Using antibiotics and vaccines together

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Respiratory diseases especially porcine respiratory disease complex (PRDC) in the grower-finisher phase of pig production remain one of the biggest health challenges facing pig producers today. This syndrome, primarily caused by Mycoplasma hyopneumoniae (Mh) is distributed worldwide and has an important economical impact in this industry.

The complexity of aetiological agents involved can be overwhelming to both growers and finisher pigs. Interactions related to environment, housing type, pig flow, group size, pig age and stocking density play critical roles in the severity of clinical signs seen with different respiratory syndroms, like PRDC.

With the increased emphasis on food safety and specifically antimicrobial resistance and residues, swine practitioners have an ever increasing responsibility to manage respiratory treatment regimes in a prudent and judicious manner.

In grower-finisher units having ongoing respiratory distress, identifying and controlling the risk factors associated with the health challenges are critical to have a favourable outcome with prevention and or treatment programmes.

Mycoplasma hyopneumoniae

In recent years, a number of efficacious vaccines against Mycoplasma hyopneumoniae have been introduced and widely accepted by the industry. Protective immunity and less severe lesions have been demonstrated in animals vaccinated against Mycoplasma hyopneumoniae.

Traditionally, all the suckling piglets are vaccinated at about seven days of age, with a booster vaccination at 21 days or 'one' with a single shot before weaning.

Timing of vaccination resolves around a number of critical issues like:

- Levels of maternal antibodies.
- Timing of the Mycoplasma hyopneumoniae challenge.
- Exposure to other pathogens (PRRSV is of particular concern, if this disease is present during the foreseen vaccination of Mycoplasma hyopneumoniae it will decrease or eliminate the effective immunisation against Mh).
- Availability of workers or time frame.

In many cases, vaccination against mycoplasma alone is not resolving the existing respiratory problems like PRDC. The reasons of failing in growing-finisher pigs, even when different vaccines and/or vaccination programmes against Mycoplasma hyopneumoniae are used, is multiple and complex.

One of the reasons often not considered as relevant, is the different antibody status against Mycoplasma hyopneumoniae and this in relation to the age and/or parity of the sows.

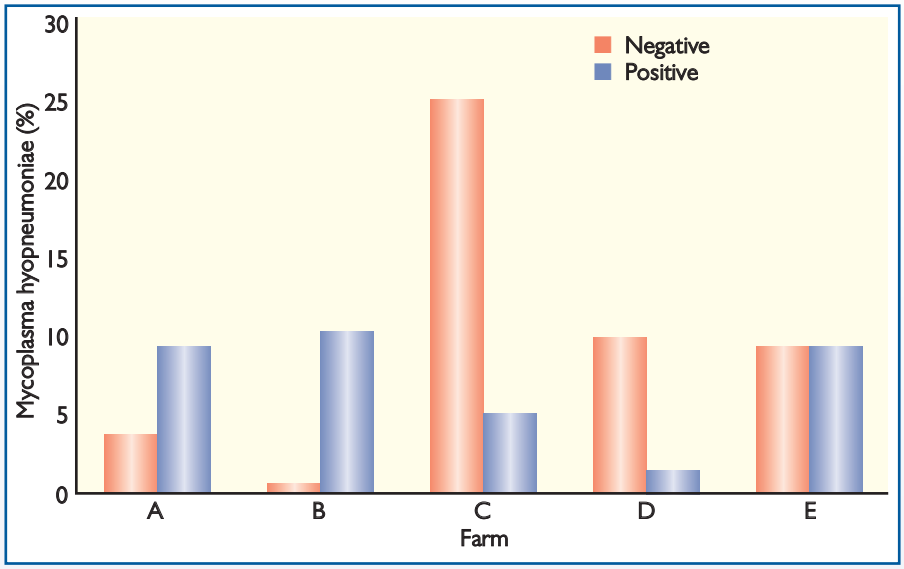

Fig. 1. Belgian sow serology survey for Mycoplasma hyopneumoniae.

Table 1. Farm history presented in the survey.

Farm	B	C	D	E
Sows	170	300	300	700
Pigs	1500	1600	1000	5000
Mycoplasma vaccine	yes	yes	yes	yes
Period (weeks)	1-4	1-3	3	10
Respiratory distress and target weight	–	–	±	30-40kg
[1]Performance	±	±	–	±

[1] *+ = good - = bad ± = average*

Effect of mixing piglets

Mixing of piglets from different sows and origins will influence strongly the seroconversion response and active protection level induced by vaccination.

In an average sow production unit, 35% of the population consists of gilts and second parity sows.

This spread in parity is seen as good farm management and is recommended to improve reproductive profitability in sow herds.

In a recent serological survey in Belgium done in different closed sow units, Huvepharma demonstrated that a significant percentage of 57% of the blooded sows were serologically negative against

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Parity	%	A		B		C		D		E		Total
		–	+	–	+	–	+	–	+	–	+	
Total	100											84
0-1	20	0	50	0	0	13	0	0	0	6	33	17
2	25	8	8	0	25	17	7	33	0	17	11	21
3	23	8	8	8	8	17	3	42	17	6	6	19
4	11	8	0	0	25	7	0	0	0	11	6	9
5	15	0	8	0	17	20	7	8	0	6	0	13
>5	6	0	0	0	17	10	0	0	0	0	0	5

Table 2. Serology and parity distribution (%).

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Mycoplasma hyopneumoniae (see Fig. 1), next to 43% positive sows.

The serology was done with the standard indirect ELISA – kit (HerdCheck, Idexx, Westbrook MA Mycoplasma hyopneumoniae).

No relation could be found between parity and sero-positivity between blooded sows in this survey.

The persistence of passively acquired antibodies is dependent on the initial antibody concentration in the newborn piglet and the latter is highly correlated with the serostatus of the sow population.

However, there is no perfect dose response relationship between the sow's and newborn piglets's titre since colostral intake may be influenced by suckling behaviour.

Taking this into account can be one of the possible reasons to explain the spread of seroconversion against Mycoplasma hyopneumoniae seen in growing-finishing pigs.

Control in practice

Serology in growing-finishing pigs is often used to monitor the status of maternal antibodies and the timing of Mycoplasma hyopneumoniae challenge and seroconversion.

This is done using a cross sectional and longitudinal serology throughout the weaned and growing-finishing periods (10-15 blood samples/age group).

This serological data will provide huge herd health information if pig producers take into account the following important rules:

- Vaccinated piglets can respond actively to the vaccine if they have received it in the absence of maternal antibodies (as the level of maternal antibodies go up, the ability to respond to the vaccine is going down).
- Antibodies from natural immunity do not appear until four to six weeks after pathogen exposure.

To prevent the incidence of PRDC and for the reduction of clinical signs it is generally recommended implementing, next to vaccination programmes, improved management systems with the main focus on housing, ventilation and batch management.

The emergence of PRDC, a late grow-finishing clinical pneumonia for which Mycoplasma hyopneumoniae is a primary agent, demonstrate that the traditional Mycoplasma vaccination programmes and improved management systems are not able to fully control the disease.

The strategic use of treatment programmes with selected antibiotics at defined time points can be an important aid in the coverage of higher protection level of late grow-finishing pigs against PRDC.

Microbial medication

The choice of antibiotics is very important to be effective and to maintain profitability in the pig herd to overcome a possible outbreak of PRDC during a later stage of the growing stages. In preference Huvepharma use active antimicrobials with a special focus on mycoplasmacidal effects such as macrolides (Pharmasin/Tylovet containing tylosin as active or Tilmovet containing tilmicosin as active).

Using antibiotics in therapeutic doses for strategic defined periods of 10 -15 days, (results of the cross sectional and longitudinal serology) will help to prevent serious respiratory distress in the later grow and finishing phase next to the established vaccination programmes.

The family of antimicrobials which are used need to have particular properties such as:

- Mycoplasmacidal mode of action.
- Highly sensitive against most field strains of Mycoplasma hyopneumoniae.
- Showing little resistance.
- Low MIC's.
- Short withdrawal times.
- Generally perceived safe in regard to public health.

Using Pharmasin/Tylovet or Tilmovet will not influence the used vaccination programme against Mycoplasma hyopneumoniae or the different available vaccines.

Using this approach, combining vaccination and strategic use of an antimicrobial treatment, in field circumstances is offering the best results in reducing multiple respiratory diseases caused by PRDC in fattening pigs and will keep the highest performance in a challenging and competitive pig environment. ■