An experience with the use of a PM-AR toxin vaccin combating AR in practice.

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Bordetella bronchiseptica (BB) and Pasteurella multocida (PM) are able to cause Atrophic Rhinitis (AR). The immunisation of the sows with BB vaccins, results in suppresion and or disappearance of BB out of the noses of the piglets nursed by these sows. With the use of killed PM-bacterin-vaccins, this effect was not demonstrated (3).
The AR pathoginicity of the PM bacteria is caused by the forming of a dermonecrotic-thermolabile toxin, which can be found in the filtrated bacteria-free supernatant (4).
Antibodies that were stimulated by toxins of two PM isolates with a different O-characterization on rabbits, appeared to give cross protection (4).
For this research the filtrate containing thermolabile dermonecrotic-toxin was brought in an incomplete oil-adjuvanted vaccin. This vaccin was tested on a multiplying herd with 120 sows. The herd has been under medical control for some years because of persisting AR problems.
In the beginning AR pathogen BB and PM bacteria were isolated frequently in the piglets. Due to the vaccination of the sows with a BB vaccin, BB almost disappeared (5).
The AR problems however were persisting.
Vaccination with commercial PM vaccins caused no clinical and bacteriological improvement.
Vaccination scheme: the sows and gilts were vaccinated intramusculary with 2 cc vaccin 8 and 4 weeks before parturition. In the beginning the piglets of sows, which were not vaccinated, received vaccination of 1 and 2 cc in the firts and fourth week of life. Piglets produced by sows that were vaccinated once got a vaccination with 2 cc in the 4th week.
In the next gestation a booster-dose of 2 cc was given ± 3 weeks before parturition.
The all in - all out system cannot be applied optimally on the herd, therefore an infection (challenge) was maintained in the farrowing houses.
Monthly a bacteriological nose examination was carried out on ca. 4 and 8 week old piglets.
Sera were also collected. The antibodies against the PM-AR toxin were determined with an Elisa method. At the age of ± 8 weeks the piglets were examined clinically according to the extent of the AR deviations with the aid of the BS method (1, 2).

Results of the clinical examination (BS)
The percentage of piglets with clinical AR decreased. Formerly this percentage often amounted to ± 30%, but after some months it decreased till ± 5%. After a year this percentage was ± 1%.

Year	period	No. pigs	BS(2) % Δ TR-	CLIN AR %	
1979	Oct-Dec	570	28	21	
1980	Jan-March	483	28	24	
1980	Apr-Jun	710	37	27	-- start of the
1980	Jul-Sept	584	62	5	PM-AR toxin
1980	Oct-Dec	726	70	5	vaccination
1981	Jan-March	657	53	8	
1981	Apr-Jun	614	60	5	
1981	Jul-Sept	667	77	1	
1981	Oct-Dec	799	77	1	

Bacteriological examination.
BB was not isolated during the research.
The isolation score of PM showed the fluctuating course. A decline of the PM isolates seems to develop slowly in 4-week old piglets.
In addition no remarkable changement between the AR pathogen and AR non pathogen PM isolates occured.

Serological examination.
Most sows reacted after vaccination with a clear increase of an anti-PM toxin-titer in sera and colostra. The titer-increase seems to continue gradually in the population with the continuation of the vaccination-scheme.

Relation of clinical AR state and the anti PM toxin titer.
Through a screening of the collected sera of piglets at the age of 4 and 8 weeks on the anti-PM toxin titer, no clear relation was demonstrated with the clinical AR state of these piglets.

Discussion and conclusions.
- Vaccination of sows with the PM-toxin reduces the percentage of piglets with clinical AR.
- Among the sows there is a clear variation in PM-AR toxin titer.
- These differences also exist among the piglets of each litter.
- If AR appears, it is especially strongly litter-associated, especially the gilt-litters.
- The intake, for what ever reason, of too little colostrum or colostrum with a low amount of AR-toxin antibodies, results in potential AR piglets, in case of a certain infection pressure.
- The possible rapid decline of the AR toxin content (antigen) in the vaccin is a practical problem. Every three months a new charge of vaccin was produsued. Difference among the charges can not be excluded completely.

Selected literature.

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