

Difference between experimental- and field trials with a live AR non-pathogen *Bordetella bronchiseptica* vaccin.

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Introduction: Fighting the AR in young piglets concentrates on the elimination of *B. bronchiseptica* (BB) and *P. multocida* (PM). Especially young pigs have to be medicated to fight these agents. This is carried out either by means of parenteral infections and or oral addition by food and or a nose-spray. Besides vaccination of sows and/or piglets is applied with inactivated BB or BB+PM vaccines. The improvement of the housing-circumstances, ventilation and management is indicated as a primary condition for obtaining a clinical improvement during a long period. Without the often expensive housing adaptations (all in - all out systems), the use of medicins and inactivated vaccines frequently had unsatisfactory clinical results in Dutch pig-farming. The preventive effect of a BB-vaccination directed against BB can be considered satisfactory, whereas the protection against PM is often insufficient, especially in AR-problem herds. At the latter a change of the nasal flora of piglets was observed after a vaccination with inactivated BB respectively BB + PM vaccines. The BB disappeared almost completely but instead there was a replacement by PM (AR-toxinforming) in the population. With the increase of the AR-pathogen PM in these herds the clinical AR also increased. This bacteriological phenomenon was the base of the following. A live

AR-non path.- BB vaccin may prevent the colonisation of the path. BB and PM bacteria in such a way that no clinical AR will appear among piglet population. By means of such a control of the colonisation of the piglets nose the possibility would be created to prevent the enormous financial burden attending the advices to improve housing or reduce medication costs. **Experimental results:**

From a herd without clinical AR a AR non path. BB strain was isolated and tested through the primary SPF piglet-test and the guinea-pig skin test. From the bacteriological examination of these SPF piglets noses, it was found that 2 and 4 weeks after the nasal infection (vaccination): 100% resp. 50 % were BB positive (AR non path.) of the contact control-piglets, 100 % resp. 33 % were BB positive (AR non path.). Colonisation and spread seems to be possible with this strain in piglets of 3 weeks old.

In a following experiment secondary SPF piglets were vaccinated intranasally with the AR-non path. BB culture during the first week of live. These piglets were challenged at the age of 3 weeks with a AR path. BB strain of a AR path. PM strain.

After four weeks the challenge results were compared with vaccinated, vaccinated challenged and non-vaccinated and challenged piglets (fig. 1). The results of the average ventral conchal atrophy were used for comparing the protection percentage.

Fig. 1. Group	No. of piglets	Average V.C.A.	Protection percentage
Vaccinated	2	0	
Vaccinated + BB challenge	3	0,5	} ± 80 %
Not. vacc. + BB challenge	2	2,5	
Vaccinated + PM challenge	4	0,9	} ± 75 %
Not. vacc. + PM challenge	2	3,8	

The fieldtrail on a farm with clinical AR and AR path. BB and AR path. PM:

Ten litters were vaccinated and ten litters were treated the same way with only the broth (placebo). A third group of ten litters served as controls. The sows were divided in these groups by drawing lots. From every litter three piglets were drawn lots for the bacteriological survey, which was done in week 1 (± day 2), week 3, week 6 and week 8. From this three piglets two or one were drawn lots from resp. the vaccinated, placebo and control group.

The results are presented in fig. 2.

Fig. 2.

Results	Group BB vacc.	Group plac.	Group contr.	Protection Percentage
<u>Clin. observ.</u>				
No. of pigs	82	103	90	
Perc. BS +	23%	31%	32%	± 28%
Nose Dev.	7%	17%	16%	± 56%
Severe AR	6%	10%	13%	± 54%
<u>Bact. research</u>				
No. of pigs	30	33	33	
Perc. BB pos.	20%	33%	67%	+ 70%
" BB AR path.	13%	33%	67%	± 80%
" PM pos.	47%	55%	70%	+ 33%
" PM AR path.	27%	33%	37%	± 27%
<u>Path. results</u>				
No. of pigs	20	11	10	
Av. V.C.A.	1,52	2,36	2,45	+ 38%

Conclusions

1. There seems to be a difference in colonisation SPF and conventional pigs with the AR non path. BB strain.
2. The colonisation of the AR path. BB could be reduced with 70% - 80%.
3. In the fieldtrail we did not find such numerous colonisation of the AR non path. BB, which is possibly necessary to block the colonisation of PM sufficiently.
4. In the fieldtrail PM colonisation already starts before the third week, which possibly influence strongly the clinical results.
5. A complete elimination of BB and PM seems not to be necessary to control clinical AR; minimizing this colonisation seems to be necessary.
6. The intranasal vaccination with a AR non path. BB live-vaccin can be helpful to minimize the colonisation of the pathogens.
7. Research to improve colonisation at a young age by probably other BB vaccinestrains or research to find a better vaccination schedule have to be developed.
8. From the piglets infected with PM-AR path. 70% had a PCMV-titer ≥ 160 , from the piglets infected with PM-AR non path. 47% had a PCMV-titer ≥ 160 . From the piglets which were bacteriological PM negative 25% had a PVMV titer ≥ 160 . There seems to be a correlation between a PCMV-infection and the colonisation of PM especially the PM-AR path.

Selected references: M.F. de Jong, H.L. Oei and G.J. Tetenburg, I.P.V.S. Copenhagen 1980 p. 212.
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- 1) Protection percentage between vaccinated and controlgroup.