



Summary

OIE Reference Laboratory Twinning Programme: Brucellosis ANSES-France and NIAH-DLD -Thailand

NIAH Background

The National Institute of Animal Health (NIAH), Department of Livestock Development (DLD) has been established in collaboration with the government of Japan through the Japan International Cooperation Agency (JICA) in 1986 after successful completion of the Phase I Project. As a national institute, NIAH is well equipped and could carry out research and diagnosis on animal diseases extensively. NIAH Phase II project (5 years) was started and based on the Record of Discussion with three main subjects: Development of control programme for five major animal diseases (Classical swine fever, Brucellosis, Tuberculosis, Paratuberculosis and Arthropod-borne diseases); Training activities and guidance for Regional Veterinary Research and Development Centres (RVRDCs) in Thailand; Improvement and standardisation of diagnostic techniques. The project has maintained the condition of buildings and facilities under the allotted Thai local budget. NIAH provided with high technology and modern equipment, which could conduct research and diagnostic activities on animal diseases and improving the laboratory network with RVRDCs. Furthermore, NIAH has been expanding the collaboration internationally regarding both research and diagnostic activities to keep improving the laboratories capabilities.

OIE Reference Laboratory Twinning Programme on Brucellosis

The Beginning of OIE Reference Laboratory Twinning Programme

Thailand raised the re-appearance of *Brucella melitensis* and its threat in the 65th Executive Committee Meeting and the 29th Session of Animal Production and Health Commission for Asia and the Pacific (APHCA)/Food and Agriculture Organization (FAO) (25 September 2005). The member countries requested APHCA to organise a relevant workshop. Later, the 30th Session of APHCA (Luang Prabang, Lao PDR, 25 October 2006), in session APHCA-OIE Regional workshop on goats, Dr Bruno Garin-Bastuji, c/o World Organisation for Animal Health (OIE) was invited for a presentation on “*Brucellosis in sheep and goats - diagnosis and control*”.

From this point, FAO-RAP, APHCA and OIE-RRAP jointly organised the “FAO-APHCA/OIE Regional Workshops on Brucellosis Diagnosis and Control – with an emphasis on *Brucella melitensis*” in the Asia and Pacific Region in collaboration with the DLD of Thailand from 2008 to 2010 (3 workshops) and chaired by Dr Bruno Garin-Bastuji, OIE/FAO Brucellosis Expert and head of the EU, OIE and FAO Reference Laboratory for Brucellosis in ANSES¹, Maisons-Alfort, France. These workshops provided an updated protocol on diagnosis and control measures for brucellosis, update the disease situation in Asia and the Pacific, including hands-on training on

¹ AFSSA (French Agency for Food Safety) until 1 July 2010, when it became ANSES (French Agency for Food, Environmental and Occupational Health and Safety)

diagnosis of *Brucella melitensis* and other *Brucella* infections of importance in livestock and to promote collaboration on diagnosis and control of brucellosis in the region.

Conclusions and recommendations of the first and second workshops finally proposed to provide for the establishment of a Reference Laboratory for Brucellosis for the Asia and Pacific Region. It would support the strengthening of laboratory capacity and activities of Brucellosis diagnosis and surveillance, and for national brucellosis control strategies on the short and/or long-term basis in the respective countries. For this purpose, an OIE twinning programme should be developed in this Region, with NIAH-DLD as the junior laboratory and ANSES OIE/FAO Reference Laboratory for Brucellosis in France as the parent laboratory.

From the third workshop, the participants requested for support on Brucellosis proficiency testing (ring-trial) to member country Brucellosis National Reference or expert laboratories in the region. This would provide a stage for promoting collaboration in the region.

The discussion and preparation of the twinning project on brucellosis started during the first and second FAO-APHCA/OIE Regional Workshops on Brucellosis Diagnosis and Control in 2008 and 2009. Dr Bruno Garin-Bastuji visited NIAH-Brucellosis laboratory in order to evaluate the potential of NIAH for becoming a reference laboratory in the region.

Frame of OIE Reference Laboratory Twinning Programme

The objectives of the ANSES-NIAH twinning project were endorsed by the directors of both laboratories and respective national CVOs. The project was approved in June 2010 for a 3-year duration (July 2010- June 2013) with a budget of 99,300 €.

Main objectives

There were to strengthen the level of expertise in brucellosis (serological diagnosis/screening and bacteriological isolation of *Brucella* spp. by culture) and implement reference activities:

- (i) control and standardisation of diagnostic reagents and vaccines recommended by OIE for the control and surveillance programmes of brucellosis,
- (ii) organisation of Regional serology proficiency ring-trials in order to improve the quality of testing in the brucellosis national reference labs in the region, and
- (iii) *Brucella* typing and molecular detection and identification, according to the methods and standards described in the OIE Manual. All procedures to be implemented should fulfil the requirements of ISO/IEC 17025 Standard.

Work plans and training programme

- ◆ Three annual training sessions for up to a maximum of senior laboratory technicians/veterinarians in ANSES.
 - First year training session: serological diagnosis and control of diagnostic antigens and ELISA kits with discussion regarding the organisation of the bacteriological diagnosis in adequate quality and biosafety condition
 - Second year training session: bacteriological and molecular detection as well as biotyping and molecular identification with discussion as regards the control of *Brucella* vaccines in adequate quality and biosafety conditions.
 - Third year training session: control of *Brucella* vaccines and organisation of proficiency ring-trials.

- ◆ Three visits of ANSES experts to NIAH, 6 months after each training session in order to assist the NIAH in improving the organisation and the quality management of brucellosis activities as far as the topic of the previous training session was concerned.
- ◆ The participation of NIAH to the European/International proficiency ring-trials organised by ANSES in order to monitor the progress in the quality of serological testing in NIAH.
- ◆ The collection of large volumes of serum from positive cattle, buffaloes, sheep and goats in order to establish a common serum collection for the establishment of regional secondary standard sera, further organisation of regional ring-trials, and quality assurance and test validation controls.
- ◆ The establishment of a NIAH collection of *Brucella* strains, including reference and field strains from infected animals at the regional level.
- ◆ Assistance in completing the quality assurance system in place (acc. 17025 ISO/CEI std.)
- ◆ Assistance in designing research activities as studies on the distribution, both, geographical and by animal species, of *Brucella* species in the region.
- ◆ The provision of minimal volumes of *Brucella*-phages and monospecific sera for a rapid implementation of *Brucella* biotyping at NIAH
- ◆ In addition included an adequate re-organisation of the NIAH laboratory with the acquisition of the necessary equipment and materials for the improvement of *Brucella* bacteriology in adequate biosafety and biosecurity conditions (NIAH budget).

Programme Achievement

All activities in the programme were achieved and completed on 31 December 2013 (extended for 6 months due to the heavy flooding in Bangkok). The achievement of all objectives was expected to strengthen the Asia-Pacific regional impact of the NIAH brucellosis laboratory and to ensure the capability for the already ongoing implementation of regional activities expected from an OIE Reference Laboratory. The benefit of this programme would be a guide for stimulating and enhancing an active network of regional diagnostic expertise for the surveillance and control of brucellosis for the benefit of the Regional Animal and Public Health.

The main results were:

- (i) a regional secondary standard bovine serum established in NIAH;
- (ii) the implementation of quality control of locally-produced RBT antigens by NIAH;
- (iii) the joint organisation (ANSES and DLD-NIAH) of the first “2013 Asia-Pacific Bovine Brucellosis Interlaboratory Proficiency Test” with support of FAO-APHCA and OIE, the results of which were presented and discussed during “The 4th FAO-APHCA/OIE/DLD Regional Workshop on Brucellosis Diagnosis and Control in Asia-Pacific Region – Proficiency Test and Ways Forward”, Chiang-Mai, Thailand, March 2014;
- (iv) the participation of NIAH to the EU/OIE interlaboratory proficiency tests 2012 and 2014;
- (v) the provision of NIAH with all the *Brucella* reference strains, *Brucella*-phages and monospecific sera needed for a rapid implementation of *Brucella* biotyping in standard conditions;
- (vi) the validation by ANSES of the identification of *Brucella* strains stored in the NIAH *Brucella* collection;
- (vii) ANSES assistance in completion of the quality assurance system (ISO/IEC 17025:2005) in place in NIAH;
- (viii) ANSES support in designing research activities and a project of PhD thesis.

Related activities of NIAH

- ◆ NIAH-Laboratory Biosafety and Biosecurity, supported by FAO and APHIS-USDA: NIAH staffs participated in BSC class II inspection course for NSF/ANSI 49 at NFS (National Sanitation Foundation), Maine, USA. These certified staffs have been effectively inspecting BSCs class II of all RVRDCs since 2014.
- ◆ Participation and presentation: Brucellosis 2011, International Research Conference including the 64th Brucellosis Research Conference Buenos Aires, Argentina, 21-23 September, 2011 (presentation of a NIAH-ANSES poster: “*Brucellosis control and eradication programme in Thailand: Preliminary evaluation of the epidemiological situation in cattle, buffalo and sheep and goats*”).
- ◆ Participation and presentation: Thailand-Japan Joint Conference on Animal Health 2012
- ◆ Participation and presentation: Prince Mahidol Award Conference, 28-31 January 2013, Bangkok: NIAH attended and common NIAH-ANSES presentation on brucellosis “*Brucellosis diagnosis and control in Asia-Pacific Region: a joint FAO-APHCA and OIE initiative*” by Dr Bruno Garin-Bastuji.
- ◆ Co-organised: The 4th FAO-APHCA/OIE/DLD Regional Workshop on Brucellosis Diagnosis and Control in Asia-Pacific Region-Proficiency Test and Ways Forward-Chiang Mai, 19-21 March 2014, supported by FAO-APHCA and OIE-RRAP
- ◆ Installation of necessary equipment for Brucellosis laboratory (Two common NIAH-ANSES presentations: “*Brucellosis OIE laboratory twinning programme – France/Thailand*” and “*First proficiency tests– management and result analysis*”).
 - FAO-Regional office for Asia and the Pacific (FAO-RAP): molecular equipment
 - OIE under twinning programme: minor (small) equipment
- ◆ Research collaboration:
 - QIA-Korea and NIAH-DLD-Thailand (2014-2016): “*The molecular epidemiological analysis of Brucella species from a variety of animals and application on diagnostics for Brucella canis in Thailand*”
 - NIAH-Japan and NIAH-DLD-Thailand (June 2014-March 2017): “*Evaluation of milk sample for diagnosis of bovine brucellosis with Japanese-Enzyme-linked immunosorbent assay (ELISA-kit)*”
- ◆ Interlaboratory Proficiency test (ILPT): *1st Bovine Brucellosis Interlaboratory Proficiency Test in Asia-Pacific in 2013*

In 2013, a complementary action was supported by both FAO-APHCA and OIE Asia-Pacific Office in order to organise a regional proficiency ring-trial regarding the serological diagnosis of brucellosis with the continued support from the ANSES Laboratory in France. Thirty-three laboratories participated to this ILPT, including laboratories from 17 Asia-Pacific countries, 8 DLD’s RVRDCs, 1 Government enterprise, 4 Universities and 2 Private companies in Thailand and ANSES. Overall results were very good for a first ILPT (see above-mentioned poster).

Lessons learned from OIE Reference Laboratory Twinning Programme

In order to achieve the success of this laboratory twinning-programme, goal setting and effective communication are crucial. The laboratory policy needs to support the collaboration between organisations and encouragement from the laboratory directorate is essential. Furthermore, OIE Reference Laboratory comes with great responsibility thus laboratory members must work as a team and put all their efforts to address all technical and scientific issues, in order to fulfil its mandate. Becoming an OIE Reference Laboratory brought experts' experiences sharing, which significantly improved the laboratory capabilities regarding diagnostic techniques and staff's skills. This improvement has standardised the laboratory practices, which ensures the diagnostic result reliability. Hence, any brucellosis control programmes or measures could confidently utilise the laboratory's outputs. Additionally, the twinning programme has led to the collaboration between DLD and Public Health in a One Health concept approach. Moreover, the programme strongly strengthened the laboratory network in Asia-Pacific region.

Application for designation as an OIE Reference Laboratory for Brucellosis

An application for official recognition as an OIE Reference laboratory for Brucellosis was submitted by NIAH in 2015 to the OIE Biological Standards Commission, which gave a favourable opinion in September 2015. NIAH-DLD was then designated as a new OIE Reference Laboratory for Brucellosis on 26 May 2016, at the OIE World Assembly of Delegates.
