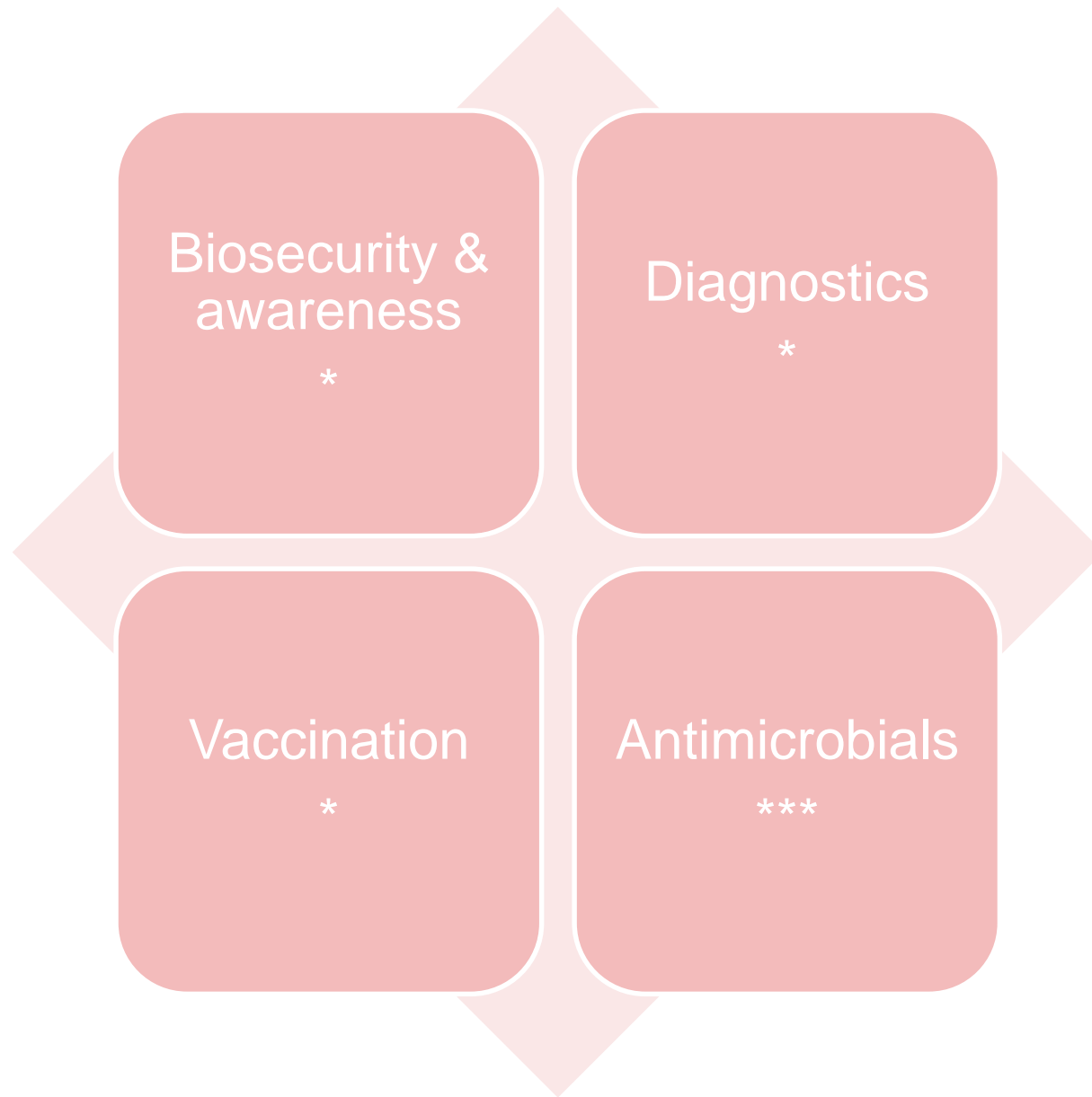
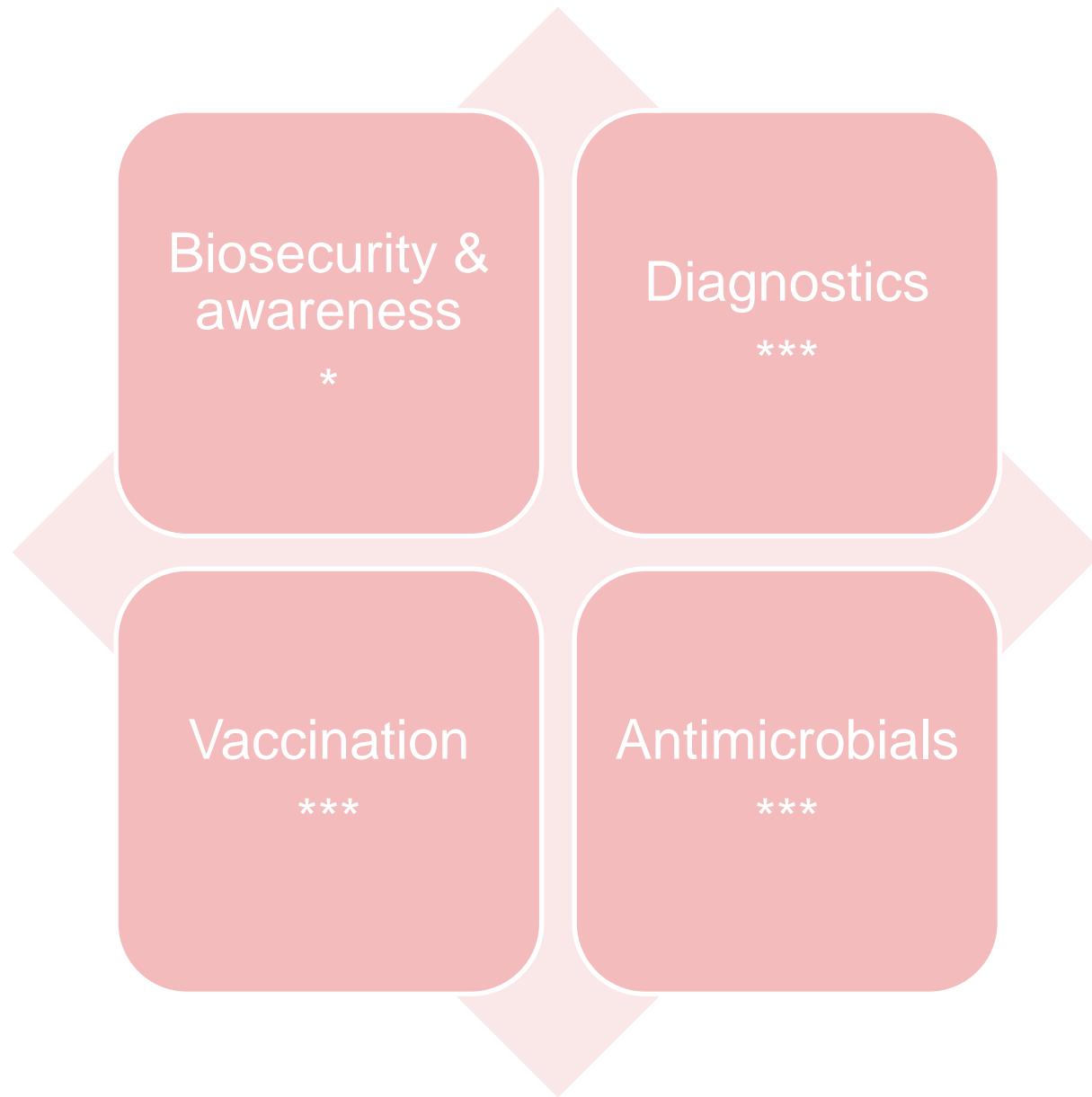




European perspective: new tools and strategies





■ Best strategy in breeders: eradication?

- MG versus MS
- Requires investments in diagnostics

■ Antibiotic programmes:

- Preventives
- Therapeutics
- Macrolides (tylosin, tylvalosin), pleuromutilines (tiamulin, valnemulin), lincosamides (lincomycin), fluoroquinolones (enrofloxacin), tetracyclins (chlortetracyclin, oxytetracyclin, doxycyclin)

■ Vaccines:

- Bacterines (MG-MS)
 - Reduce clinical symptoms but do not protect against infection
- Live vaccines (F strain, 6/85, ts-11 and MS-H)
 - Must be given before natural challenge
- Recombinant vaccine (MG)

- Limited progress on new antimicrobials
 - Compare to progress in diagnostics and vaccines
 - Only one molecule (tylvalosin) was registered in EU in last 15 years
- Still, comparing the three strategies, AMB most popular
 - Quite some countries simply don't have diagnostic labs that can run serology neither molecular techniques
 - They often don't have sophisticated cold chain that are required handling vaccines (2-8° C; -80° C)
 - Prevalence data are often so high stamping out is not an option

- Preventive antimicrobial treatments still standard in many countries
- Advantage MG and MS can be covered (usually)
 - Economic at least on the short term
 - No sensitivity data available from countries where AB use is highest
 - Prevalence remains often very high in these countries
 - So programs are not performing always as they should
 - Pressure on AMB use in EU and abroad (UK)

- Biosecurity is neglected as AMB to provide enough control
- Diagnostics are not available or wrong tools are used for the wrong purposes
- Treatment intervals are ad random based on an expected ROI balance acceptable cost
- Dose levels are not appropriate (too low or too high)

- With new tools available we can become more ambitious in controlling Mycoplasma infections
- This includes innovation on biosecurity, diagnostics, vaccination
- But still we need antimicrobials to make the difference
 - For instance when vaccinating integrated companies starting from high prevalence, often at time of vaccination (6 -17 weeks) rear has become positive already
 - Using an antimicrobial treatment before vaccination seems to be able to suppress (very often) the field strain and replace it by vaccine strain
- AMB have never been more valuable or better used than today, as we have better diagnostics and vaccines!

■ Use PCR outcome to check dose levels

- Registered doses always appropriate?
 - Some molecules registered at higher doses than clinically applicable (tylvalosin, tylosin,...) – cost could be lower than anticipated
 - Some dose levels seem not appropriate with a given sensitivity, water quality, product quality – dose could be too low

■ Use PCR to check intervals and doses needed

- No specific rules, start with 4 weeks interval, check before and after treatment, extend period if ok to 6 weeks
- Adapt dose levels (start highest dose, and decrease using PCR guidance)

■ Inactivated vaccines

- MG only
- Not popular
- Stamping out breeders
- Old adjuvants
- Mainly in layers

■ Autogenous vaccines

- Difficult to produce for MS
- But increasingly popular for E. coli, ORT, Erysipelas, Pasteurella, Enterococcus – multivalent are cheaper as adjuvant is shared
- Lot of innovation in adjuvants
- Therefore might increase in the future

■ Live vaccines

- Ts11, 6/85, MSH, MS Live
- MS Live experience close to zero, commercial layers only

- Registration from 2012 MUMS, central registration for all EU countries
- Experience with vaccine for longer time outside EU
- Ts – type of vaccine, live
- FAQ MSH
 - Transport & storage – specific requirements, not always feasible
 - Application
 - Eye drop and increasingly spray
 - In practice often combined with ILT (not registered in this way)
 - Eye drop is better than many other application routes due to individual dose application but spray is becoming more popular in turkeys, layers
 - Practical application seems very succesful, early days big question mark
 - If some birds are missed, it is advantagous to have live vaccine, so birds can by preening and bird to bird contact increase vaccine take

■ Vertical transmission:

- TS not likely to survive systemic spreading to oviduct
- Even if would happen, it would be at very low levels based on monitoring programs on hundreds of flocks of progeny of vaccinated flocks based on PCR
- Serology of progeny vaccinated flocks typically positive
- Compared to field strain, huge advantage of vaccination, progeny remains negative on PCR

■ Horizontal transmission

- Very slow :
 - Not comparable with viral vaccines (IB, NCD,...)
 - No possibility to reduce registered dose levels
- Beak to beak yes
- Some rare cases where vaccination teams, farmers, ... bring MSH into non vaccinated houses

- Spiking with vaccinated roosters in non vaccinated flocks
 - We detected by PCR flocks that turned positive after introducing vaccinated roosters tested +/- 16 weeks after spiking
- From field – different feedback on farms with vaccinated and non vaccinated flocks
 - Some no horizontal transmission between houses at all
 - Some slow spreading
 - Need focus on why
 - Low biosecurity?
 - Contact birds?
 - No apparent affects on partially vaccinated flocks (no vaccination reactions, no change in virulence seen)

- Reduction of field infection / colonization of field strain in presence of vaccine strains
 - Based on Belgian field study, spectacular reduction of
 - Vertical transmission of field strains of layer progeny and broiler progeny
 - Retrieval of field MS from vaccinated flocks compared to non vaccinated flocks very rare
 - Strong indication of reduced possibility of colonization field strain in vaccinated flocks
 - Clinical signs (egg shell quality, respiratory, synovitis) and vertical transmission reduced
- Confirmed by Feberwee
 - “Quantification of the horizontal transmission of Mycoplasma synoviae in non–vaccinated and MS–H vaccinated layers Anneke Feberwee WVPA Cape Town 2015”
 - Vaccination does reduce symptoms but also reduces shedding of MS
 - Important for strategy of control of MS- vaccination versus stamping out

■ Similar prevalence 2010

- 80% of breeders positive
- Netherlands : focus on awareness, biosecurity
- Belgium: vaccination broiler breeders, but not layers

■ 2016:

- Prevalence Netherlands, fluctuations but similar as 2010
- Belgium: rarely field strains are detected in breeders – layers prevalence remains similar
- Backyard flocks, wild birds largely positive for MS. Continued risk for re-infection – Michiels T.

Prevalence backyard chickens (PCR)

- *Mycoplasma gallisepticum*:

PCR	positives	prevalence	95% CI
Herd (n = 9)	6	66,67%	42 – 100%
Within herd	21	35 %	19,76 – 61,98%

- *Mycoplasma synoviae*:

PCR	positives	prevalence	95% CI
Herd (n = 9)	7	77,78 %	54,85 – 100%
Within herd	57	81,43 %	71,32 – 92,97%

- *Mycoplasma meleagridis*: all negative

- Greatest progress in this field
- Serology – less used than before, especially RPA
- Molecular tools
 - Many advantages few disadvantages
 - Differentiation field strain versus vaccine strains
 - Several labs can differentiate several vaccines, so vaccine use can be monitored
 - DIVA testing GD /Anicon:
 - Advantage pick up different strains in same bird.
 - We tested the GD test with known strains and had 4/20 results which were not in line with reality
 - In practice we just started recently using the Anicon DIVA which is modified from the GD test – should be better but no significant experience yet
 - PCR + Sequencing: disadvantage only one strain is detected, advantage sequencing is very powerful for differentiation vaccine and field and epidemiology

■ Turkeys! See presentation Dr Vriens

- Off label
- Trend of AMB reduction – MSH vaccination helps tremendously

■ Spray instead of eye drop

- Mainly in layers and turkeys
 - High numbers of birds, practically not feasible to eye drop
 - In breeders often combination with ILT, reducing the cost

- Mycoplasma synoviae control has become a lot more successful
- This is combination of improvement of diagnostics (PCR!), vaccines (live attenuated) and antibiotics

Thanks for your attention

