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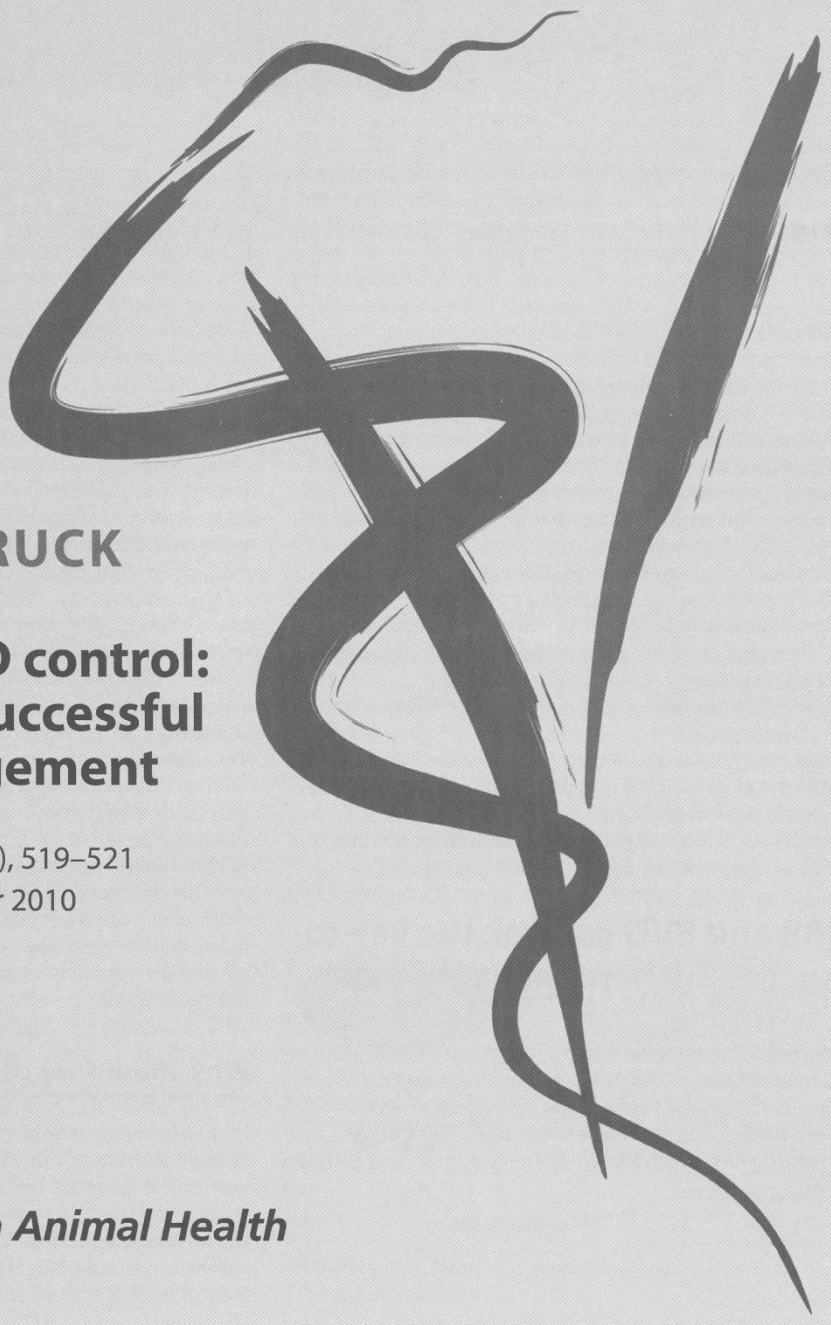

SONDERDRUCK

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FIGURE 1: *Participants Symposium "IBR and BVD control", Prague, June 2010.*

Proceeding

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IBR and BVD control: the key to successful herd management

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Veterinary scientists and practitioners from 17 European countries convened in the beautiful city Prague in June 2010 to exchange knowledge and experiences on the control of infectious bovine rhinotracheitis (IBR) and bovine viral diarrhoea (BVD). More than 60 delegates (Fig. 1) from the different countries followed the invitation of Professor Thiry (University of Liege, Belgium) to participate in the two-day scientific symposium that was facilitated by Intervet/Schering-Plough Animal Health. The participants listened to the talks presented by 18 experts and contributed to the lively round-table discussions.

The first day was dedicated to the control of IBR, while BVD was the subject of the second day. Both days started with a session addressing general aspects. A number of papers, that addressed the approaches and achievements in the control of the two diseases in the different countries, formed the introduction to the comprehensive round table discussions on both days.

The experts agreed that the necessary tools for successful IBR and BVD control such as vaccines and diagnostics are available. The success of a control program, however, strongly depends on the systematic and consistent use of these tools by a good management of the programs.

Why should we control IBR and BVD?

In his opening lecture, Dr. Franken labeled IBR as a "political disease"due to the fact that the main economical benefit of IBR control relates to trade constrains on animals that are (potentially) infected with the bovine herpesvirus 1 (BoHV-1). On the other hand, losses due to subclinical infections including the reduction of milk production also account to considerable

economic damage. Prof. Cavirani from Italy reported about clinical outbreaks in dairy cows in combination with heat stress.

The main driver for BVD control is the reduction of costs related to BVD infections. Prof. Brownlie notified about experiences from herds of which the general health status strongly improved after eradication of BVD from a herd. A formula to calculate the costs of a BVD outbreak in a herd was presented by Dr. Wolf. The formula takes different variables, including the virulence of the strain and the immune status of the herd into consideration. Expectedly, the risk of an outbreak and the costs are highest in a naïve herd.

While the benefits of IBR and BVD control are generally acknowledged, and numerous control programs for each of the two diseases are in progress, the question was raised, whether it would be desirable to have combined control programs. In this context, the audience was very interested in the data presented by Dr. Makoschey who discussed the use of IBR vaccines in a herd and how this can fit within herd control of other diseases, such as BVD.

Can we control IBR and BVD?

Good diagnostic tools are a prerequisite for the control of both diseases. A large variety of tests for antibody and virus detection are available. "Antibody testing plays a central role in IBR diagnostics", explained Dr. Mars: "In The Netherlands we monitor herds by monthly bulk milk testing for antibodies against gE, while the IBR monitoring in other countries is often based on serum samples which are tested at much longer intervals (yearly). The Dutch approach, however, might be the most cost-effective testing strategy", although it is of course not applicable in beef cattle. Dr. Schroeder presented results on the use of a milk sample preparation method to increase the sensitivity of the antibody detection. For those countries that use marker vaccines for IBR control, it was reassuring to hear from Dr. Mars that all Dutch field isolates are typed and until now, no gE negative field isolates have been detected.

PD Dr. Beer reviewed the techniques applied in the diagnostics of BVD (Fig. 2). Due to the biology of this virus, detection of persistently infected animals is the key element in BVD monitoring programs. A number of ELISAs and PCR tests are commercially available for the testing of blood samples and ear notches. The latter are the first choice for the diagnostics in young animals in which maternal antibodies might interfere with the virus detection in blood samples.

Most BVDV antibody tests measure the response against non-structural proteins. New data from the laboratory of Prof. Alvarez confirmed data from previous studies that an inactivated BVD vaccine (Bovilis® BVD, Intervet Schering-Plough Animal Health) has properties of a marker vaccine and demonstrated that the BVDV antibody levels in milk are lower than in serum, suggesting that milk might be a suitable substrate for monitoring. In the round table discussion, the question whether a marker vaccine for BVD was needed was adressed: " We actually already have a marker vaccine". Also from the presentation on the BVD control program in Spain (Dr. Arnais) it became evident that the principle of marker vaccines is applied into practice. Similar experiences are available from Italy (Prof. Cavirani).

Prof. Klee from the University of Munich gave a presentation on bovine neonatal pancytopenia (BNP), a bleeding disorder affecting calves of under four weeks of age. He presented information demonstrating that the dams had been vaccinated with a particular inactivated BVD vaccine, or the calves had received colostrum from such cows in almost 99% of 365 cases confirmed by haematology and/or autopsy. Studies are ongoing to understand what other likely factors are involved. In the round table discussions, experts expressed their concerns, that the uncertainties on the etiology might unreasonably discredit BVD vaccines in general. On the other hand, the knowledge that becomes available during ongoing investigations should be taken into consideration in future developments of vaccines for animals and humans.

In most IBR control programs, marker vaccines are applied with good results. While the efficacy of live IBR marker vaccines is generally accepted, the potential risk of transmission of vaccine virus was addressed in the round table discussion. Based on previous studies and experiences from the field, PD Dr. Beer advised to perform vaccinations via the intramuscular route in situation where spreading of vaccine virus to unvaccinated in-contact animals has to be prevented. Moreover he reminded the participants of a study in which is has been demonstrated, that animals seroconverted after vaccination with 1/5000 of a dose of an IBR marker live vaccine dissolved in an inactivated BVD vaccine. These results stress the importance of good veterinary practice in the use of single-use needles and syringes, or efficient cleaning and desinfection of injection devices.

A general concern of the experts involved in IBR and BVD control programs is the question of interspecies infections. The paper given by Dr. Thiry summarized the current knowledge on interspecies infections with ruminant alphaherpesviruses while interspecies infections with ruminant pestiviruses were reviewed by Dr. Meyer. Both scientists concluded that close contacts between the animals are required for interspecies transmission of viruses, which limits the spread under natural conditions. With regards to IBR control, water buffaloes and the herpesvirus of buffalos (BuHV-1) are the most relevant risk factors, especially in mixed herds, that can be found mainly in Italy. In the Italian IBR control programs, BuHV-1 infections are treated the same way as BoHV-1 infections (Prof. Cavirani). The border disease virus (BDV) and the interspecies transmission of ruminant pestiviruses between goats

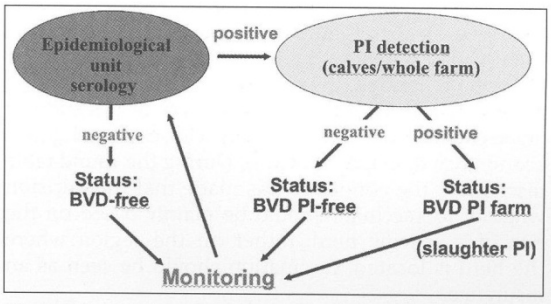

FIGURE 2: *Diagnostic strategies for BVD control (PD Dr. Beer).*

or sheep and cattle might interfere with BVD control, especially when eradication of BVD will lead to zero seroprevalence and a high susceptibility to pestivirus infection. Therefore, diagnosis of a BDV infection in cattle is treated in the same way as a BVDV infection in most BVD control programs. In addition, BDV control measures are applied in some regions, where BDV causes damage to the sheep industry. Dr. Makoschey reported on positive experiences from a BDV control program in a French dairy sheep herd.

How can we control IBR and BVD?

The experts agreed that control of IBR and BVD would benefit from a harmonized approach on European level. The reality however is that currently control programs apply only on national level (IBR control in Germany, France (Dr. Dubois) and Czech Republic (Dr. Bartak); BVD control in Germany (Prof. Moennig) or even on regional level (IBR and BVD control in Spain (Dr. Arnais) and Italy (Prof. Cavirani), IBR control in Belgium (Dr. Houtain) as well as BVD control in France (Dr. Dubois) and UK (Prof. Bronwlie) with differences in the goals and strategies (see Figure 3 for IBR control).

This diversity leads to a situation, where BoHV-1 seropositive animals or animals persistently infected with BVDV are sold outside a region, while import of these animals is prohibited. "On the other hand, culling of large numbers of animals in the framework of disease eradication might result in the introduction of disease due to the purchase of new animals to re-stock the herds", was a concern raised by Prof. Bronwnlie based on experiences with foot-and-mouth disease and tuberculosis control in the UK.

From the experiences with past and ongoing control programs it was concluded, that any successful control program needs to have an owner, which could be the government, farmer organisations or levy bodies. "No program that was not supported by the vast majority of farmers had a lasting effect", was a comment made by Prof. Moennig. This owner has to ascertain that the program follows a very systematic approach and is strictly implemented. Any exceptions will eventually negatively affect the success and therefore increase the costs. According to a survey that was performed in the UK and presented by Prof. Brownlie, the knowledge of veterinarians on BVD strongly influences her/his willingness to actively promote BVD control.

All programs need to have a reliable and cost-effective monitoring system in place. In addition, vaccination might be applied as an additional measure to protect free herds against new introductions. As also demonstrated by the field case presented by Dr. Rypula, groups of unvaccinated animals have the highest risk of re-infection. Moreover re-infection in unvaccinated, uninfected herds causes the highest economical damage (Dr. Wolf). During the round table discussion, the comment was made that the decision whether to vaccinate should be mainly based on the risk of a specific herd, rather on the region where the herd is located. Vaccination should be seen as an insurance.

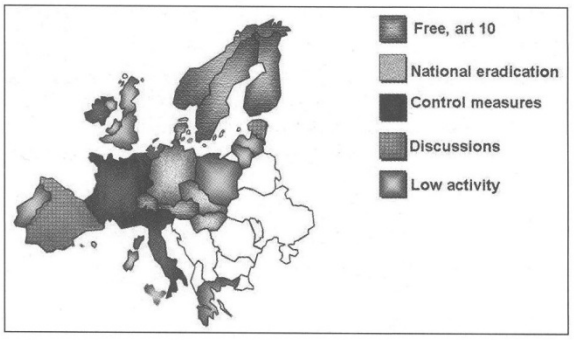

FIGURE 3: *Status of IBR control in Europe (Dr. Franken).*

Summarising the control of IBR and BVD both in a historical and geographical perspective, PD Dr. Beer concluded that similar patterns can be seen: Control starts with voluntary/regional programs. As the prevalence decreases, the programs are extended to larger regions or on national level. The final phase of any eradication program can only be successful if control measures are made mandatory. All experts agreed that control of IBR and BVD is possible, but requires a systematic approach. In most European countries, the high cattle density and prevalence of IBR and BVD makes the use of vaccines in a control program necessary from an economic point of view.

Summary

- Control of IBR and BVD should be possible in Europe.
- Effective vaccines and reliable tools for monitoring are available.
- Systematic approach and strict implementation of control measures are essential.
- Voluntary or mandatory programs are ongoing on regional or national level in a lot of countries.
- Successful programs put pressure on surrounding regions/countries to initiate control program as well.