PERSPECTIVES AND PROGRESS ON: CONTROL PROGRAMS

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In considering the output of the Control Programs theme and providing a perspective on recent progress it is worth considering this theme in context of the rest of the Colloquium. This Colloquium showcases the vast array of international research and activity taking place in relation to Mycobacterium avium subsp. paratuberculosis (Mptb). It is a sobering thought to realise that most of the program (perhaps 80%) is dedicated to a wide range of research activities in fields as diverse as epidemiology, diagnostics, host response and immunology, pathogenomics, genotyping, public health and environmental biology, for the primary purpose of providing tools and methods for the control of this agent! The presentations and posters presented in this theme build on previous work in these underpinning disciplines and provide a demonstrable outcome for the research funds expended.

At previous colloquia we have seen concepts, ideas and developing regional and national programs, as well as application of a variety of approaches for on-farm control. This Colloquium continues that trend but extends into the realm of evaluation or review of more mature programs. As a snapshot of where “control” is up to, I have broadly classified the 41 abstracts submitted for this theme as: 15 on program evaluation & review; 5 on program planning & implementation; 5 on education and training; 4 on on-farm control and 12 on vaccination.

Obviously there is some blurring across categories, and particularly the vaccination category could also be classified under some of the other headings, as several of the abstracts relate to the role of vaccine in on-farm control or in national and regional programs. So what does this tell us?

Firstly, it is apparent that there are now a number of national or regional programs that are undergoing evaluation and review. An important aspect of program evaluation is that of looking at what aspects have worked well and what has been less successful, so that programs can be modified and improved going forwards. As well as evaluation of existing programs, it is also evident that the need for paratuberculosis control in livestock continues to be recognised, with several papers describing planning and implementation of new or ongoing programs.

Another category which I feel is growing in importance and is now well represented in the program is that of education and training, either for farmers or practitioners (or both). The best program in the world will fail if key participants don’t understand or support it. Education/training has been well recognised for many years as essential for the success of any disease control program and it is an indicator of progress to see active research and implementation in this area for paratuberculosis control programs. This is particularly important for a disease where research for many years has been dominated by “hard” science being undertaken in laboratories and then translated into rules-based programs for implementation without adequate communication and education of the target group.

Finally, the number of abstracts relating to vaccination obviously warrants some discussion. Although there were 12 abstracts relating to vaccination in total, this is somewhat misleading, as several research groups submitted multiple abstracts in this area. Nevertheless, this is an important area of research, as vaccination provides one of the few potential tools for effective on-farm control of the clinical and production effects of this disease. This is an important area of research and one which is being watched with interest.

So, where to from here? What are the challenges on the horizon for control programs? How might we pre-empt or overcome those challenges? Firstly, let us briefly consider the principles of disease control. From a scientific perspective, for effective control we need to be able to:

- **Detect the disease or infection:** Current tests still have quite poor sensitivity for early infections. Research is ongoing looking for new diagnostic methods, particularly for early detection before onset of shedding or clinical signs and for tests able to differentiate animals that will succumb to clinical disease from those that remain latent or eliminate the infection.

- **Prevent new cases:** Currently we rely on segregation of new-born animals at birth and/or vaccination to prevent new cases. Segregation is effective in theory but implementation can be problematic and is an important area of research and education to try and improve uptake and effectiveness. Vaccination is an important but imperfect tool. While it appears to be successful at reducing clinical disease, it does not
prevent infection and ongoing transmission from vaccinated animals. An important area for research is to produce a more effective vaccine, ideally one that prevents rather than suppresses infection.

- **Prevent spread of infection between farms:** In general, paratuberculosis spreads mainly through movement of infected animals. Therefore, in the absence of effective tests for early diagnosis and effective measures to prevent on-farm transmission, the only reliable tool for preventing farm-to-farm spread is to limit animal movements off infected farms to either slaughter or to farms with a similar risk profile. This causes disruption to trade and significant losses for some producers and is therefore a source of angst and resistance to program implementation.

From a scientific/research perspective, the keys to effective control are therefore a better test and a better vaccine. This is not new and is the underlying basis of the many millions of dollars currently being spent internationally on paratuberculosis research each year.

If there are no immediate solutions for these technical issues forthcoming, what other challenges are there and what might be required to address them?

Other factors that should be considered in any disease control program include:

- **Economic cost and funding sources:** Governments in many countries are increasingly reluctant to fund disease control programs, particularly where much of the benefit is seen to flow directly to the affected industry. This is resulting in an increasing reliance on government-industry partnerships or even direct industry-managed programs. The challenge here is to find an appropriate model (and funding) for the specific circumstances in individual countries and industries.

- **Adequate veterinary infrastructure:** Any technical program requires trained professionals to implement the program. Again, with increasing government constraints and the move to industry-based programs, the support of government veterinary services is no longer assured. Alternative approaches using private veterinarians for program management and implementation are increasingly common, but again face the challenge of finding suitable funding and management models, as well as ensuring commitment, technical knowledge and understanding of the program in veterinarians already under significant other workload.

- **Producer and community support:** For a program to succeed it is essential that it has support from the affected industry(s) and from the community in general. Without widespread support the program is likely to struggle to gain momentum and can easily fail to meet its objectives. This is a significant challenge for paratuberculosis control, particularly where programs may be complex and to be effective must disadvantage some producers, often through no fault of their own. The challenge here is to maintain communication with producers and the public; to educate them on key aspects of the disease and the program and to engage them in constructive discussions to help assure program success. This is already starting to happen, as evidenced by the presentations to this Colloquium.

In conclusion, control programs in many countries are maturing, while others are still in the implementation phase. These programs depend on the ongoing support of the research effort and also on the continued communication and education strategies and development of new models for program funding, management and support.