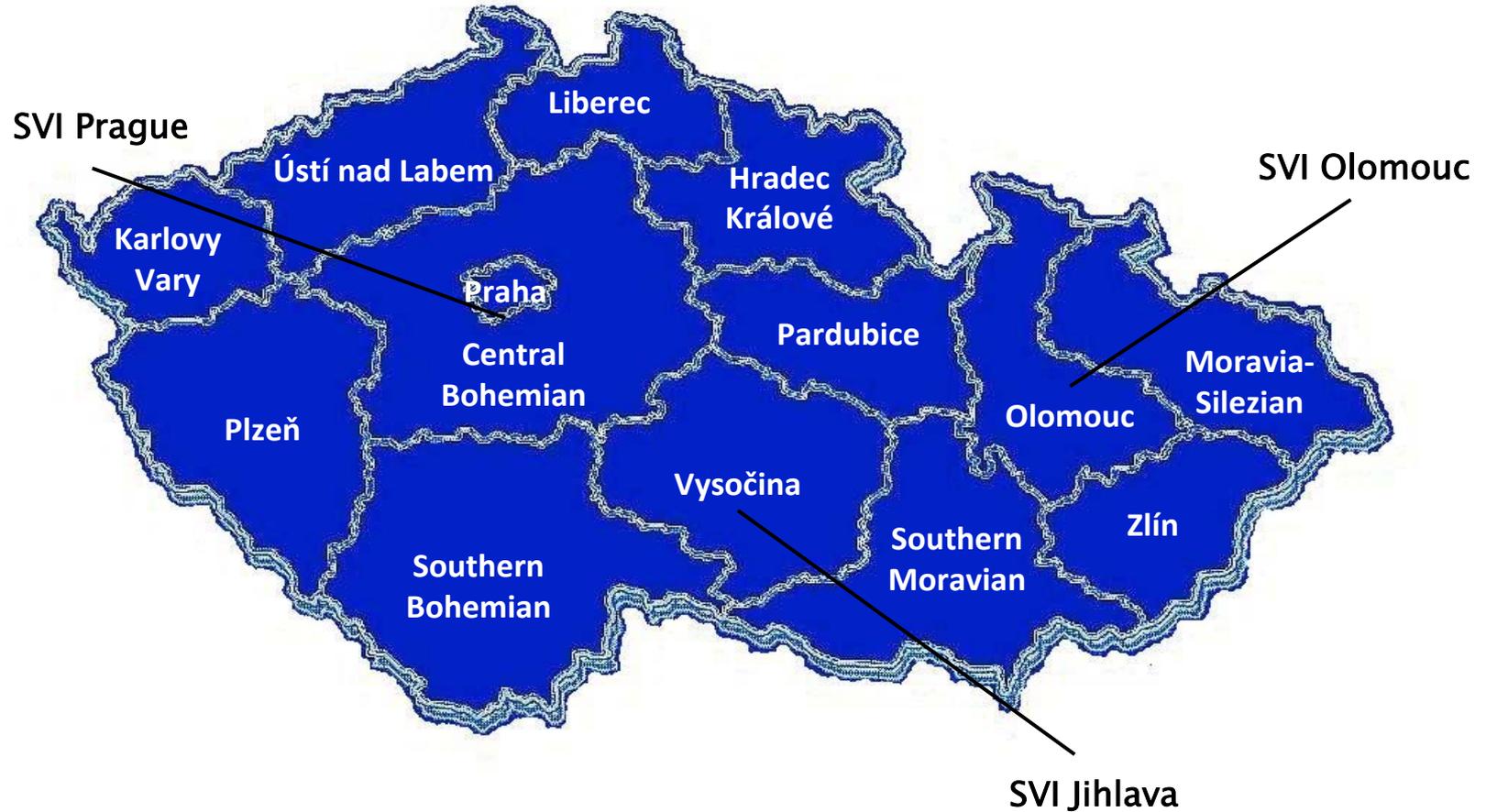
**Černý Tomáš, DVM**



# Schema of organisation and collaboration



# Map of the Czech Republic with demarcated administrative areas and laboratories which taking part in monitoring and eradication programmes



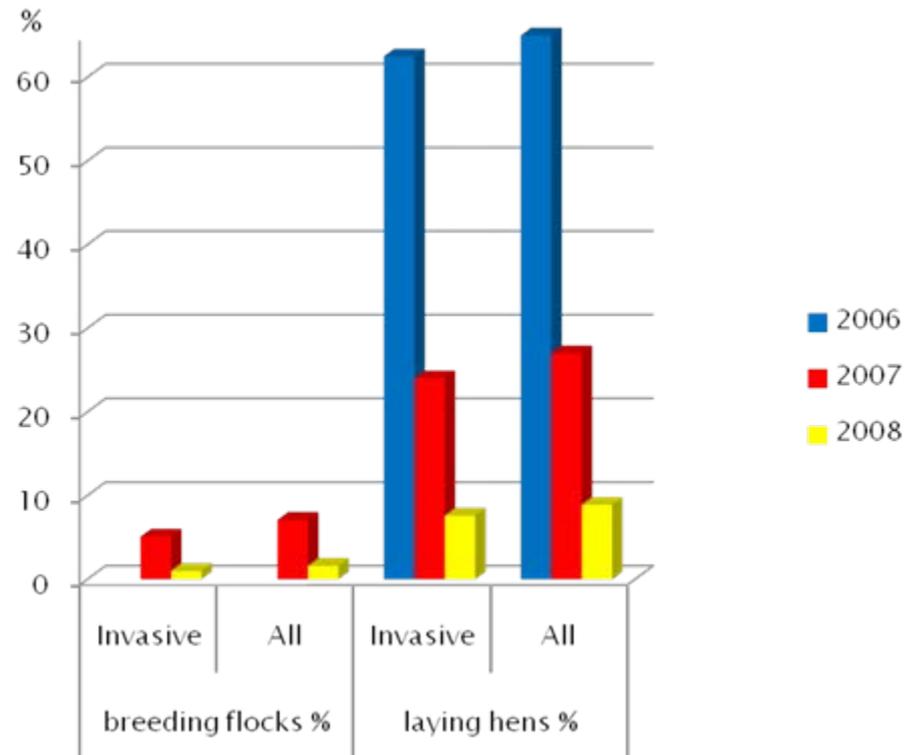
## Monitoring and eradication programmes in the Czech Republic in 2008

- ▶ National programme for control of *Salmonella* spp. in laying hens (fowl) flocks (since 2007)
  - ▶ National programme for control of *Salmonella* spp. in breeding flocks of *Gallus gallus* (since 2007)
  - ▶ National programme for control of *Salmonella* spp. in broiler flocks of *Gallus gallus* (since december 2008)
  - ▶ Baseline survey on the prevalence of *Salmonella* spp. and MRSA in herds of breeding pigs
  - ▶ Baseline survey on the prevalence and antimicrobial resistance of *Campylobacter* spp. in broiler flocks and on the prevalence of *Campylobacter* spp. and *Salmonella* spp. in broiler carcasses
  - ▶ Monitoring on the prevalence and antimicrobial resistance of etiological agents of zoonoses in pig, bovine and broiler meat (*Salmonella* spp., VT *E.coli*)
- 

# National control programmes in breeding flocks and laying hens

- ▶ Last year was examined in both of programmes 7842 samples from 1859 flocks in 197 holdings
- ▶ Prevalence of salmonella including invasive serotype compare to 2007 has decreased
- ▶ Dominant serotyp was Salmonella Enteritidis
- ▶ Dominant fagotyps of Salmonella Enteritidis were PT8 and PT4

Prevalence of salmonella in adult flocks:



# National control programmes in breeding flocks and laying hens

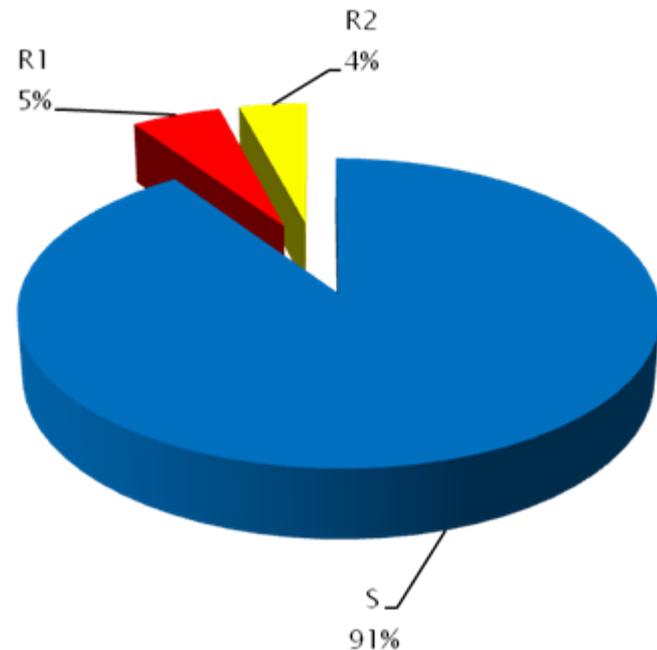
74 salmonella strains were tested to antimicrobial resistance with results:

- ▶ Low level of resistance in this group
- ▶ Absence of multiresistant strain
- ▶ Presence of strain with typical resistance:

Salmonella Enteritidis PT 13 resistant to Ampicilin

Salmonella Newport resistant to Ampicilin and Tetracycline

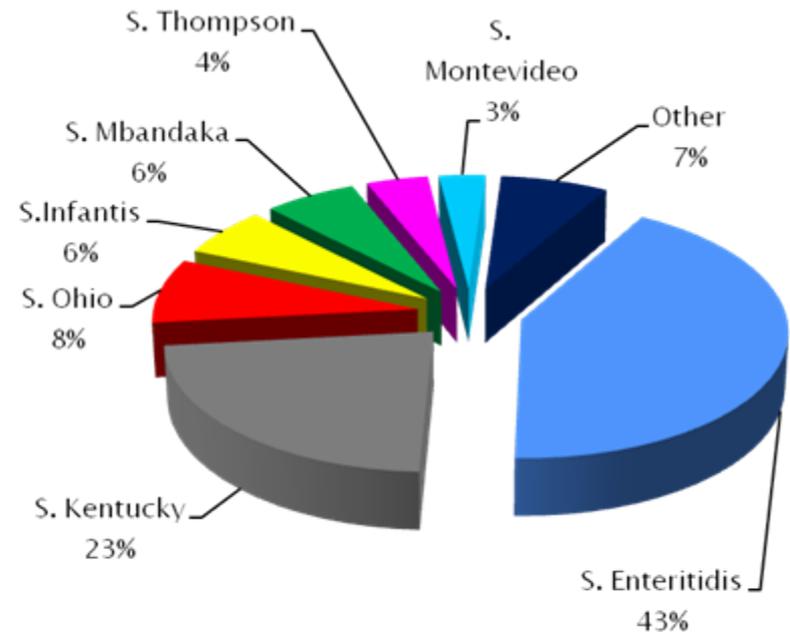
Distribution of resistance in tested group:



## National control programmes in chicken broiler flocks

- ▶ Since 12/2008 were examined 1135 samples from 1053 flocks in 263 holdings
- ▶ Total occurrence of salmonella is 9,1% flocks
- ▶ Prevalence of invasive serotype is for the present 3,9 % flocks
- ▶ By comparison with flocks of hens there were predominant non invasive serotypes
- ▶ Was observed close relationships between serotypes and holdings

Distribution serotypes of salmonella in flocks of broilers:

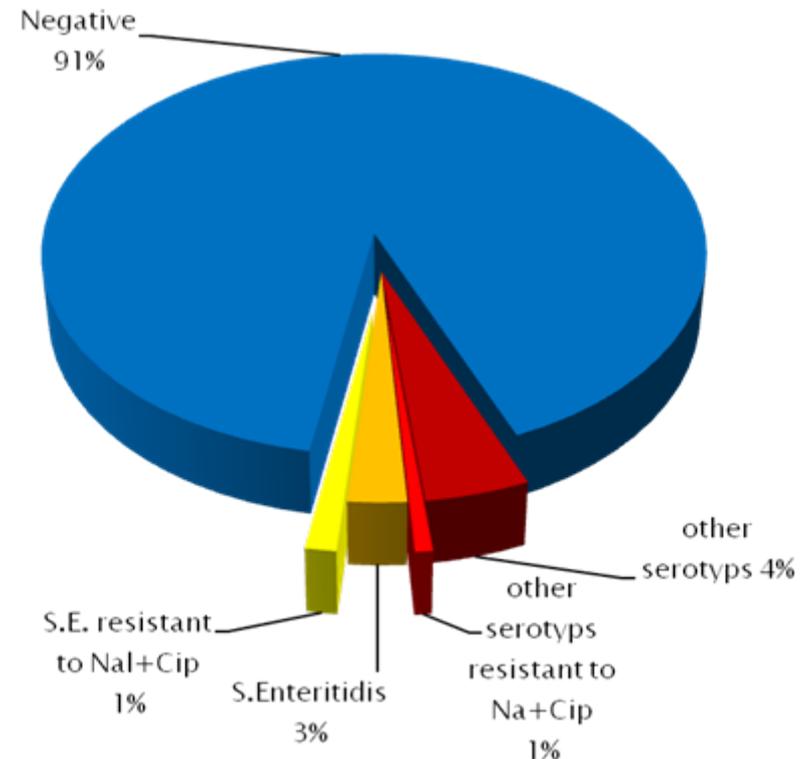


# National control programmes in chicken broiler flocks

97 salmonella strains were tested to antimicrobial resistance with results:

- ▶ Presence of multiresistant strain  
Salmonella Infantis resistant to Sulphonamides, Tetracyclines, Ampicilin and border MIC of Spectinomycin
- ▶ Presence of strain with resistance to Quinolones  
Salmonella Enteritidis PT 8 and Salmonella Infantis with resistance to Nalidixic acid and reduced susceptibility Ciprofloxacin
- ▶ Presence of rough strain

Occurrence of flock which were infected with serotypes resistant to Quinolones:



# Baseline survey on the prevalence of Salmonella spp. and MRSA in herds of breeding pigs

- ▶ During the survey were examined samples from 283 holdings
- ▶ Total occurrence of salmonella were 14,5% of holdings
- ▶ In 1,7 % of holdings were occurred coinfection of more than one serotype
- ▶ Prevalence of invasive serotype were 3,9 % of holdings
- ▶ Dominant serotypes were Salmonella Agona and Salmonella Derby
- ▶ Dominant invasive serotype was Salmonella Typhimurium DT104
- ▶ In 1,8 % of holdings were detected MRSA (all five strains were sequence type ST 398\*)

\*-source of information NRL for Coagulasepositive staphylococci

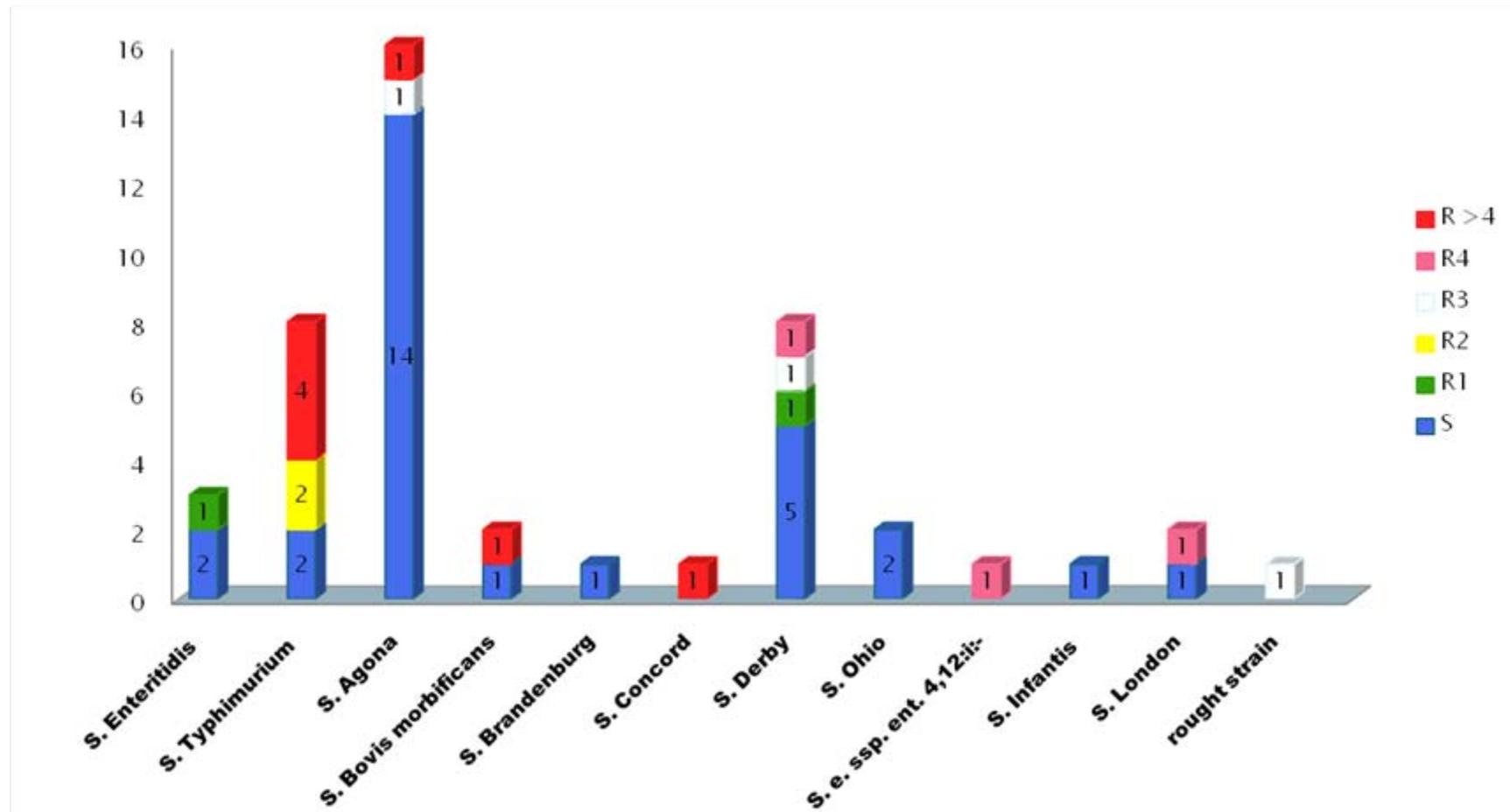
# Baseline survey on the prevalence of Salmonella spp. and MRSA in herds of breeding pigs

46 salmonella strains were tested to antimicrobial resistance with results:

- ▶ Presence strains with resistance to Quinolones  
Salmonella Typhimurium DT 104 with resistance to Nalidixic acid and reduced susceptibility Ciprofloxacin
- ▶ Presence strain with ESBL type of resistance  
Salmonella Concord resistant to Ciprofloxacin (MIC 0,5 mg/l) with presence of ESBL and resistance to Aminoglycosides
- ▶ Presence of multiresistant strain with SGI-1 type of resistance  
Salmonella Typhimurium DT 104, Salmonella Derby and Salmonella Agona with resistance to Ampicilin, Chloramphenicol, Streptomycin, Sulphonamides, Tetracyclines and Florfenicol
- ▶ Results of testing showed a marked heterogeneity in incidence of resistant and multiresistant strains

# Baseline survey on the prevalence of Salmonella spp. and MRSA in herds of breeding pigs

Distribution of resistance in serotypes of salmonella isolated within survey:



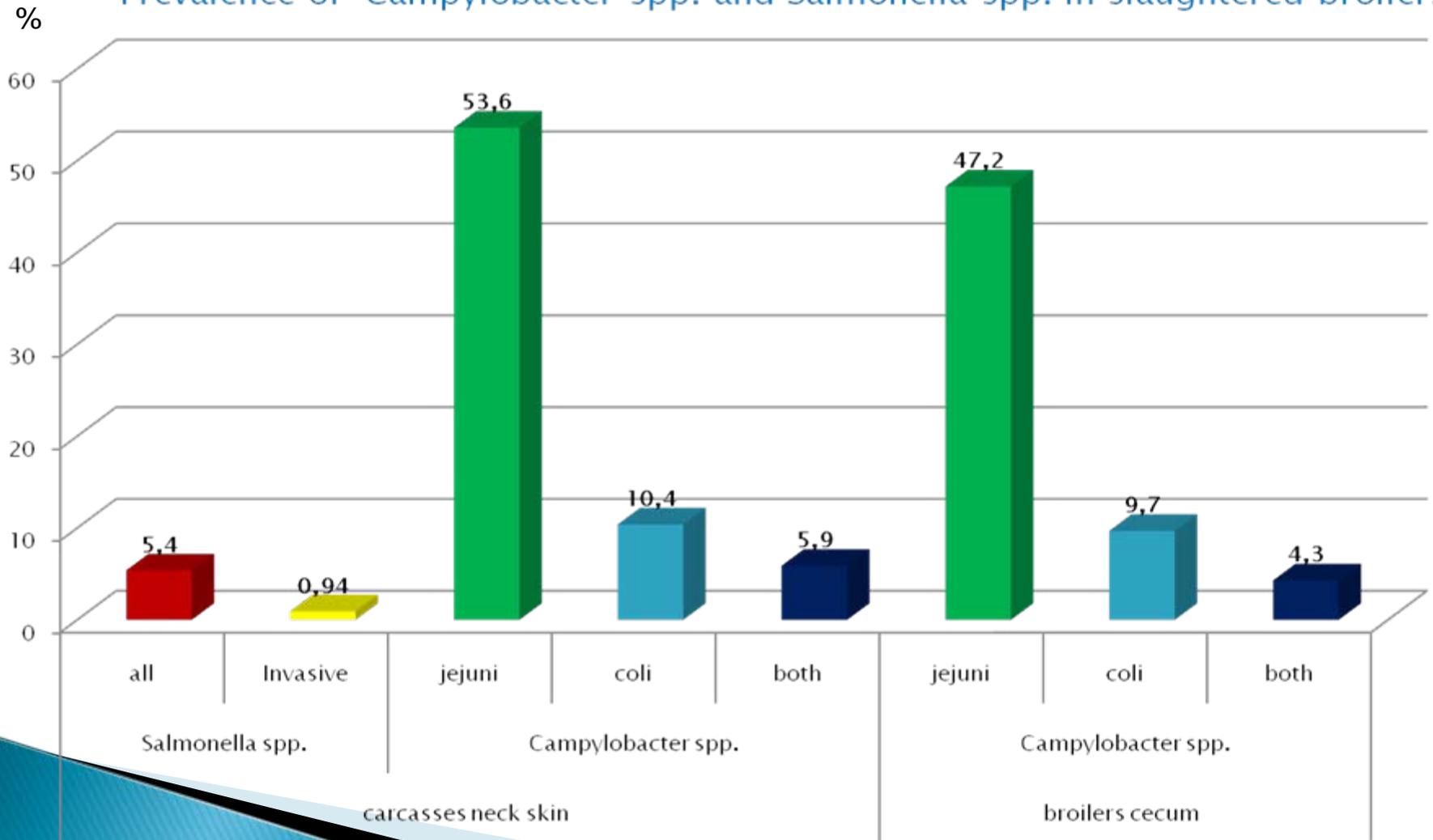
# Baseline survey on the prevalence and antimicrobial resistance of *Campylobacter* spp. in broiler flocks and on the prevalence of *Campylobacter* spp. and *Salmonella* spp. in broiler carcasses

- ▶ During the survey were examined samples from 422 batches of slaughtered broilers
- ▶ Total occurrence of *Campylobacter* spp. in samples of cecum were 61,1% \*
- ▶ Total occurrence of *Campylobacter* spp. in samples of neck skin were 69,9% \*
- ▶ In 5,1 % of cases were occurred coinfection of *Campylobacter jejuni* and coli\*
- ▶ Total occurrence of *Salmonella* spp. in samples of neck skin were 5,4%
- ▶ Were found a lower prevalence of salmonella than in flocks of broilers

\*-source of information NRL for *Campylobacter*

# Baseline survey on the prevalence and antimicrobial resistance of *Campylobacter* spp. in broiler flocks and on the prevalence of *Campylobacter* spp. and *Salmonella* spp. in broiler carcasses

Prevalence of *Campylobacter* spp. and *Salmonella* spp. in slaughtered broilers:

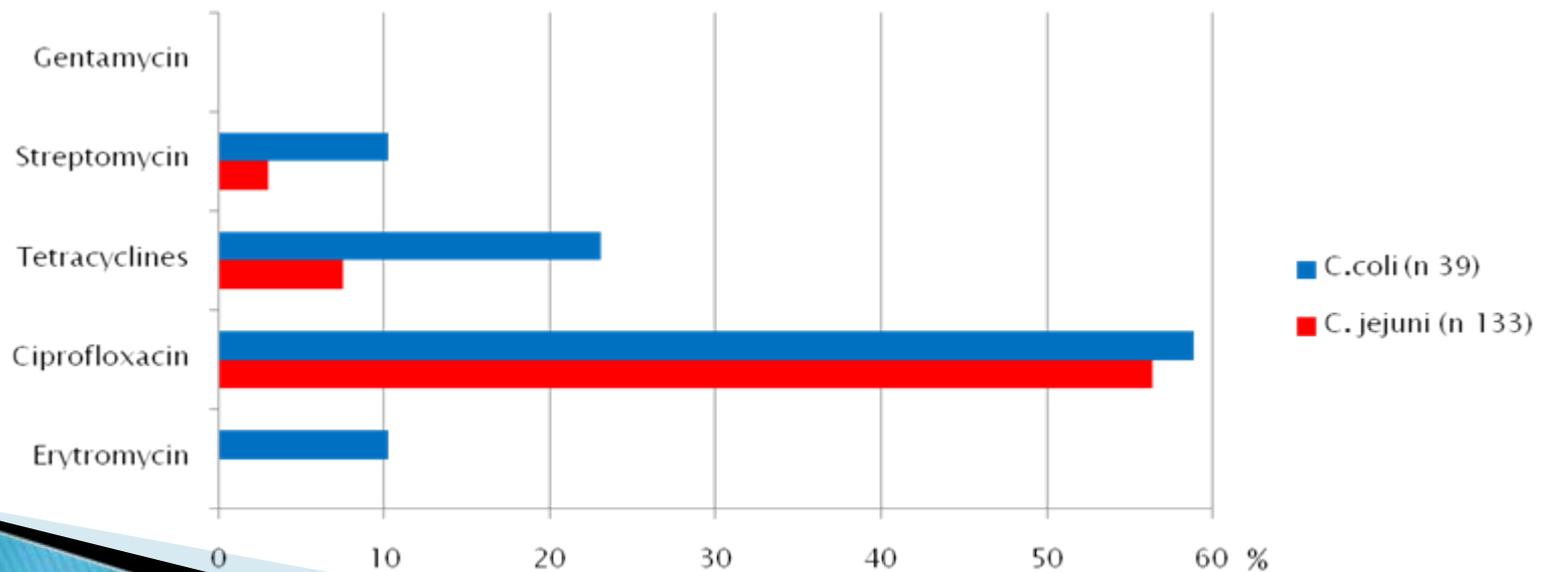


# Baseline survey on the prevalence and antimicrobial resistance of Campylobacter spp. in broiler flocks and on the prevalence of Campylobacter spp. and Salmonella spp. in broiler carcasses

172 campylobacter\* and 23 salmonella strains were tested to antimicrobial resistance with results:

- ▶ High presence of campylobacter strain resistant to Ciprofloxacin\*
- ▶ Presence of multiresistant strain with resistance to Quinolones  
Salmonella Infantis with some type of resistance as strain occurred in broilers flocks

## Distribution of resistance of tested campylobacter strains:\*



\*-source of information NRL for Campylobacter

# Risk Analysis

## High-risk factors of resistance in the Czech republic:

- ▶ Presence of Quinolone resistance

Occurrence of multiresistant strains of *Salmonella* *Infantis* (SSuT+Nal+Cip) isolated from feces, raw meat and food indigenous from chicken broilers

Occurrence of strains of *Salmonella* *Enteritidis* PT 8 isolated from broiler feces resistant to Nalidixic acid and Ciprofloxacin

Occurrence of multiresistant strains of *S.* *Typhimurium* DT 104 (ACSSuT+F+Nal+Cip) indigenous from clinical investigation of pigs and cattles

Presence of Ciprofloxacin resistance in more than 50% campylobacter isolates indigenous from slaughtered broilers

## Low-risk factors of resistance in the Czech republic:

- ▶ Till now low presence of ESBL and AmpC type of resistance of Enterobacteriaceae

- ▶ Till now low presence of Methicilin resistant strain of *Staphylococcus aureus*

# Activities and aims of NRL in 2009

## Present activities:

- ▶ Monitoring on the prevalence of *Campylobacter* spp. and *Salmonella* spp. in broiler raw meat in markets.
- ▶ Screening of presence MRSA in clinical samples indigenous from mastitids cows.
- ▶ Screening of presence ESBL and ampC resistace of Enterobacteriaceae isolated from clinical samples indigenous from pigs and cattles.

## Aims for 2009:

- ▶ Set up routine PCR testing of Quinolone resistance genes in Enterobacteriaceae
- ▶ In co-operation with human authority to determine a part of Quinolone resistant salmonellas in foot-born oubreaks in human population.

The background of the slide is a microscopic image showing numerous clusters of small, purple-stained cells, likely bacteria, against a light pinkish-tan background. The clusters vary in size and density, with some appearing as large, dense groups and others as smaller, more dispersed aggregates. The overall appearance is that of a Gram-stained bacterial smear.

**Thank you for your  
attention**