UK Experience with on-farm interventions to control *Salmonella* in finisher pigs

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Outline

- Background
- Challenge in *Salmonella* control
- Principals of intervention
- Experience with interventions
- Motivation for change
- Conclusions
Background

- Industry recognised *Salmonella* was a potential problem in 1999-2000
- Instituted “ZAP” programme in 2001 to monitor farms via MJ ELISA as part of Quality Assurance
- Despite individual farms responding to poor “ZAP” scores & regaining acceptable status, no reduction in national prevalence
Facing the challenge!

- Salmonella is adapted to live in the gut
- It also survives well in the environment
- It has a wide host range
- Infected animals may not be diseased
- Infected animals may become carriers
- Salmonella is readily spread within and between farms
Principal of control

- Keep salmonella out
- Minimise risk of salmonella surviving in the environment
- Minimise risk of salmonella transmission in the herd
Interventions

**Aims**
- To reduce risk of *Salmonella* entering farm
- To reduce the risk of *Salmonella* contamination of environment between batches of pigs
- To reduce risk of transmission within batches of pigs
- To reduce risk of exposed pigs becoming infected

**Approaches**
- Enhanced hygiene & biosecurity
- Organic acid in feed
- Vaccination
Where does salmonella come from?

- Salmonella might be brought into farms by:
  - Farm staff – on clothing, shoes etc
  - Dogs, cats or other domestic animals
  - Vehicles eg under wheel arches
  - Visitors eg on shoes or clothing
  - Wild birds eg gulls
  - Feed or water

- BUT ......
The main culprits!

Risk of infection is ~4 times higher if salmonella is introduced with pigs
Biosecurity & hygiene

- Tested on 2 groups of batch finisher farms in RCT
- Measures included:
  - Strict all-in/ all-out policy
  - Introduce pigs from a single source
  - Rodent control
  - Reduced movements of people & vehicles
  - Increased cleaning & disinfection
  - Increased days empty between batches
  - No moving pigs back from sick pens
  - Provision & use of boot dips & brushes
Results from Biosecurity & Hygiene interventions on batch finisher farms

- Farms with better biosecurity & hygiene had lower *Salmonella* incidence
- Effective rodent control reduced risk of *Salmonella* by \( \sim 25\% \)
- Effective cleaning & disinfection between batches reduced risk by \( \sim 50\% \)
- BUT \( \sim 60\% \) of cleaned pens *Salmonella* positive before re-stocking
- Can be successful: 4 of 44 farms had 0/30 positive salmonella cultures and 0/40 positive MJ ELISA tests
- BUT introduction of infection with weaners could overwhelm benefits
- So, overall reductions modest (eg up to \( 1/3^{rd} \) reduction)
- Compliance, esp with biosecurity, difficult
- Unpredictable response amongst farms
Hygiene failures

- Some observed reasons:
  - Salmonella isolated from staff changing rooms including tables used at lunch time
  - Foot dips changed less than once/fortnight
  - Clothing (farm boots/overalls) worn off site
  - Clothing washed less than once/fortnight
  - Some visitors didn’t wear protective clothing or observe “pig free” rules
  - Equipment cleaned infrequently if at all
Organic acids in feed

- Repeated trials within several individual farms, with control groups
- Intervention often begun when prevalence was high
- At end of intervention, prevalence was reduced on some farms – in treated & untreated groups
- Where no response was seen, may have been that challenge was overwhelming

![Graph showing percentage positive for different groups and batches.]

- Group 1
- Group 2
- UU1 – start
- UU2 – end; untreated
- UM/ MU/ MM – end; treated
Vaccination

- Use of oral vaccine via drinking water at re-stocking in a group of specialist finishers – NO effect
- Some success reported in breeder-finisher farms where vaccine used in combination with improved hygiene & biosecurity
- Other intervention trials on-going at present
Bespoke farm interventions

- “ZAP” 2 or 3 farms offered free intensive visit by VIO
- Intensive sampling on farm to identify “hotspots”
- Detailed discussion with farmers & vets
- Detailed action plan created
- Common issues:
  - Widespread environmental contamination
  - Poor hygiene
  - Rodents infected
  - Sick pens infected
- Reportedly successful based on feedback & ZAP score – but follow-up difficult & expensive; ZAP unreliable at farm level
- Case study ZAP2/3 farms reduced their prevalence to below 25%
Frequency of *Salmonella* in a survey of finisher pig farms in GB

Many farms have a lower prevalence

- All farms can aspire to improve
- BUT most *Salmonella* positive pigs live on low prevalence farms
- So ALL farms would have to intervene to produce public health benefits
Motivation

- Achieving national targets demands change by many
- Intent -> Implement -> sustain control measures
- Rate of change impacted by societal factors eg:
  - Acceptance of individual responsibility
  - Belief that change is possible
  - Recognition that industry is acting together
  - Ability to see results
  - Feedback & reward
  - Etc

- In UK, farmers accept some responsibility in principal
- Are not persuaded they must change
- Do not believe proven interventions exist
- Do believe they will bear costs but not gain benefits
- Believe that abattoirs should also be involved
- Value advice from their private veterinary consultants above all else

Challenge is not only to design effective interventions but to engage everyone in change
Conclusions

- *Salmonella* control on farm is possible but challenging
- Some farm conditions increase risk:
  - Outdoor production
  - Solid floors
  - Specialist finishers
- Low profit margins & decline in industry has led to deterioration in buildings etc
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Thank you!